



A NOTICE OF A BUSINESS MEETING OF **THE GAMBIER ISLAND LOCAL TRUST COMMITTEE**
to be held at 10:30 am on Thursday, January 30, 2014
at Gleneagles Community Centre,
6262 Marine Drive, West Vancouver, BC

AGENDA

		Page No.	*Approx. Time*
1.	CALL TO ORDER		10:30 am
2.	APPROVAL OF AGENDA		
3.	MINUTES		
3.1	Local Trust Committee Meeting Minutes dated October 24, 2013 – <i>for adoption</i>	1	
3.2	Local Trust Committee Meeting Minutes dated November 29, 2013 – <i>for adoption</i>	11	
3.3	Section 26 Resolutions Without Meeting - <i>none</i>		
3.4	Gambier Island Advisory Planning Commission Minutes - <i>none</i>		
4.	BUSINESS ARISING FROM MINUTES		10:50 am
4.1	Follow-up Action List dated January 28, 2014 - <i>attached</i>	24	
4.2	Eelgrass Mapping for the Gambier Associated Islands		
	4.2.1 Islands Trust Fund Briefing – Memorandum dated January 21, 2014 - <i>attached</i>	26	
	4.2.2 Final Report – Nearshore Eelgrass Inventory 2012-2013 - <i>attached</i>	29	
	4.2.3 Gambier Associated Islands eelgrass mapping – Map 3a and 3b - <i>attached</i>	87	
5.	CHAIR’S REPORT		11:00 am
6.	TRUSTEES’ REPORT		
7.	DELEGATIONS		
7.1	Nancy Grenier for Belcorp Environmental Services Inc. regarding Garbage Incineration and Potential Port Mellon Site		
8.	TOWN HALL SESSION		
9.	CORRESPONDENCE		
	<i>Correspondence specific to an active development application and/or project will be received by the Gambier Island Local Trust Committee when that application and/or project is on the agenda for consideration.</i>		
10.	LOCAL TRUST COMMITTEE PROJECTS		11:30 am
10.1	Sustainability Guide - <i>for discussion</i>		
10.2	Foreshore Protection		
	10.2.1 Staff Report dated January 20, 2014 - <i>attached</i>	89	
	10.2.2 Draft Project Charter - <i>attached</i>	92	
	10.2.3 Staff Report dated November 16, 2013 – <i>attached</i>	93	
10.3	Official Community Plan Advocacy Policies Implementation – <i>for discussion</i>		
10.4	Riparian Areas Regulation Implementation and Use of Brochure – <i>for discussion</i>		

11.	APPLICATIONS AND PERMITS - <i>none</i>	
	BREAK	12:30 pm
12.	BYLAWS	
13.	REPORTS	
13.1	Work Program Reports	12:50 pm
	13.1.1 Top Priorities Report and Projects List dated January 28, 2014 - <i>attached</i>	97
13.2	Applications Log	
	13.2.1 Report dated January 28, 2014 - <i>attached</i>	100
13.3	Trustee and Local Expenses	
	13.3.1 Expenses posted to November, 2013 – <i>attached</i>	105
	13.3.2 Expenses posted to December, 2013 – <i>attached</i>	106
14.	NEW BUSINESS	
14.1	Sunshine Coast Regional District Referral regarding Temporary Use Permit for Concrete Batch Plant - <i>attached</i>	107
14.2	Sunshine Coast Regional District Referral regarding Agricultural Area Plan - <i>attached</i>	124
14.3	Hunting Issues, Southwest Corner of Gambier Island – <i>discussion</i>	
14.4	Meeting with Members of Legislative Assembly - <i>discussion</i>	
14.5	Advisory Planning Commission Terms Expire March 1, 2014 – <i>for discussion</i>	
	14.5.1 Memorandum dated January 17, 2014 – <i>attached</i>	128
14.6	Sensitive Ecosystem Maps – <i>for discussion</i>	
15.	ISLANDS TRUST WEBSITE	
15.1	Gambier pages – <i>for discussion</i>	
16.	NEXT MEETING	
	Thursday, March 20, 2014 at 10:30 am at Gibsons Library, 470 South Fletcher Road, Gibsons, BC	
17.	ADJOURNMENT	2:30 pm

*Approximate time is provided for the convenience of the public only and is subject to change without notice.



Gambier Island Local Trust Committee Minutes of a Regular Meeting

Date of Meeting: October 24, 2013
Location: The Manil Room, Gibsons and District Public Library,
 470 South Fletcher Avenue, Gibsons, BC

Members Present: David Graham, Chair
 Jan Hagedorn, Local Trustee
 Kate-Louise Stamford, Local Trustee

Staff Present: Aleksandra Brzozowski, Island Planner
 Linda Prowse, Planner 2 (in part, via teleconference)
 Diane Corbett, Recorder

1. CALL TO ORDER

Chair Graham called the meeting to order at 10:31 a.m.

Chair Graham acknowledged that the Local Trust Committee was meeting in the traditional territory of the Coast Salish people.

2. APPROVAL OF AGENDA

The Agenda was adopted, by consensus, as amended:

- 4.3 Woodlots on Gambier Island Discussion
- 4.4 Updates on BURNCO Working Group
- 4.5 2014 Schedule Confirmation
- 14.2 LNG Working Group Update
- 14.3 Trustee Hagedorn's Attendance at Foreshore Workshop in Whistler

3. MINUTES

3.1 Gambier Island Local Trust Committee Meeting Minutes dated September 26, 2013

The minutes of the Gambier Island Local Trust Committee meeting dated September 26, 2013 were adopted as amended by consensus:

- Page 6, item 10, last bullet, last sentence: replace "At UBCM"

- with “During the meeting with the Minister” followed by a comma;
- Page 7, delete third sentence of first paragraph: “The trustee noted...parks funds.”
- Page 16, item 18.6: replace “Trust Council” with “Trust Fund Board”.

3.2 Gambier Island Local Trust Committee Public Hearing Record dated September 26, 2013

The Gambier Island Local Trust Committee Public Hearing Record dated September 26, 2013 was received for information.

3.3 Section 26 Resolutions Without Meeting – None

3.4 Gambier Island Advisory Planning Commission Minutes – None

4. BUSINESS ARISING FROM MINUTES

4.1 Follow-up Action List dated October 10, 2013

Island Planner Brzozowski provided an update on the Follow-Up Action List dated October 10, 2013. Trustees provided updates on their respective designated actions.

GM-067-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee request staff to remove activity number 1 from the Follow-up Action Report dated May 12, 2011.

CARRIED

4.2 Membership in Coastal Douglas-Fir and Associated Ecosystems Conservation Partnership

Staff provided an overview of the Coastal Douglas-Fir and Associated Ecosystems Conservation Partnership (CDFCP) and responded to questions and comments from trustees. The entire Gambier Island Local Trust Area lies within the proposed boundaries. Trustees considered implications of alignment and possible outcomes regarding potential involvement with the Partnership.

GM-068-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee request staff to initiate membership in the Coastal Douglas-Fir and Associated Ecosystems Conservation Partnership; and sign the Statement of Cooperation, and appoint Trustee Stamford as a representative.

CARRIED

4.3 Woodlots on Gambier Island Discussion

Trustee Stamford discussed her concerns related to the woodlots on Gambier Island as they pertained to the correspondence she was drafting on behalf of the LTC to the Ministry of Forests, Lands and Natural Resource Operations. Key amongst her concerns was the lack of opportunity for public engagement in the process, and a question about the appropriateness of the established procedures for islands. The trustee invited input and feedback regarding content of the correspondence.

Trustee Graham noted the Local Trust Committee would have an opportunity to comment on the Ministry's management plan for the woodlots.

Trustee Hagedorn commented on the recovery of the area from previous industrial activities, noting the woodlots would create one to two jobs on the island and that the tourism potential of the area is huge. Trustee Hagedorn advocated advising the Ministry of the concerns that the trustees had received from constituents.

It was noted the woodlots had not yet been advertised.

Island Planner Brzozowski explained that the Ministry was currently looking into the ecosystem and environmentally sensitive data.

Trustee Stamford suggested the "Wilderness Conservation" zoning was misleading, as it implies "park".

4.4 Update on BURNCO Working Group

Trustees and staff discussed involvement of Islands Trust with the BURNCO Working Group.

4.5 2014 Schedule Confirmation

The 2014 schedule and the location of the November 29 business meeting were discussed. The 2014 schedule was confirmed.

GM-069-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee request staff to book the November 29, 2013 business meeting in an available location in West Vancouver.

CARRIED

5. CHAIR'S REPORT

Chair Graham enjoyed being on Lasqueti Island for a recent Trust Council meeting. Islands Trust is now moving into the 2014 - 2015 budget cycle. Chair Graham remarked that he was preparing for the upcoming Trust Council

meeting in December.

6. TRUSTEES' REPORT

Trustee Stamford announced that on October 3, 2013, the Sunshine Coast Regional District (SCRD) voted to exempt the Town of Gibsons from funding the nine regional docks, of which seven are on islands in the Gambier Island Local Trust area. The resulting funding gap is approximately \$44,000; there is also a dock maintenance request for approximately \$50,000 for 2014. Thus, the SCRD will be looking to make up almost \$100,000 for the coming year over a reduced funding base of about 11,500 taxpayers. This is in addition to the Langdale access dock levy that Howe Sound SCRD islands currently pay. Trustee Stamford plans to attend the early budget meetings at the SCRD in November.

Trustee Stamford recently sent out a request, based on previous Local Trust Committee discussions, that constituents email her if they do not have cell phone service, in order to assist in identifying where there are gaps in service. The trustee has received many emails already.

Trustee Hagedorn recommended a three-minute video on the Howe Sound area that was produced by a 15-year-old resident of Howe Sound, available at [Where can you find 45 adventures so close to Vancouver.](#)

On October 21, 2013, there was an article on Howe Sound in *The Globe and Mail*, on the threats to the ecosystem and the recovery, entitled: "Return of industry threatens renewal of Howe Sound's marine ecosystem" [Globe and Mail article.](#)

The Chair of Islands Trust submitted a formal letter with comments on the draft Application Information Requirements for the Proposed BURNCO Aggregate Project on October 18, 2013. On October 19, 2013, Trustee Hagedorn submitted individual comments on the draft Application Information Requirements for the Proposed BURNCO Aggregate Project to the Environment Canada Webpage. There will be an additional comment period later in the process.

Trustee Hagedorn spoke with Sandra Bicego, Manager of Environment and Sustainability with the District of West Vancouver. West Vancouver's work with homeowners and foreshore enhancements and Greenshores projects were discussed. Plans are to continue learning from West Vancouver initiatives and the work they have done with their community.

On October 15, 2013, Trustee Hagedorn attended an ad hoc committee in Horseshoe Bay with discussion concerning a Land/Marine Management Plan for Howe Sound. On October 1, 2013, the trustee attended the BC Environmental Assessment Office (EAO) public open house in Gibsons regarding the proposed BURNCO aggregate project at McNab Creek. There was a large turnout, with public, elected officials and many Gambier/Keats residents asking questions. There will be an additional comment period during

the application review stage when it will be possible to provide comments to the EAO on the proposed project.

7. **DELEGATIONS** – None

8. **TOWN HALL SESSION** - None

9. **CORRESPONDENCE** – None

10. **LOCAL TRUST COMMITTEE PROJECTS**

10.1 **Sustainability Guide**

Islands Planner Brzozowski discussed the Staff Report dated October 8, 2013. Trustees provided suggestions for additions to the guide and indicated they would forward further information to staff.

GM-070-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee change the “Building Sustainably: A Guide for Howe Sound and the Northern Gulf Islands” work plan as follows:

1. Remove “Second draft to the Local Trust Committee” dated November 29;
2. Remove “Referral to APC for review” dated December 2013/January 2014;
3. Change date for the “Final draft to Local Trust Committee” to November 29, 2013; and
4. Change the date for the “Printing for 250 copies” to December 2013.

CARRIED

GM-071-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee:

1. Endorse the work plan, as amended, for the Sustainability Guide project; and
2. Receive the attached first draft of “Building Sustainably: A Guide for Howe Sound and the Northern Gulf Islands”.

CARRIED

Chair Graham recessed the meeting at 12:30 p.m.

Chair Graham resumed the meeting at 12:45 p.m.

10.2 Shoreline Protection Guide

Islands Planner Brzozowski updated trustees on work done to gather requested background materials regarding a Shoreline Protection Guide.

Island Planner Brzozowski announced that webpages on shoreline types and how to care for shorelines has recently been uploaded to the Islands Trust website. [How do I Care for my Shoreline](#). Planner Brzozowski suggested that future work on Foreshore Protection education build on this new resource.

Planner Linda Prowse joined the meeting at 1:40 p.m. via teleconference.

11. APPLICATIONS AND PERMITS

11.1 GM-DVP-2013.3 (Wubs – North Thormanby Island)

Planner Prowse reviewed the staff report dated October 10, 2013 regarding Development Variance Permit for Lot 7, Block A District Lot 1017, New Westminster, Plan 10306, Vaucroft, North Thormanby Island, to vary the front setback from 6 metres (19.68 feet) to .61 metre (2.0 feet).

Planner Prowse confirmed:

- That the development variance permit application had been reviewed under newly adopted Bylaw No. 120;
- That a legal opinion confirmed that the legal owner, not the Crown, is the owner of land submerged under water when there is sudden erosion; and
- That the applicant had changed the plan to make the building smaller to comply with the new bylaw regarding maximum floor area and lot coverage.

There had been no response from community members regarding the application.

Trustee Hagedorn expressed support for the application in light of the closeness to the ocean and fragility of the foreshore, and that the structure backs onto bare land.

GM-072-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee issue a Development Variance Permit for GM-DVP-2013.3.

CARRIED

Planner Prowse left the meeting at 1:50 p.m.

11.2 GM-RZ-2012.1 (Reel 17 Investments Ltd. – Gambier Island)

Public comment on the application had been forwarded to trustees.

Trustee Hagedorn confirmed support for staff recommendations as noted in the Staff Report on application GM-RZ-2013.1, dated October 3, 2013.

Trustee Stamford indicated she wished to remove the restrictive covenant from some lots, indicating it was her understanding that the restrictive covenant was something that could be dealt with separately from the rezoning. The trustee inquired about the possibility of site-specific zoning.

Planning staff provided technical and process information related to the rezoning application, the community dock and the restrictive covenant.

Trustees and staff discussed the history of the application.

Trustee Stamford noted her concern to minimize the impact of the development on the existing road network. Another concern was receiving formal public feedback on the application late in the process. A majority of those present at the public hearing were in favor of the rezoning to W1 zone but not in favor of the restrictive covenant.

Chair Graham and Trustee Hagedorn supported preserving the community dock and not allowing a proliferation of private docks.

Trustee Hagedorn voiced support for the application in its protection of the foreshore. The trustee proposed that owners would probably use the community dock, the New Brighton public dock, and the road network, and mentioned that she looked at how owners could access their property with the least amount of impact. There are also OCP policies in strong support of foreshore protection.

Chair Graham noted that this was good, environmentally, for the Trust Area and is a model bylaw.

The applicant had already paid fees related to the application and the restrictive covenants, and had advised that he wished to move the application forward.

Island Planner Brzozowski explained that while the community dock exists and keeping the current size is the most efficient and economic option, the proposed bylaw would allow for expansion in the future. The original intent of the W1 zoning is to allow for a somewhat larger community dock and not allow private docks on the adjacent benefiting lots.

12. BYLAWS

12.1 Proposed Bylaw No. 123 cited as "Gambier Island Local Trust Committee Land Use Bylaw No. 86, 2004, Amendment No. 1, 2013"

GM-073-2013

It was **MOVED** and **SECONDED**,

that the Gambier Island Local Trust Committee give second reading to proposed Bylaw No. 123, cited as "Gambier Island Local Trust Committee Land Use Bylaw No. 86, 2004, Amendment No. 1, 2013".

OPPOSED – 1

(Stamford)

CARRIED

GM-074-2013

It was **MOVED** and **SECONDED**,

that the Gambier Island Local Trust Committee give third reading to proposed Bylaw No. 123, cited as "Gambier Island Local Trust Committee Land Use Bylaw No. 86, 2004, Amendment No. 1, 2013"; and refer proposed Bylaw No. 123, cited as "Gambier Island Local Trust Committee Land Use Bylaw No. 86, 2004, Amendment No. 1, 2013" to the Executive Committee for approval.

OPPOSED – 1

(Stamford)

CARRIED

Following up on a recommendation made at the Local Trust Committee (LTC) business meeting of January 31, 2013, Island Planner Brzozowski inquired if the trustees intended to tie successful adoption of the bylaw to successful adoption of the development variance permit.

There was consensus amongst trustees that the rezoning and the development variance permit applications would be considered separately.

13. REPORTS

13.1 Work Program Reports

The Top Priorities Report and Projects List dated October 10, 2013 were received for information. The Top Priorities list was discussed and modified.

GM-075-2013

It was **MOVED** and **SECONDED**,

that the Gambier Island Local Trust Committee request staff to

renumber the Top Priorities list as follows:

1. Foreshore Protection and Outreach;
2. OCP advocacy implementation support;
3. Sustainability guide; and
4. RAR implementation project for Gambier Island Local Trust Area.

CARRIED

13.2 Applications Log

The Applications Log Report dated October 20, 2013 was received for information.

13.3 Trustee and Local Expenses

The expenses report posted to September 30, 2013 was received for information.

14. NEW BUSINESS

14.1 Islands Trust Council Strategic Plan – Local Trust Committee Input

The Islands Trust Council Strategic Plan was received for information.

14.2 LNG Working Group Update

Trustee Hagedorn announced that a LNG working group has started.

14.3 Trustee Hagedorn's Attendance at Foreshore Workshop in Whistler

GM-076-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee approve expenditure of \$125 for Trustee Hagedorn to attend a workshop on addressing sea level rise and impacts on coastal communities, in Whistler from November 29 to December 1, 2013.

CARRIED

15. ISLANDS TRUST WEBSITE

Staff was requested to add to the Gambier page as new information, the foreshore website link noted in the previous discussion on the Shoreline Protection Guide (item 10.2).

16. CLOSED MEETING

GM-077-2013

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee close the next part of the business meeting to discuss matters pursuant to Section 90(1)(f) (Bylaw Enforcement) of the *Community Charter* and that staff be invited to attend this meeting.

CARRIED

Chair Graham closed the meeting at 2:22 p.m.

By general consent Committee reconvened in open meeting at 2:38 p.m.

17. RECALL TO ORDER

18. NEXT MEETING

The next meeting of the Gambier Island Local Trust Committee is scheduled for Thursday, November 29, 2013 in West Vancouver, location to be announced.

19. ADJOURNMENT

By general consent, the Gambier Island Local Trust Committee meeting was adjourned at 2:40 p.m.

David Graham, Chair

CERTIFIED CORRECT:

Diane Corbett, Recorder

DRAFT



Gambier Island Local Trust Committee Minutes of a Regular Meeting

Date of Meeting:	November 29, 2013
Location:	Gleneagles Community Centre, 6262 Marine Drive, West Vancouver, BC
Members Present:	David Graham, Chair Jan Hagedorn, Local Trustee Kate-Louise Stamford, Local Trustee
Staff Present:	Aleksandra Brzozowski, Island Planner Marnie Eggen, Planner 2 Francesca Marzari, Islands Trust Legal Counsel (a.m.) David Marlor, Director, Local Planning Services (a.m.) Kelly Gesner, Contract Planner (p.m.) Sonja Zupanec, Island Planner (p.m. via teleconference) Diane Corbett, Recorder
Others Present:	Garry Peters, Applicant, GM-DVP-2013.1 (a.m.) Margaret Crompton, Owner, GM-DVP-2013.1 (a.m.) Michael Stacey, Legal Counsel, GM-DVP-2013.1 (a.m.) Kevin Healy, Agent, GM-RZ-2004.1 Ian Grant, Owner, GM-RZ-2004.1 David Connop, Owner, GM-RZ-2004.1 Glen Donaldson, Keats Island Leaseholders Assoc. 37 members of the public – a.m. 7 members of the public – p.m.

1. CALL TO ORDER

Chair Graham called the meeting to order at 10:40 a.m.

Chair Graham introduced trustees and staff in attendance and thanked the public for coming.

2. APPROVAL OF AGENDA

The Agenda was adopted as amended by consensus, with the following additions:

- 14.2 Proposed Port Mellon waste incineration plant
- 14.3 Discussion of hunting issues on southwest peninsula, Gambier Island
- 14.4 MLA meeting discussion

For the convenience of the public, the business agenda commenced with items 11.1 and 11.2. The subsequent order of review of agenda items was as follows: 14.1, 14.2, 12.1, 16, 17, 10.1, 10.2, and 10.4. The following items were deferred to January, 2014: 3.1, 4.1, 5, 6, 10.3, 13.1, 13.2, 13.3, 14.3, 14.4 and 15.

3. MINUTES

3.1 Gambier Island Local Trust Committee Meeting Minutes dated October 24, 2013 – *Deferred*

3.2 Section 26 Resolutions Without Meeting – *None*

3.3 Gambier Island Advisory Planning Commission Minutes– *None*

4. BUSINESS ARISING FROM MINUTES

4.1 Follow-up Action List dated November 20, 2013 – *Deferred*

5. CHAIR'S REPORT – *Deferred*

6. TRUSTEES' REPORT – *Deferred*

7. DELEGATIONS – *None*

8. TOWN HALL SESSION – *None*

9. CORRESPONDENCE – *None*

10. LOCAL TRUST COMMITTEE PROJECTS

10.1 Sustainability Guide Final Draft

Island Planner Brzozowski discussed the memorandum, dated November 18, 2013, pertaining to an update on the status of the Sustainability Guide project.

GM 078/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee forward the Sustainability Guide on to the Bowen Island trustees for their consideration.

CARRIED

10.2 Foreshore Protection

Island Planner Brzozowski discussed the staff report, dated November 18, 2013, regarding drafting of a Project Charter for Foreshore Protection.

Trustees were requested to provide Island Planner Brzozowski with desired outcomes regarding foreshore protection, for discussion at the January meeting.

10.3 Official Community Plan Advocacy Policies Implementation – *Deferred*

10.4 Electronic Meetings

Island Planner Brzozowski noted that Legislative Services staff was working on the topic of electronic meetings for the Saltspring Island Local Trust Committee meeting in December, and that further information likely would be available for discussion on this topic at the Gambier Island Local Trust Committee business meeting in January, 2014.

11. APPLICATIONS AND PERMITS

11.1 GM-DVP-2013.1 (Crompton - 362 Mary Road, Gambier Island)

Two late items were presented for distribution:

- Staff Report dated November 21, 2013 regarding Development Variance Permit – Lot 1 of Lot 1, Block 2 of Block C, District Lot 847, Plan 499, Gambier Island; PID 007-295-928; and
- GM-DVP-2013.1 (Crompton) Compilation of Correspondence dated November 25 and 28, 2013.

Planner Eggen provided a summary of the staff report regarding a request for variances:

- to reduce the setback from the natural boundary of the sea from 15.0 metres to 2.56 metres (8.4 feet) to allow the location of a single family dwelling consisting of an existing cottage and connected cottage annex (including decks), existing freestanding wooden deck, existing wood shed and existing retaining wall; and
- to reduce the setback from the western interior side lot line from 3.0 metres to 0.0 metres (0.0 feet), and the eastern interior lot line from 3.0 metres to 0.64 metres (2.1 feet) to allow the location of a single family dwelling consisting of an existing cottage and a connected cottage annex (including decks), and an existing garage deck.

Planner Eggen summarized the number of public submissions on the application received since the Notice of Permit was issued: a total of 50 received, with 39 supportive and 11 unsupportive. Of the 39 supportive, six live on Gambier Island, 33 have visited the property; within a 100 metre radius of the property, two were supportive and six unsupportive.

Michael Stacey, Legal Counsel for the owner, presented a proposal for a redrafted form of the development variance permit. Mr. Stacey also indicated he had passed correspondence received on the application to Legal Counsel Marzari the previous day, and that, for the purposes of this application, the Cromptons had said they would accept the latest survey by Underhill and Underhill, notwithstanding the issues that are historic, and that measurements were based on the current natural boundary of the sea.

Mr. Stacey referenced supportive comments from the above noted correspondence. He questioned whether the "rural aesthetic" is a principle upon which this application should be considered, noting that a number of the properties in the area do not meet that criteria if this were to be applicable.

Mr. Stacey proposed a redrafted Development Variance Permit that included variances as follows:

- siting and setback regulations be reduced for the setback from the natural boundary of the sea from 15.0 meters to 2.6 meters (8.6 feet);
- siting and size be varied to reduce the setback from the western interior side from 3.0 meters to 2.0 meters (6.6 feet), and the eastern interior setback from 3.0 metres to 0.7 metres (2.3 feet); and
- the reductions would apply to the removal of the existing garage deck and removal of a portion of the decking on the single family dwelling that is less than 2.0 meters from the western lot line.

Chair Graham thanked Mr. Stacey for his presentation.

Legal Counsel Marzari noted, if the Local Trust Committee did wish to adopt something like what was just proposed, on a technical review she noticed that 2(b)(i) refers to the setback of the garage deck of 2.3 meters for the permission of a single family dwelling; the garage did not need a variance as it was not mentioned in Mr. Stacey's draft permit, so it probably should be 2.8 meters distance as that was the closest the single family dwelling is to the lot line.

Mr. Stacey accepted the updated distance of 2.8 meters.

Chair Graham invited members of the public who had signed a speakers list to provide comment to the Local Trust Committee.

Ruth Hume remarked that in a small community there is a lot of chance for challenges in letters that can destroy relationships. She hoped that a mediation of some kind is put towards future relationships on the island.

Margaret Crompton commented that anything that can be done to emulate everyone's love of Gambier and living on Gambier should be uppermost on peoples' minds.

Garry Peters apologized for having to put everyone through this, and indicated that he should have gone with a variance request first. Mr. Peters remarked that a better way to resolve this would be to mediate with the neighbor and that

he would be willing to participate in that. Mr. Peters did not think that taking down the annex would do that.

Gord Steele, resident of Gambier Island, remarked that some of the complainants had themselves built their houses without a permit; some built right to the lot line and road allowance. Mr. Steele commented that there seemed to be a persecution going on with this particular property. The lots are very small in the neighbourhood. Properties have been built too close to the sea with the current regulations. Presently three houses were being built on Gambier without permits, one right up to the lot line. Mr. Steel recommended granting the variance.

Chair Graham noted that Islands Trust does not go out of the way to look for inconsistencies with the bylaw. Its bylaw enforcement process is complaint driven.

Brian Anthony, long-time Gambier resident, commented that he hoped this matter could be resolved through arbitration, and that the small community seemed to be able to resolve problems that arise. Mr. Anthony indicated he did not know why the owner did not apply for a variance before building a house. He remarked that Islands Trust needed to take a stand on what is right or wrong. Mr. Anthony wanted this to be resolved without financial hardships for everybody.

Bruce Wilkie commented that the annex enhances the view of the cottage from the water and is a superb design that fits with the landscape and remainder of the property. The owners had spent a lot of time and effort ensuring the building tied in with existing and surrounding properties, and had ensured that the property is nice elsewhere, enhancing the beauty on Gambier in total and the value of surrounding properties.

Don Crompton remarked that the rural aesthetic should be off the table. A lot of the complainants did not have conforming properties; there was a suggestion in the letters that, if Islands Trust did not tear the place down, it would lose its power. Mr. Crompton asserted that the variances come out of English common law, and he did not think that by allowing the variance it would reduce the authority or value of Islands Trust. Mr. Crompton perceived there was not a loss of sight lines. Mr. Crompton recommended what Legal Counsel Stacey had suggested, with an added responsibility on the owner to satisfy the neighbours.

Andy Cleminson, a part-time resident of Gambier for 24 years, indicated that he was very conscious of Islands Trust's purpose, that he considered a very important one. Mr. Cleminson commented on the significant contributions of the owner and family to Gambier Island, and he recommended looking past this and at the whole community to acknowledge that this was a mistake and to move beyond that. Mr. Cleminson recommended ensuring the creation of "an ambience in the islands that we love."

Chair Graham noted that a perspective of Islands Trust's mandate, preservation and protection of the local environment, is a unique perspective that trustees have to use as a lens for making decisions. None of the decisions

are based on who owns what. Trustees are islanders and understand the value and strength of living on islands. Chair Graham requested that those present be respectful of the work the trustees have to do.

Trustee Hagedorn emphasized that each individual variance application is separate, with unique circumstances.

Planner Eggen indicated that the variance proposed by staff was structured in a way that all the structures and buildings on the site could not encroach any further vertically or horizontally.

Mr. Peters expressed a willingness to remove the deck if it hurt the application. Mr. Peters explained that, in the year of the new construction on the property, there was a lot of construction going on and a lot of people were building without a permit. Plans had been put together to submit, and, because the expense of building on Gambier and because others were building without a permit, he decided to join them. Mr. Peters noted he built the structure in two months. It stayed empty and there was nothing happening for over two years. He hoped this would go away and, when it did not, he had to deal with it.

Trustee Hagedorn remarked that this is a really unique property, where she had visited twice. She had heard a lot of comments regarding the view scape. She had visited the neighbor. The trustee explained that it appeared to her that the annex does cut off some view scape.

Trustee Hagedorn inquired about how much construction had been done when the Sunshine Coast Regional District (SCRD) contacted the applicant in 2008, to which Mr. Peters responded that the building was completely built with windows, doors and roof, but not finished inside. It was left empty in 2008. When he did not hear anything further, he finished the inside.

Chair Graham referred to the recommendation of staff and the proposed recommendation of the applicant, and invited trustees to make a motion.

GM 079/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee issue a Development Variance Permit for GM-DVP-2013.1 (Crompton) that authorizes the reduction of the minimum setback to the natural boundary of the sea from 15 metres to 2.8 metres (9.2 feet) to allow the location of the following:

- i. a single family dwelling consisting of only an existing cottage and its decks, up to within 2 metres (6.6 feet) from the western interior lot line;
- ii. an existing freestanding wooden deck;
- iii. an existing wood shed;
- iv. an existing retaining wall north west of the dwelling;

and to authorize the reduction of the setback from the western interior side lot line from 3 metres to 2 metres (6.6 feet) to allow the location of the following:

- i. a single family dwelling consisting of only an existing cottage, and decking;

located on Lot 1 of Lot 1, Block 2 of Block C, District Lot 847, Plan 4991, Gambier Island, PID 007-295-928 in accordance with Schedules 'A1' through 'A2' attached to and forming part of the permit, and amended to show:

- ii. the removal of the existing garage deck;
- iii. the removal of the portion of the single family dwelling that is less than 3 metres from the eastern interior lot line and that is less than 15 metres from the natural boundary of the sea;
- iv. the removal of the portion of the decking of the single family dwelling that is less than 2 metres (6.6 feet) from the western interior lot line.

Trustee Hagedorn commented on the difficulty and awkwardness of this decision. Trustee Hagedorn had referred to the Official Community Plan policies, the mandate of Islands Trust, and the land use bylaw policies, and visited the property twice to ensure doing due diligence. She noticed this is an extremely tiny lot, adjacent to very tiny lots. It is unique, attached to the natural boundary of the sea on two sides, highly visible, adjacent to a park and public dock with public access right beside it.

The trustee considered the questions: What are the reasons for allowing this DVP that is different from what the OCP and land use policy put in place, by the Gambier Island community? Is there a good reason why these bylaws should be changed to allow for this? Trustee Hagedorn looked for what is unique about the situation that would alter the policies and bylaws put in place because the community wanted them. The trustee looked at the mandate of Islands Trust, and at covenants, and sensitive ecosystems, whether there would be a better place for the house, and at whether it is reasonable that a new dwelling be built in the setback.

Trustee Hagedorn raised the following points:

- Policies that apply include: to protect public beach access to and from the marine shoreline, and to protect the foreshore. The 15-metre setback is to protect the foreshore because so many people want to build there. It is the highest density on the island.
- Another policy that applies is to minimize impacts on coastal ecosystems. There is a sensitive ecosystem right where the annex is placed. If the applicant were asking for permission to build there today, the answer would be 'no'.
- It is an awkward building site, although there is some room at the back; possibly something could be added to the existing footprint of the old cottage.
- Regarding the overall visual quality, when approaching Gambier Harbour by boat and seeing the property for the first time, the trustee thought there were two homes on the property and did not see it as visually tucked in but out in the setback.
- An objective in the Gambier Island OCP is that any new residential development in the Gambier Planning Area is undertaken in a manner that is respectful of the privacy of the adjoining property owners. There were two in support of the application, and six not in support. The trustee had heard there was no consideration or consultation before the structure was built.

Trustee Stamford agreed with what Mr. Cleminson said about the importance of this family in the community of Gambier Harbour and in the southwest peninsula as a whole. One of the strengths of The Hollies property is to bring different areas of Gambier Island together. Trustee Stamford noted she lives on Gambier in West Bay and that it is wonderful to be part of this large extended family and friends, and to see families from West Bay, who may not usually participate, out at events at The Hollies. Trustee Stamford reiterated her comment on the strength of the family at The Hollies to bring different areas of Gambier Island together.

The trustees' issues were not so much about the aesthetics. Trustee Stamford agreed with many of the comments about some egregious examples of architecture around the island. Trustee Stamford noted it was a question of process, and how this fit in primarily to the setback from the sea. Trustee Stamford remarked that there was every reason to give this property every consideration possible for variance. It is bounded by a public park. The boundary to the ocean is critical and a contentious issue everywhere.

Trustee Stamford asserted that this is a question of process, not just for this particular application but for everything that Islands Trust does: most often when there is a problem or a concern within the community, it is because the process was not followed. Examples would be what had been happening with Gambier logging, or with a proposal for a waste disposal incinerator at Port Mellon. It was because of the lack of public process that people were so upset.

The trustee's concern with this particular property was the setback from the sea and the lack of public process for the community of Gambier Harbour.

Trustee Stamford commented on peoples' questions about concerns that the Local Trust Committee decision at this meeting would cause divisiveness in the community, noting that she agreed but that the divisiveness already happened and started happening in 2008, and that it was unfortunate it was this property that precipitated some of that divisiveness.

Trustee Graham commented on the Islands Trust mandate of preserving and protecting unique amenities. He thought it was likely that the historic nature of this 1920s development could be considered a unique amenity. Chair Graham remarked that it was unfortunate that the process was not followed.

The question on the motion was then called.

CARRIED

Chair Graham recessed the meeting at 12:19 p.m.

Chair Graham reconvened the meeting at 12:34 p.m.

11.2 GM-RZ-2004.1 (Keats Camp – DL 696 – Keats Island)

Trustee Hagedorn declared a conflict of interest with application GM-RZ-2004.1 and left the meeting at 12:35 p.m.

Contract Planner Gesner reviewed the staff report dated November 15, 2013 on the rezoning application for amendments to the Keats Island Land Use Bylaw and District Lot 696, Keats Island Land Use Contract. It was intended that the rezoning would enable subdivision, with a subsequent stratification of a portion of the subdivided lots.

Contract Planner Gesner noted that the plan used in Figure 6 on page 12 of the report was outdated.

It was explained that there appeared to be some confusion regarding the community information meeting, which was not well attended, as well as the subdivision and rezoning process; Contract Planner Gesner recommended discussion of ways to better communicate with the community at large.

The Chair recessed the meeting at 1:06 p.m. to relocate the meeting to another room, and resumed the meeting at 1:10 p.m.

Island Planner Zupanec, scheduled to take over this file in December, 2013, joined the meeting at 1:10 p.m. via teleconference.

Discussion continued on developing the communications needed that would include all stakeholders and would update and educate on the current situation and applicable regulatory processes.

Contract Planner Gesner described the purpose and process of development permit areas, and noted the importance of minimal impacts of development when they accumulate upon the shoreline. It was noted there are up to about 50 additional piers that could be built. Discussion ensued on development permit areas as compared to restrictive zoning.

Agent Kevin Healy of Creus Engineering Ltd. thanked Island Planner Brzozowski and Contract Planner Gesner for moving this process along. Mr. Healy recommended against looking at inclusion of development permits for the foreshore at this time, as this would be something new in the Gambier Trust Area and on Keats that he thought would impede the current rezoning process and would overly complicate what should be a simple process.

Mr. Healy commented on the process of communications with leaseholders, noting that he had assumed there would have been more constituent awareness of land use processes, and describing other “hiccups” in the process of getting the word out about the scheduled November 26 community information meeting. In light of the poor attendance at that meeting in West Vancouver, Mr. Healy agreed that another community information meeting should be held. He offered to produce a communications plan to the Local Trust Committee moving forward.

Glen Donaldson, chair of the Keats Island Leaseholders Association, declared the association was in agreement with the communication plans. Mr. Donaldson

noted his agreement with the comments of Mr. Healy regarding development permit areas, which would be new information to the public and which he thought would best be dealt with separately as it was something that he felt would require study.

Kim Benson, Keats Island, as a former trustee involved in the Community Plan and the rezoning to 2008 and as a Keats Islander at large with a family neighbouring on the subject property, itemized her views on the current state of the application as follows:

- There is a need for the applicant to provide information on the application and communicate with and solicit feedback from the rest of the Keats Island community;
- In light of the size of the property (20% of the island) and it being an entrance point to the island, whatever is done there will affect the rest of the island especially in impacts on the water supply;
- There should be two information meetings, one in town and one on the island, with information provided in advance; and
- Neighbours within a radius immediately adjacent to the property should receive notification of the application.

Ms. Benson noted she was on the fence regarding a development permit area for the property shoreline. The area where the leasehold cottages are is water access; the need for docks there is a traditional one. The camp's marine zoning is constrained; little of the property has marine development. Most of the docks are nonconforming.

The owners of DL 696 replied that it is their understanding that there are water licenses for all the docks on the property.

Mr. Healy acknowledged the need to enhance the communications on the application. Potential communications venues were discussed.

Island Planner Brzozowski provided an overview on the current Gambier Trust Area process related to the study of options for shoreline protection.

GM 080/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee request that the applicant provide a communications strategy for public information to inform Keats Islanders and the community at large of the rezoning process and other information pertaining to District Lot 696.

CARRIED

GM 081/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee direct staff to revise draft Bylaw Nos. 100 and 101, amending the Land Use Bylaw No. 78 and the Land Use Contract, Keats Island Bylaw No. 4, respectively.

CARRIED

GM 082/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee request that staff provide the committee members with further discussion regarding shoreline protection strategies on District Lot 696.

CARRIED

Chair Graham recessed the meeting at 2:00 p.m.

Chair Graham reconvened the meeting at 2:10 p.m.

Trustee Hagedorn joined the meeting at 2:10 p.m.

12. BYLAWS

12.1 Proposed Bylaw No. 123 cited as “Gambier Island Local Trust Committee Land Use Bylaw No. 86, Amendment No. 1, 2013”

GM 083/13

It was MOVED and SECONDED,

that the Gambier Island Local Trust Committee adopt bylaw No. 123 as presented.

CARRIED

13. REPORTS

13.1 Work Program Reports – *Deferred*

13.2 Applications Log – *Deferred*

13.3 Trustee and Local Expenses – *Deferred*

14. NEW BUSINESS

14.1 Environmental Assessment Office Process regarding Eagle Mountain Gas Pipeline Environmental Assessment (LNG at Woodfibre)

Island Planner Brzozowski gave an overview of the memorandum dated November 18, 2013 with attached SCRD staff report of November 1, 2013 on the “Environmental Assessment Office Process regarding Eagle Mountain Gas Pipeline Environmental Assessment”.

GM 084/13

It was MOVED and SECONDED,
that the Gambier Island Local Trust Committee request staff to write a letter in response to the Sunshine Coast Regional District referral regarding Eagle Mountain/Woodfibre pipeline environmental assessment referencing the letter sent to the Sunshine Coast Regional District regarding issues affecting the Local Trust Area on the initial BURNCO Application Information Requirements.

CARRIED

14.2 Proposed Port Mellon Waste Incineration Plant

The consideration by Metro Vancouver of Port Mellon as a proposed waste incineration site was discussed.

GM 085/13

It was MOVED and SECONDED,
that the Gambier Island Local Trust Committee request the Executive Committee to amend the current Trust Council topic of proposed waste incineration location at Duke Point to include the Port Mellon location, for consideration for advocacy.

CARRIED

14.3 Hunting Issues, Southwest Corner of Gambier Island – *Deferred*

14.4 MLA Meeting Discussion – *Deferred*

15. ISLANDS TRUST WEBSITE – *Deferred*

16. CLOSED MEETING

GM 086/13

It was MOVED and SECONDED,
that the Gambier Island Local Trust Committee close the next part of the November 29, 2013 business meeting to discuss matters pursuant to Section 90(1)(f) (Bylaw Enforcement) of the *Community Charter* and that Staff be invited to attend this meeting.

CARRIED

Committee closed the meeting at 2:28 pm.

By general consent, Committee reconvened in open meeting at 2:34 pm.

17. RECALL TO ORDER

Rise and Report from Closed Meeting – none.

18. NEXT MEETING

18.1 Next Local Trust Committee Regular Business Meeting

The next Local Trust Committee regular business meeting is scheduled for Thursday, January 30, 2014 at 10:30 am at Gleneagles Community Centre, 6262 Marine Drive, West Vancouver, BC.

19. ADJOURNMENT

The Gambier Island Local Trust Committee meeting was adjourned by consensus at 2:40 pm.

David Graham, Chair

CERTIFIED CORRECT:

Diane Corbett, Recorder



Islands Trust

Follow Up Action Report w/ Target Date

Gambier Island Apr-11-2013

No.	Activity	Responsibility	Target Date	Status
1	GMLTC Chair to write a letter to Minister Terry Lake requesting the unanswered questions in last correspondence be addressed.	David Graham	Apr-19-2013	On Going

Jul-11-2013

No.	Activity	Responsibility	Target Date	Status
1	Staff to review the North Pender Shoreline brochure and modify it for either Gambier LTA or all Northern Islands. Update (Sept 26): Staff arrange to remove the two areas in the "Sharing Our Shorelines" document where it says "North Pender" and to add "Gambier Trust Area", and that staff print twenty-five copies.	Aleksandra Brzozowski	Oct-24-2013	On Going

Sep-26-2013

No.	Activity	Responsibility	Target Date	Status
1	Staff to research the history of Site-Specific water zones on Gambier.	Aleksandra Brzozowski	Nov-29-2013	On Going

Oct-24-2013

No.	Activity	Responsibility	Target Date	Status
1	Add a link to the 'How to Care for My Shoreline' webpages once they are available to go live.	Aleksandra Brzozowski	Nov-29-2013	Done

Nov-29-2013

No.	Activity	Responsibility	Target Date	Status
1	Issue GM-DVP-2013.1 (Crompton) as per resolution following staff recommendation.	Lisa Webster-Gibson	Dec-30-2013	Done

1	Adopted Bylaw 123 amending the Gambier Island Land Use Bylaw 78 on November 29, 2013.	Aleksandra Brzozowski Lisa Webster-Gibson	Dec-31-2013	Done
1	Staff to revise draft Bylaws No. 100 and No. 101, amending the Land Use Bylaw No. 78 and the Land Use Contract, Keats Island Bylaw No. 4, respectively.	Kelly Gesner Sonja Zupanec	Mar-20-2014	On Going
1	Staff to provide Trustees with possible shoreline protection strategies for DL 696.	Aleksandra Brzozowski Sonja Zupanec	Mar-20-2014	On Going



Memorandum

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Date: January 21, 2014

To: Gambier Island Local Trust Committee

From: Kate Emmings, Ecosystem Protection Specialist, Islands Trust Fund

Re: Islands Trust/Islands Trust Fund Eelgrass Mapping

Eelgrass Mapping in the Gambier Island Local Trust Area

Eelgrass mapping for the Gambier Island was completed in 2012 and mapping of the Gambier Associated Islands in Howe Sound was completed in 2013. Mapping was conducted by SeaChange Marine Conservation Society under contract with the Islands Trust (see attached report). Under a special funding agreement with Metro Vancouver, Bowyer Island and Passage Island surveys mapped the full areal extent of the eelgrass. For other islands, mapping shows the linear extent of eelgrass along the shoreline.

Findings for the Gambier Island Local Trust Area (excluding islands off of the Sunshine Coast, e.g. the Thormanbys) indicate that approximately 8.3% of the shoreline of Gambier Island has eelgrass present. Findings for the Associated Islands in Howe Sound showed eelgrass presence around Keats, Passage, Bowyer, Shelter, Preston, Pasley, Mickey, Hermit, Little Popham, Popham, Grace, Woolridge, Anvil islands as well as around the Ragged Islets. Eelgrass was not observed around Homer or Worlcombe islands. Because of time limitations and weather, the islands off of the Sunshine Coast were not surveyed. The Islands Trust and Islands Trust Fund hope to survey these in 2014, subject to budget.

About Eelgrass

Eelgrass is a critical nearshore habitat for birds, mammals, invertebrates and commercial and non commercial fish. Eelgrass beds are also an important carbon sink. Contaminants, shading from docks and overwater structures, increased sedimentation, marine traffic and development pressures from shoreline land use threaten eelgrass ecosystems and the species they support.

Report Recommendations

The 2012-2013 Nearshore Eelgrass Inventory Report contains several recommendations for consideration. Some of the relevant recommendations for local trust committees to consider are:

- Create setbacks from the shoreline in regulatory bylaws.
- Prevent construction of docks in eelgrass beds. Where dock construction cannot be avoided, ensure that docks are built to allow light to pass through to eelgrass beds below and that they are constructed from materials that have a minimum impact on water quality.
- Require removal of illegal shoreline modifications and habitat restoration where appropriate.

- Support education of the boating community and shoreline landowners regarding the importance of eelgrass beds and natural shorelines.
- Encourage the boating community not to locate mooring buoys in eelgrass beds and not to anchor in eelgrass beds. Where mooring buoys are located in eelgrass beds, encourage the use of line floats to keep chains and lines off of the sea floor where they can drag and scour the bottom, removing eelgrass habitat and killing species.
- Encourage dock owners to replace dock materials with light penetrable materials.

Next Steps

The Islands Trust Fund will place the eelgrass mapping and the associated report on its website at www.islandstrustfund.bc.ca and eelgrass mapping will be added to the MapIT public mapping site at <http://mapit.islandstrust.bc.ca> (links on Islands Trust and Islands Trust Fund websites). Local trust committees are encouraged to provide links to the mapping on their websites and consider actions within their local trust areas to include eelgrass protection in their official community plans and regulatory bylaws as per the Islands Trust Policy Statement, section 3.4.4 (see background below).

Attachment Report: 2012-2013 Nearshore Eelgrass Inventory
 Map 3a. Eelgrass Presence, Gambier Island
 Map 3b. Eelgrass Presence, Gambier Local Trust Area, Howe Sound Associated Islands

Background

The Islands Trust Policy Statement, section 3.4.4, states:

Local trust committees and island municipalities shall, in their official community plans and regulatory bylaws, address the protection of sensitive coastal areas.

The 2013 Audit of Biodiversity in B.C. (Office of the Auditor General of B.C., www.bcauditor.com/pubs/2013/report10/audit-biodiversity-bc-assessing-effectiveness-key-tools) highlighted the importance of collecting sufficient and reliable information on species distribution in order to make well-informed decisions about conserving biodiversity. With sensitive ecosystem mapping completed in the Islands Trust Area (2008-2010), the Bowen Island Municipality (BIM) and local trust committees have access to ecosystem data for terrestrial species. The Islands Trust and Islands Trust Fund are now working to acquire mapping of sensitive coastal areas to help island governments meet the requirements of the Islands Trust Policy Statement.

In 2012, the Islands Trust and Islands Trust Fund launched a project to map eelgrass as a partnership with the Seagrass Conservation Working Group and SeaChange Marine Conservation Society. The arrangement between the partners results in shared funding of the program between the Islands Trust, the Trust Fund Board and the Seagrass Conservation Working Group (through its member group, SeaChange Marine Conservation Society).

Eelgrass mapping is intended to assist BIM, local trust committees and the Trust Fund Board in making science-based decisions about land use and conservation to preserve coastal ecosystems in the Islands Trust Area. Eelgrass mapping will serve as a baseline inventory to monitor the effects of conservation activities, such as Marine Protected Areas, as well as human impacts, such as potential increased tanker traffic, marine industrial activities (e.g. log dumping and booms) and foreshore use (e.g. wharves and docks). It will also enable marine conservation groups to identify areas ideal for eelgrass restoration.

In 2012, the Islands Trust Fund and Seagrass Conservation Working Group, with financial assistance from some local trust committees and outside funders, mapped eelgrass in the following areas:

- Gambier;
- Lasqueti;

- Mayne;
- North and South Pender; and
- Thetis and associated islands (except Valdes).

In 2013, the partnership mapped eelgrass in the following areas, with funding from the Islands Trust, Islands Trust Fund, Metro Vancouver, Comox Valley Regional District, Capital Regional District, Victoria Foundation, Greater Victoria Savings and Credit Union Legacy Foundation and the Pacific Salmon Foundation:

- Bowen Island Municipality;
- Denman Island;
- Gabriola and associated islands;
- Galiano and associated islands;
- Gambier associated islands;
- Hornby Island; and
- Valdes Island.

Resources for Local Trust Committees

The following are some resources for local trust committees. Please see references in the attached report for a more complete list.

Hutton, K. E. and S. C. Samis. 2000. Guidelines to protect fish and fish habitat from treated wood used in aquatic environments in the Pacific Region. Can. Tech. Rep. Fish. Aquat. Sci. 2314: vi + 34 p. Available at <http://www.dfo-mpo.gc.ca/Library/245973.pdf> .

Fisheries and Oceans Canada. Projects Near Water. Available at <http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html> .

Province of BC. 2011 (amended August 2013). Land Use Operational Policy: Private Moorage. Available at http://www.for.gov.bc.ca/Land_Tenures/documents/policies/private_moorage.pdf .

EnviroVision, Herrera Environmental, and Aquatic Habitat Guidelines Program. October 2007 (revised June 2010). Protecting Nearshore Habitats and Functions in Puget Sound. Available at <http://wdfw.wa.gov/publications/00047/>.

2012 - 2013

Final Report Nearshore Eelgrass Inventory



**Prepared for the Islands Trust and
Islands Trust Fund by:**

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SeaChange Marine Conservation Society

Leanna Boyer, BSc. MA
Mayne Island Conservancy Society

Keith Erickson, R.P. Bio. Conservation
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Galiano Conservancy Association

Table of Contents

1.0	Introduction	3
2.0	Importance of Eelgrass	4
2.1	Biodiversity	4
2.2	Blue Carbon	4
2.3	Ecosystem Services	5
3.0	Eelgrass Habitat Characteristics	5
3.1	Wildlife Corridors	6
4.0	Impacts from Human Activities	6
4.1	Removal and Burial	7
4.2	Pollution and Changes to Freshwater Input	7
4.3	Forestry Practices	8
4.4	Oil Spills	8
4.5	Shading by Overwater Structures	8
4.6	Effects of Boating	8
5.0	Eelgrass and Rising Sea Levels	9
6.0	Mapping Methodology	9
6.1	Distribution	10
6.2	Form	10
6.3	Sediment Types	10
6.4	Percent of Cover	11
6.5	Tidal Fluctuations	11
6.6	Presence of Other Vegetation	11
6.7	Visibility	11
7.0	Survey Limitations	12
8.0	2012 Inventory Findings	12
8.1	Gambier Island Local Trust Area	12
8.2	Lasqueti Island	15
8.3	North Pender Island	15
8.4	South Pender Island	16
8.5	Mayne Island	16
8.6	Thetis Island Local Trust Area	16
9.0	2013 Inventory Findings	19
9.1	Galiano Island Local Trust Area	20
9.2	Gabriola Island Local Trust Area	21
9.3	Denman Island Local Trust Area	23
9.4	Hornby Island Local Trust Area	23
9.5	Ballenas – Winchelsea (Executive Islands)	
	Local Trust Area	23
9.6	Bowen Island Municipality	24
10.0	Threats to Eelgrass Habitats	26
11.0	Opportunities for Eelgrass Restoration	26
11.1	History of Eelgrass Restoration	27

11.2	Criteria for Successful Restoration	27
12.0	Recommendations	27
12.1	Education	28
12.2	Regulatory and Enforcement	28
12.3	Opportunities to collaborate with other agencies	29
13.0	Conclusion	29
	References	30

Eelgrass Maps

- Map 1. Eelgrass Presence North Pender Island
- Map 2. Eelgrass Presence South Pender Island
- Map 3a. Eelgrass Presence Gambier Island Local Trust Area
- Map 3b. Eelgrass Presence Gambier Local Trust Area Associated Islands
- Map 4a. Eelgrass Presence Thetis Island Local Trust Area Excluding Valdes
- Map 4b. Eelgrass Presence Valdes Island
- Map 5a. Eelgrass Presence Lasqueti Island – East
- Map 5b. Eelgrass Presence Lasqueti Island – West
- Map 6. Eelgrass Presence Hornby Island Local Trust Area
- Map 7. Eelgrass Presence Mayne Island
- Map 8. Eelgrass Presence Ballenas – Winchelsea (Executive Islands) Local Trust Area
- Map 9a. Eelgrass Presence Bowen Island North and Bowyer Island
- Map 9b. Eelgrass Presence Bowen Island South and Passage Island
- Map 10. Eelgrass Presence Denman Island Local Trust Area
- Map 11a. Eelgrass Presence Gabriola Island Local Trust Area – Southeast
- Map 11b. Eelgrass Presence Gabriola Island Local Trust Area – Northwest
- Map 12a. Eelgrass Presence Galiano Island Local Trust Area – South
- Map 12b. Eelgrass Presence Galiano Island Local Trust Area – North

Appendix A	Mapping Methodology
Appendix B	Maps of Shoreline Units
Appendix C	Summary of Overwater Structures

SeaChange Marine Conservation Society acknowledges the Mayne Island Conservancy Society for the use of its software and computer for data management. Seachange would also like to acknowledge funding from the following sources, which has made this project possible: Islands Trust, Islands Trust Fund, the Capital Regional District, the Comox Valley Regional District, Metro Vancouver, the Greater Victoria Savings and Credit Union Legacy Foundation, Vancouver City Savings (Vancity), the Public Conservation Assistance Fund, Moonstone Enterprise, the Pacific Salmon Foundation and the Victoria Foundation.

Thank you.

1.0 Introduction

Land use developments within watersheds have led to a loss of natural estuarine and nearshore marine habitats in British Columbia - the receiving waters of land based activities. Agriculture, forestry, and dredging for commercial and residential development have all contributed to the loss (Durance, 2002). The pressure to modify natural marine features and habitat for the development of commercial facilities and residential units within coastal areas is intensifying. To prepare for the increase in populations on the BC coast and concurrent shoreline developments, it is necessary to identify and quantify nearshore habitats to protect and maintain these valuable nearshore environments.

This final report of the 2012 - 2013 nearshore inventory of native eelgrass, *Zostera marina* in selected islands is a summary of the rationale, methodology and findings conducted for the Islands Trust and Islands Trust Fund. The areas mapped during the summer and fall months of 2012 for eelgrass habitats were the Thetis Island Local Trust Area (excluding Valdes and the Cufra Inlet), Lasqueti Island, Gambier Island, North and South Pender Islands and Mayne Island.

The islands mapped in 2013 include the Bowen Island Municipality, Valdes Island and Cufra Inlet within the Thetis Island Local Trust Area, the Gambier Island Local Trust Area Associated Islands (excluding the islands off of the Sunshine Coast) and the local trust areas of: Denman, Hornby, Ballenas – Winchelsea (Executive Islands), Gabriola and Galiano.

The report serves also as background information for future eelgrass inventories and adds value to the Islands Trust Shoreline Mapping Project. The goal is to support sound decisions that will affect the natural ecological health of the marine nearshores within the Islands Trust Area. The Islands Trust and Islands Trust Fund have limited jurisdiction over marine areas; however, they can have an impact on long term development and protection of the shoreline. This report and the mapping information that forms its basis are designed to assist Islands Trust and Islands Trust Fund planners to make science-based decisions when planning for nearshore areas.

ShoreZone maps of coastal habitats within the Islands Trust Area were created over the past decade. ShoreZone is a mapping and classification system that produces an inventory of geomorphic and biological features of the intertidal and nearshore zones from low altitude aerial images of the coastal environment (Harper 2011). These maps provided the groundwork for identifying suitable physical components for eelgrass on the islands mapped during 2012-2013. The presence/absence of *Zostera marina* was determined according to the methodology of Cynthia Durance, R.P. Bio., Precision Identification (Appendix A). A more detailed description of the methods used can be found in Section 6.

2.0 Importance of Eelgrass

Seagrasses are rooted aquatic plants that grow in estuaries and along low wave energy shorelines throughout the world. They have important influences on biogeochemical cycling, sediment stability, and food web support (McGlathery et al. 2007; Orth et al., 2006). Seagrasses can form extensive meadows supporting high biodiversity. The global species diversity of seagrasses is low (~60 species). Across the globe, however, seagrass meadows cover about 177,000 square kilometers of coastal waters – larger than the combined area of the Maritime Provinces (Short et al, 2007). British Columbia has about 400 km² of saltmarsh and eelgrass habitats (Campbell 2010).

2.1 Biodiversity

The complex and intricate food webs of an eelgrass (*Zostera marina*) meadow provide food and shelter for numerous fish and invertebrates. Meadows also serve as a nursery habitat and as a refuge from predation for juvenile fishes (Orth et al., 1984; Bostrom and Bonsdorff 2000; Duarte 2000). The productivity of native seagrasses rivals the world's richest farmlands and tropical rainforests. From an unstructured muddy/sandy bottom grows a myriad pattern of leaves that supply nutrients to salmonids and other fish, shellfish, waterfowl and about 124 species of faunal invertebrates. The plants offer surface area for over 350 species of macroalgae and 91 species of epiphytic microalgae – the basis of the food web for juvenile salmon in marine waters (Phillips 1994). Often referred to as “salmon highways”, nearshore marine environments containing eelgrass beds (*Zostera marina*) are home to over 80% of commercially important fish and shellfish species, including all species of salmon, at some point in their life histories (Durance 2002).

2.2 Blue Carbon

Like terrestrial forests, eelgrass habitats capture and store large amounts of carbon but at much more efficient rates - up to ninety times the uptake provided by equivalent areas of forest. This “Blue Carbon” is stored in sediments where it is stable for thousands of years. In B.C., roughly 400 km² of salt marsh and seagrass meadows sequester as much carbon as B.C.'s portion of the boreal forest, and the equivalent of the emissions of some 200,000 passenger cars (Campbell 2010).

When eelgrass beds are restored, the rate of carbon sequestration appears to be rapid over the first few years and up to 40 years following restoration. The natural transport of eelgrass by currents and wave action to deeper waters in estuaries and the coastal ocean may further sequester more carbon (Thom 2011).

As ocean waters warm as a result of climate change (up to 5 C° during the spring), greater flowering as well as faster growth of eelgrass shoots has been observed. Both of these changes result in greater biomass. Like marshes, much of the eelgrass biomass is under the substrate, indicating that a warming environment may result in greater carbon accumulation rates (Thom 2011).

2.3 Ecosystem Services

Ecosystem services are the benefits provided by the land, air, water and subsurface materials of the earth (Molnar et al 2012). Eelgrass habitats within the lower reaches of the Salish Sea provide carbon sequestration and storage, habitat refugia and nursery and nutrient cycling benefits to an approximated natural capital cost of \$80,929 per hectare per year (Molnar et al., 2012). Within the Islands Trust Area, eelgrass habitats also provide revenue for commercial fisheries, recreational fishery, and revenue from tourism.

Protecting and conserving, and in some instances restoring these critical habitats is a recommendation of the Islands Trust Fund's Regional Conservation Plan. Mapping eelgrass is identified as a priority to meet the goal of conserving marine ecosystems and habitats. As well, accounting for these benefits in economic dollars and cents and factoring them into decision making policies would emphasize the economic, cultural and ecological values of nearshore habitats.

3.0 Eelgrass Habitat Characteristics

Eelgrass meadows are found in most of the world's coastal temperate regions except at extremely high latitudes. Physical and chemical factors affecting *Zostera marina* include temperature, light attenuation, elevation, substratum, wave action, salinity and pH. Worldwide, the plants survive under a wide range of water temperatures, from 0° to greater than 30°C. The optimum temperature for growth lies between 10° - 20° C in most areas (Phillips 1984). Eelgrass grows best within the Salish Sea in salinity ranges of 20 ppt - 32 ppt. Eelgrass can tolerate periods of freshwater inundation on a seasonal or daily basis (Durance 2002).

Of all the above factors, light availability and elevation may be the most crucial. Light availability seems to be the primary factor limiting depth distribution, density, and productivity of eelgrass meadows within their salinity and temperature ranges. When the Coal Port was expanded in 1982-1983 in Roberts Bank, both species of eelgrass (*Z. japonica* and *Z. marina*) expanded. The construction of causeways across a broad intertidal zone directed the turbid Fraser River water offshore, improving the light regime and initiating higher productivity in the eelgrass beds (Harrison and Dunn 1999).

3.1 Wildlife Corridors

Seagrasses are in decline throughout much of the world, with rates of loss accelerating from a median of 0.9% per year before 1940 to 7% per year since 1990 (Waycott et al., 2009). It has been estimated that 18% of coastal marine and nearshore wildlife habitat in the Salish Sea has been destroyed (British Columbia/Washington Marine Science Panel 1994). A large percentage of this decline is attributed to human impacts, including filling of shallow waters, dredging, and eutrophication (Short and Wyllie-Echeverria 1996).

Often referred to as “salmon highways”, nearshore marine environments containing *Z. marina* beds are home to more than 80% of commercially important fish and shellfish species, including all species of salmon, at some point in their life histories (Durance 2002). *Zostera marina* beds are highways for Chinook, Coho, Pink, Chum, and Sockeye salmonid stocks (Thompson 1994). Great Blue Herons have been observed to feed in eelgrass beds within 3 km of their nesting colonies. Other important bird species using these habitats include Brant geese, Rhinoceros Auklets, cormorants and Western Grebes.

E.O. Wilson proposed the importance of habitat corridors in the 1960s (MacArthur and Wilson 1967). Habitat reduction and fragmentation at a variety of spatial scales has been widely acknowledged as a primary cause of the decline of many species worldwide (Thompson 1994). Habitat fragmentation generally leads to smaller and more isolated animal populations. Smaller populations are more vulnerable to local extinction. To reduce the isolation of habitat fragments, many conservation biologists have recommended maintaining landscape "connectivity" - preserving habitat for movement of species between remaining fragments (BC/Washington Marine Science Panel 1994).

Many nearshore environments on the islands inventoried in 2012 and 2013 indicated continuous fringing eelgrass beds. These beds are the connectivity for salmon and other marine wildlife for shelter, food and refugia. Although they may be less biomass than continuous flat beds of eelgrass plants, they serve an important function and should be protected.

4.0 Impacts from Human Activities

The majority of the earth’s population now lives within 10% of land defined as “coastal”. One of the results of this increased pressure on coastal shorelines has been the destruction of approximately 215,000,000 acres of estuarine habitat worldwide (BC/Washington Marine Science Panel 1994). Seagrasses are in decline throughout much of the world, with rates of loss accelerating from a median of 0.9% per year before 1940 to 7% per year since 1990 (Waycott et al., 2009).

It has been estimated that 18% of coastal marine and nearshore wildlife habitat in the Salish Sea has been destroyed (British Columbia/Washington Marine Science Panel 1994). A large percentage of this decline is attributed to human impacts, including filling of shallow waters, dredging, and eutrophication (Short and Wyllie-Echeverria 1996). With the population of the Georgia Basin/Puget Sound forecasted to exceed nine million people by 2020, nearshore critical habitat loss is likely to increase.

The following is a description of some of the major impacts human coastal settlements have on eelgrass habitats and their functions.

4.1 Removal and Burial

Dredging and filling associated with the construction of harbors and ports have been the major cause of the decline in eelgrass beds (Levings and Thom 1994). The plants themselves are removed and then the physical, chemical and biological composition of the system is altered. Sediments raised by dredging can also bury plants growing nearby and alter eelgrass density by affecting water clarity. The reduction in plant density can further increase silt load because it reduces the capacity of eelgrass beds to trap sediments. It can also increase the erosion of bottom sediments because of the reduced root mass available to hold sediments together. The ultimate result is the reversal of the entire nutrient-flow mechanics of the ecosystem. Dredging activities include hydraulic clam harvesting, bay scallop raking, oyster harvesting and maintenance dredging of harbors. Filling in shallow wetland areas with the debris from wood processing (e.g. log dumps and log booms), sediment runoff from agricultural land and logging severely impact eelgrass habitats as well (Phillips 1984).

4.2 Pollution and Changes to Freshwater Input

Since estuaries are extremely vulnerable to changes in salinity and temperature, human activities affecting freshwater flows from streams heavily affect eelgrass meadows. Pristine watersheds surrounding estuaries provide steady supplies of fresh water and clean sediments to seagrass communities in the estuary. The opposite holds true as well: unhealthy watersheds increase the problems for seagrass distribution and productivity. Activities that cause increased nutrient loads in streams and rivers can result in overgrowth of algae that then die and deplete the oxygen from the bottom of poorly flushed bays. Chemical contaminants, such as fertilizers, pesticides and household hazardous wastes, runoff from streets and roads and runoff from industrial activities also add to the toxic composition of muddy bottoms of eelgrass meadows (BC /Washington Science Panel 1994).

Quiescent waters are more susceptible to chronic contamination than areas with high energy water flows (Harrison and Dunn 1999). In the Salish Sea, more than 540 sq. kilometers of intertidal gravel, sand and mud habitat are closed for shellfish harvesting because of bacterial

contamination. More than 730 sq. kilometers of shallow water habitat are unusable for crab and shrimp because of dioxin contamination from pulp mills. More than 32% of classified commercial shellfish growing areas in Puget Sound and Juan de Fuca Strait are either restricted or prohibited for harvesting due to water quality issues (Levings and Thom 1994). The same activities that impact shellfish, crab and shrimp harvesting also impact the health of eelgrass meadows.

Most toxic chemicals that accumulate in sediments in an inland sea such as the Salish Sea reside there for long periods of time unless they are physically removed. There is evidence that the roots of eelgrass take up a significant amount of heavy metals for long periods of time (e.g. lead, cadmium, zinc and chromium), thereby making up a large pool of heavy metals in coastal systems (Lyngby and Brix 1989). The consequences of toxic chemicals may have long term effects on eelgrass consumers, especially waterfowl and marine invertebrates.

4.3 Forestry Activities

Logging may cause scouring of stream channels and thereby increase sedimentation in estuaries, limiting the light available for photosynthesis. Bark chips from log booms smother eelgrass beds and form a blanket on the substrate, which leads to anaerobic sediment devoid of life (BC/Washington Marine Science Panel 1994).

4.4 Oil Spills

Oil spills pose serious threats to eelgrass communities growing in sheltered bays that are poorly flushed. These areas will tend to retain oil for long periods of time, becoming chronically contaminated. If spills happen in late summer or winter when leaf sloughing is at its peak, mats of drift blades will tend to catch and retain oil for later decomposition in the intertidal zone. Seed production and viability could be affected if a spill occurs in the spring (Beak Consultants 1975).

4.5 Shading by Overwater Structures

The apparent increase in demand for overwater structures in the Howe Sound Islands can have deleterious and cumulative impacts on the nearshore system. Shading, disruption of nearshore marine water movement, damage to the shore and subtidal habitat and operational pollution from boats can be some of the impacts (Van der Slagt et al., 2003).

4.6 Effects of Boating

Boat propeller cuts disturb eelgrass beds in shallow waters, both when boats are travelling through shallow areas and when they are approaching the shore to debark passengers, moor or anchor. The impacts from boating activities in eelgrass beds may be affecting waterfowl such as Black Brant, direct grazers on eelgrass. The Brant have been steadily decreasing in the Pacific Northwest since the 1940's (Phillips 1994).

Conserving eelgrass habitats enhances the amount of high quality rearing habitat as well as increases the ecological services for human communities, including erosion control, sediment settling and food production (shellfish and fish). With the population of the Georgia Basin/Puget Sound forecasted to exceed nine million people by 2020, nearshore critical habitat loss is likely to increase.

5.0 Eelgrass and Rising Sea Levels

Sea level rise and increased frequency and intensity of extreme weather are two expected and observed effects of climate change (IPCC, 2007, IPCC 2012). The Intergovernmental Panel on Climate Change warns that on small islands in particular, sea level rise is expected to exacerbate coastal hazards such as storm surges, floods and erosion (IPCC 2007).

Impacts of rising sea level on the coastline of the Salish Sea will be more complicated than the inundation of low-lying areas. The effects will differ significantly between different shoreline features. Inland movement of sea water (Titus and Strange 2008), as well as erosion and re-deposition of sediment will reshape the coastal landscape where there is room for the shoreline to shift and sufficient sediment is available (Mumford 2007). Increasing sea levels are expected to shift the zone in which sunlight is available to eelgrass beds. As a result, eelgrass beds are expected to shift inland unless barriers impede this shift (Titus and Strange 2008).

Eelgrass beds play a role in shoreline stability. Established eelgrass beds reduce currents, leading to increased sediment and organic detritus deposition (Durance 2002). Continuous dense eelgrass beds provide a buffer for incoming wave energy. The more the bed is fragmented by physical structures (e.g. boats, wharves, docks and overwater play structures), the less eelgrass beds function as an erosion buffer. Where shorelines are constrained by development or structures to prevent erosion (e.g. rip rap, sea walls), natural coastal features will be squeezed out and maintaining shoreline infrastructure and development will require increasingly expensive engineering measures (Mumford 2007). Pre-emptive planning for these changing conditions is necessary to protect settlement areas and shore features recognized for their natural and ecosystem services. This planning includes protection of natural buffers such as eelgrass beds. Preemptive planning for these changing conditions is necessary to protect settlement areas and shore features recognized for their natural and ecosystem services.

6.0 Mapping Methodology

Identifying and monitoring the distribution of native eelgrass habitats supplies much needed information for regional planning for conservation purposes. Maps and associated outreach activities also may lead to improvements in land use practices from increased knowledge and awareness about the habitat. Locating areas suitable for eelgrass restoration will lead to rehabilitation of eelgrass meadows as funding opportunities become available.

The eelgrass inventory for this project entailed determining the presence or absence of *Zostera marina* with an underwater towed camera and a boat, except in the Cufra Inlet (Thetis Island) where mapping was done by kayak without a towed camera due to shallow tides. GPS hand held units were used to record waypoints at approximately 10 m intervals in 2012. Accuracy of the GPS readings was on average +/- 2.4 metres. In 2013, a Trimble Pathfinder ProXR GPS was used, except in the Cufra Inlet where a handheld GPS unit was used. A detailed description of the methods used to map eelgrass habitats can be found in Appendix A.

The terms used to map eelgrass habitats are described below:

6.1 Distribution

The distribution of eelgrass within the bed is described for this inventory as either patchy or continuous. Patchy beds are those that contain isolated groups or patches of plants. Beds which are not patchy are classified as continuous; a bed that contains bare patches surrounded by eelgrass is classified as continuous. The boundary of a bed is determined by a shoot density of less than 1 shoot per square meter (Durance, 2002).

6.2 Form

There are two basic forms of eelgrass beds in the Pacific Northwest: fringing beds that occur as relatively narrow bands usually on gentle slopes, and more expansive beds that cover large areas such as tidal flats known as “flat” beds (Durance, 2002). Inter-annual variation within a bed is not well known, but appears to be less than ten percent (Dowty et al, 2005). Fringing beds are generally linear. Flat beds are areas of large eelgrass beds in embayments that extend deeper than fringing and more linear beds found along shorelines (Dowty et al. 2005). Distribution is often, but not solely, determined by aspect to dominant winds. Eelgrass distribution across a bathymetric gradient is limited at the upper boundary by the degree of exposure at low tide (desiccation) and by light limitations at the lower boundary.

6.3 Sediment Types

When possible, field observers rated the primary, secondary and tertiary occurrence of substrate types: sand, mud, pebble and cobble. A subtidal environment dominated by cobble might indicate a habitat more suitable for large kelps, which would shade any eelgrass shoots growing between the cobble during the summer months. A predominately sandy muddy bottom would support continuous eelgrass meadows in most cases, unless other factors are present, such as exposure to strong waves or the interruption of habitat by boat mooring buoys. In some cases substrate characteristics change with increasing depth (e.g. cobble to sandy or mud to cobble).

6.4 Percent of Cover

Percent cover was estimated in broad categories to increase accuracy of observation (<25%, 26-75%, >75%). The coverage of an eelgrass meadow reflects both the substrate and the flow of water through it. A calm environment with a sandy mud substrate generally supports a dense, continuous eelgrass bed with virtually 100% cover. The cover of eelgrass in areas subjected to strong currents is typically patchy. Areas with heterogeneous substrate (mixture of fine and coarse) also tend to be patchy (Durance 2002). The percent of cover data collected from this inventory is based on subjective approximations as observed through the lens of an underwater camera. The approximate percent of cover does give important information on the density and productivity of a bed.

6.5 Tidal Fluctuations

It was important to note whether the tide was running or slack at the time of the inventory. Eelgrass shoots will tend to bend towards the substrate during running tides; the accuracy of percent of cover is then very approximate.

6.6 Presence of Other Vegetation

Other types of algae were documented as broad or tuft. Broad algae, such as kelps, sea lettuce and *Sargassum muticum* can blanket the ocean floor and make it difficult to characterize substrate. They can also shade eelgrass in mixed substrates as they anchor to hard surfaces. Tuft algae, such as brown and red algae do not shade eelgrass but indicate presence of hard surfaces for attachment. The presence of kelps, predominately large brown kelps, was noted, as was the presence of other types of smaller algae and *Sargassum muticum*. *Sargassum* is an exotic species of algae that can overshadow eelgrass if the substrate is a mix of sand and cobble. The presence of *Sargassum* was noted especially off the shores of Thetis and North and South Pender Islands.

6.7 Visibility

Visibility was a subjective observation and was rated low, medium and high. The amount of visibility could impact in some instances the accuracy of the observations, namely characterization of substrate. For example, Gambier Island often had low visibility. This can be caused by winds, sediment flows from the lower reaches of watersheds, inputs from nearby streams and tidal/current movements. Low tide periods make for the best visibility.

7.0 Survey Limitations

The range of accuracy for all the islands surveyed in 2012 was within +/- 2.4 metres. Visibility at times was poor, due to tidal influences, sedimentation in the water column from stream outflows, summer plankton blooms and wind. During the last day of mapping Gambier Island in August,

2012 the wind was too high to continue the inventory. The survey team returned to complete the inventory in September 2012. During the 2013 survey of islands within Howe Sound, the winds were often a factor in scheduling the inventories. The average horizontal precision for the GPS unit used for the 2013 eelgrass inventory was 0.814 m.

Percent of cover of eelgrass shoots is difficult to assess accurately with an underwater camera but was deemed important to characterize. Areas of particular interest (e.g., impact of shoreline modifications, restoration potential) should be surveyed by SCUBA divers. Overall, this inventory is an indication of the presence or absence of eelgrass habitat and does not represent maps of the outer or shoreward edges of each bed, with the exception of Bowen, Passage and Bowyer Islands. Polygons were mapped for these islands where possible in 2013.

8.0 2012 Inventory Findings

Eelgrass inventories were conducted using ShoreZone inventory maps which include presence of eelgrass where available and the ShoreZone shoreline classification types (available for all islands) as a reference.

The Islands Trust eelgrass inventory is important, particularly on islands such as Gambier and Lasqueti, as the ShoreZone data was based on Orthophoto images alone. Valdes, Cufra Inlet (Thetis Island), Passage and Bowyer Islands were mapped in 2013, but are included here under the 2012 inventory, as they are within the Thetis Island and Gambier Island local trust areas which were surveyed in 2012.

8.1 Gambier Island Local Trust Area

Gambier Island was surveyed on August 21st-23rd and September 11th, 2012. This island has rugged shorelines, with steep slopes leading to the subtidal zone. Eelgrass habitat comprises approximately 8.3% of the island's linear subtidal shoreline. The majority of the eelgrass beds are fringing, the significance of which has been described earlier in this report as important to wildlife corridors.

Gambier Island has been highly impacted by historical log storage practices. Eight sites were identified as possible restoration areas starting with small eelgrass test plots (approximately 800 to 1000 shoots). Larger eelgrass restoration might occur if these test plots increase in shoot density and coverage and as funding opportunities arise. In some of these sites, backshore lands have been placed on the real estate market, which may impact future restoration efforts if docks and wharves are permitted as additions to upland development.

Boat mooring buoys and recreational equipment on the water over eelgrass beds as well as derelict log booming cables and booms were observed. There were numerous docks and wharves within eelgrass habitats. Several large shoreline modifications were also noted. These changes to

the shore can have long term impacts on nearshore environments, including wave scouring, shading and interruptions to sediment transport. With the presence of active and retired log leases, the island would greatly benefit from an eelgrass restoration strategy plan to increase value for both biological diversity and ecological services.

Bowyer Island was surveyed on October 11-12th, 2013 using the polygon mapping methodology. The west, north and east coasts of Bowyer Island are largely steep and rocky. The south shore is characterized by several coves, varying in substrate. Eelgrass was estimated to extend along 11.35% of the Bowyer Island shoreline, observed only in particular coves along the southern portion of the island. The area of polygons containing eelgrass was observed to total 3690 m² and the length of mapped line features was observed to total 70 m. In addition to continuous beds, 4 individual patches of eelgrass were recorded, noted on the map as points. Eelgrass around Bowyer Island was similar in appearance and percent cover to that surrounding Bowen Island, i.e. patchy and sparse. Percent cover within the polygons was less than 25%.

Docks were located in eelgrass depth in the bay on the central southern shore of Bowyer Island, within zone W2/W1a. Eelgrass beds in that bay were observed to extend as far as the docks. Several chains were located on the ocean floor in zone W2 on the southeast shore of the island, and a large dock is within or adjacent to the eelgrass bed.

Large schools of small fish were frequently observed while circumnavigating Bowyer Island, particularly on the west, north and east coasts. Also observed were large numbers of pile perch (*Rhacochilus vacca*) and rockfish. Harbour seals were observed in several locations.

Passage Island was surveyed on October 5th, 2103 using the polygon methodology. One of the most exposed islands of Howe Sound, this island is a good example of how people and eelgrass tend to occur within similar, sheltered environments. Most of the island is characterized by rocky cliffs, with a few beaches. Eelgrass was observed in sections of the east coast of the island, along 15.67% of the total shoreline of the island. The area of polygons containing eelgrass was observed to total 3718 m² and the length of mapped line features was observed to total 40 m. Percent cover within the polygons was less than 25%. Ropes were observed on the sea floor in eelgrass depth in an area of the southeast coast of the island in the presence of patchy eelgrass. In this area was also located a floating dock within eelgrass depth and approximately 12 moorings in the eastern part of the area, where the eelgrass was very sparse and patchy. A floating dock and mooring was located at the south end of the more northerly eelgrass polygon on the east coast of the island.

The islands west of Bowen Island were inventoried between August 4th - 6th, 2013. The linear shoreline extent of eelgrass habitat surrounding the associated islands within the Gambier Island Local Trust Area totals approximately 13.27%.

Most of **Keats Island** contains flat or fringing beds of continuous eelgrass habitat on sandy/mud substrates, especially on the north and west facing shores. Patchy eelgrass beds were observed on the southeast shores, most likely due to exposure to predominant winds.

A high preponderance of single eelgrass patches lie on the southern tip of Keats Island, which may be caused by exposure to southerly winds, but also to the multiple locations of docks, especially on the southwestern shore.

There is potential for eelgrass restoration on the northern end of the island at the eastern point of a log booming area if the log lease is retired in the future. This area has a rocky/cobble foreshore, forested backshore and water park with overwater floats. There are also many docks on the southwestern portion of the island, which may cause fragmentation of eelgrass beds. Where there were low rock/cobble substrates, no eelgrass was present.

Anthropogenic Impacts include the construction of docks, presence of moored boats in eelgrass beds, removal of native backshore vegetation and recreational use of the nearshore (water park overwater play structures).

Continuous flat eelgrass habitat was observed in the southeast and western shores of **Shelter Island** directly west of Keats Island. No eelgrass was found near **Home Island** south west of Keats Island. **Preston Island** south of Keats Island contains a small continuous eelgrass bed on the southeast shore. The backshore is forested. **Ragged Islets** contain mostly patchy eelgrass beds throughout most of the subtidal areas, except for the west facing side of the islets. Mooring buoys and docks were observed on the eastern shore and a float on the northern side of the islets. Most of the islets are forested and contain rocky substrate. The small islet to the northeast contains a fringing continuous eelgrass bed.

The majority of eelgrass surrounding **Pasley Island** south of Ragged Islets is flat and continuous in sandy/shell hash substrate. Vegetation along the foreshore has been cleared near many residences. Retaining walls, docks and mooring buoy chains interrupt eelgrass continuity along the south and southeastern facing shores. There is potential for eelgrass restoration on the southeastern facing shore almost at the midpoint of the island where there is a gap in an otherwise flat continuous eelgrass bed. On the northeastern shore of Pasley there is a dense eelgrass bed that could serve as a possible harvesting site for restoration of lost or damaged eelgrass habitat.

No eelgrass was noted off of **Worlcombe Island** southeast of Pasley Island.

Mickey Island northeast of Pasley Island is surrounded on its western, southern and northern shores by mostly fringing patchy beds of eelgrass in sandy/shell substrate. Eelgrass is mostly likely limited on the eastern shores by low rock/boulder substrates. The rocky shores are surrounded by natural forests. Minimal anthropogenic impacts were observed.

To the west lies **Hermit Island**. The majority of eelgrass habitat is flat and continuous in sandy/shell hash substrates. Most of the habitat is located on the east facing shoreline, though the foreshore is cobble or low rock. The majority of the backshore is forested. In some areas, dock construction interrupts eelgrass beds. Harlequin ducks were observed within an eelgrass area on the southwestern side of the island.

Little Popham Island south of Hermit Island has mostly continuous flat beds of eelgrass to the southwest and northeast next to rocky shores and forested backshores. It is very likely eelgrass is limited by the subtidal low rock/boulder substrate surrounding the remaining areas of the island. Most of the eelgrass around **Popham Island** lives on the northeastern portion of the island in sandy/shell substrate and consists mostly of continuous and flat beds along steep rocky shores.

Grace Island southwest of Gambier Island contains mostly fringing continuous eelgrass habitats in shell/sand substrates next to steep rocky foreshores and forested backshores. A large school of fish was observed. **Woolridge Island** to the northwest of Gambier Island contains mostly flat continuous beds of eelgrass on its north facing shores. The beds are very robust, with a possible harvesting site on the east shore if restoration is undertaken in this area. There is woody debris noted near a breakwater on the north western facing shore of the island.

The majority of eelgrass habitat surrounding **Anvil Island** northeast of Gambier Island lives on the southeastern shores and is characterized as fringing. Most of the island is classified as cliff or low rock/boulder which is limiting for eelgrass growth. The presence of numerous mooring buoys and retaining walls impact the habitat. One potential restoration site was identified on the eastern shore.

The islands near the Sunshine Coast within the Gambier Island Local Trust Area were not mapped in 2013 due to poor mapping conditions and scheduling limitations. There are plans to inventory them in 2014, subject to funding and capacity.

8.2 Lasqueti Island

Lasqueti was surveyed from July 17th to July 19th 2012. This island's shoreline is composed of substrate formed from shallow stony deposits over bedrock. Shallow sandy/muddy benches extend into the subtidal zones. Eelgrass comprises approximately 13.8% of the island's linear intertidal and subtidal shoreline. The majority of the eelgrass habitat is flat, dense and continuous. Most of the backshore lands were naturalized with little development.

Possible impacts that could be occurring would be from boat mooring buoys anchored within eelgrass habitats, grazing by Canada geese, historical damage from log booming practices, hardened shoreline modifications and site locations of some aquaculture enterprises. False Bay could benefit from more detailed eelgrass mapping, as the multiple mooring buoys might be impacting eelgrass habitats.

8.3 North Pender Island

North Pender was inventoried on July 3rd, 4th and 6th 2012. Eelgrass comprises approximately 11.6% of the island's linear intertidal and subtidal shoreline. The majority of the eelgrass beds are flat and continuous. The protected nature of North Pender results in a relatively high proportion of soft substrate in shallower areas.

Impacts include housing developments with accompanying tree and shrub clearings, rip rap and rock wall modifications, some of which were constructed below the high water line, direct raw sewage outfall at Port Washington which would directly affect the water quality for eelgrass productivity, the presence of Canada geese, direct grazers on eelgrass shoots during low tides, and mooring buoys within eelgrass beds. Port Browning might be an appropriate site for eelgrass restoration as the substrate is suitable and there is a small bed on the northeast side.

8.4 South Pender Island

South Pender was surveyed on July 6th 2012. Eelgrass comprises approximately 8.5% of the island's linear intertidal and subtidal shoreline. South Pender has more exposed shoreline therefore less eelgrass is to be expected. Roughly the same proportion of flat and fringing beds are present with slightly more than half of them being continuous.

8.5 Mayne Island

Mayne Island was surveyed from 2009-2012 using two methodologies on a variety of platforms including: 1) delineation and creation of polygons (with towed underwater camera, on foot, by kayak, by free diver), 2) linear presence/absence (by kayak). Data was converted to presence/absence line format for incorporation into the 2012 Islands Trust Eelgrass Inventory.

Mayne Island is mostly protected except on the Northeast side which is exposed to winds from the Strait of Georgia. Eelgrass comprises approximately 22% of the island's linear intertidal and subtidal shoreline. The Mayne Island associated islands, Georgeson Island and Curlew Island, contain 15.7% and 24.8% respectively.

Evidence from the Mayne Island Conservancy's eelgrass monitoring program and historical anecdotal evidence has shown loss in intertidal eelgrass in Miners Bay and two Southeast facing bays on the Southeast side of Mayne. Reasons for loss are unknown, but ongoing monitoring will indicate natural variability in these eelgrass beds. Potential impacts include grazing from Canada geese, anchoring, mooring buoys, trampling by kayakers and damage from boats and propellers. Winter heavy rain events could be introducing increased sediment loads into eelgrass beds, but this would need to be studied.

Gallagher Bay (on Navy Channel) and Conconi Reef Park are potential eelgrass restoration sites. They both have large bare areas adjacent to continuous eelgrass beds and have suitable substrate.

8.6 Thetis Island Local Trust Area

Thetis and its associated islands were surveyed July 31st through August 3rd, 2012, except for the inside of Cufra Inlet which was inaccessible because of low tides, and Valdes Island. The Cufra Inlet survey was completed in the summer of 2013. Valdes Island was surveyed July 29th, and 30th, 2013.

Approximately 26.6% of the linear subtidal shoreline on Thetis Island is composed of eelgrass habitat, 72% of which is continuous. Fringing continuous eelgrass beds were observed off the western shore of Thetis where the ShoreZone map indicates a preponderance of low rock and boulder (not a typical shoreline type for eelgrass). **North Cove** is also rich with an abundance of eelgrass, except where it is shaded by overwater structures.

Cufra Inlet contains dense (26-75% cover) flat continuous eelgrass beds. The inside of the inlet was surveyed during the summer of 2013 by local residents using kayaks and hand held GPS units but without the use of an underwater camera, as the water was shallow enough for eelgrass to be observed from the kayaks. Low tides in 2012 prevented an aluminum boat from approaching close to shore during the low tides occurring during the survey. The continuous bed begins on the western shore of Cufra Inlet as a narrow 1 m wide swath on the shoreward side and then widens out. An abundance of drifting sea lettuce (*Ulva* spp.) was observed within this area. Eelgrass became denser seaward in the muddy/shell hatch substrate. The substrate became sandier as the mappers traveled towards the mouth of the channel. Patches of sand dollars were noted as the inlet widens and the eelgrass extends towards the eastern shore. Diatoms were noted growing on the eelgrass blades. At the western edge of the mouth of the inlet eelgrass is patchy and sparse despite its ShoreZone classification of 'cliff'.

Clam Bay eelgrass was dense and continuous.

Telegraph Harbour on Thetis Island had a preponderance of algae (*Ulva* spp.), *Sargassum muticum* and filamentous algae growth. Visibility was poor. Upland and shoreline development (rip rap, retaining walls and cement ramps) with accompanying vegetation clearing most probably has led to higher sedimentation in the nearshore waters.

Understory kelps were observed at most sites, although no fish or crab species were present at the time of the survey in the majority of the survey area. Possible impacts from boat moorings within eelgrass beds (e.g. **Ruxton Island** had > 15 boats moored off shore in one small area), recreational overwater play structures, shoreline modifications and nutrient run-off could be impacting nearshore habitats. Where there was suitable substrate for eelgrass as indicated by the ShoreZone data, eelgrass was present, with the exception of the narrow channel between Thetis and Penelakut Islands. However a long-time resident remembers eelgrass presence there approximately 40-50 years ago. Islets and small islands are important refugia for wildlife and often are less impacted than the surrounding larger islands.

A short description of the smaller islands and islets associated with Thetis Island are described below.

Percentages of eelgrass for each associated islet are:

Island	Eelgrass % Cover
Ruxton	11.6%
Pylades	0%
Bute	50.3%
Dunsmuir Islands (2)	34.7%
Hudson	30.9%
Reid	3.9%
Dayman & Scott Islands	39.6%
Valdes	12.7%

Hudson Island west of Thetis is rich with continuous fringing beds of eelgrass (26-75% cover) on both its eastern and western subtidal areas. **Dayman Island** has just under approximately 25% coverage of patchy eelgrass habitat mostly on its eastern facing side. **Reid Island** to the east has dense patches of fringing eelgrass on its northeast facing shore.

Ruxton Island to the north of Thetis has flat, continuous (less than 25% cover) eelgrass beds within sheltered sites on the western facing area; an abundance of nudibranchs was observed on eelgrass blades. The eastern shore, with the exceptions of some sites with fringing patchy beds, is too deep for eelgrass growth.

Whaleboat Island to the east of Thetis had too steep a drop off to be suitable for shallow eelgrass habitats. **Tree Island** contained 100% cover of understory kelps, which is an indication of a dominance of cobble/pebble substrate. As well, the subtidal area is too deep for eelgrass production.

Bute Island off of Ladysmith Harbour contained dense continuous beds because it is surrounded by a shallow bay with sandy substrate. There is a potential eelgrass restoration site on the northeast side of **Dunsmuir Island**, as it is composed of clean sandy substrate in a protected site. The narrow channel between Dunsmuir Island and Ladysmith Harbour contains continuous dense flat eelgrass beds.

Valdes Island was surveyed between July 29th and 30th, 2013. Eelgrass covers 12.69 % of its linear subtidal shores. The majority of the habitat is flat and continuous, with most of the locations cited on the northeastern and southwestern shorelines. Although the majority of the shorelines

on the western portion of Valdes are ShoreZone classified as low rock/boulder or cliff, the presence of flat continuous beds with bare patches was noted on the north and south western shores. Three potential restoration sites were identified; one on the central western side of the island, the second site on the northern tip of the island containing a small degraded eelgrass bed adjacent to the BC Parks dock, and the third is located on the southwestern shore which might have been historically impacted by log storage. The substrate at this site is suitable for a transplant; however *Ulva* spp. is present, which might be an indication of a high level of nutrient inputs.

The location of mooring buoys in eelgrass habitats with fifty-one buoys observed within beds and the interruption of eelgrass continuity by the construction of docks are the major anthropogenic impacts affecting eelgrass habitats on Valdes. The majority of the shoreline is naturally vegetated.

9.0 2013 Inventory Findings

The islands mapped in 2013 for eelgrass (*Zostera marina*) within the Islands Trust Area Islands include:

- Denman Island Local Trust Area,
- Hornby Island Local Trust Area,
- Ballenas – Winchelsea (Executive Islands) Local Trust Area,
- Gabriola Island Local Trust Area,
- Galiano Island Local Trust Area,
- Valdes Island and Cufra Inlet in the Thetis Island Local Trust Area
- Bowen Island Municipality
- Gambier Island Local Trust Area Associated Islands in the Howe Sound
(i.e. excluding the islands off of the Sunshine Coast)

The characteristics and locations of eelgrass habitats for each island are described below in order of the beginning dates eelgrass inventories occurred. Note that Valdes and Cufra Inlet are described in Section 8 above as they are in the Thetis Island Local Trust Area. Similarly the Gambier Island Local Trust Area Associated islands are also described in Section 8 as they are in the Gambier Local Trust Area. Both Thetis and Gambier Islands were mapped in 2012.

9.1 Galiano Island Local Trust Area

Galiano and its associated islands were inventoried over seven days between June 26th and November 25th, 2013. Approximately 16.66 % of the linear subtidal shoreline of Galiano Island is eelgrass habitat.

ShoreZone maps indicate that most of the southwestern and northeastern shorelines of Galiano Island are not suitable substrates (coastal bluffs and low rock/boulder respectively), except where there are sheltered embayments. However there are notable exceptions over the north, south west, south and eastern areas of the entire island.

The eelgrass distribution on Galiano is 88% continuous; 12% patchy. The placement of mooring buoys (at least 14 were noted within eelgrass beds, especially on the southwestern shores of the island), private docks (at least 12) and log storage have damaging effects on the habitat's continuity and function as a wildlife corridor. The construction of retaining walls (rip rap, rock and wooden) and the removal of backshore vegetation (at least 10 sites were observed) are obstacles for eelgrass to flourish in certain sites.

Most of the backshore on Galiano Island remains naturalized, with notable exceptions where trees and understory vegetation surrounding residences are removed and where shores are modified with retaining walls. Exotic invasive plants include English ivy, St John's Wort and gorse. Heavy epiphytic algae growth on eelgrass blades were noted within **Montague Harbour**, a possible indication of a high level of non-point source pollution. Another site for pollution is the public dock in **Whaler Bay** where boats are worked upon. Best management practices are recommended for boat sewage disposal and using tarps for collection of boat paint chips at each location.

There is the potential for eelgrass restoration within Whaler Bay, as the channel in front of the public dock contains a narrow band of eelgrass that could be expanded shoreward if log leases were retired in the future. In November, bufflehead and Barrow's Goldeneye as well as schooling forage fish were observed. Patchy eelgrass beds were noted off the eastern shores of Galiano Island. This area is ShoreZone classified as low rock/boulder. Four mooring buoys were located with these beds.

The eelgrass habitats covering the associated islands of Galiano comprise approximately 19.98% of the islands' linear shorelines. **Parker Island** has extensive eelgrass on its northeastern shores (96% continuous). The construction of docks and the placement of mooring buoys within eelgrass beds, however, may be impacting the habitat. Most of the eelgrass surrounding **Gossip Island** lives on the island's east facing shores is continuous (95%); however docks (7 were noted within the eelgrass beds) interrupt their form and function. Mooring buoys (3 observed) are situated within the existing beds on the south-western facing shores also disrupt the connectivity of eelgrass habitats.

No eelgrass was observed on **Ballingall** and **Lion Islets**, **Wise**, **Charles**, **Sphinx** or **Julia Islands**.

9.2 Gabriola Island Local Trust Area

Gabriola Island and associated islands were surveyed between July 8th and 21st, 2013. Gabriola Island's linear shores are comprised of 24.8 % eelgrass, with 89% continuous distribution. Two potential eelgrass restoration sites were identified on this island. The first is on the southwestern shore facing **Mudge Island** near an active log booming site. When the log lease is retired at this site, a small eelgrass transplant (100-500 shoots) could indicate whether the area is suitable for a larger transplant. The second site is on the northeast tip of Gabriola Island where a small existing bed could be expanded.

Wildlife in some areas abound, including Canada geese, an abundance of fish species, Great Blue Herons (22 at the southern channel entrance between Gabriola and Mudge Islands), sand dollars and Bald Eagles. Beaches that have suitable substrate for sand lance and surf smelt spawning were also noted. Healthy eelgrass beds near the **Malaspina Galleries** in Gabriola Sands Provincial Park are not surrounded by mooring buoys and docks and are thriving in 4-5 metres water depth, although the area also contains rocky substrates.

Possibly the biggest impacts to marine wildlife habitats on Gabriola and its associated islands are the locations of floats and mooring buoys (in one embayment on the northwestern shore of Gabriola, over 12 floats – moorings and/or crab traps – and 14 buoys were observed in a continuous eelgrass bed); construction of retaining walls (nine riprap or rock walls identified); and, the removal of native backshore vegetation (13 sites). Numerous moorings are located in an otherwise robust eelgrass bed in **Degnen Bay**.

The eelgrass coverage for the Gabriola associated islands' linear shorelines totals 19.98%. Near the eastern shore of **DeCourcey Island** south of a marine park there are many docks and boats. Poor water quality was noted, and there are no washroom facilities at this location. No marine life was observed growing on the seafloor. North of the marine park there is a potential restoration site facing a steep rock ramp foreshore and a steep grassy conifer backshore near a former log booming site.

Snake Island has the potential for eelgrass restoration on its southern tip where there is a protected area with suitable subtidal sandy mud substrate, although this location may be too close to active boating. Seal pups and oyster catchers were cited near a large mussel bed.

There was no eelgrass habitat observed on **Hudson Rocks**. Marine life there included seal pups hauled out, bird habitats, cormorants and oyster catchers. The shell hash substrate off of **Five Finger Island** was noted to be situated too deep for eelgrass growth.

Mudge Island also has a potential eelgrass restoration site on its southeastern shore. Kelps are mixed with sandy/muddy/shell substrate. Most of the backshores are naturally vegetated, with exceptions near residential developments where mooring buoys are situated within eelgrass

beds (4 observed). The eelgrass habitat observed on Mudge was a mix of patchy/ continuous and flat / fringing beds on the eastern shores of the island. One bed in particular, located mid- island on the eastern side extended 100 metres shoreward beyond the waypoint, but the water depth was too shallow to delineate the bed.

Eelgrass on Link Island is characterized as flat continuous beds on its eastern shores. On the south shore of Link Island there are multiple docks (4) and mooring buoys (6).

Continuous fringing beds lie next to the northwest shores of Breakwater Island. Near Saturnina Island there are fringing continuous beds of eelgrass habitat on the western and northern shores.

Bath Island has a wide rock ramp in front of a windblown forest with a patchy bed with two larger patches surrounded by kelp and *Sargassum muticum* on its northwestern shore, while on its western shore there was a flat continuous bed.

Eelgrass habitat on Tugboat Island is characterized as narrow beds tucked between shore and wharf floats on the eastern side of the island and between the Tugboat Island and Sear Island to the south, which has flat continuous beds on its western shores. Continuous flat beds lie at the entrance to a marina on Vance Island. A rock/boulder shoreline with a, private dwelling with floating dock and several moorings are near flat continuous eelgrass habitat on Acorn Island.

9.3 Denman Island Local Trust Area

Denman Island and its associated islands were inventoried on several boat expeditions between August 20th and September 15th, 2013. In the Denman Island Local Trust Area 33.24% of the linear shore contains eelgrass. In some areas, especially in eastern subtidal areas, patchy eelgrass was observed amongst broad leaf kelps and *Sargassum muticum*, where the substrate is classified as low rock/boulder. A potential restoration site is located on the southwest area of the island near Metcalf Bay and is close to a site that could be used for harvesting transplants. The substrate south of this site gradually changes to cobble and gravel. Most of the beds surrounding the island are fringing, most likely due to coarser substrate changes at depth.

Eelgrass habitat is situated on the north eastern shores, classified by ShoreZone as sand/cobble and where numerous overwater structures are located and associated with industrial aquaculture activities. The eelgrass here was predominately patchy; most likely there are more patchy beds both shoreward and seaward of the mapped area. This area is the second most patchy eelgrass habitat observed, second only to areas in Howe Sound.

The majority of the backshore is not heavily impacted by development; most of the residences had either forested or grassy areas between them, with a minimum of landscaping. Abundant species of birds including black legged kittiwakes, surf scoters, marbled murrelets, grebes, harlequin ducks, surf scoters, herring gulls, and other marine wildlife species such as hooded nudibranchs, sand dollars, sand lance juveniles and abundant schooling fish were observed.

Sandy Island north of Denman Island contains continuous (99%) eelgrass habitats although the southern shores are ShoreZone classified as sand/cobble and the northern areas are classified as altered. Sand dollars were observed on both eastern and western sides of the island. **Seal Islets** were surrounded by fringing continuous (81%) eelgrass habitats. Associated with these beds were observed marbled murrelets and rafts of harlequin ducks and surf scoters, kittiwakes, gulls and seals. The backshore consisted of flat shrub, herbaceous and grassy slopes. . No eelgrass habitat was observed near **Chrome Island** due to unsuitable rocky substrates.

9.4 Hornby Island Local Trust Area

Eelgrass beds on Hornby Island were mapped over several days between August 21st and September 12th, 2013. The linear shoreline of the Hornby Island Local Trust Area is composed 31.70 % of eelgrass habitat. Large areas on both the western and northeastern shores of Hornby have continuous (90%) flat beds, although the classification by ShoreZone of these shorelines is low rock/boulder. The small areas of eelgrass found in these otherwise rocky cobble areas are valuable as critical habitat and corridors for marine life.

Most of the backshore is naturalized, even where residential houses are situated. Suitable substrate for spawning sites for forage fish was identified on the north eastern shores. Three potential restoration sites were also noted; one near this area for potential forage fish spawning, the second within a sandy embayment on the eastern shore (if boat anchoring pressures were decreased), and the third near the Hornby Island ferry terminal on the western side of the island (eelgrass was noted just north of the terminal growing in pebbles). There is also an opportunity for a community clean-up of underwater debris near a breakwater and marina on the southern end of the island. On **Toby Island** dozens of seals were hauled out.

9.5 Ballenas – Winchelsea (Executive Islands) Local Trust Area

The islands within the Ballenas – Winchelsea Local Trust Area were surveyed for eelgrass habitat between November 21st and 23rd, 2013. The total linear shoreline coverage of the Local Trust Area is 1.4%.

Mistaken Island west of Parksville has two eelgrass sites, one fringing patchy bed and the second within a cove with a dock, both on the southwestern shore. A flat continuous bed lies between the channel separating the **Ballenas Islands**. A continuous bed also lives on the north shore of the south island, punctuated with rock substrate. A school of forage fish, possibly sand lance was observed at the time of the survey in the shallow subtidal zone.

A small flat continuous bed on the west facing shores of the **Ada Islands** also may serve as suitable habitat for forage fish, prey for ancient murrelets, of which one was cited by field staff (unconfirmed). A second eelgrass bed is situated on the western shore of the west Ada Islands. The substrate at this location is primarily sandy with a secondary substrate of bedrock with associated intermixing rockweed and detritus. A seal haul out with 61 seals was noted near this site.

A small flat continuous eelgrass bed is located on the northeastern side of **Southey Island**. No eelgrass habitats were observed on **Gerald, Yeo, Amelia, Ruth** or **Winchelsea Islands**.

9.6 Bowen Island Municipality

Bowen Island was surveyed between Aug 6th -11th and Oct 4th, 5th and 12th, 2013 using the polygon mapping methodology. The island is characterized by a mix of sandy bays and steep shorelines. Large homes are common, with docks constructed both in the bays and on the steep cliffs. Bays, which are areas in which eelgrass is expected to grow, were also the location of waterfront homes and associated docks (both land-based and floating), moorings and anchored boats.

Eelgrass was estimated to extend along 11.6% of the shoreline of Bowen Island. The area of mapped eelgrass polygons was observed to total 41,917 m² and the length of mapped line features was observed to total 958 meters. Percent cover was low, however, and in addition to continuous beds, 84 individual patches of eelgrass were recorded and noted on the map as points. Eelgrass was observed within bays and straight sections of coastline on the southwest, northwest, northeast tip, east (Mannion Bay and north) and southeast coasts.

Around much of the island eelgrass was characterized by frequent individual patches, with each patch often consisting of very few shoots. Patches on the west coast were observed in areas that, from the shoreline or ShoreZone analyses, would not have been predicted, as the plants occurred seemingly opportunistically in patches of soft substrate located amid boulders and other coarser substrate. Percent cover even in continuous beds was consistently far less than 25% and noticeably sparser than other islands within the Islands Trust areas also surveyed during the 2013 mapping season.

Docks in areas such as in **Tunstall Bay** were located in depths suitable for eelgrass growth. Distances between some points on the polygon mapped in Tunstall Bay are longer than 20 meters as the eelgrass field surveyors needed to navigate around swimmers, docks and moored boats. Large clusters of sunflower stars (*Pycnopodia helianthoides*) were observed in the bay on sandy bottoms that did not contain eelgrass. Docks and moorings were also located in eelgrass depth elsewhere on the west coast of Bowen Island (e.g. the relatively straight shoreline north of Bowen Bay, King Edward Bay, the shoreline north of King Edward Bay and Galbraith Bay).

In some sites such as **Galbraith Bay** and **Columbine Bay**, eelgrass was only observed on one side of the bay despite suitable sandy substrate on the other side. For example, the substrate on the north side of Galbraith Bay was bare sand. There were several moorings in that bay. Eelgrass in Columbine Bay was sparse and appeared unhealthy; individual clumps were surrounded by bare sand. One hypothesis for this is that eelgrass may be impacted by boat wakes in the area. Boats were moored throughout eelgrass depth in **Cates Bay**.

Multiple beds of continuous eelgrass were identified throughout **Mannion Bay** between zero and more than 5 meter depth relative to chart datum. These beds, however, were not as dense as would be predicted given the soft substrate and sheltered environment. In the northeast side of the bay bare sandy fringing beds are interrupted by the construction of docks.

Mannion Bay is heavily used for boat anchoring, mooring and docking within depths suitable for eelgrass growth. The construction of docks and floats and their associated chains are impediments for eelgrass productivity in this area. Multiple adjacent docks have been constructed within eelgrass depth. Ropes and chains from docks, moorings or anchors had dragged on the sea floor, apparent due to the patterns they had created in the sand. The motion of the chains due to waves and currents can damage or uproot eelgrass.

Eelgrass otherwise appeared healthy in Mannion Bay and there are opportunities to restore lost eelgrass habitat if boat anchoring were restricted to a defined area outside of the depth range for eelgrass growth, i.e. if they were limited to 6 m depth or deeper. Schools of fish were observed within the existing sparse eelgrass; therefore, restoring the eelgrass in the area would serve to enhance fish habitat. Although it was not included in the project deliverables, the research team had been requested to look for evidence of litter on the sea floor in this bay; however, only a few cans and the possible remnants of a shopping cart were observed. Some of the moorings and anchored boats appeared derelict. Many crabs were observed on the south side of the bay, but were not identified to species.

No eelgrass was observed in **Snug Cove** including the head of the cove, near Crippen Park beach. Possible reasons include dredging, ferry wakes, eutrophication and boat traffic associated with the marina, and pollution of the substrate due to chipped wood debris. No flora was observed on the sea floor except for encrusting algae. There are restoration opportunities for the nearshore environment by Crippen Park beach if the historical and present impacts from the marina and former log booming site are addressed.

The inner portion of the eastern cove of **Konishi Bay** on the south coast of the island appeared suitable for eelgrass due to the sandy substrate and sheltered cove with a sandy beach. The substrate was bare sand, however. Eelgrass was observed in deeper locations of that bay. Removal of native plants and retaining wall constructions were noted around residences. In another eelgrass location in the southern portion of Seymour Bay/Seymour Landing where an adjacent coastal lot was for sale, coastal vegetation had been cleared and there is already evidence of slope failure both at the top and foot of the slope, despite installation of riprap. Water flow had also been channeled in the area, which could intensify water and sediment flow into the nearshore environment. Slope failure is a possible threat to eelgrass through smothering by eroding sediments. Shoreline hardening also increases wave energy and wave deflection, which can scour shorelines (Lamont 2013).

The area around **Cape Roger Curtis** has been of concern to local residents due to the construction of large docks and potential for damage to submerged habitats. Eelgrass was not observed around the exposed cape, as the observed substrate was steep and rocky. Kelp was observed in the area, however. Chains from the new construction were observed on the ocean floor. Kelp beds are a major feature along the rocky parts of the Bowen Island shoreline. Several schools of small or juvenile fish were also observed around the island.

10.0 Threats to Eelgrass Habitats

The impacts from human activities have been described previously (Section 4.0). Other field observations are described below.

There seems to be an increase in the abundance and distribution range of the invasive seaweed, *Sargassum muticum* within the Islands Trust Area, although there is at present no research to substantiate this. Although the plant settles and grows on cobble, surrounding eelgrass in sandy/muddy sediment can be shaded out by its overarching canopy. The presence of *Zostera japonica* was noted on Lasqueti and Thetis Islands and other areas within the Islands Trust. This non-native species of eelgrass is not known to compete with *Z. marina*, though it can be found mixed with the native eelgrass in the lower reaches of the intertidal zone.

Though there is some disagreement about the causes of epiphytic algae growth on eelgrass blades, it was noted within Telegraph Harbour on Thetis Island and Montague Harbour on Galiano Island. This could be an indication of excessive nutrients, causing an abundance of algae growth on the blades and blocking light, nutrients and gas exchange (Mumford 2007).

Canada geese are infamous for their grazing on eelgrass shoots. They were noted in large numbers on Lasqueti, Gabriola, and North Pender and South Pender Islands. Overgrazing of shallow eelgrass beds might be a growing concern as the birds are increasing in range and numbers.

As winter storms intensify, there might be an increase in burial of eelgrass shoots by sand over wash. Monitoring eelgrass habitats over time in selected locations vulnerable to storm events might shed light on the effects of climate changes upon the nearshore environment.

Eelgrass Restoration

11.0 Opportunities for Eelgrass Restoration

Thirteen areas in 2012 and nineteen in 2013 were identified as potential sites for eelgrass restoration as indicated in the legends on the maps produced by this project. When funding is available, these sites can be further investigated. The history of eelgrass transplants and their success in British Columbia to date is described below.

11.1 History of Eelgrass Restoration

In the Pacific Northwest, the history of success for *Zostera marina* transplanting projects was dismal prior to 1985. Initially transplant techniques were developed and successful on the Atlantic coast. However, these techniques were not well suited to the Pacific north coast environment and eelgrass. Many of the early transplants were conducted without a thorough understanding of eelgrass physiology and ecology; the donor stock was not always well suited to the area where they were transplanted, and the biophysical conditions of the transplant site were not always appropriate for the species (Durance 2001).

Since 1985, knowledge and experience from adaptive management practices have resulted in a higher success rate for focused mitigation and enhancement projects along the Pacific coast (Thom, Borde, Williams, Southard, Blanto and Woodruff 2001). Factors that led to a higher success rate include the correct selection of physical attributes for the restoration area, including elevation, substrate composition and light and current regime. The selection of the most suitable ecotype or genotype increased the likelihood for success and rate of production. The criteria for success included shoot density and area re-vegetated (Durance 2001).

11.2 Criteria for Successful Restoration

In British Columbia, the criterion for transplant success is based upon the mean shoot density being equal or greater than the area of adjacent natural beds and the area coverage. Projects are thus considered successful if the habitat that was created provided habitat equal in eelgrass productivity (shoot density) to that which it was designed to replace (Durance 2001).

Site selection with the appropriate biophysical characteristics (salinity, sediment type, current velocity, light/depth, temperature, and pH), using suitable plant donor stock (ecotype), using an appropriate transplanting technique and handling the donor plants with care are necessary for successful transplants. Several restoration transplants have occurred in Squamish, the Sunshine Coast, Campbell River, Cowichan Bay and Saanich Inlet. Most of the locations have been impacted by historical log storage practices. The majority of these transplants are considered successful based on monitoring of shoot densities and area coverage post-transplant. They were completed under the supervision of a scientific advisor with community volunteer support and a Workers Compensation Board (WCB) certified team, with funds collected by environmental conservation groups.

12.0 Recommendations

Globally, eelgrass has been used as an indicator of water quality (Neckles 1994). Often, a bed will decrease or increase in width and length dependent on light availability. The lower depth distribution of eelgrass is related to overall water clarity. Water quality, including water clarity, is affected by land practices and water uses. If, for example, a large scale development occurs on shore near an eelgrass bed, the bed may decrease in size because the water quality in the nearshore is consistently compromised by the increased pollution load, known as non-point source pollution, frequently delivered by the storm water system. When the amount of light reaching the

plants is limited by shading from increased sediment or plankton blooms associated with increased nutrients from land, eelgrass meadows adapt to the poor light availability through dieback, decreases in density or width and migration to shallower depths.

The Islands Trust Area is home to more than 25,000 people and is located between the highly populated centres of Vancouver, Victoria and Nanaimo. However, only approximately 12.5 % of the marine environment has some type of protection. Most of this protection is in Rockfish Conservation Areas, with Provincial and Federal Marine Protected Areas accounting for only 1.53% (Islands Trust Fund Regional Conservation Plan 2011-2015). Sound decisions by local trustees and an educated public are necessary to protect the functions of the nearshore for all who benefit from their healthy ecology.

A set of recommendations is listed below to contribute to the conservation work of the Islands Trust and Islands Trust Fund.

12.1 Education

1. Educate boaters and coastal residents about the presence and importance of eelgrass beds.
2. Encourage shoreline landowners to replace light-impenetrable docks with materials that allow light penetration.
3. Encourage signage at boat ramps reminding boaters to avoid eelgrass beds in shallow water.
4. Build public awareness about the importance of reducing nutrient inputs in marine riparian areas; encourage protection and restoration of wetlands and the construction of retention ponds to filter land based pollutants; and encourage reduction in the use of fertilizers, pesticides and herbicides.
5. Develop a long term public outreach nearshore marine education strategy that includes new shoreline property owners.

12.2 Regulatory and Enforcement

1. Limit dock development, particularly in established and potential eelgrass areas (i.e. areas where substrate is suitable for eelgrass growth).
2. Encourage creation of “No anchoring/mooring” zones in suitable eelgrass areas (based on substrate, depth and observed presence of eelgrass); encourage movement of moorings to areas that are too deep for eelgrass.
3. Limit shoreline development; maintain a coastal riparian zone that will enable inland shift of eelgrass beds as sea levels rise.

4. Create and implement appropriate setbacks for built structures from the nearshore.
5. Limit or reduce overwater structures; increase shared community docks and wharves when possible.
6. Require removal of illegal shoreline modifications; require restoration or removal of aged derelict structures where possible.

12.3 Opportunities for collaboration with other agencies

1. Encourage and undertake as resources allow regularly scheduled monitoring of sensitive or vulnerable shorelines; make monitoring results readily accessible to all.
2. Where boat traffic must go through an eelgrass bed, encourage establishment of marked boat channels so that the least damage is done to the habitat.
3. Create protected marine zones and encourage planned siting for mooring buoys for recreational boats around eelgrass beds.
4. Promote management strategies to mitigate conflicting uses in eelgrass habitat, such as oyster and clam harvesting, boating and anchoring in meadows and near-shore development requiring dredging.
5. Promote restoration of natural hydrology when opportunities arise.
6. Promote restoration of eelgrass habitats where possible.

13.0 Conclusion

Changes from increased human population, more frequent and intense storms and changes in sea levels and pH of the oceans emphasize the need to monitor eelgrass habitat and protect it with sound science-based policies and regulations.

Eelgrass meadows function as natural marine sanctuaries, as indicators of nearshore ecological health, and as sequesters of atmospheric carbon. As well, these valuable habitats are important sources of nutrients for local and off-shore marine and nearshore systems. The conservation, protection, monitoring and restoration of native eelgrasses within the Islands Trust Area is and will continue to be a long term smart investment in the social, cultural and biological vitality of the islands.

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Appendix A

Mapping Methodology

2012 - 2013

2012 Methodology for *Zostera marina* Presence and Absence Mapping With a Towed Underwater Camera

The following methodology for eelgrass mapping (*Zostera marina*) was used to determine the location (presence/absence) of eelgrass habitats for Thetis, North and South Pender, Mayne, Lasqueti and Gambier Islands in 2012 under contract with the Islands Trust Fund.

The methodology reported here is an addendum to “Methods for Mapping and Monitoring Eelgrass Habitat in British Columbia” (“Methods”) authored by Precision Identification Biological Consultants and peer reviewed by experts in the field. This addendum was created by the Seagrass Conservation Working Group with input and review by Precision Identification.

The purpose of presence and absence mapping methodology is to determine the linear extent of eelgrass along the coastline. This is achieved by deploying an underwater camera that is towed by a boat and recording the geographic location of eelgrass beds using a hand held GPS. The resulting representation of eelgrass beds are lines.

General habitat characteristics outlined in Methods are also recorded: Form (flat/fringing), Distribution (continuous/patchy), Percent Cover (<25%, 26-75%, >75%), and Substrate type (sand/mud/pebble/cobble/boulder). The state of the tide was recorded as “slack” or “running” in order to indicate the level of confidence in the percent cover estimate. A slack tide yields a higher level of confidence than a running tide, which causes the eelgrass lay across the ocean floor.

Eelgrass ShoreZone bioband mapping and marine charts were used to determine potential locations of eelgrass beds. The majority of the eelgrass beds in the Southern Salish Sea include habitat between 1 and 3 m chart datum. This depth contour was followed and eelgrass presence within this depth range was recorded. If eelgrass was not found in this depth range where bathymetry and substrate characteristics were suitable for eelgrass growth, a perpendicular transect was followed ranging from +1m to -6m which is the typical range of eelgrass in the Salish Sea.

GPS waypoints and the following parameters were recorded at roughly 10m intervals: depth, eelgrass presence, form, distribution, substrate, percent cover, tide state, presence of broad or tuft algae, visibility.

Where marine charts indicated suitable conditions (a shallow bathymetric relief) for eelgrass but eelgrass was not present, waypoints and substrate type were recorded at 20m intervals. Where marine charts indicated unsuitable conditions for eelgrass (steep bathymetric relief), only waypoints were recorded to indicate mapping coverage.

2013 Methodology for *Zostera marina* Presence Mapping with a Towed Underwater Camera

For the 2013 contract, the following methodology for eelgrass mapping (*Zostera marina*) was used to determine the location (presence) of eelgrass habitats for the Gabriola Island Local Trust Area, the Galiano Island Local Trust Area, Valdes Island, Ballenas – Winchelsea (Executive Islands) Local Trust Area, Cufra Inlet (Thetis Island) and the Gambier Associated Islands found within Howe Sound (excluding the Thormanbys and other islands off of the Sunshine Coast).

The methodology reported here is an addendum to “Methods for Mapping and Monitoring Eelgrass Habitat in British Columbia” (“Methods”) authored by Precision Identification Biological Consultants and peer reviewed by experts in the field. This addendum was created by the Seagrass Conservation Working Group with input and review by Precision Identification. For 2013 mapping Islands Trust Global Positioning System Specifications (Schedule G to the Islands Trust contract) were adopted except for Cufra Inlet on Thetis Island where a hand held GPS was used to be consistent with 2012 mapping. Average accuracy was 0.814m and was the combined result of the built-in accuracy of the GPS unit, lag time between sighting eelgrass and the unit gathering enough satellite data to create a waypoint, in combination with boat drift.

Linear Mapping

With the exception of the islands in Metro Vancouver, the Islands Trust eelgrass mapping was done using a linear method to determine presence of eelgrass along the shoreline. This linear eelgrass mapping is achieved by towing an underwater camera using a boat, except for the mapping done in Cufra Inlet in 2013, where the water was shallow enough to observe eelgrass from kayaks, and by concurrently recording the geographic location of eelgrass beds using a GPS. The resulting representations of eelgrass beds are lines and points (where the eelgrass patch was less than 3m in length).

Polygon Mapping

With financial assistance from Metro Vancouver, eelgrass beds on Bowen, Bowyer and Passage Islands were mapped using polygons to show their full extent. In addition to the linear mapping described above, underwater camera transects were conducted perpendicular to shore to map shoreward and seaward edges. In some areas, fringing eelgrass and eelgrass patches were too small to map as polygons. In these locations lines and points were used respectively to show eelgrass presence. Fringing eelgrass bands $\leq 5\text{m}$ wide were mapped as lines and patches less than 10m^2 were mapped as points. Mapping of polygons according to standard methodology was limited due to safe boat operation in wind, current and tidal movements, as well as navigation around boats and swimmers.

For all the islands, general habitat characteristics outlined in Methods are also recorded: Form (flat/fringing), Distribution (continuous/patchy), Percent Cover (<25%, 26-75%, >75%), and Substrate type (sand/mud/pebble/cobble). The state of the tide was recorded as “slack” or “running” in order to indicate the level of confidence in the percent cover estimate. A slack tide

yields a higher level of confidence than a running tide, which causes the eelgrass to lie across the ocean floor.

ShoreZone eelgrass bioband mapping and marine charts were used to determine potential locations of eelgrass beds. The majority of the eelgrass beds in the Southern Salish Sea are found between 1 and 3m chart datum. This depth contour was followed and eelgrass presence within this depth range was recorded. If eelgrass was not found in this depth range where bathymetry and substrate characteristics were suitable for eelgrass growth, a perpendicular transect was followed ranging from +1m to -6m which is the typical range of eelgrass in the Salish Sea.

GPS waypoints and the following parameters were recorded at roughly 10m intervals with intervals no longer than 20m: depth, eelgrass presence, form, distribution, substrate, percent cover, tide state, presence of broad or tuft algae, visibility.

The following section was removed from the methodology for 2013:

Where marine charts indicated suitable conditions (a shallow bathymetric relief) for eelgrass but eelgrass was not present, waypoints and substrate type were recorded at 20 metre intervals. Where marine charts indicated unsuitable conditions for eelgrass (steep bathymetric relief), only waypoints were recorded to indicate mapping coverage.

Appendix B

Maps of Shoreline Units

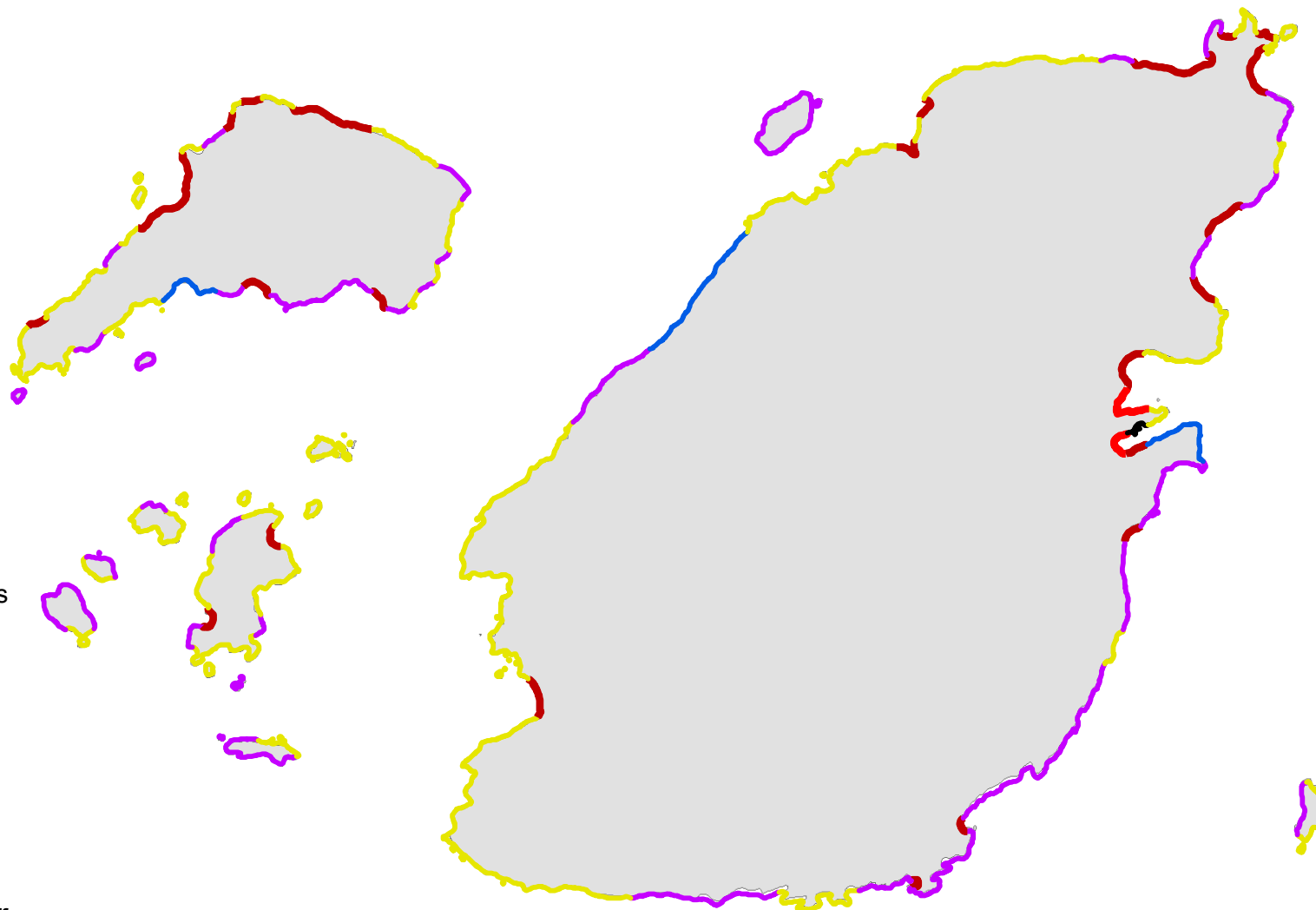
Shoreline Units & Zostera Bioband Units -- Bowen Island --

Produced By: Galiano Conservancy Association

Data Source: Provincial Shorezone Database

Map Date: June 2013

Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

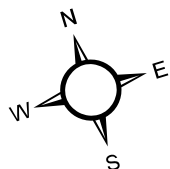
SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:70,000

Shoreline Units & Zostera Bioband Units -- Denman Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

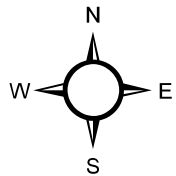
SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:70,000

Shoreline Units & Zostera Bioband Units -- Executive Islands --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

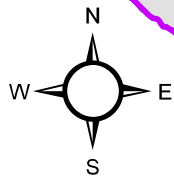
SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:46,362

Shoreline Units & Zostera Bioband Units -- Gabriola Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2012
Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:57,500

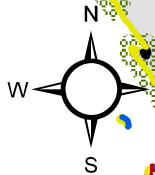
Shoreline Units & Zostera Bioband Units -- Galiano Island --

Produced By: Galiano Conservancy Association

Data Source: Provincial Shorezone Database

Map Date: June 2013

Projection: UTM Zone 10 NAD83

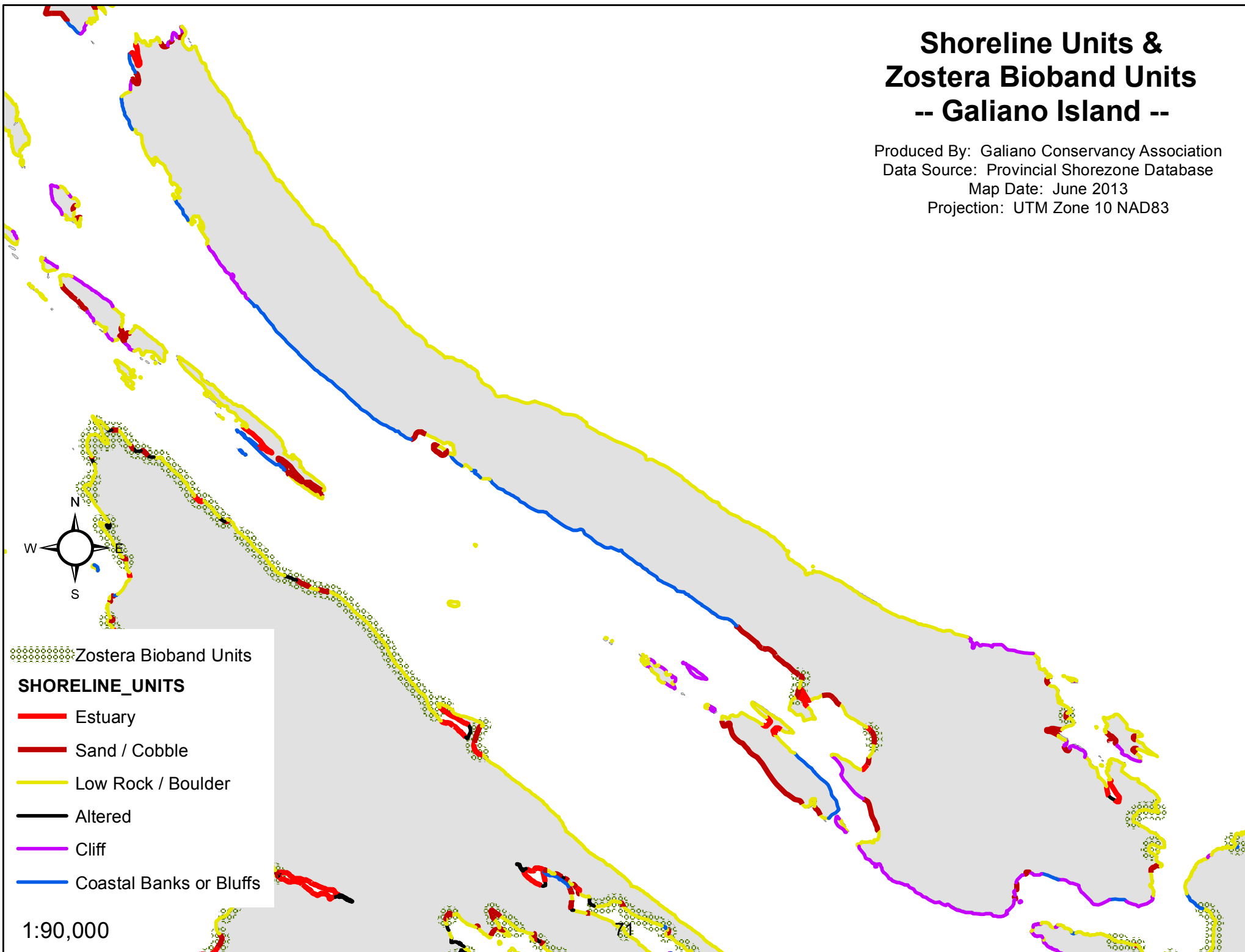


 Zostera Bioband Units

SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:90,000



Shoreline Units

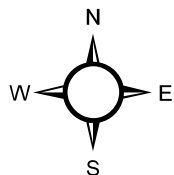
-- Gambier Island --

Produced By: Galiano Conservancy Association

Data Source: Provincial Shorezone Database

Map Date: June 2012

Projection: UTM Zone 10 NAD83



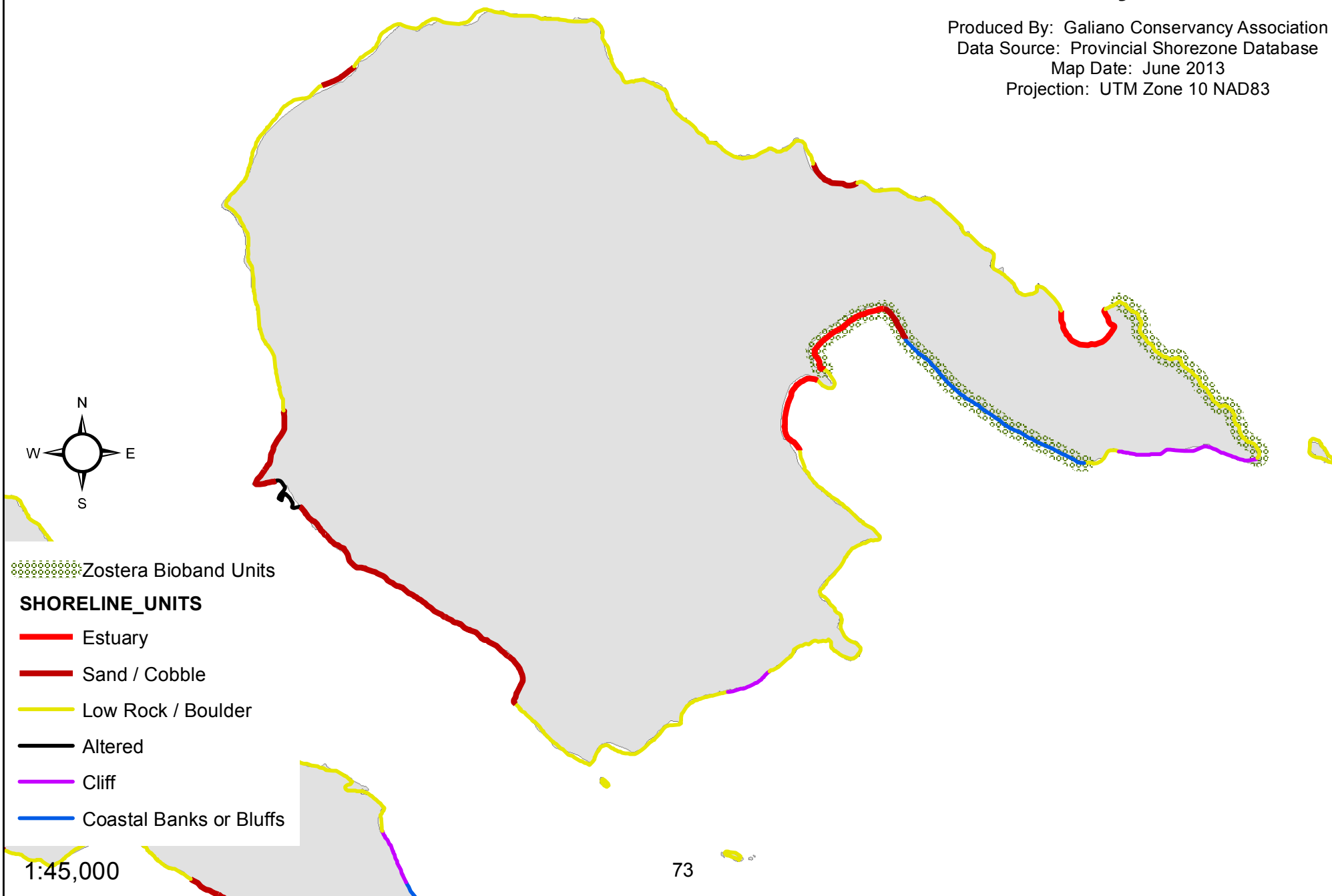
SHORELINE_UNITS

- Estuary
- Sand / Cobble
- Low Rock / Boulder
- Altered
- Cliff
- Coastal Banks or Bluffs

1:70,000

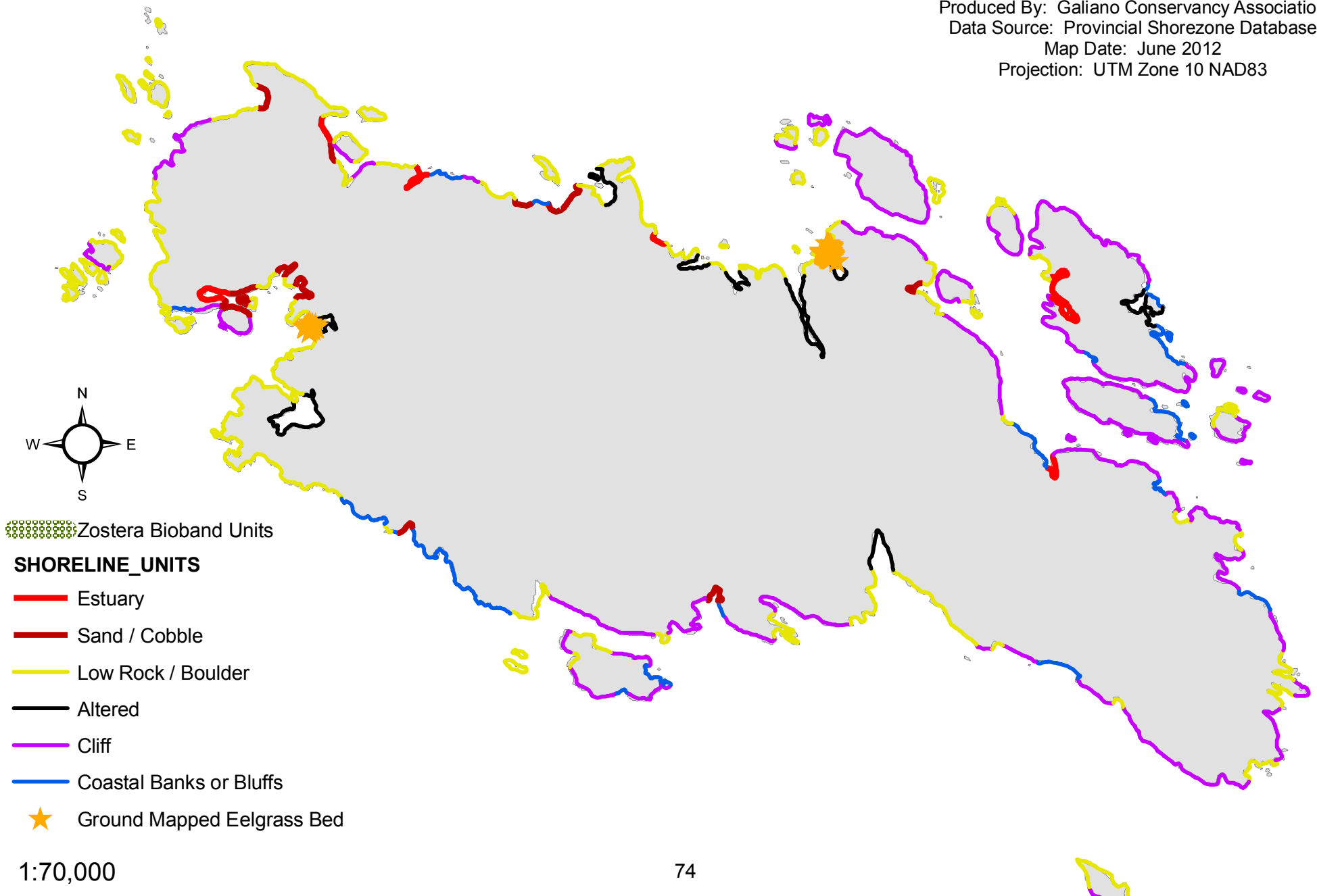
Shoreline Units & Zostera Bioband Units -- Hornby Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



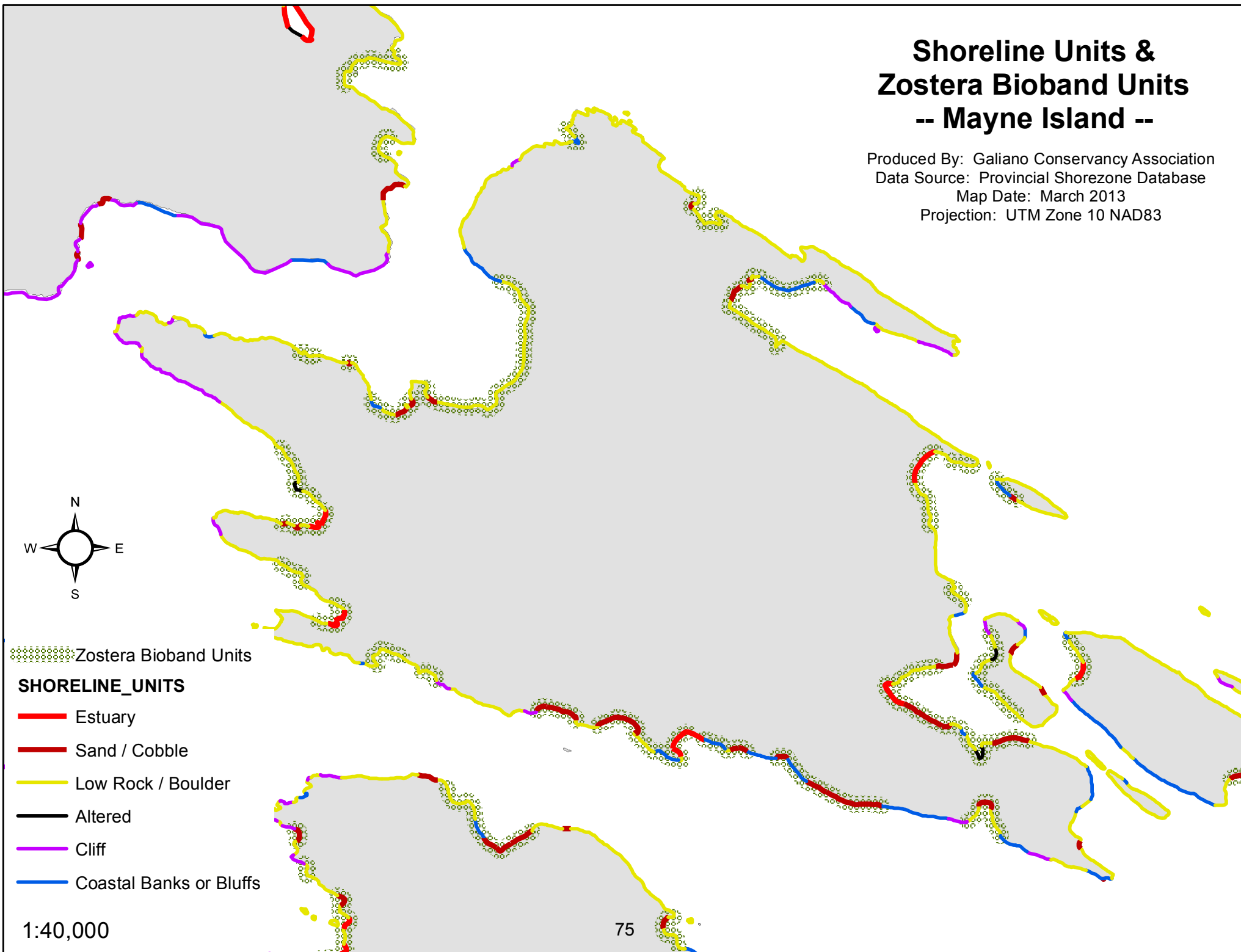
Shoreline Units & Zostera Bioband Units -- Lasqueti Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2012
Projection: UTM Zone 10 NAD83



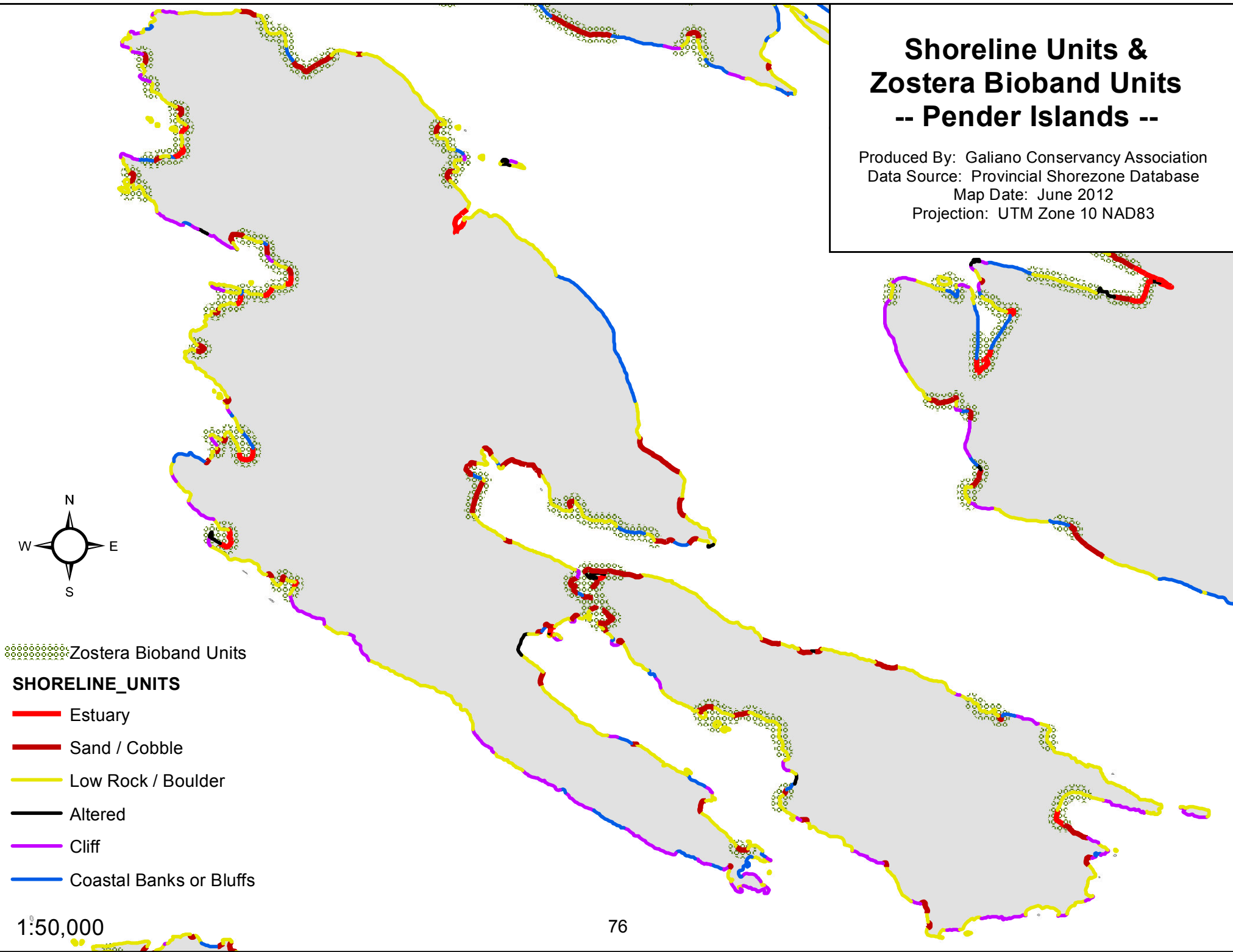
Shoreline Units & Zostera Bioband Units -- Mayne Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: March 2013
Projection: UTM Zone 10 NAD83



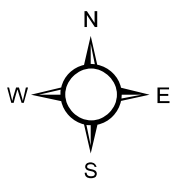
Shoreline Units & Zostera Bioband Units -- Pender Islands --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2012
Projection: UTM Zone 10 NAD83



Shoreline Units & Zostera Bioband Units -- Thetis Island Trust Area --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2012
Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

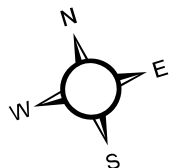
SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:55,000

Shoreline Units & Zostera Bioband Units -- Valdez Island --

Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



 Zostera Bioband Units

SHORELINE_UNITS

-  Estuary
-  Sand / Cobble
-  Low Rock / Boulder
-  Altered
-  Cliff
-  Coastal Banks or Bluffs

1:61,321

Appendix C

Summary of Overwater Structures

The Impacts of Overwater Structures on the Marine Nearshore Environment



The following information was taken from two sources. A Green Shores document summarizes possible effects of docks.¹ A White Paper published in 2001² for the Washington State Transportation Commission in Puget Sound is more detailed. The page numbers at the end of paragraphs indicate the page on which the information was found in the original document.

Information collated by Nikki Wright, Executive Director

SeaChange Marine Conservation Society

¹ Province of British Columbia. *Coastal Shore Stewardship: A Guide for Planners, Builders and Developers on Canada's Pacific Coast*. www.greenshores.ca

² Nightingale, B. & Simenstad, C.A. (2001) *Overwater Structures: Marine Issues White Paper Research Project T 1803, Task 35*. Prepared for Washington State Transportation Commission and in cooperation with U.S. Department of Transportation, Federal Highway Administration. 108 pages.

Summary of Possible Effects of Docks

Coastal Shore Stewardship: A Guide for Planners, Builders and Developers on Canada's Pacific Coast Province of British Columbia (Available on the Green Shores Web site: www.greenshores.ca)

What Can Happen (p. 65)

The installation of docks can affect the coastal biophysical environment in a variety of ways:

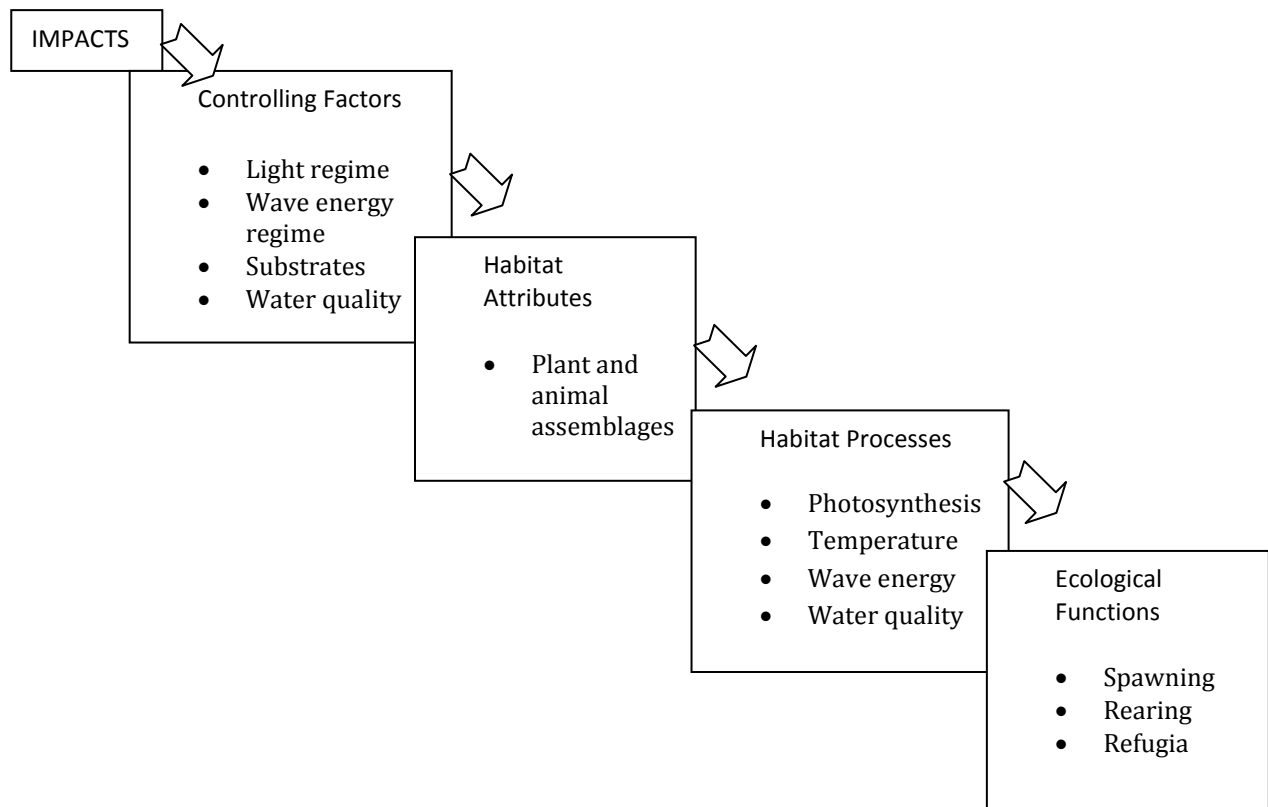
- Shading: Shading caused by the dock can affect the vigor of intertidal and subtidal plant communities, such as marsh plants, eelgrass and kelp beds. These impacts may be chronic (reduced productivity) or acute (wiping out plant communities, leaving the area barren).
 - Disruption of shore drift patterns: This can result in updrift beach formation and downdrift shoreline erosion.
 - Shore damage: Removal of shore plants and disturbance of soils where docks are attached to land can increase erosion and sedimentation of the intertidal and adjacent subtidal areas.
 - Bottom habitat: Installation of footings, pilings and other structures permanently alienates benthic habitat. Dredging to create sufficient depth next to the dock can also disrupt or destroy bottom habitat.
 - Operational pollution: poor refueling and dock maintenance practices, bilge releases and accidental spills from boats and docks can release contaminants into the nearby waters.
- (p. 65)

Overview of Ecological and Habitat Issues

From: Overwater Structures: Marine Issues White Paper Research Project T 1803, Task 35.

Estuarine and shallow marine nearshore habitats provide passage for fish and fish larvae, ocean water and human transportation, as well as areas for settlement of marine shellfish and other marine life. These sites are important sources of prey resource production, refugia, and spawning areas for Pacific salmon, groundfish, and forage fish, such as herring, sand lance and surf smelt. Overwater constructed structures can pose alterations to key factors that control prey production and spawning. Light, wave energy and substrate regimes determine the habitat characteristics that support these critical functions (p. 1).

Overwater structures are typically located in intertidal areas from above the area submerged by the mean higher high tides and out to 15 meters below the area exposed by the mean lower low tide. The primary physical processes controlling habitat attributes (i.e. plant and animal assemblages) and functions are depth (elevation) substrate type, wave energy, and light and water quality. These are the most important factors influencing the development and distribution of nearshore habitats (p. 33).



Conceptual model used by authors to define overwater structure impacts to nearshore habitat (p. 33).

Overwater structures and associated activities can impact the ecological functions of habitat through the alteration of habitat controlling factors (light regime, wave energy regime, and

substrate and water quality). These alterations can, in turn, interfere with habitat processes supporting the key ecological functions of spawning, rearing and refugia. Whether any of these impacts occur and to what degree they occur at any one site depend upon the nature of site-specific habitat controlling factors and the type, characteristic, and use patterns of a given overwater structure located at a specific site (p. 34).

In addition to impacts associated with overwater constructed structures, activities associated with docks can also pose risks to the quality and quantity of habitat through prop scour, groundings, contaminant introduction to the marine environment and structural interferences with shallow nearshore habitats with the placement of ramps and haul-outs in nearshore areas.

Habitat Impact Mechanisms (p. 34)

Habitat Controlling Factors	Overwater Structures & Activities	Habitat Impact Mechanisms	Habitat Impacts
Light Regime	• Docks • Floats • Pilings • Moored vessels	• Reduced light levels	• Limited plant growth & recruitment • Altered animal behavior and assemblages
Wave Energy Regime	• Floats • Breakwaters • Prop wash • Marina	• Altered wave patterns	• Altered plant and animal assemblages • Altered substrate type • Altered sediment transport & distribution
Substrate	• Prop & anchor scour • Pilings, breakwaters & floats	• Altered substrate characteristics	• Altered sediment transport & distribution • Altered substrate type • Altered plant & animal assemblages
Water Quality	• Discharges • Boat & upland run-off	• Increased exotics, toxics, nutrients and bacterial introductions	• Altered plant & animal assemblages • Limited growth & recruitment • Exotic species replacement of natives

Overwater Structure Effects on Light Regime

Effects on Underwater Vegetation

Without proper precautions, docks, piers, and pilings can cast shade upon the underwater water environment thereby limiting light availability for plant photosynthesis. Distributions of invertebrates, fishes, and plants have been found to be severely limited in under-dock environments when compared to adjacent vegetated habitat in the Pacific Northwest not shaded by overwater structures (p. 38).

Each dock defines a shade footprint specific to its structural specifications. Dock height, width, construction materials, and the dock's orientation to the arc of the sun are primary factors in determining the shade footprint that a given dock casts over the submerged substrates. Researchers found underwater light availability and eelgrass bed quality under docks to be primarily dependent upon dock height, followed in importance by dock width and dock orientation to the arc of the sun. Light is the most important variable affecting canopy structure (i.e. shoot density and height) and eelgrass bed quality. To the degree that a shade footprint limits plant photosynthesis, it decreases the extent and quality of habitat that support a wide variety of fish and shellfish populations. Construction of even partially shading types of structures, floating or on pilings, could be expected to largely eliminate existing eelgrass and other macroflora with little chance for replacement plant growth (p. 39).

Effects on Fish

Overwater structures can create sharp underwater light contrasts by casting shade in ambient daylight conditions. They can also produce sharp underwater light contrasts by casting artificial light in ambient nighttime conditions. Changes to ambient underwater light environments pose a risk of altering fish migration behavior and increasing mortality risks. Findings have demonstrated that fish responses to piers are ambiguous with some individuals passing under the dock, some pausing and going around the dock, schools breaking up upon encountering docks, and some pausing and eventually going under the dock (p. 43).

Light is considered to be the primary factor limiting the survival and distribution of eelgrass. Given the strong association of important fish prey resources with eelgrass, limitations in the extent of eelgrass pose a potential risk of reduced prey resources. Prey resource limitations likely impact migration patterns and the survival of many juvenile fish species. For smaller fish less than 50 mm in length, residence times along particular shorelines are thought to be a function of prey abundance. Research in the Hood Canal demonstrated that outmigrating juvenile chum fry (30-45 mm) feed extensively upon small, densely distributed harpacticoid copepods selecting for the largest copepods available. As the fish grew in size, their diet content became composed more of larger epibenthos and pelagic crustaceans. Consistent with other studies, the highest densities of harpacticoid copepods occurred in magnitudes 4-5 times higher in eelgrass stands than in sand

habitat without eelgrass. Similarly, the largest abundance of first post-larval stage crabs of 0+ age are found in eelgrass beds (p. 45).

Impacts on Wave Energy

Wave energy and water transport alterations imposed by docks, bulkheads, breakwaters, ramps and associated activities alter the size, distribution, and abundance of substrate and detrital materials required to maintain the nearshore detrital-based food web. Alteration of sediment transport patterns can present potential barriers to the natural processes that build spits and beaches and provide substrates required for plant propagation, fish and shellfish settlement and rearing, and forage fish spawning. Although the specific characteristics of the factors at play vary with the geology of each region or subsystem, changing the type and distribution of sediment will likely alter key plant and animal assemblages. Wave and current interactions in shallow water (i.e. depths <1.0m) are particularly important to intertidal flora and fauna (p. 48).

Dock pilings have also been found to alter adjacent substrates with increased shell hash deposition from piling communities and changes to substrate bathymetry. Similarly, dock uses and construction activities are known to limit underwater light and redistribute sediments through prop scouring, vessel shading, and pile driving. These changes in substrate type can change the nature of the flora and fauna native to a given site. In the case of pilings, native dominant communities typically associated with sand, gravel, mud, sand, and seagrass substrates are replaced by those communities associated with shell hash substrates (p. 49).

Cumulative Effects

Given the apparent increasing demand for overwater structures, structural design to allow maximum light transmission and to mitigate energy and substrate changes is required to protect the ecosystems marine fishes rely upon. Given what is known concerning overwater structure impacts in marine and estuarine ecosystems, we conclude that multiple placements of overwater structures in marine waters can pose substantive risks of significant changes to the immediate and surrounding marine and estuarine ecosystems. These risks require the assessment of existing cumulative light limitation effects and wave energy and substrate effects to the shoreline environment. These risks require assessment at the drift cell before considering the addition of new structures (p. 91).

MAP 3a: Eelgrass Presence Gambier Island

-  Potential Restoration Site
-  Eelgrass Present: Flat, Continuous
-  Eelgrass Present: Flat, Patchy
-  Eelgrass Present: Fringing, Continuous
-  Eelgrass Present: Fringing, Patchy

Eelgrass inventory was completed by SeaChange Marine Conservation Society under contract by the Islands Trust Fund and the Islands Trust. The inventory was conducted in July 2012 using a towed underwater camera and Garmin GPS.

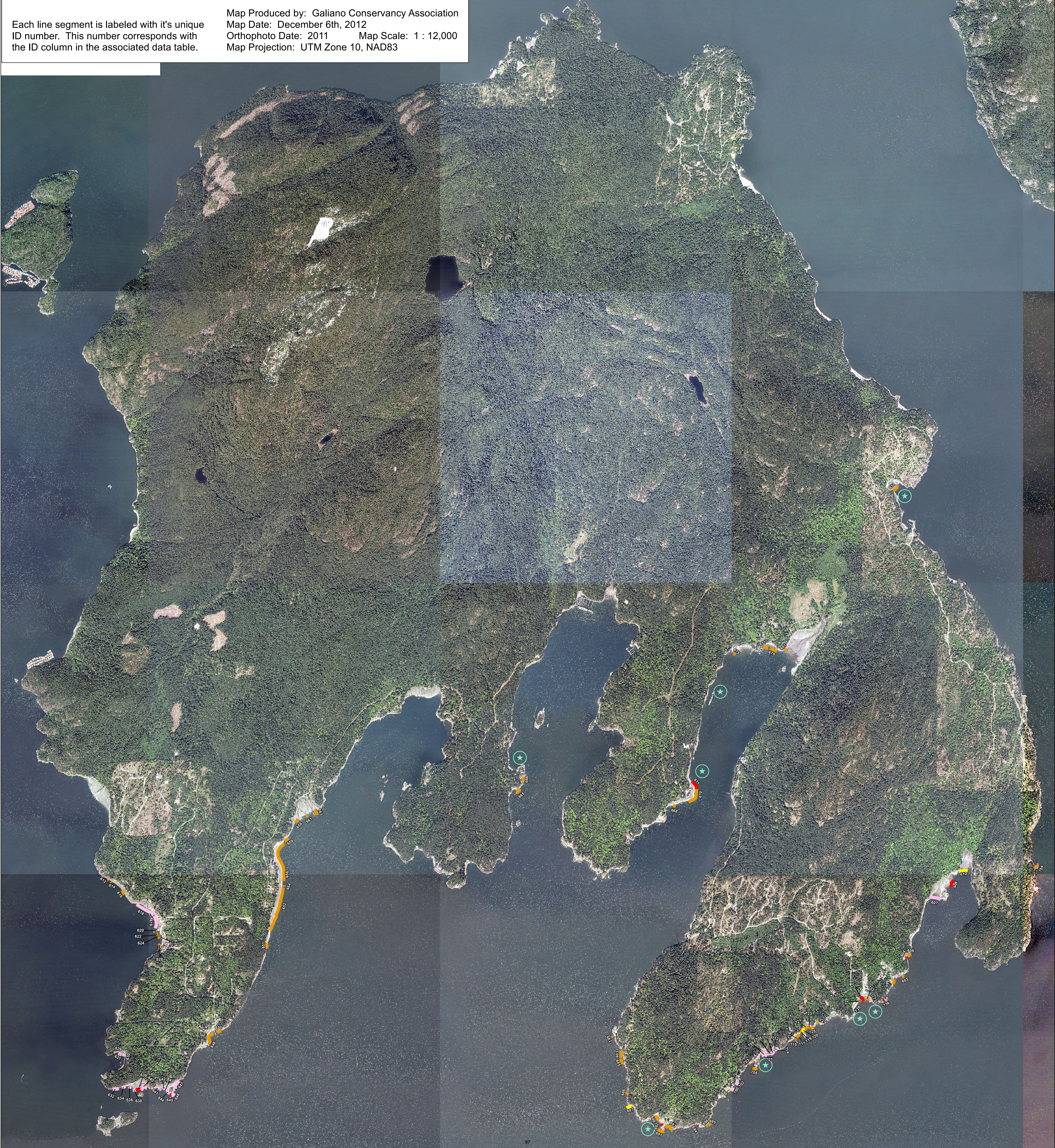
0 500 1,000 Meters

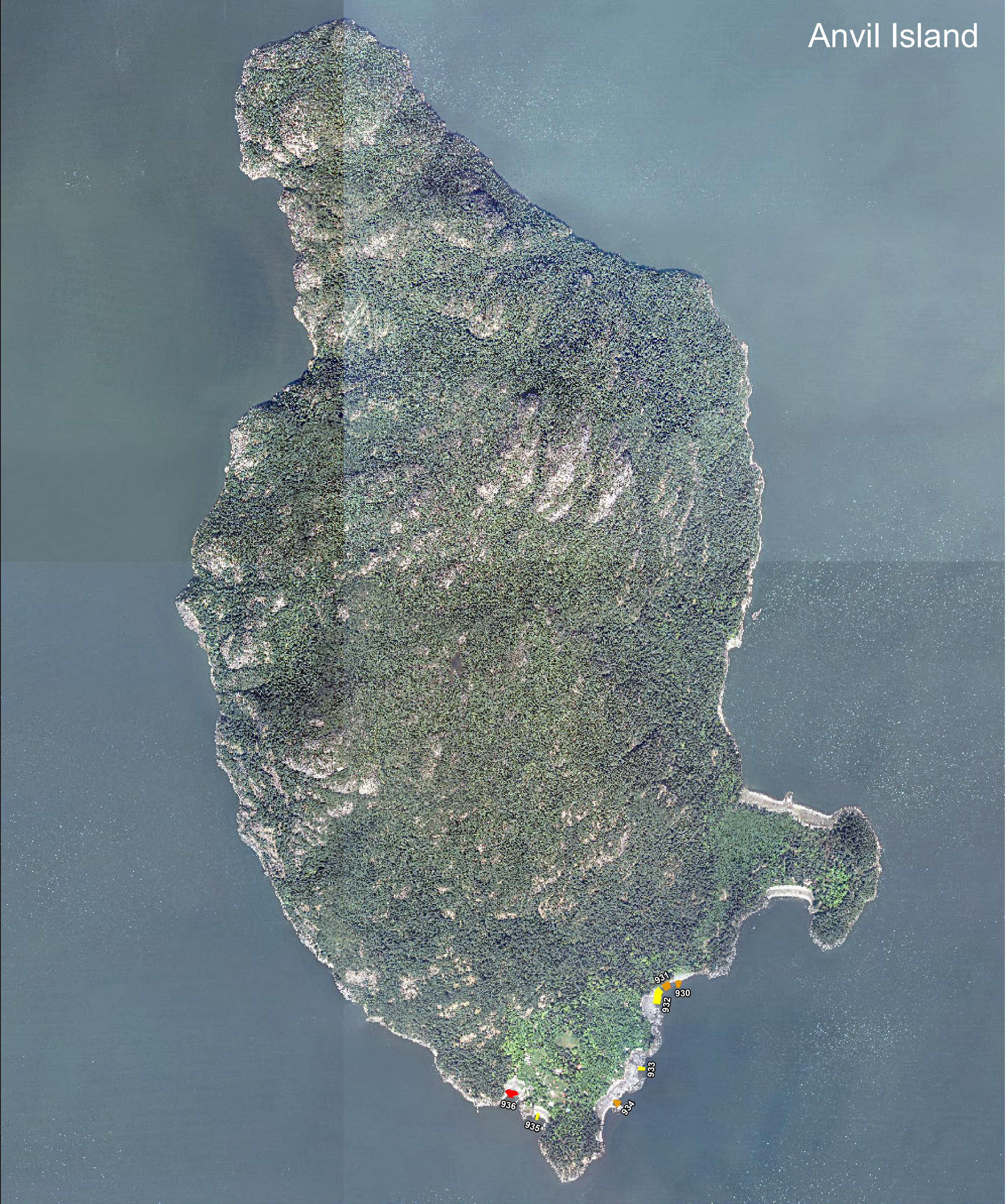
Map Produced by: Galiano Conservancy Association
Map Date: December 6th, 2012
Orthophoto Date: 2011 Map Scale: 1 : 12,000
Map Projection: UTM Zone 10, NAD83

Each line segment is labeled with it's unique ID number. This number corresponds with the ID column in the associated data table.



4.2.3





MAP 3b: Eelgrass Presence Gambier Local Trust Area, Howe Sound Associated Islands

- Eelgrass Bed: Flat, Continuous
- Eelgrass Bed: Flat, Patchy
- Eelgrass Bed: Finging, Continuous
- Eelgrass Bed: Flat, Continuous
- Eelgrass Bed: Flat, Patchy
- Eelgrass Bed: Fringing, Continuous
- Eelgrass Bed: Fringing, Patchy
- Eelgrass Patch: < 10m2
- Potential Site for Restoration

FOR BOWYER AND PASSAGE ISLANDS:
EELGRASS PATCHES < 5m WIDE ARE
REPRESENTED BY LINES. PATCHES > 5m
WIDE ARE MAPPED AS POLYGONS.

The eelgrass inventory was completed by
SeaChange Marine Conservation Society under
contract by Islands Trust Fund and the Islands
Trust. The inventory was conducted from July
to November, 2013 using a towed underwater
camera and Trimble Pathfinder Pro XR GPS.

0 500 1,000 Meters

Each polygon and line segment is labeled with
its unique ID number. This number corresponds
with the ID column in the associated data table.

Produced by: Galiano Conservancy Assoc.
Map Date: December 12th, 2013
Orthophoto Date: 2011 Scale: 1 : 12,000
Map Projection: UTM Zone 10N, NAD83



STAFF REPORT

Date: January 20, 2014

File No.: GM 6500-20
Foreshore Protection

To: Gambier Local Trust Committee
For the meeting of January 30, 2014

From: Aleksandra Brzozowski, Island Planner

CC: Courtney Simpson, Regional Planning Manager (Northern Office)

Re: Project Charter for Foreshore Protection priority project

PURPOSE:

Staff presents a draft Project Charter for the Foreshore Protection priority project seeks feedback from the LTC specifically on the scope, desired deliverables, and milestones in order to endorse a Project Charter and work plan for Foreshore Protection. This Project Charter will cover the remainder of the 2013/2014 fiscal, as well as the first half of the 2014/2015 fiscal year.

BACKGROUND:

At its January 31, 2012 regular business meeting, the Gambier Island Local Trust Committee (LTC) passed a resolution placing Foreshore Protection, including the implementation of development permit areas and development approval information bylaws, as Number 3 on the Top Priorities Work Program. While work has moved forward on this item over the last two years, a Project Charter has not yet been created to guide and scope this work.

In discussion of this topic over the last several LTC meetings, a number of tasks on foreshore protection education have been requested of staff. Over this time, it has become clear that establishing a clear vision of the goals and scope of the work to complete by November 2014 would significantly improve efficient expenditure of budget and staff work hours.

An initial staff report on a Foreshore Protection project charter was presented to the LTC on November 29, 2013 detailing work to date and relevant bylaw policies. Due to time constraints, detailed consideration of the staff report was not possible; it is attached (Attachment 1) for information, in particular the activity options laid out in the report.

STAFF COMMENTS:

Staff has prepared a draft Project Charter (Attachment 2) to solicit specific feedback. The following four items have been suggested as activities for the 2014 year, and will require LTC feedback:

1. **Modification of the Sharing our Shores Publication:** Modification of a number of recent publications was discussed at the September 26, 2013 and October 24, 2013 LTC meetings. Staff believes the *Sharing Our Shorelines* publication prepared for North Pender Local Trust Area (LTA) could readily be modified for the Gambier LTA; however, Staff seeks direction from the LTC on what shoreline messages are most important in any printed materials to ensure that this publication reflects desired messaging.
2. **Summer Education Event:** Trustees have expressed a desire to have an educational event with experts in the field at some point during the summer of 2014. Presentations have previously been made regarding Shoreline Mapping (Paul de Greeff), the Greenshores approach and credit rating system (Brian Emmett) and Forage Fish Ecosystems (Ramona de Graaf).

Possible future presenters include engineers/biologists advocating for shoreline protection, contractors taking 'soft shoreline' approaches, stewardship societies sharing best practices, or other local governments pursuing shoreline protection in their jurisdictions. Staff seeks direction on the topics deemed top priority to the LTC, so to ensure that the presenter(s) invited will speak directly to the desired topic.

3. **Additional Information to the Care for My Shoreline webpages:** In conjunction with the educational event, the LTC may wish to have new information added to the Islands Trust website. Rather than solely placing this on the Gambier webpages, staff recommends placing this on the Trust-wide "Care for My Shoreline" pages. Staff has allotted a budget item in the draft project charter to pay for a review by a coastal engineer of any technical information.

Part of the webpage additions could also be a comprehensive set of links to external documents that give advice on the protection of foreshore ecosystems.

4. **Improving shoreline management regulations:** Over the last three years, Planning Staff has identified a review of current shoreline regulations as a needed work item. Staff recommends that research begin on shoreline regulation best practices to provide the LTC with options for either new regulations or modifications of existing regulations, with the aim to more effectively protect the foreshore.

RECOMMENDATIONS:

THAT the Local Trust Committee review and revise the draft Project Charter for Foreshore Protection; and,

THAT the Local Trust Committee endorse the Project Charter for Foreshore Protection once revised.

Prepared and Submitted by:

Aleksandra Brzozowski

January 20, 2014

Aleksandra Brzozowski
Island Planner

Date

Concurred in by:

Courtney Simpson

January 20, 2014

Courtney Simpson, RPP, MCIP
Regional Planning Manager

Date

Attachments:

- 1) Staff Report re: Foreshore Protection dated November 29, 2013
- 2) Draft Project Charter – Gambier LTA Foreshore Protection, dated January 17, 2014

Purpose This project aims to increase understanding about shoreline ecosystems and coastal processes, and to better protect those foreshore ecosystems in the Gambier Local Trust Area.

Background Foreshore protection is a priority project of the GMLTC work program in the 2011-2014 term. Mapping of shorelines and eelgrass have been completed for Gambier Island, Keats Island, and the Associated Islands; shoreline mapping was presented in a webinar in 2013. Keats and the Thormanby Islands in particular have previously been identified as shorelines highly sensitive to foreshore modification issues.

Objectives

- Provide property owners with tools and best practices for shoreline landscaping and development.
- Identify and develop improved regulatory tools to proactively protect the foreshore.

Scope & Deliverables

- Modification and printing of existing informational materials.
- Expansion of *Caring for My Shoreline* webpages with further information.
- Educational event on the topic of _____.
- Video of educational event posted on website.
- Staff Report presenting options for improving regulatory approaches to foreshore protection.

Workplan Overview

Deliverable/Milestone	Date
Modification of Sharing our Shorelines brochure & printing	March 20, 2014
Detailed event plan for educational event presented to LTC.	April 10, 2014
Host educational event in the Gambier LTA.	July 2014
Expansion of <i>Caring for My Shoreline</i> webpages.	Summer 2014
Report on possible regulatory improvements for foreshore protection.	September 18, 2014

RPM Approval:

Courtney Simpson

Date: January 20, 2014

LTC Endorsement:

Resolution #:

Date: 92

Project Team

Aleksandra Brzozowski (Island Planner) (Lead)

Gambier LTC (promotion of educational event)

Penny Hawley (venue logistics, web posting)

Wendy Hawthorne (webpage design)

Budget

Budget Source: Work Program 2013/2014 (\$5,000) and 2014/2015 (\$3,000 requested)

Item	Cost	Fiscal
Prep and printing information materials	\$500	2013/ 2014
Educational event (speaker, venue)	\$2,000	2014/2015
Video of educational event	\$500	2014/2015
Technical review of new webpage information	\$500	2014/2015



STAFF REPORT

Date November 16, 2013 **File Number** GM 6500-20

To Gambier Island Local Trust Committee

From Aleksandra Brzozowski
Island Planner
Northern Office

Re Drafting of Project Charter for Foreshore Protection project

PURPOSE:

At its January 31, 2012 regular business meeting, the Gambier Island Local Trust Committee (LTC) passed a resolution placing Foreshore Protection, including the implementation of development permit areas and development approval information bylaws, as Number 3 on the Top Priorities Work Program. While work has moved forward on this item over the last two years, a Project Charter has not yet been created to guide and scope this work.

Staff seeks direction from the LTC specifically on scope and desired outcomes in order to prepare a Project Charter and work plan for Foreshore Protection. This Project Charter and Work Plan will cover the remainder of the 2013/2014 fiscal, as well as the first half of the 2014/2015 fiscal year.

BACKGROUND:

The Foreshore Protection project description tasks the LTC to investigate and recommend options for protection/stewardship within the Local Trust Area through the use of existing land use planning tools. This project is consistent and supported by the following policies noted in the Islands Trust Policy Statement, the Islands Trust Strategic Plan, and the Gambier Island OCP:

Islands Trust Policy Statement

Local trust committees are clearly directed to protect the shorelines in the Trust Area, including protection of sensitive marine habitats, intertidal habitats, riparian habitats, water quality, and natural coastal processes.

In its section on Ecosystem Preservation and Protection, the Islands Trust Policy Statement makes the following commitment regarding ecosystems, including coastal ecosystems:

Trust Council holds that:

- *proactive land use planning is essential for the protection of Trust Area ecosystems*
- *protection must be given to the natural processes, habitats and species of the Trust Area, including those of the old forests, Coastal Douglas-fir forests, Coastal Western Hemlock, Garry Oak/Arbutus forests, wetlands, open coastal grasslands, the vegetation of dry rocky areas, lakes, streams, estuaries, tidal flats, salt water marshes, drift sectors, lagoons, and kelp and eel grass beds.*

In the Policy Statement, there is also a directive policy that:

Local trust committees shall in their Official Community Plans and regulatory bylaws, address:

- *the protection of sensitive coastal areas;*

- *the planning for and regulation of development in coastal regions to protect natural coastal processes;*
- *opportunities for the sharing of facilities such as docks, wharves, floats, jetties, boat houses, board walks and causeways; and*
- *the compatibility of the location, size and nature of marinas with the ecosystems and character of their local planning area.*

Islands Trust Strategic Plan

Trust Council's current Strategic Plan identifies the following current priorities relevant to shoreline protection:

- *To advance the stewardship of coastal areas and marine shore lands*
- *Provide stewardship information about waterfront lands to community members*
- *Develop and implement new land use planning tools for shoreline and marine protection*

Gambier Island Official Community Plan

The Gambier Island Official Community Plan features the following policies on foreshore protection:

- Policy 3.7 The zoning regulations should establish setbacks for buildings and structures, in accordance with good planning practices, from the sea to protect buildings and structures from floodwaters or coastal erosion; to protect marine and riparian habitat and water quality; and to maintain a view of the coastline that is rural in character and relatively pristine in appearance.*
- Policy 7.41 Natural coastal processes should be left undisturbed to the maximum extent possible.*
- Policy 7.42 All property owners are encouraged to retain natural vegetation on any land sloping towards the shoreline.*
- Policy 9.19 Wharves, docks, floats, barge loading ramps and boat launch ramps should be sited to minimize their impact on the natural environment and allow public access to the foreshore.*
- Policy 9.20 Property owners are encouraged to share the use of docks and wharves with one or more of their neighbours through joint ownership or rental agreements and through the use of easements or other forms of agreed upon access to the facilities rather than erecting individual private docks or wharves.*

Schedule G (Qualitative criteria for environmentally sensitive areas) and Schedule H (Principles of sustainability of environmental features) also outline development approval criteria that consider the environmental impacts of coastal development.

Keats Island Official Community Plan

The Keats Island Official Community Plan features the following policies on foreshore protection:

- P 3.19 In order to protect the island's foreshore and beaches from pollution, environmental degradation, and inappropriate development or use, zoning regulations for coastal areas should be designed to ensure protection of natural coastal processes and features.*
- P 4.21 The location of new buildings and structures should be regulated so as to protect public access to, from and along the marine shoreline and to minimize negative impacts on sensitive coastal environments.*
- P 4.22 Foreshore and adjacent coastal water area land use regulations should place emphasis on retaining natural characteristics.*

The integrity of foreshore features, shoreline features, and intertidal processes should be maintained by discouraging uses that disrupt natural features and processes, and encouraging owners of shoreline properties to retain, wherever possible, natural vegetation and natural features on areas sloping towards the foreshore.

WORK TO DATE:

Since the project was first put on the Top Priorities list on January 31, 2012, the LTC has pursued a number of related activities on the subject of foreshore protection:

March 2012	LTC directed staff to pursue including Gambier Island as part of the Integrated Shoreline and Watershed Mapping project spearheaded by the trust-wide Local Planning Committee.
July 2012	LTC released funds to include Keats and the Thormanby Islands as part of the Integrated Shoreline and Watershed Mapping project.
August – September 2012	Eelgrass mapping was conducted for Gambier Island.
October 2012	Gambier LTC was invited to coordinate a funded Greenshores outreach event. LTC and staff began planning an event for March 2013.
March 2013	A webinar was held on March 20 to present the results of the Integrated Shoreline and Watershed Mapping project and to introduce the Green Shores for Homes program.
April 2013	Feedback following the Green Shores webinar indicated that there is appetite for incorporating best LUB practices and regulations on shorelines into existing bylaws, provided necessary resources and support were developed as well.
July 2013	LTC released funds to map eelgrass on the Associated Islands in the Gambier Local Trust Area.
July 2013	Ramona de Graaf gave a presentation on marine habitats and forage fish ecology to public/shoreline property owners on Keats Island.
July 2013	LTC advised the Local Planning Committee to provide proactive educational support regarding unlawful structures on the foreshore in the Gambier Island Local Trust Area.
July 2013	LTC expressed interest in seeing the Green Shores for Homes credit rating system when the draft is available.
August - September 2013	Planning staff researched publications and posters on shoreline protection to be modified for the Gambier Local Trust Area.
October 2013	Planning staff presented the new Caring for My Shoreline webpages to be posted on islandstrust.bc.ca.

STAFF COMMENTS:

In discussion of this topic over the last several LTC meetings, a number of tasks on foreshore protection education have been requested of staff. Over this time, it has become clear that establishing a clear vision of the goals and scope of the work to complete by November 2014 would significantly improve efficient expenditure of budget and staff work hours.

Looking forward, a number of activity options are available to the LTC on this topic, listed below along with attending considerations for each option. The LTC has a budget of \$5,000 for the 2013/2014 fiscal year and has requested \$3,000 for the 2014/2015 fiscal. The necessary staff work hours will need to also be taken into account.

Printed Publications: Publications could be produced for the Local Trust Area, either as modifications of other LTC projects, or as original work. If considered a priority activity, staff would seek direction on the scope and messaging to be put forward in such publications to ensure that any publication speaks directly to desired messaging.

Web-oriented Information: Expansion of the *Care for My Shoreline* webpages is a possible activity. If considered a priority activity, staff would seek direction on the scope of outstanding information to be drafted and added to the website.

Speakers evening and education sessions: Information to property owners could be provided through interactive information sessions with experts in the field. Such sessions could be held face-to-face or as a webinar. If considered a priority activity, staff would seek direction on the scope and messaging to be conveyed, so to ensure that the speaker(s) invited ties in directly with desired messaging and education.

Drafting shoreline management regulations: Research could begin on shoreline management best practices to help inform either new regulations or modifications of existing regulations, with the aim to more proactively protect the foreshore. Regulatory measures could either come in the form of zoning regulation amendments, amendments to the Development Procedures bylaw, or the implementation of Development Permit Areas and Development Approval Information bylaws. If considered a priority activity, staff would seek direction on goals and scope, to ensure that the most appropriate regulatory methods are chosen.

Collaboration with agencies and stakeholders: The LTC could embark on stakeholder engagement with other agencies (Regional Districts, FLNRO, Fisheries and Oceans Canada, etc) and perhaps the development community (contractors, excavators, real estate agents, etc) to establish agreed-upon guidelines for foreshore protection. If chosen as a priority activity, realistic expectations would need to be set regarding the long timeline required for such an activity.

RECOMMENDATIONS:

THAT the Local Trust Committee provide Staff with desired outcomes and direction for the Foreshore Protection Priority work item;

THAT the Local Trust Committee pursue an expansion of the *Caring for My Shoreline* webpages to provide further information to property owners on foreshore development best practices;

THAT the Local Trust Committee host an information session in the Gambier Local Trust Area on a specific desired topic related to foreshore protection, to be held in the summer of 2014; and,

THAT the Local Trust Committee direct staff to research regulatory practices related to foreshore protection.

Prepared and Submitted by:

Aleksandra Brzozowski

November 18, 2013

Aleksandra Brzozowski
Island Planner

Date

Concurred in by:

Courtney Simpson

November 18, 2013

Courtney Simpson, RPP, MCIP
Regional Planning Manager

Date



Top Priorities

Gambier Island

No.	Description	Activity	Received/Initiated	Responsibility	Target Date	Status
1	Foreshore protection/stewardship and clarity; implementation of Development Approval Information Bylaw (DAI) or Development Permit Areas (DPA's).	Investigate and recommend options for protection/stewardship within the local trust area through the use of existing land use planning tools.	Jan-31-2012	Aleksandra Brzozowski	Nov-27-2014	On Going
2	OCP advocacy policies - implementation & support	Work related to supporting the advocacy policies stated in the Gambier, Keats, and Associated Islands OCPs and in the IT Strategic Plan. Ex. Woodlots, industrial facilities, cross-jurisdictional management of Howe Sound	Oct-24-2013	Aleksandra Brzozowski	Nov-03-2014	On Going
3	Sustainability Guide	Customize the southern islands' "Guide to Environmentally Friendly Building and Renovating" for the northern trust area.	May-23-2013	Aleksandra Brzozowski	Jul-11-2013	On Going
4	Riparian Areas Regulation Implementation Project for Gambier Island Local Trust Area.		Oct-26-2011	Aleksandra Brzozowski	Dec-31-2012	On Going



Projects

Gambier Island

No.	Description	Activity	Received/Initiated	Status
1	Keats Island OCP Map Amendment - add trail map used during public process developing OCP.		Mar-08-2007	On Going
1	Staff to prepare an issues outline with respect to Gambier Island Comprehensive Land Use Planning Project. (Address community planning and environmental protection issues) Gambier dp and comprehensive planning - subject to alternate funding and resources. To include: 1. Road issues - road network, and parking issues 2. Gambier forest tenure and reallocation - Gambier Island Crown lands. Gambier LUB follow-up: Definition of recreation in Area 3, CD1 Zone. Subdivision and use of common property in a bare land strata plan. Legal non-conforming - information note. ssociated secondary dwelling - definition and use. Potable water requirements.		Jun-23-2010	On Going
1	Consider a mechanism to recognize authorizations of additional dwellings as permitted by s. 4.4.10 of Keats LUB		Aug-04-2010	On Going
1	GHG Emissions - examine as part of next OCP reviews more proactive approaches to plan for GHG reductions especially in relation to Policies 6.1 and 6.2 in consultation with SCRD. Initiative arises from recommendation of SCRD in comments about bylaws 111 & 112.		Oct-06-2010	On Going
1	Food Security: Based on the November 2010 'Exploring Food Security in the Islands Trust Area' - explore opportunities to implement policies and regulations to address food security in the Gambier Trust Area.			On Going

1	Development Approval Information Bylaw	Develop and adopt a D.A.I bylaw for the Gambier Trust Area.		On Going
1	Consultation with Squamish First Nation	Scope interim strategies pending completion of a possible protocol agreement to address protection of archaeological and heritage resources.	Jan-31-2012	On Going
1	Strategic Planning Review for Howe Sound		Jan-31-2012	On Going
1	REVIEWING KEATS AND GAMBIER LUBS FOR ACCOMMODATION of OCEAN LOOP GEO-EXCHANGE SYSTEMS		Apr-11-2013	On Going
1	Allow electronic meetings of the Gambier LTC	Amend the meeting procedures bylaw	May-23-2013	On Going



Applications w/ Status - Gambier Island Status: Open

Applications

Development Variance Permit

File Number	Applicant Name	Date Received	Purpose
GM-DVP-2002.1	Land Plan Group Inc. Planner: Sonja Zupanec	Jan-24-2002	PID: 014-385-694 Keats Island - Keats Camp cottage lots - siting variances DL 696

Planning Status

Status Date: Apr-10-2008

still on hold pending rezoning

Status Date: Aug-13-2007

on hold pending rezoning application

Status Date: May-16-2006

Met with applicant. Outstanding items forwarded for attention. May be add'l fees.

File Number	Applicant Name	Date Received	Purpose
GM-DVP-2011.2	Elena and France Corin and Larouche Planner: Marnie Eggen	Mar-22-2011	PID: 024-212-041 1250 Taki-Te-Si Road, Gambier Island vary the setback to the natural boundary of the sea for retaining wall

Planning Status

Status Date: Jan-17-2014

no change

Status Date: Sep-13-2013

no change

Status Date: Oct-19-2012

New owners working with planning staff to provide further information

File Number	Applicant Name	Date Received	Purpose
GM-DVP-2013.2	Jim Green	Apr-08-2013	027-998-967 Jim Green (Reel 17 Investments) Gambier Island A variance to site a rock retaining wall and to authorize additional width for a walkway pier

Planner: Aleksandra Brzozowski

Planning Status

Status Date: Oct-25-2013

Staff advised applicant of outstanding information required for application.

Status Date: Aug-14-2013

Applicant submitted application and some supplemental information.

File Number	Applicant Name	Date Received	Purpose
GM-DVP-2013.4	Silverspan Trams Inc. (Grayson Syryda)	Dec-10-2013	013-386-581 1010 Taki-Te-Si Road (Gambier Island - Farrokh Elmieh) Variance for setbacks and in order to bring lift down to dock level. One pre-existing deck included in this variance.
Planner: Linda Prowse			

Planning Status

Forest Land Reserve

File Number	Applicant Name	Date Received	Purpose
GM-FLR-2013.1			

Planner:

Planning Status

Rezoning

File Number	Applicant Name	Date Received	Purpose
GM-RZ-2004.1	LandPlan Group Inc.	Jun-16-2004	PID: 014-385-694 Keats Island - Keats Camp rezoning application DL 696
Planner: Sonja Zupanec			

Planning Status

Status Date: Jan-20-2014

File transferred to S. Zupanec - staff in contact with applicant to ensure timely review of their consultation strategy and cost recovery deposit for 2014 planning work.

Status Date: Oct-08-2013

Applicant wishes to continue with contract planner until Dec 2013

Status Date: Sep-26-2013

Status report presented to LTC

File Number	Applicant Name	Date Received	Purpose
GM-RZ-2012.1	Jim Green	Jun-27-2012	Rezoning a portion of Lot 1 from Residential to S2 zone and rezoning a portion of the marine area from W3 to W1

Planner: Aleksandra Brzozowski

Planning Status

Status Date: Nov-29-2013

Amending Bylaw Adopted

Status Date: Nov-06-2013

Executive Committee Approval

Status Date: Oct-24-2013

Second and Third Reading

File Number	Applicant Name	Date Received	Purpose
GM-RZ-2013.1	Rob Langford	Mar-20-2013	007-041-616 Trident Foreshore Lands (Burrard Yacht Club) to rezone from P3 to YCO to allow the placement of two floating breakwaters to protect our existing facilities at Ekins Point from storm damage

Planner: Marnie Eggen

Planning Status

Status Date: Nov-15-2013

Applicant working with Squamish FN to address concerns

Status Date: Sep-26-2013

First Reading given

Status Date: Jul-11-2013

Amendment Bylaw requested to be drafted

File Number	Applicant Name	Date Received	Purpose
GM-RZ-2013.2	Lynn Roxburch	May-23-2013	Strata Lots 1-33 & Common Prop. Gambier Island Sea Ranch Strata Lot 1 PID: 005-188-016 Amendment of the Gambier Island Sea Ranch Comprehensive Develop. Zone of the Gambier LUB

Planner: Aleksandra Brzozowski

Planning Status

Status Date: Jan-20-2014

Draft SROW prepared and reviewed by SCRD and GISR solicitor. Draft changes to be reviewed by GISR Strata late Feb prior to LTC review and comment.

Status Date: Sep-26-2013

Prelim report to LTC

Subdivision

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2000.1	LANDPLAN GROUP INC.	May-04-2000	PID: 014-385-694 Keats Island - 111 bare land strata subdivision, 2 camp lots, and remainder(Keats Camp); nature reserve, park dedication, parking lot. DL 696

Planner: Sonja Zupanec

Planning Status

Status Date: Jun-06-2007

On hold pending rezoning application.

Status Date: May-16-2006

Met with applicant - revised plan to come based on LUC. May be add'l fees.

Status Date: Dec-21-2005

MOT issues Prelim Layout NOT APPROVED with conditions.

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2010.1	Venture Management Ltd	May-25-2010	PID: 015-980-324 7 residential lots

Planner: Sonja Zupanec

Planning Status

Status Date: Jan-06-2012

No further action until applicant finalizes final plan of subdivision.

Status Date: Mar-16-2011

Comments sent to MoTI. Depth to width information was received.

Status Date: Feb-23-2011

Waiting for applicant to confirm that lots comply with depth to width ratio. Revised comments to be sent to MoTI.

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2011.2	EDWARD TRAFF	Jul-21-2011	014-111-888 and 014-111-896 Lot Line adjustment on Gambier Island

Planner: Marnie Eggen

Planning Status

Status Date: Jan-17-2014

no change

Status Date: Sep-16-2013

no change

Status Date: Oct-12-2012

Requires DVP to permit lot size; awaiting further info from MOTI and Health Authority

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2012.2	Reel 17 Investments Ltd. Planner: Sonja Zupanec	Jun-29-2012	4 lot subdivision

Planning Status

Status Date: Oct-03-2012

Referral response sent to MOTI and applicant

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2013.1	Creus Engineering Planner: Sonja Zupanec	Dec-09-2013	PID: 014-385-694 The Convention of Baptist Churches of BC Keats Island 9 Lot Subdivision

Planning Status

File Number	Applicant Name	Date Received	Purpose
GM-SUB-2014.1	Mary & Richard Potter Planner: Marnie Eggen	Jan-16-2014	028-117-000 & 012-825-034 (2220 Maple Rd, Gambier Is) Boundary adjustment

Planning Status

Islands Trust

LTC EXP SUMMARY REPORT F2014

Invoices posted to Month ending November 2013

630 Gambier	Invoices posted to Month ending November 2013	Budget	Spent	Balance
65000-630	LTC "Trustee Expenses"	1,200.00	2,001.40	-801.40
LTC Local				
65200-630	LTC - Local Exp - LTC Meeting Expenses	3,000.00	2,035.98	964.02
65210-630	LTC - Local Exp - APC Meeting Expenses	1,000.00	0.00	1,000.00
65220-630	LTC - Local Exp - Communications	500.00	0.00	500.00
65230-630	LTC - Local Exp - Special Projects	2,000.00	2.00	1,998.00
65240-630	LTC - Local Exp - Miscellaneous	250.00	0.00	250.00
TOTAL LTC Local Expense		<u>6,750.00</u>	<u>2,037.98</u>	<u>4,712.02</u>
Projects				
73001-630-2003	Gambier Associated OCP/LUB	<u>2,000.00</u>	<u>1,992.72</u>	<u>7.28</u>
TOTAL Project Expenses		<u>2,000.00</u>	<u>1,992.72</u>	<u>7.28</u>

Islands Trust
 LTC EXP SUMMARY REPORT F2014
 Invoices posted to Month ending December 2013

630 Gambier	Invoices posted to Month ending December 2013	Budget	Spent	Balance
65000-630	LTC "Trustee Expenses"	1,200.00	2,179.00	-979.00
LTC Local				
65200-630	LTC - Local Exp - LTC Meeting Expenses	3,000.00	2,867.25	132.75
65210-630	LTC - Local Exp - APC Meeting Expenses	1,000.00	0.00	1,000.00
65220-630	LTC - Local Exp - Communications	500.00	0.00	500.00
65230-630	LTC - Local Exp - Special Projects	2,000.00	1,352.00	648.00
65240-630	LTC - Local Exp - Miscellaneous	250.00	0.00	250.00
TOTAL LTC Local Expense		<u>6,750.00</u>	<u>4,219.25</u>	<u>2,530.75</u>
Projects				
73001-630-2003	Gambier Associated OCP/LUB	<u>2,000.00</u>	<u>1,992.72</u>	<u>7.28</u>
TOTAL Project Expenses		<u>2,000.00</u>	<u>1,992.72</u>	<u>7.28</u>

SCRD STAFF REPORT

DATE: December 5, 2013

TO: Planning and Development Committee – December 19, 2013

FROM: David Rafael, Senior planner

RE: **TEMPORARY USE PERMIT F-01 FOR A CONCRETE BATCH PLANT TO CONSTRUCT THE BOX CANYON HYDRO PROJECT (ELECTORAL AREA F)**

RECOMMENDATIONS

1. **THAT the report titled “Temporary Use Permit F-01 for a Concrete Batch Plant to construct the Box Canyon Hydro Project (Electoral Area F)” be received;**
2. **AND THAT draft TUP F-01 be referred to:**
 - a) **Squamish Nation;**
 - b) **West Howe Sound Advisory Planning Commission;**
 - c) **SCRD Natural Resources Advisory Commission;**
 - d) **Property Owners of McNab Creek Strata;**
 - e) **Adjacent property owners within 100 metres;**
 - f) **Ministry of Forests, Lands and Natural Resource Operations;**
 - g) **Future of Howe Sound Society; and**
 - h) **Others as identified during the referral period;**
3. **AND THAT a public information meeting be arranged for 7:00 pm on Tuesday January 21, 2014 at the Gibsons and Area Community Centre, 700 Park Rd, Gibsons, BC.**

BACKGROUND

At the July 25, 2013 meeting the SCRD Board adopted Bylaw 310.109 to designate the general location of the powerhouse for the Box Canyon project as I9 (Independent Power Project). The bylaw amendment included a provision that the I9 area also be designated as a temporary use permit area.

As part of the process for amending Bylaw 310, the proponents (Box Canyon Hydro Corps.) were advised to apply for a temporary use permit (TUP) for the anticipated concrete batch plant that would be needed to support the project's construction. The SCRD received an application for a TUP for a concrete batch plant for a period of 16 months (from spring 2014 to autumn 2015). The batch plant will be located with the area designated as I9, near the location of the proposed powerhouse and over 30 metres from McNab Creek or any other stream. The applicant provided a letter outlining the proposal and location map (Attachment A) and documents setting out best management practices, specifications for the type of portable batch plant, the proponent's Construction Environmental Management Plan (CEMP) and the

province's License of Occupation. All of these documents are available from staff and will be posted on the SCRD website prior to commencement of referrals.

The proponent held pre-application discussions with staff to set out the timelines, information requirements and TUP process. The proponent hopes to commence work in the spring of 2014 and desires that the TUP is issued by the end of March 2014 to facilitate this.

DISCUSSION

Local Government Act (LGA) Requirements

The LGA sets out that the local government must give notice prior to consideration of issuing a TUP. Notices must be placed in a newspaper a least 3 days and no more than 14 days before adoption of a resolution to issue the permit; thus before the relevant Board meeting. Staff note that this allows for the notice to be placed prior to the Planning and Development Committee which would also be within the 14 day period for the Board meeting the following week. The notice must state

- (i) in general terms, the purpose of the proposed permit,
- (ii) the land or lands that are the subject of the proposed permit,
- (iii) the place where and the times and dates when copies of the proposed permit may be inspected, and
- (iv) the date, time and place when the resolution will be considered

In addition, notices need to be sent to property owners and tenants of properties within the area specified in a relevant local government bylaw; in the SCRD this is *Bylaw 522* and the notification area will be 100 metres from the property (the boundary of the lease area in this case).

No public hearing is required as the land use zone identifies the I9 zone as a temporary permit use area. The LGA does not require a public information meeting. However the SCRD's *Planning & Development Procedures and Fees Bylaw No. 522, 2003*, allows for the SCRD to require a public information meeting. Staff consider that given the public interest expressed regarding the rezoning application and in the wider Howe Sound Area, a public information meeting should be required.

Information Analysis

The applicant provided a supporting statement and location map (Attachment A). The site is within the area designated as I9. The site is currently described as 'rural wilderness' and will be logged in advance of construction activity. It is about 2 km from the residential properties at the mouth of McNab Creek. The proponent describes the type of batch plant that could be used and provides specifications (Attachment B); the applicant commented that if an alternative batch plant is needed it would be of a similar scale and design. Water for batch plant operation will be drawn from McNab Creek and be the subject of a short term use water license from the province; the SCRD should have an opportunity to comment on the water license application as per regular provincial processes. Staff will seek additional details regarding water use from the proponent ahead of any public meeting or referral regarding the TUP.

The CEMP sets out the potential impacts of concrete production and provides a description of environmental protection measures; an extract relating to concrete production is included in Attachment C. It acknowledges that there is a risk of fish kills if high pH material leaks into the creek. Once the concrete is cured then this is not a concern. However the risk will be minimized by ensuring best practices are used. The prime contractor and construction manager

will be responsible for making workers aware of safe concrete handling. The CEMP notes that clean out pits and washing areas will be located well away from watercourses and that CO2 canisters and diffusers will be available for immediate use to reduce the impact of any release of high pH material into a watercourse.

The best management practices document reflects legislation from Atlantic Canada and at the federal level. Staff will ask the proponent to describe relevant BC legislative requirements and comment on whether the document covers the BC requirements. The document covers activities such as cleaning the equipment, storm water isolation, wastewater management, chemical and fuel management, noise and so on.

TUP Conditions

The draft TUP (Attachment D) sets out that the time period should be 2 years rather than the 16 months that is requested. SCRD staff consider that the additional 8 months should allow for the TUP to accommodate any construction delays due to unforeseen issues. Staff discussed this with the proponent and they agree that this would be a good idea.

Staff suggest that the proponent should be required to agree to an undertaking to remediate the site of the batch plant and the SCRD should require a bond to ensure that this is done. The proponent would need to provide an independent report from a qualified professional (most likely a registered biologist) to confirm that the site was remediated before the bond is returned. At this point in time, staff consider that a bond of \$10,000 could be appropriate. Additional discussion and advice regarding this will be sought during the referral period.

Another condition that could be included could be establishing hours of operation for the batch plant. This could be added if there is a concern about noise arising from operation that could impact the residents of the McNab Creek Strata which is about 2 km away. This will also be considered in more detail during the referral period.

Referrals

Staff suggest that the following be consulted regarding the proposed TUP:

- Squamish Nation;
- West Howe Sound Advisory Planning Commission;
- SCRD Natural Resources Advisory Commission;
- Property Owners of McNab Creek Strata;
- Adjacent property owners within 100 metres;
- Ministry of Forests, Lands and Natural Resource Operations; and
- Future of Howe Sound Society.

Additional referral agencies may be identified during consideration of the TUP and will be contacted by staff.

Staff are working with the proponent to schedule a public information meeting and suggest that it be held starting at 6:30 pm on Tuesday January 21, 2014 in the Gibsons and Area Community Centre. This date is acceptable to the proponent.



David Rafael, Senior Planner



**Box Canyon
Hydro Corp.**

November 25 2013

Sunshine Coast Regional District
Planning Department
1975 Field Road
Sechelt, BC
V0N 3A1

Attn: David Rafael, Sr. Planner

RE: Temporary Use Permit Application – Box Canyon Hydro Corporation

Dear David:

Please find enclosed a Temporary Use Permit ("TUP") application relating to the use of a temporary concrete batch plant during the construction of the Box Canyon Hydro Project (the "Project"). This letter is intended to provide additional context regarding certain elements of the application. Box Canyon Hydro Corp ("BCHC") is committed to the environmentally responsible development, installation, and operation of the Project.

Overview

The Project is an approximately 15MW run-of-river hydroelectricity facility which will sell power to BC Hydro through a 40-year Electricity Purchase Agreement ("EPA"). All major permits required for the construction and operation of the Project have been received from the province of British Columbia, most notably including a Water License, License of Occupation and License to Commence Construction.

BCHC is seeking a TUP from Sunshine Coast Regional District ("SCRD") for the use of a temporary concrete batch plant (the "Batch Plant") during the construction of the Project. Included in this application package is a specification sheet for a BMH Systems DEC 50 mobile Batch Plant that is intended to be representative of what will be used. If another Batch Plant is used, its specifications and operating characteristics will not differ materially.

On August 9, 2013, the Project received a zoning bylaw amendment with the SCRD which changed the powerhouse location zoning to I9 (Independent Power Project). This amendment also enabled the application for and issuance of TUPs, with an understanding that a Batch Plant will be used for the installation of the Project.

BCHC understands this to be the first TUP application for a Batch Plant and that the standard form application does not necessarily match with the specific nature of the Project. As a result, BCHC is providing all information it believes will allow the SCRD to process and evaluate this application.

Location

It is intended that the Batch Plant will be situated at or near the powerhouse location (I9 zoned area), per the location reference documentation included with this application. The Batch Plant

will be set back a minimum of 30 metres from McNab Creek or any other stream or creek and will be operated in a manner consistent with the Construction Environmental Management Plan ("CEMP").

Schedule

The Batch Plant will be used throughout the estimated 16 month construction period (spring 2014 to fall 2015). The Batch Plant operating hours will be in accordance with SCRD bylaws.

Location

The overall location of the Project is described in the attached Licence of Occupation ("LOO") as:

"That parcel or tract of land in the vicinity of District Lot 677A, together with unsurveyed foreshore of land covered by water being part of the bed of Box Canyon Creek, Group 1, New Westminster District, containing 239.51 hectares, more or less"

The proposed location can generally be described as rural wilderness in which active commercial logging is commonplace. There are fourteen (14) seasonal dwellings at the McNab Creek Estates, approximately 2km from the proposed location of the Batch Plant (I9 zoned area).

The portion of the Project location that is being primarily considered for the operation of the Batch Plant is that which received I9 rezoning from SCRD on August 9 2013 under SCRD Bylaw File No. 310.109. Although yet to be confirmed, the Batch Plant may be relocated from time to time as needed for the reasonable construction of the Project to other locations contained within the LOO area. In all cases, the Batch Plant will be operated in accordance with the Operating Details described in the subsequent section.

Operating Details

It is anticipated that the Project will use the BMH Systems DEC 50 mobile Batch Plant or equivalent. The Batch Plant will be used to produce concrete for the construction of:

- Powerhouse foundation;
- Intake structures; and,
- Penstock foundations and reinforcement, as needed

A Short-term Use Water Licence will be required from the Ministry of Forestry, Lands and Natural Resources Operations ("FLNRO") to cover the 2-year construction period. It is anticipated that this licence will be applied for in early 2014 by the contractor hired to manage the Project's construction.

It is anticipated that water required for the Batch Plant's operation will be drawn from McNab Creek in accordance with the terms and conditions set forth in the Project's development, CEMP and forthcoming Short-term Use Water License.

Any and all personnel operating the Batch Plant will be appropriately trained in its operation or supervised by someone who is.

Application Documents

(1) TUP Application Form

(2) Map

- Identification of proposed Batch Plant location

(3) Specification Sheet

- BMH System DEC 50 Batch Plant Specification Sheet

(4) Construction Environmental Management Plan (CEMP)

- Section 5.12 "Concrete Production, handling and Wastage:

(5) Industry Best Management Practices

- Environmental Management Practices for Ready Mixed Concrete Operations in Canada

(6) License of Occupation

- Government of BC contact:
Jacqueline Cavill, Crown Lands Authority
Jacqueline.cavill@gov.bc.ca
Tel: 604 586 4313

Contact Information

In the event additional information or clarification is needed, please contact:

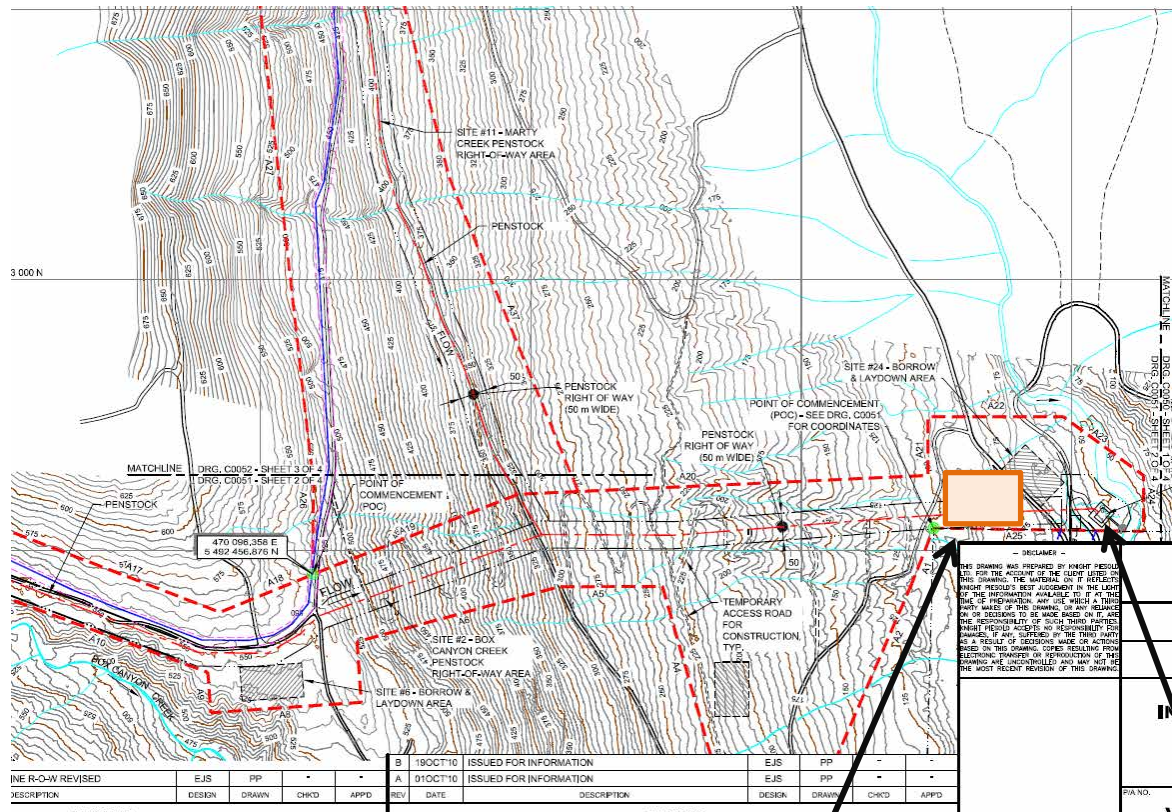
Graeme Millen
Manager, Project Development
gmillen@elementalenergy.ca
tel: 604 648 6621

Thank you for your consideration of this application.



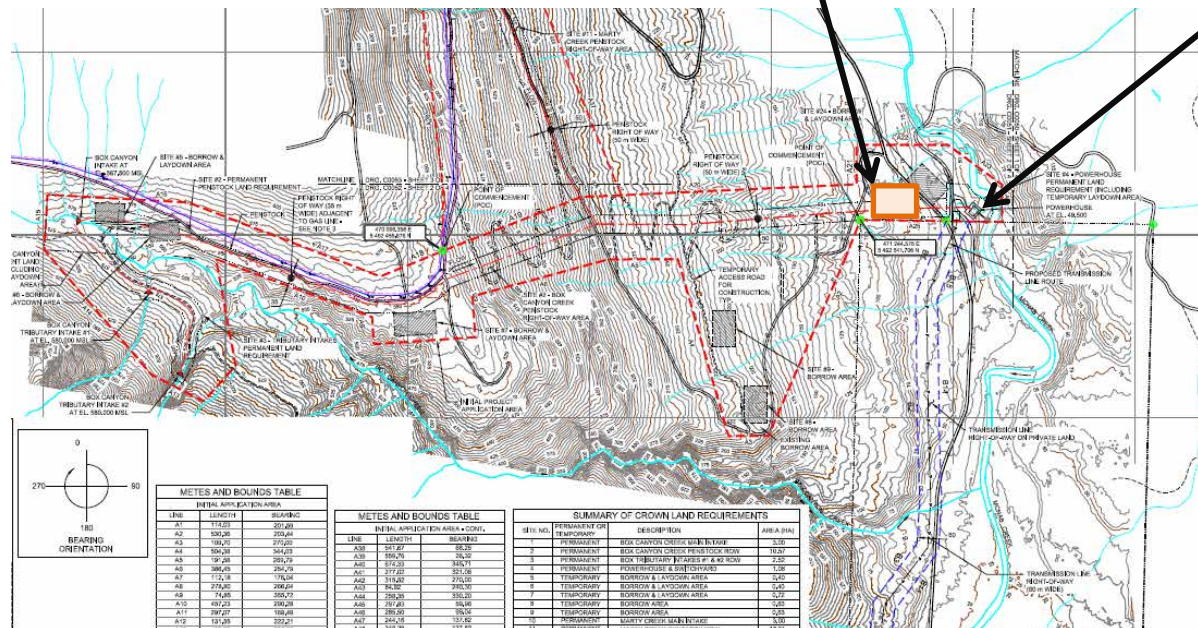
Graeme Millen
Manager, Project Development

BOX CANYON HYDRO PROJECT Powerhouse & Concrete Batch Plant Location Reference



Concrete Batch Plant
(~1 ac)
49.586066, -123.39509

Powerhouse



Ingenious design.
Innovative technologies.

DEC 50 ▶

Mobile
Concrete
Batch
Plants



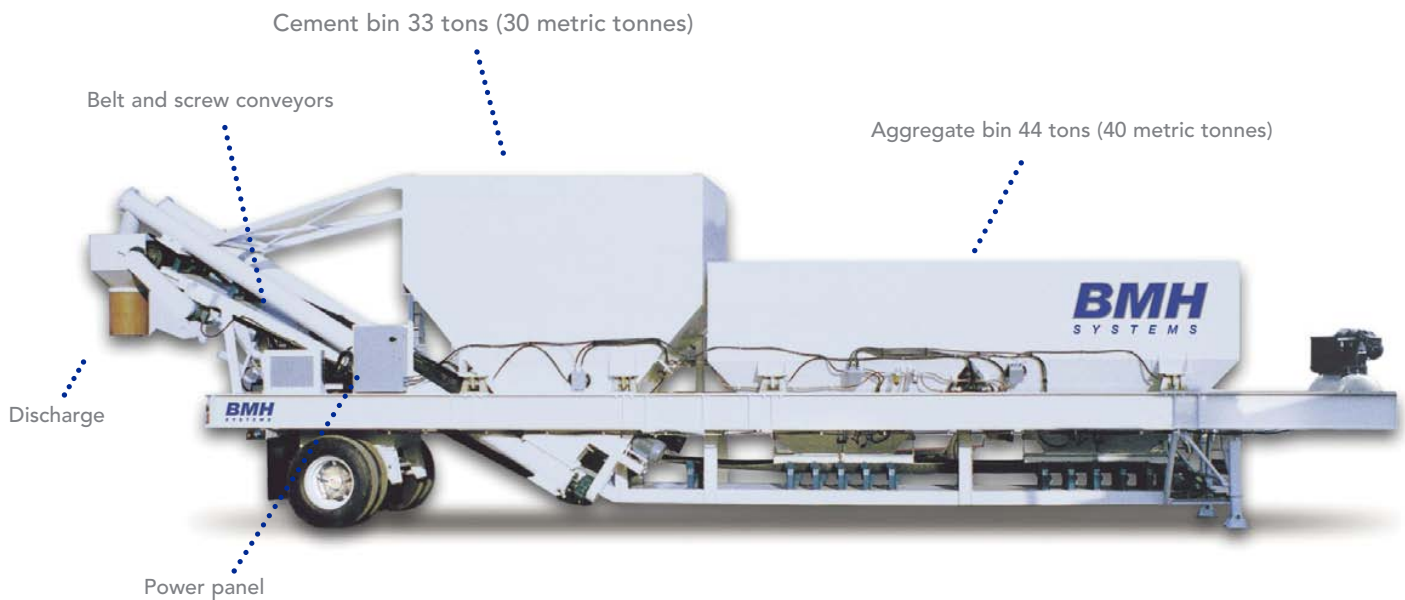
BMH
S Y S T E M S

ISO 9001:2000 certified

Mobile Concrete Batch Plants **DEC 50**

Designed for performance

Whether for temporary installation, special projects or permanent facilities, DEC 50 mobile concrete batch plants by BMH Systems are designed for optimal performance. Our exclusive decumulative mobile plants needs no concrete foundations and are ready for use in a snap. Any load size can be processed from the scale-mounted aggregate hoppers and cement bin. This economical system makes no compromise on quality, versatility or performance.



From design to start-up and service, we control every step of the process.

FEATURES

- Low profile high mobility
- Production capacity 65 yd³ (50 m³) per hour
- Decumulative batching
- Quick set up time
- No foundations/erection required, blocking only
- Telescopic legs
- Aggregate bins 44 tons (40 metric tonnes) with 2 compartments
- Direct front end loader charging of aggregates
- Cement bin 33 tons (30 metric tonnes)
- Cement delivery, 2 screw conveyors, 10" diameter (250mm), 24' long (7.32 m) with 10 HP (7.5 kW) motors
- Transfer belt 30" (760mm), ribbed
- Electronic water meter, 2" (50 mm)
- Air compressor 5HP (3.75 kW) motor
- Air brakes, single axle, double wheels and fifth wheel
- Signal, brake and tail lights
- Factory wired and plumbed
- Factory tested



PRODUCTION CAPACITY: 65 yd³ (50 m³) per hour

AGGREGATE BINS

- 20' 0" (6.10 meters) long
- 8' 0" (2.40 meters) wide
- 10' 3" (3.12 meters) charging height

WEIGHING SYSTEM

- Two (2) digital indicators
- Cement bin mounted on four (4) load cells of 25 000 lb (11 350 kg) each
- Aggregate bin mounted on four (4) load cells of 25 000 lb (11 350 kg) each

WEIGHT

- 30,000 lbs (13,500 kg)

BATCHING CONTROL

- Manual electric/air

ELECTRICAL POWER

- Power panel 460 or 575 volts
- Other voltage available upon request

TRAVEL DIMENSION

- 55' 4" (16.9 meters) long
- 8' 6" (2.6 meters) wide
- 14' 2" (4.32 meters) high

OPTIONS

- Aggregate bins, 3 compartments 44 tons (40 metric tonnes)
- Cement bin extension 11 tons (10 metric tonnes)
- Double axle, double wheel assembly
- Computerized batch control system
- Moisture probe
- Dust collector for cement bin
- Diesel generator power
- Quick-connect plugs
- Cement bulk bag handling system



Any batch size can be processed from the scale-mounted aggregate hoppers and cement bin.

BMH's road-tested expertise makes the most of your investment.

For more information call 450 449-4770

www.bmhsystems.com

DEC 50 ▶

MOBILE CONCRETE BATCH PLANTS DESIGNED FOR PERFORMANCE

All components used in our mobile plants are designed from the start to perform with outstanding results. From the design to the manufacturing, BMH directly controls each and every step of the project through a truly integrated approach.



BMH Systems is committed to being a leader in its field by providing the most efficient, high-performance technologies on the market and the most qualified human resources available. No matter the size of the project, BMH is dedicated to finding creative ways of fulfilling its clients' specific needs, now and in the future, and becoming a true partner in their success.

www.bmhsystems.com

450 449-4770

71 ch. du Tremblay, Boucherville (Quebec) Canada J4B 7L6

info@bmhsystems.com

ISO 9001:2000 certified

environmental protection measures will be provided to the IEM and regulatory authorities by the Prime Contractor once the blasting Contractor(s) have been retained (and before blasting begins).

Rock mucked from excavations may be used for embankments, riprap erosion protection, slope stabilization, cofferdam construction, topping and rework of the access roads, provided it is environmentally suitable (e.g., not acid generating) and of proper grade. Excess waste rock from excavations will be stored in the waste rock disposal (spoil) area to be identified by the Prime Contractor.

5.12 Concrete Production, Handling, and Wastage

5.12.1 Description of Activities and Environmental Concerns

Concrete may be produced on site for construction of the works. Although ready mix and pre-formed concrete plant operations do not generally pose high threats to the environment, there are a number of environmental risks that may be realized if appropriate environmental management practices are not followed, including contamination of ground and/or surface water and air emissions of fine and/or coarse particulates (MFLNRO Website). Nonetheless, an experienced, licensed operator will establish a concrete batch plant at a suitable site and shall operate the batch plant in accordance with applicable government⁵ regulations and the Canadian Ready-Mixed Concrete Association's "Environmental Management Practices for Ready-Mixed Concrete Operations in Canada (May, 2004). Wash-water from concrete production may contain cement, chemical additives, and form oil. Some concrete additives pose potential human health and/or habitat hazards. Cementitious products in concrete are very alkali rich (high pH) and are deadly to aquatic life if sufficient quantity comes into contact with a habitable watercourse. Other products in concrete can also be detrimental to the environment if spilled in sufficient quantity. The effects of high alkaline concrete wash-water on fish may include:

- death;
- damage to outer surfaces like gills, eyes, and skin; and
- an inability to dispose of metabolic wastes.

In addition, concrete wash-water is very cloudy and has a very high content of suspended sediments. Should these suspended sediments be released into a fish-bearing waterway they can:

- clog fish gills, preventing the fish from getting oxygen from the water that passes over their gills (possibly leading to suffocation and death);

⁵ The MoE has established a "code of practice" (Minister's regulation) that addresses discharges to the environment from the concrete and concrete products industry under provisions of the Environmental Management Act (EMA) and the Waste Discharge Regulation (WDR). The code of practice establishes province - wide standards for waste discharge from the concrete and concrete products industry. Operations included in the definition of "concrete and concrete products industry" under WDR of EMA are required to comply with all relevant provisions of EMA, WDR and the code. Specifically, the EMA prohibits the introduction of waste into the environment "in such a manner or quantity as to cause pollution." The code addresses air quality management, discharge of process water and storm water and the management of waste solids — as well as registration, monitoring, record keeping and enforcement.

- smother habitat. If the spaces between gravel particles are filled in, incubating eggs will not get enough oxygen and the insects that fish eat will be smothered and their living space obliterated; and
- impair feeding ability. Salmon are visual predators. If the water they are feeding in is cloudy, the fish will not be able to see their prey.

5.12.2 Environmental Protection Measures

The amount of concrete needed, and the number, timing and location of concrete pours, will be determined on site. The batch plant operator will be responsible for securing all required concrete production permits, approvals, and ensuring operations are carried out in accordance with the applicable terms/conditions and BMPs.

The best way to protect the environment is to prevent the discharge of high pH liquids into neighbouring watercourses, or in places where it might eventually reach creeks and streams. Environmental protection procedures will be identified for each site prior to concrete being mixed, delivered, or poured. Concrete pours will be conducted “in the dry” and every effort will be made to prevent concrete from contacting the watercourse until it is properly cured. Watertight forms will be constructed so that concrete is poured into a dry cavity and does not spill into the water. As concrete cures, it could change water chemistry resulting in harmful effects on fish and fish habitat. Once it has set, concrete is not harmful to water quality. All concrete handling will follow the applicable Health and Safety precautions as provided on Material Safety Data Sheets (MSDS). The Prime Contractor and Construction Manager will make workers aware of safe concrete handling procedures. The IEM will be on site for all concrete pours where there is potential for water to come into contact with uncured concrete. Concrete handling will employ watertight forms, spill contingencies, and designated truck clean out pits. Clean out pits and washing areas will be established well away from a watercourse and will be subject to best industry practice and regulatory requirements. Carbon dioxide (CO₂) canisters and diffusers shall be on hand for immediate deployment in the watercourse should that be necessary.

5.13 Fuels, Oils and Lubricants

Storage and handling of petroleum products, fuels, oils and lubricants, many of which are flammable, will comply with industry best practices and regulatory requirements of the Workers Compensation Act, regulations, and guidelines, including the OHS Regulation, Workplace Hazardous Materials Information System (WHMIS), and the Workers’ Compensation Board of British Columbia’s Prevention Manual. The storage and handling of flammable substances must comply with:

- Occupational Health and Safety Regulation Part 5 – Chemical and Biological Substances, Flammable and Combustible Substances;
- Environmental Code of Practice for Above Ground Storage Tank Systems Containing Petroleum Products (Canadian Council of Ministers of the Environment (CCME), 1994);
- Environmental Code of Good Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products (CCME, 1993); and



**SUNSHINE COAST REGIONAL DISTRICT
TEMPORARY USE PERMIT**

No. F-01

DRAFT for Information

TO: Box Canyon Hydro Corps
3260 – 666 Burrard Street
Vancouver, BC
V6C 2XD

This Temporary Use Permit is issued subject to compliance with all of the Bylaws of the Sunshine Coast Regional District applicable thereto, except those specifically varied or supplemented by this Permit.

This Permit applies to those lands within the Sunshine Coast Regional District described below:

Unsurveyed Crown land in the vicinity of District Lot 677A more particularly shown in Schedule

The lands described herein shall be developed strictly in accordance with the terms and conditions and provisions of this Permit and any plans and specifications attached to this Permit which shall form a part thereof.

Sunshine Coast Regional District *Zoning Bylaw No. 310* is varied or supplemented, and conditions and requirements pursuant to Section 920 of the *Local Government Act* are imposed.

This Temporary Use Permit for a “concrete batch plant” use is issued subject to compliance with the following terms and conditions:

Conditions:

- (1) The batch plant shall be located within the area zoned I9 (Independent Power Project)
- (2) That a bond of \$10,000 be issued to the Sunshine Coast Regional District to be released upon completion of the undertakings described in Schedule B
- (3) Unless renewed by the Regional District, upon expiration of this Temporary Use Permit, the applicant shall carry out all undertakings described in the letter of undertaking attached as Schedule B to this permit
- (4) This permit is non-transferable and may be amended or cancelled by Board resolution;
- (5) The Permit will expire two (2) years of the date issued.

This Permit is not a building permit.

Except as specifically provided above, this Temporary Use Permit in no way relieves the owner or occupier of the responsibility of adhering to all other legislation of responsible authorities which may apply to the land.

Authorizing Resolution No. XX/Year passed by the Sunshine Coast Regional District Board the nn DAY OF Month, Year

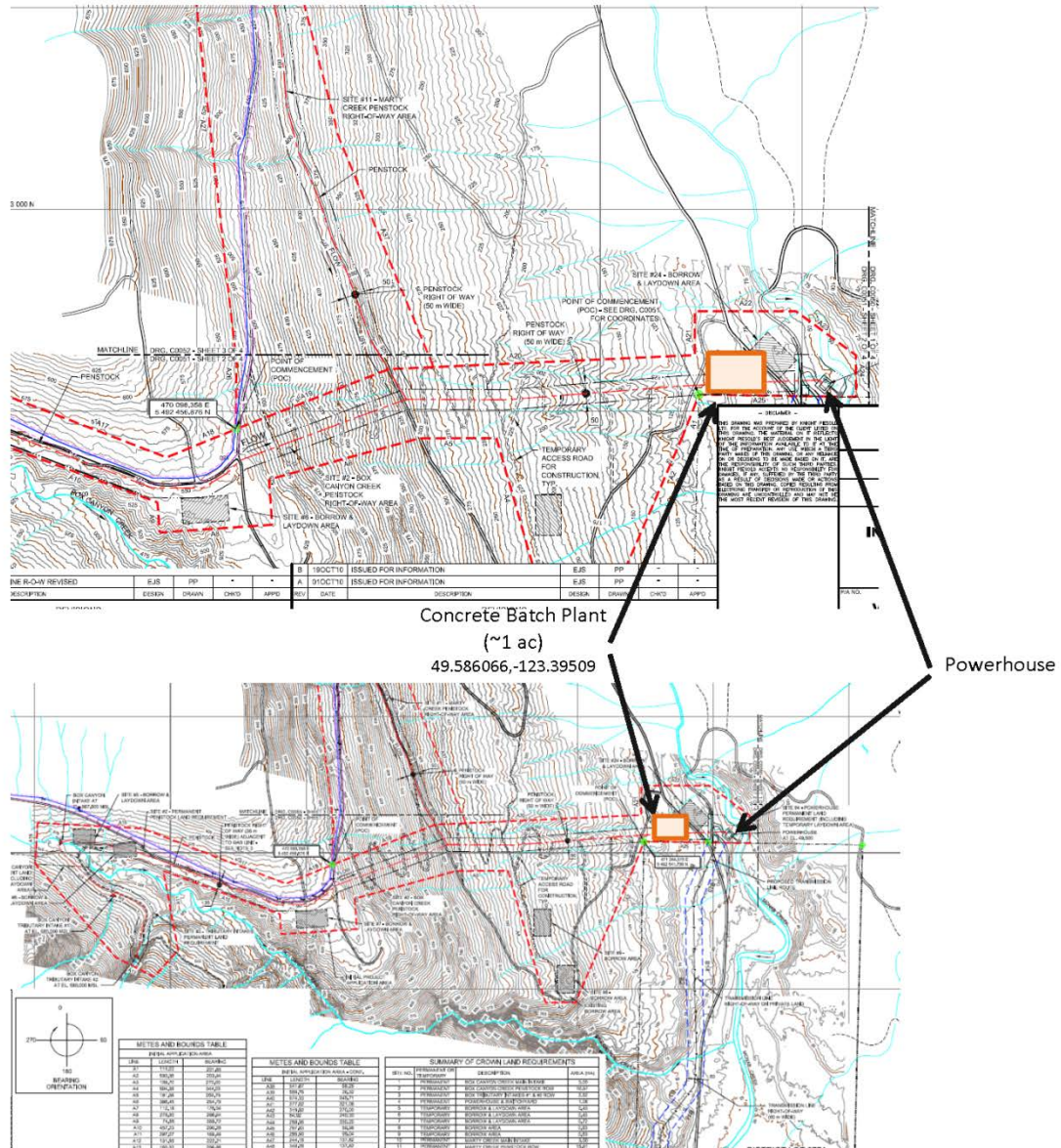
ISSUED THIS nn DAY OF Month, Year

THIS PERMIT EXPIRES ON nn DAY OF Month, Year

Ms. Angie Legault, Corporate Officer
SUNSHINE COAST REGIONAL DISTRICT

Schedule A

BOX CANYON HYDRO PROJECT
Powerhouse & Concrete Batch Plant Location Reference



Schedule B

DATE

TO:

Dear (Proponent)

RE: Temporary Use Permit F-01

Within 30 days of expiration of Temporary Use Permit F-01, the applicant shall:

- (a) Remove any equipment and material associated with the concrete batch plant
- (b) Remediate the location of the concrete batch plant that will be outside of any buildings
- (c) Provide a letter to the Sunshine Coast Regional District from a qualified environmental professional confirming that the above is completed.

Yours truly,

SUNSHINE COAST REGIONAL DISTRICT

Angie Legault, Corporate Officer



SUNSHINE COAST REGIONAL DISTRICT

1975 Field
Road
Sechelt
British
Columbia
Canada V0N
3A1

Tel: (604) 885-6804
Fax: (604) 885-7909

PLANNING DEPARTMENT REFERRAL

DATE: January 2, 2014

No. of Pages: 4

Originals to follow: ☐ YES ☒ NO

REFERRAL TO:

- ☒ District of Sechelt
- ☒ Agricultural Land Commission
- ☒ School District #46
- ☒ Town of Gibsons
- ☒ Vancouver Coastal Health
- ☒ Ministry of Agriculture
- ☒ Islands Trust (Gambier Island Local Trust Committee)
- ☒ Sechelt and District Chamber of Commerce
- ☒ Community Futures Sunshine Coast
- ☒ One Straw Society
- ☒ Sechelt Innovations
- ☒ Powell River and Sunshine Coast Real Estate Board
- ☒ Sunshine Coast Botanical Garden Society
- ☒ Coast Community Builders Association
- ☒ Salish Soils
- ☒ Gibsons and District Chamber of Commerce
- ☒ Pender Harbour and Egmont Chamber of Commerce
- ☒ Sunshine Coast Tourism

REFERRAL TO:

John Henderson
Tony Pellett
Patrick Bocking
Wayne Rowe
Meghan Molnar
Chris Zabek
David Graham

Christine Stefanik
Brian Smith
Chris Hergesheimer
Dave Jephcott
Paige Anderson

Paddy Wales
Clark Hamilton
Aaron Joe
Lisa Houle
Leonard Lee

Celia Robben

REFERRAL TO:

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wrowe@gibsons.ca
Meghan.Molnar@vch.ca
Chris.Zabek@gov.bc.ca
dgraham@islandstrust.bc.ca

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dave@secheltinnovations.ca
prscreb@gmail.com

info@coastbotanicalgarden.org
info@coastbuilders.ca
salishsoils@gmail.com
exec@gibsonschamber.com
chamber@penderharbour.ca

info@sunshinecoastcanada.com

PLEASE RESPOND BY: January 27, 2014

You are requested to comment on the attached referral for potential effect on your agency's interests. We would appreciate your response by the date listed. If no response is received within that time, it will be assumed that your agency's interests are unaffected.

FILE #: Ag Area Plan

TYPE OF PLAN DOCUMENT: Agricultural Area Plan

LEAD AGENCY: Sunshine Coast Regional District

CIVIC GENERAL LOCATION: SCRD wide

REFERRAL SYNOPSIS:

At the December 19 Planning and Development Committee meeting, the Committee made the following recommendation:

“Recommendation No. 3 *Agricultural Area Plan*

The Planning and Development Committee recommended that the staff report dated December 10, 2013 titled “Final Draft Agricultural Area Plan”, including draft Sunshine Coast Agricultural Area Plan (“Ag Plan”) be received;

AND THAT following additional refinements, the Ag Plan:

- a) be forwarded and, where requested, presented to the following partners, stakeholders, agencies and community groups for final input and feedback:*
 - i. Investment Agriculture Foundation of BC*
 - ii. District of Sechelt*
 - iii. Town of Gibsons*
 - iv. Sechelt Indian Band*
 - v. Islands Trust (Gambier Island Local Trust Committee)*
 - vi. Squamish Nation*
 - vii. School District No. 46*
 - viii. Vancouver Coastal Health*
 - ix. Agricultural Land Commission*
 - x. Ministry of Agriculture*
 - xi. Agricultural Advisory Committee*
 - xii. Sunshine Coast Food Policy Council*
 - xiii. Area A to F APC’s*
 - xiv. All Electoral Areas Chamber of Commerce’s*
 - xv. Sunshine Coast Botanical Garden Society*
 - xvi. One Straw Society*
 - xvii. Roberts Creek OCPC*
 - xviii. Sechelt Innovations*
 - xix. Real Estate Board*
 - xx. Sunshine Coast Real Estate Association*
 - xxi. Coast Community Builders Association (CCBA)*
 - xxii. Salish Soils c/o Sechelt Indian Band*
 - xxiii. Other lead organizations, as identified in the Ag. Plan”*

The recommendation is scheduled to go before the SCRD Board on January 9, 2014.

The Final Draft Agricultural Area Plan (Ag Plan) includes a set of Goals and Objectives (pg 30-44) and Recommended Actions for Implementation (pg 45-71). The recommended actions include key stakeholders (lead and supporting), priorities, timeframes and funding requirements and sources. The final draft plan also includes four pilot projects (pg 72-82) a section on implementation, monitoring and evaluation (pg 79-82) and a public consultation report (Appendix C). The SCRD is sending out the final draft Ag Plan to agencies and organizations for final comments and input.

SYNOPSIS OF AGRICULTURAL AREA PLAN:

The Sunshine Coast Agricultural Area Plan (Ag Plan) is a three-stage project initiated in early 2012, jointly funded by the Sunshine Coast Regional District (SCRD) and the Investment Agriculture Foundation of BC (IAF) through Agriculture and Agri-Food Canada and the BC Ministry of Agriculture. Supporting local governments included the District of Sechelt, Town of Gibsons, Sechelt Indian Band, and Islands Trust (Gambier Island Local Trust Area).

The overall objective of this Plan is to enable the SCRD and other local governments, community stakeholders and partners to identify, advance and prioritize opportunities for growth in agriculture on the Sunshine Coast, within its economic sectors, communities, and cultural fabric.

The Ag Plan contains:

- A vision statement for agriculture on the Sunshine Coast, developed collaboratively by the AAC, locally elected officials, SCRD Planning & Development staff, with community input and feedback
- A set of goals and objectives for achieving the vision
- A review of local land use policies and regulations
- A detailed explanation of recommended actions for implementation
- High level descriptions of potential pilot projects
- An implementation, monitoring, and evaluation plan; and
- A funding strategy

Throughout the plan process, the vision statement was refined to help guide the development of recommended actions for implementation. The resulting vision statement reads as follows:

Agriculture is our growing opportunity – deeply rooted as an integral part of a thriving, resilient coastal community, culture, and economy where:

- *We take pride and responsibility for being self-sufficient and food-secure*
- *We respect and conserve our land and water*
- *We celebrate how food brings people together, nourishing a healthy and vibrant community*
- *Our farmers prosper by providing nutritious food and goods for the entire region*
- *We protect our farmland and encourage innovative ways to enable a diverse range of agricultural activities*

Based on the vision statement, results of the opinion survey and opinion poll, plus input and feedback received through a series of community engagement initiatives, the following seven goals emerged as the top agricultural priorities for the Sunshine Coast:

- 1 – Protection of Farmland from Non-Farm Development
- 2 – Increased Market Viability and Economic Development of the Local Food Sector
- 3 – Support for Sustainable Farming Practices
- 4 – Water Use, Climate Change, and Emergency Preparedness
- 5 – Access to Farmland
- 6 – Supportive Policies and Regulations
- 7 – Consumer Awareness and Education

Specific actions to achieve these goals are detailed in the Implementation section of this Plan. A list of key interests (including leaders and supporting partners) is provided along with the priority level, timeframe, funding requirements and suggested potential funding sources for each action.

Strategies for implementation and monitoring of progress are also provided to ensure the overall success of the Ag Plan. It is suggested that the SCRD, or an established implementation body, develop a work plan to implement this Plan and evaluate the Plan's progress using indicators and biennial reporting to the SCRD Agricultural Advisory Committee (AAC), Planning & Development Committee (PDC) and Board.

Attachments:

None - Draft Ag Plan is available for download at:

<http://www.scrd.ca/files/File/Community/Planning/Agricultural%20Area%20Plan/4.%20REPORT%202013%20Report%20to%20Dec%2019%20PDC%20Draft%20Ag%20Plan%20combined.pdf>

If your organization requires a pdf or hard copy of the draft Ag Plan please get in touch with the SCRD contact listed below.

REFERRAL SENT BY: Stina Hanson

(Please contact this person directly for additional information)

PHONE: (604) 885-6804 ext 1

EMAIL: Stina.Hanson@scrd.ca

REFERRAL AGENCY COMMENTS: *(Please provide comments below or attach separate pages)*

Signed By:

Title:

Date:

Agency File:



Memorandum

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Date January 17, 2014 File Number GM 3050-01

To Gambier Island Local Trust Committee

From Aleksandra Brzozowski
Island Planner
Northern Office

Re Advisory Planning Commission Appointments

This memorandum is to inform the Gambier LTC that the eight appointments to the Gambier Advisory Planning Commission (APC) will expire on March 1, 2014.

An advertisement calling for Expressions of Interest was published in the Coast Reporter on January 17, 2014 and has been distributed for posting on bulletin boards around Gambier Island.

The deadline for expressions of interest has been set for February 14, 2014; applications are scheduled to be considered at the March 20, 2014 LTC meeting.

Pursuant to the Gambier Island Local Trust Committee Advisory Planning Commission Bylaw, 2010, the APC may consist of no more than nine members. At least two-thirds of the members of the APC must be residents of the Local Trust Area.

Attachment: Call for Expressions of Interest for the Gambier Advisory Planning Commission