A NOTICE OF A BUSINESS MEETING OF **THE DENMAN ISLAND LOCAL TRUST COMMITTEE**
to be held at 10:30 am on Tuesday, April 1, 2014 at the Denman Seniors Hall,
1111 Northwest Road, Denman Island, BC

AGENDA

		Page No.	****Approx. Time****
1.	**CALL TO ORDER**		10:30 am
2.	**APPROVAL OF AGENDA**		
3.	**CHAIR'S REPORT**		
4.	**TRUSTEES' REPORT**		
5.	**MINUTES**		10:45 am
5.1	Local Trust Committee Meeting Minutes dated February 25, 2014 – *for adoption*	1	
5.2	Section 26 Resolutions Without Meeting - *none*		
5.3	Denman Island Advisory Planning Commission Minutes - *none*		
5.4	Denman Island Marine Advisory Planning Commission Draft Minutes - *none*		
6.	**BUSINESS ARISING FROM MINUTES**		10:50 am
6.1	Follow-up Action List dated March 17, 2014 - *attached*	12	
7.	**APPLICATIONS AND PERMITS -** *none*		
8.	**DELEGATIONS**		
8.1	Denman Community Land Trust		
9.	**TOWN HALL DISCUSSION**		
10.	**CORRESPONDENCE** *Correspondence specific to an active development application and/or project will be received by the Denman Island Local Trust Committee when that application and/or project is on the agenda for consideration.*		12:15 pm
10.1	Letter dated January 14, 2014 from Association for Denman Island Marine Stewards regarding Participation in the Treaty Negotiation Process - *attached*	14	
10.2	Emails dated February 23, 2014 to March 15, 2014 regarding Aquaculture Licence of Occupation Application No. 1413722 - *attached*	17	
11.	**REPORTS**		12:30 pm
11.1	**Work Program**		
	11.1.1 Top Priorities Report and Projects Report dated March 17, 2014 - *attached*	61	
11.2	**Applications Log**		
	11.2.1 Report dated March 17, 2014 - *attached*	63	
11.3	**Trustee and Local Expenses**		
	11.3.1 Expenses posted to month ending February, 2014- *attached*	68	

11.4 Policies and Standing Resolutions
11.4.1 Report – *attached for information* 69

BREAK 1:00 pm

12. LOCAL TRUST COMMITTEE PROJECTS - *none*

13. NEW BUSINESS 1:15 pm

13.1 Eelgrass Mapping for the Denman Island Local Trust Area
13.1.1 Islands Trust Fund Briefing – Memorandum dated March 17, 2014 - *attached* 70
13.1.2 Final Report – Nearshore Eelgrass Inventory 2012-2013 - *attached* 73
13.1.3 Eelgrass Presence Denman Island Local Trust Area – Map 10 - *attached* 131

14. BYLAWS

14.1 Denman Island Bylaw No 206 cited as "Denman Island Official Community Plan, 2008, Amendment No. 1, 2013" - *for approval* 132

15. CLOSED MEETING: The Denman Island Local Trust Committee closes the next part of the April 1, 2014 business meeting to discuss Marine Advisory Planning Commission Appointments and Consideration of Confidential Information pursuant to Section 90(1)(a) and Section 90(2)(b) of the *Community Charter* and that Staff be invited to attend this meeting.

16. OPEN MEETING RESOLUTION
The Denman Island Local Trust Committee re-opens this meeting to the public subject to Section 89 of the *Community Charter*.

17. RISE AND REPORT
Rise and Report from the Closed Meeting

18. ISLANDS TRUST WEBSITE

18.1 Denman Pages – *for discussion*

19. NEXT MEETING
Wednesday, May 7, 2014 at 10:30 am at The Denman Seniors Centre,
1111 Northwest Road, Denman Island, BC

20. TOWN HALL DISCUSSION – *time permitting*

21. ADJOURNMENT 3:00 pm

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

DRAFT

Denman Island
Local Trust Committee
Minutes of a Regular Meeting

Date of Meeting:	Tuesday, February 25, 2014
Location:	Denman Seniors Hall 1111 Northwest Road, Denman Island, BC
Members Present:	Peter Luckham, Chair Laura Busheikin, Local Trustee David Graham, Local Trustee
Staff Present:	Rob Milne, Island Planner Courtney Simpson, Regional Planning Manager David Marlor, Director Planning Services, by telephone Miles Drew, Bylaw Enforcement Manager Vicky Bockman, Recorder
Media and Others Present:	Approximately three (3) members of the public-am Approximately four (4) members of the public-pm

1. CALL TO ORDER

Chair Luckham called the meeting to order at 10:35 am. He welcomed the public and introduced himself, the Local Trustees, Staff and Recorder. He acknowledged that the meeting is being held in traditional territory of Coast Salish First Nations.

2. APPROVAL OF AGENDA

The following addition to the agenda was presented for consideration:

14.2 Conference on Management of Sensitive Marine Ecosystems - Lessons from Case Studies to Identify Solutions for Baynes Sound

By general consent the agenda was approved, as amended.

3. CHAIR'S REPORT

Chair Luckham reported that the upcoming Trust Council meeting will be held on Hornby Island and that items of interest will include a presentation open to the public regarding treaty negotiations and consideration of adoption of the proposed budget for 2014/2015.

He noted that on Thetis Island, the Ferry Advisory group has approached its response to the BC Ferries announced schedule changes, by completely revamping the proposal and demonstrating that lower fuel costs, resulting from slowing down the speed of the ferry would maintain a satisfactory schedule, reduced overtime expense, and achieve sufficient savings to meet the financial objectives and even create a surplus.

4. TRUSTEES' REPORT

Trustee Busheikin reported that she attended several meetings since the last Local Trust Committee meeting:

- Denman Island Residents' Association;
- Trustee Office Hours;
- Trust Programs Committee;
- Advisory Planning Commission where the housing regulations review was considered;
- Old School Committee which is proceeding with the roof replacement while preserving the bat roosting sites; and
- Met with treaty negotiators to learn about the status of the K'omoks First Nation treaty and discuss issues.

She reported that as a member of the Ferry Advisory Committee she held a public meeting last week to discuss the proposed new ferry schedule. She commented on the preferences that were expressed, particularly for sailings for as long of a day as possible even if meaning fewer sailings in the middle of the day; and some cautious interest in cutting some peak season sailings in order to have more off-peak sailings such as preserving at least one late night. She noted that she will be attending a Ferry Advisory Committee meeting with BC Ferries to share this information and to discuss scheduling in depth on March 7, 2014. She also noted that she has made an information and contact list including information about the rally scheduled for March in Victoria that people have found to be useful.

Trustee Graham remarked that he attended Trustee Office Hours and Trust Council Committee meetings. He reported that the Ferry Commissioner has announced that he has approved funding for BC Ferries to build the cable ferry. Trustees observed that the approval is conditional and these conditions address many of the issues brought forth by concerned community members.

5. MINUTES

5.1 Local Trust Committee Meeting Minutes dated January 21, 2014

The following amendment to the minutes was presented for consideration:

- Page 8, last line: change "Local Trust Committee" to "Advisory Planning Commission"

By general consent the minutes were adopted, as amended.

5.2 Section 26 Resolutions Without Meeting – None

5.3 Denman Island Advisory Planning Commission (APC) Draft Minutes dated February 11, 2014

Planner Milne distributed the attachments for items 4.1 and 4.2 of the draft minutes that had been inadvertently omitted from the agenda package. He provided a summary of the key points of the discussion that occurred at the APC meeting:

1. There was support for the use of Temporary Use Permits (TUP) for secondary dwelling units as they would be more cost and time effective than the rezoning process;
2. The size of secondary dwellings was discussed and a recommendation was made;
3. The distance between the secondary dwelling unit from the principle residence was discussed and a recommendation was made;
4. There was support for permitting a secondary dwelling on any R2 property regardless of the size of the lot. Planner Milne pointed out that this would require an Official Community Plan (OCP) language amendment for the community to consider;
5. It was noted that there should be equivalency between requirements for adding a secondary dwelling unit and subdivision in terms of verification of adequate septic capability or allowing the Local Trust Committee to see verification through the TUP; and
6. It was recognized that Vancouver Island Health Authority (VIHA) requirements would limit some properties; however, without building inspections there would be no framework to verify compliance.

Discussion ensued and the following key points were noted:

- Trustee Busheikin inquired if the draft bylaw could refer to a size of lot and larger rather than a zone and Planner Milne responded that this option is possible; however, advised that it would be new language in the existing OCP;
- Trustee Graham suggested that the TUP might be designed to accommodate conditions on a property as opposed to lot size or zone in order to ensure safe and healthy conditions. He suggested that a discussion with VIHA might be useful in order to determine what criteria could be used in a TUP to ensure adequate septic or other requirements;
- Research into the types of septic capability testing options and costs might be useful to help determine feasibility of this approach; and
- Chair Luckham observed that if the Local Trust Committee proceeds with the TUP requirement it would be able to set the minimum standard that is required and this could be adjusted according the circumstances.

5.4 Denman Island Marine Advisory Planning Commission Draft Minutes – None.

6. BUSINESS ARISING FROM MINUTES

6.1 Follow-up Action List dated February 13, 2014

Planner Milne summarized the items on the Follow-up Action List. He reported back to the Local Trust Committee as requested on the current status of what remains in the 5 percent density allowed for affordable housing. He advised that 5 percent of the total 1,020 parcels on Denman Island equals 51 and while still researching, he estimated that 16 of the units allowed for affordable housing has been used, indicating significant availability remaining.

6.2 Beach Access and Vehicular Controls

6.2.1 Staff Report dated February 12, 2014

Planner Milne summarized the Staff Report which identifies the complex issues involved in consideration of beach access and vehicular controls. He suggested that there is reason for the Marine Advisory Planning Commission to continue with the referral task of identifying the beach access points, indicating that this would provide the initial information necessary to determine next steps.

Trustees acknowledged that identifying the number of beach access points would be useful in consideration of possible strategies. There was no action taken at this time, with Trustees expressing a preference to hear the presentation from DFO on today's agenda prior to consideration of whether there is any further direction to provide on this matter.

7. APPLICATIONS AND PERMITS - None

David Marlor, Director Planning Services joined the meeting by telephone.
Miles Drew, Bylaw Enforcement Manager joined the meeting.

8. PRESENTATION BY DEPARTMENT OF FISHERIES AND OCEANS CANADA (DFO)

Compliance Inspections and Aquaculture Practices presented by Steven Schut, Senior Aquaculture Biologist

Senior Aquaculture Biologist Steven Schut gave a power-point presentation on compliance inspections and aquaculture practices in British Columbia. He introduced himself and described his position as lead biologist working on shellfish aquaculture and environmental issues at DFO. He invited conversation and responded to questions as they arose during the presentation.

He outlined the general framework of the presentation which would discuss in broad terms, the overview of aquaculture and jurisdictional issues, DFO's position on aquaculture, discussion of his group: Aquaculture Environmental Operations Fisheries Management, what has been done in the last three years and where his group is expected to go in the next year.

His discussion centered on the following topics:

1. The scope of aquaculture activities in British Columbia;
2. The contribution to the economy of resource-based coastal communities in BC/ the value of aquaculture harvest;
3. Shellfish farming aquaculture sites in the Vancouver Island area;
4. The evolution of the BC Aquaculture Regulatory Program;
5. Regulatory tools and approaches – Shellfish Conditions of License;
6. Jurisdictions involved in management of the aquaculture industry;
7. DFO key priorities for aquaculture management;
8. Delivering the program: Fisheries Management/Aquaculture Management Division/Aquaculture Resources Management/ Aquaculture Environmental Operations/ Aquaculture Programs;
9. Aquaculture Management Division teams – key roles and responsibilities;
10. Office locations; and
11. Aquaculture Environmental Operations – located in Courtenay: summary of site inspections, compliance rates, mapping assessment of clam netting with an overview of actual sites visited.

He advised that plans for next season include continued compliance inspections and better communication with growers about field operations. He concluded by noting that the group is trying to use all the tools at their disposal to engage the farmers and to encourage best practices.

A question and answer period followed. He indicated that many questions being posed are outside of his area of responsibility and suggested that the Local Trust Committee might consider inviting March Klaver, of Aquaculture Management, for a follow–up presentation.

Chair Luckham thanked Biologist Schut for his presentation. He advised that many interested members of the community had not been able to attend today's presentation due to weather conditions, and asked if this power-point presentation might be posted to the Islands Trust website.

Planning Manager Simpson added that this presentation had been useful and appreciated hearing that DFO inspections are occurring.

9. DELEGATIONS - None

10. TOWN HALL DISCUSSION

Edi Johnston read a submission "Prohibiting Vehicles from Beaches" providing references to the Golder Report, policies and examples of methods Comox Valley Regional District has utilized to restrict vehicular access to beaches. She urged the Committee to use the powers available to them to prohibit vehicles from driving on the beaches.

Shelley McKeachie asked for clarification of the Staff Report regarding Beach Accesses and Vehicular Controls, inquiring if restricting access through parks was an approach being discussed.

Planner Milne responded by explaining the road right-of-way jurisdictional issues and the difficulties with a gate approach which include concerns regarding enforcement and access for public safety such as fire response.

Liz Johnston stated that although DFO's report notes that a large percentage of predator netting is in compliance, she stated that in past years while walking the beaches all the netting she observed had trapped and killed herring.

11. CORRESPONDENCE

11.1 Email response dated January 29, 2014 from BC Ferry Commission regarding Denman Cable Ferry Proposal

Committee members received the above correspondence.

11.2 Email dated January 23, 2014 from Wendy Boothroyd regarding Opposition to Aquaculture Applications

Committee members received the above correspondence.

11.3 Email dated January 24, 2014 from Ken Madsen regarding Opposition to Aquaculture Applications

Committee members received the above correspondence.

11.4 Letter forwarded from Islands Trust Executive Committee to the Denman Local Trust Committee and dated January 21, 2014 to Islands Trust Council from Association for Denman Island Marine Stewards (ADIMS) regarding Islands Trust participation in the treaty negotiation process

Committee members received the letter and deferred a decision on response until more information is received, noting that they will be learning about the provincial perspective at Trust Council next week.

By general consent the meeting was recessed at 12:45 pm and reconvened at 1:05 pm.

12. REPORTS

12.1 Work Program Reports

12.1.1 Top Priorities and Projects List Report dated February 13, 2014

Report was reviewed.

12.2 Applications Log

12.2.1 Report dated February 13, 2014

Report was received for information.

12.3 Trustee and Local Expenses

11.3.1 Expenses posted to month ending January, 2014

Report was received for information.

12.4 Policies and Standing Resolutions

12.4.1 Report

Report was received for information.

13. LOCAL TRUST COMMITTEE PROJECTS

Trustees discussed the process, timing and next steps for the draft bylaws to enable secondary suites and secondary dwelling units. The recommendations from the APC's February 11, 2014 meeting draft minutes were considered.

DE-2014-015
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee direct staff to incorporate Advisory Planning Commission resolutions DEAPC-01-2014 and DEAPC-02-2014 from the Advisory Planning Commission meeting of February 11, 2014 into the draft bylaw regarding housing and send the amended draft bylaw out for early agency referrals.

Trustees debated the recommended increase in the secondary dwelling unit permitted floor area from 90 to 140 square metres contained in DEAPC-01-02:

- Trustee Busheikin stated that she agrees with the overall direction of the motion; however, is not comfortable with increasing the permitted floor area from 90 to 140 square metres as that is bigger than many primary dwellings on Denman Island and would exhibit less of an accessory quality. She suggested that an increase to 110 might be more appropriate; and
- Trustee Graham spoke to the motion, supporting the process of taking the APC's recommendation to the community for feedback, rather than changing the recommended floor area at this time.

Chair Luckham put the motion to the vote.

CARRIED
Trustee Busheikin Opposed

14. NEW BUSINESS

14.1 Denman Island Riparian Areas Regulation (RAR) Mapping

14.1.1 Madrone Environmental Services Ltd. Report dated January 21, 2014
Presented by Trystan Willmott, Aquatic/Terrestrial Biologist, Madrone Environment Services Ltd.

Biologist Trystan Willmott of Madrone Environmental Services introduced himself and gave a power-point presentation on Denman Island Riparian Areas Regulation (RAR) mapping. He explained the scope of the project, commenting that four watersheds had been targeted based on information from the Ministry of Environment: Chicadee Lake, Graham Lake, Beadnell Creek and Valens Brook. He noted that the Morrison Marsh watershed had been mapped previously and explained that another RAR-applicable stream had been identified and mapped: Gladstone Creek, thereby bringing the total watersheds mapped with this report to five.

He advised that the objective of the project was to map the centre line of streams to allow the Islands Trust to accurately identify RAR-applicable watercourses and he summarized the methods used and the fieldwork that was done to gather the data. He noted that in some cases he was not given permission to access properties and those occurrences had been listed as “not field verified” on the maps. The power-point presentation included maps of the watersheds, the definition of a “stream” under the RAR and when a watercourse is not a “stream” under the RAR. He advised that surface flow connectivity to potential fish habitat is the key component. He provided an outline of the results of fish distribution data and summaries of the watersheds.

Biologist Willmott clarified that per the RAR, any development within the Riparian Assessment Area (RAA) triggers the requirement for an assessment completed by a Qualified Environmental Professional. He explained that the RAA occurs within 30 metres of applicable watercourses and described how that area is measured. He concluded his presentation with the reasons to protect riparian areas and welcomed local knowledge as that can be valuable input. He confirmed that the maps will be public documents, available for viewing. A question and answer period followed.

Planner Milne suggested that it might be appropriate for staff to bring a report that addresses the implementation of the RAR process to the Local Trust Committee and noted that education can be crucial to understanding the regulations.

Trustees thanked Biologist Willmott for the report and presentation. They acknowledged that this material provides them with the data necessary to move forward with the process to enact the regulation.

By general consent agenda items 16, 17 and 18 were moved to follow agenda item 14.1.1.

16. CLOSED MEETING

16.1 Motion to Close the Meeting

DE-2014-016
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee closes the next part of the February 25, 2014 business meeting to discuss matters pursuant to Section 90(1) (a) Advisory Planning Commission and Marine Advisory Planning Commission Appointments and Section 90 (1)(i) Solicitor-Client Privilege of the *Community Charter* and that staff be invited to attend this meeting.

CARRIED

The Committee closed the meeting at 2:05 pm.

17. OPEN MEETING RESOLUTION

The Denman Island Local Trust Committee re-opens this meeting to the public subject to Section 89 of the *Community Charter*.

By general consent the Committee reconvened in open meeting at 3:00 pm.

18. OPEN MEETING RESOLUTION
Rise and Report from Closed Meeting

Chair Luckham reported that while in closed meeting the Local Trust Committee directed staff to develop a communications plan with regard to aquaculture in the Denman Island Local Trust area and to write letters to K'omoks First Nation and Ministry of Forests, Lands and Natural Resource Operations. He added that the Committee also reappointed Henning Nielsen, Jessie Edwards and Lindsay Graf to the Advisory Planning Commission for a two year term.

14.2 Conference on Management of Sensitive Marine Ecosystems - Lessons from Case Studies to Identify Solutions for Baynes Sound

Trustee Busheikin reported that she has received an invitation to attend the Conference on Management of Sensitive Marine Ecosystems - Lessons from Case Studies to Identify Solutions for Baynes Sound which will be held at Simon Fraser University in April, 2014. She reported that this will be a multi-stakeholder conference and Trustees acknowledged that attendance at this conference would serve the purpose of the Local Trust Committee's jurisdiction and the Islands Trust Strategic Plan.

DE-2014-017
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee allocate funds up to $500 from the Local Trust Committee Expense Account for Trustee Laura Busheikin to attend the Management of Sensitive Marine Ecosystems workshop April 3-4, 2014.

CARRIED

15. BYLAWS – None.

19. ISLANDS TRUST WEBSITE

19.1 Denman Page

Trustees requested several items be updated on the website:

- Post Trustee Graham's Grapevine articles (he will forward them to Planner Milne);
- Update the Trustee Office Hours;
- Remove the Planner Office Hours;
- Add the most recent Project Charter for the Policy Review of Housing Needs (removing affordable housing as a goal);
- Post the Trustee Notebooks articles;
- Change Trustee Busheikin's contact telephone number to her cell number; and
- Follow-up with Steven Schut on the possibility of posting his February 25, 2014 power-point presentation.

20. NEXT BUSINESS MEETING DATE

The next meeting will take place on Tuesday, April 1, 2014 at 10:30 am at the Denman Seniors Centre, 1111 Northwest Road, Denman Island, BC.

21. TOWN HALL DISCUSSION

Shelley McKeachie requested confirmation of the Marine Advisory Planning Commission (MAPC) referral.

Trustees responded that there would be various possible uses for the information that might be identified in the MAPC referral.

22. ADJOURNMENT

By general consent the meeting was adjourned at 3:29 pm.

_____

Peter Luckham, Chair

CERTIFIED CORRECT:

_____

Vicky Bockman, Recorder

Print Date: Mar-17-2014

Islands Trust

Follow Up Action Report w/ Target Date

Denman Island
Dec-11-2012

No.	Activity	Responsibility	Target Date	Status
1	Prepare report and amended draft bylaw addressing APC comments for draft DPA 4 guidelines. Recommend to LTC that revised DPA 4 and draft DAI are referred to the APC together. Revised DPA 4 guidelines to move forward in concert with RAR mapping. Presentation on RAR mapping results by Madron Environmental provided at February 25, 2014 LTC meeting. Mapping undergoing analysis in ordr to develop an implementation strategy for LTC review	Rob Milne	Jan-22-2013	On Going

Nov-26-2013

No.	Activity	Responsibility	Target Date	Status
1	**DE-077-2013** that the Denan Island Local Trust Committee proceed no further with Draft Bylaw No. 207 due to questions regarding legislative authority.	Lisa Webster-Gibson		On Going

Jan-21-2014

No.	Activity	Responsibility	Target Date	Status
1	staff to refer to the Marine Advisory Planning Commission the task of identifying which beach accesses on Denman Island are appropriate for installing controls on vehicular access and to advise the Local Trust Committee.	Rob Milne		Done
1	Staff to consult with the Comox Valley Regional District on potential work on vehicular control structures at beach accesses.	Rob Milne		Done

1	Staff to contact Sean Wouters to ask to be included on the distribution list to receive a draft copy of the Integrated Geoduck Management Framework.	Rob Milne	Done
1	That the Activity on Top Priority No. 1 be changed to: Investigate further with regard to alternate measures to address negative impacts of shellfish farming.	Rob Milne	Done
1	Staff to report back to the Local Trust Committee on the current status of what remains in the 5 percent density allowed for affordable housing.		Done
1	That the Denman Island Local Trust Committee refer the amended January 21, 2014 draft bylaws of the Housing Regulations Review to the Advisory Planning Commission.	Rob Milne	Done
1	That the Denman Island Local Trust Committee instruct staff to discontinue On-Island Planner Office Hours for Denman Island.	Rob Milne	Done
1	That the Denman Island Local Trust send a letter of support for the BC Ferry Coalition's Fiscal Fairness campaign to the BC Ferry Coalition, signed by the Chair.	Rob Milne	Done
1	Istruct staff to discontinue On-Island Planner Office Hours for Denman Island.	Penny Hawley	On Going

Feb-25-2014

No.	Activity	Responsibility	Target Date	Status
1	**DE-2014-015** that the Denman Island Local Trust Committee direct staff to incorporate Advisory Planning Commission resolutions DEAPC-01-2014 and DEAPC-02-2014 from the Advisory Planning Commission meeting of February 11, 2014 into the draft bylaw regarding housing and send the amended draft bylaw out for early agency referrals.	Lisa Webster-Gibson		On Going

Association for Denman Island Marine Stewards
P.O. Box #7, Denman Island, B.C. V0R 1T0
e-mail; shelleymckeachie@gmail.com or, edijohnston@gmail.com

January 21, 2014

Denman Island Local Trust Committee

Re: Participation in the treaty negotiation process

Dear Trustees Busheikin, Graham and Luckham:

The Association for Denman Island Marine Stewards (ADIMS) was very encouraged by the Islands Trust Council's recent commitment to advocate for the marine environment after the ADIMS presentation on December 4th, 2013 in Victoria and your efforts reported on at today's LTC meeting. We sincerely thank you for your efforts to protect the marine environment.

You will have received a copy of our letter of today's date to Chair Malcolmson urging the Trust Council to request to be consulted in the K'omoks treaty negotiation process. We would like to urge you to do the same. There are a number of stakeholders with interests in this process that will be impacted by the treaty settlement. The community of Denman Island is key among them and, as our local government, we rely on you to represent us. ADIMS feels it's important that you ask directly to be part of the treaty process because it is unlikely you will be invited without doing so.

The stated objectives of the B.C. Ministry of Aboriginal Relations & Reconciliation support local government consultation in the treaty process:

"***The province recognizes that communities must be consulted and informed if treaties are to be successful. Provincial negotiators develop strategic consultation plans that outline issue-specific discussions with stakeholders from different sectors and discussions with community and local government representatives. As well, reference groups may be established to review specific policy initiatives. This approach is cost effective and reflects the focus of the Ministry of Aboriginal Relations and Reconciliation on opportunities for success."***.

It is our understanding that neither the Islands Trust Council nor the Denman Island Local Trust Committee have been consulted in the K'omoks treaty negotiation process re: FN aquaculture interests in marine areas within the Islands Trust jurisdiction.

This K'omoks Treaty is now at Stage 5 of a 6 stage process. We are told that aquaculture and fisheries agreements are one of the few steps left before the Final Agreement is signed with the K'omoks First Nation. There is an Interim Measure Agreement (IMA) regarding aquaculture referred to in the Agreement in Principle (AIP). The IMA was entered into between the Province and the Komoks in March of 2011. The maps contained in the IMA show that the areas for aquaculture identified as "K'omoks First Nation areas of interest" are the same as the six geoduck and sea cucumber tenure applications by Salish Sea Farms Ltd. One of the purposes of the IMA as stated in section 2.1. (b) is to, " provide interim benefits to KFN, in particular with a view to the KFN's interests in aquaculture development, in advance of the Final Agreement;"

The K'omoks First Nation claims marine areas around Denman Island as their traditional territory. Their plans for the development of the commercial shellfish industry in these areas, which fall within Denman Island's zoning jurisdiction, conflict with the "W1 Marine Conservation" zoning, and with the mandate of the Islands Trust – to preserve and protect. In addition, such industrialized commercial shellfish activities are potentially harmful to the fragile marine ecosystem. As you are aware, the recent letter and report by retired DFO scientist, Dr. Doug Hay, outlines the threat that two subtidal geoduck tenure applications in Lambert Channel by Salish Sea Farms Ltd. pose to the health of this critical herring spawning area.

There are also unsettled legal questions surrounding the aboriginal claims of the K'omoks to their traditional territory and a commercial shellfishery as outlined in our recent presentation package to Trust Council in Victoria on Dec. 4Th, 2013. In particular, the question of aboriginal groups' right to harvest geoducks commercially was addressed in a recent decision of the BC Court of Appeal and indicates that the aboriginal right would not extend to harvesting geoducks commercially. This decision of the Court of Appeal is based on the conclusion that in 1793 the limitations on aboriginal fishing technology meant that geoducks were not harvestable in commercial quantities on the west coast of Vancouver Island and the basis for this conclusion would apply equally to harvesting geoducks in Denman Island jurisdiction.

Additionally, Salish Sea Farms Ltd. is partnering with a non-aboriginal corporation, thereby creating a further question around the legitimacy of this being a First Nations initiative and operation.

Denman Island by-laws have been created with goals of sustainability, protection of the environment, and the principle of protecting one of the most important herring spawning areas occurring in the Strait of Georgia. Local Trust Committees, as the local government for the Trust islands, should have a voice for the thousands of residents who will be impacted. ADIMS has asked Trust Council and we also respectfully ask you to:

1. Request to be consulted in a meaningful way in the treaty negotiation process including an official seat at the Aquaculture Review Committee (ARC) (as described in point 4.1 of the K'omoks Aquaculture Interim Agreement) in order to have input into the protection of the marine environment as part of the Treaty Process. ADIMS also sees this as the perfect opportunity for the Denman Island LTC to advocate on behalf of those who do not want to see commercial exploitation of marine resources for profit with little or no regard for the potential negative impacts on the marine environment.

2. Request that the three K'omoks tenure applications on the north and east sides of Denman Island, in W1 Marine Conservation zoning and critical herring spawning habitat, be denied, and that DFO or the Treaty commission suggest/provide an alternative site, as provided for in point 6.3 of the K'omoks Aquaculture Interim Measures Agreement.

There is more at stake here than just local issues, the seas are all connected and will be impacted by the increased industrialization and exploitation of marine 'resources'. ADIMS firmly believes that aquaculture can be done sustainably, providing economic health without harm to the marine environment. Please continue your efforts to protect the marine environment.

Thank you for your time and consideration in this matter. We look forward to your reply.

Respectfully,

Shelley McKeachie, Co-Chair ADIMS
Edi Johnston, Co-Chair ADIMS

Cc: Chair Malcolmson, Islands Trust Council
Rob Milne, Denman Island Trust Planner
Linda Adams, Islands Trust Chief Administrative Officer
Courtney Simpson, Islands Trust Regional Planning Manager, Northern Team

From: Janet Thomas [janetthomas@shaw.ca]
Sent: February 23, 2014 2:00 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: Rudi E FLNR:EX Mayser; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; Brent Magee; Bruce Jolliffe; Don McRae.MLA; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: I'm in opposition to #1413722 AQUA

Authorizing Authority
Aquaculture, Ministry of Forests, Lands and Natural Resource Operations
Suite 142 - 2010 Labieux Rd
Nanaimo, BC V9T 6J9
email address: authorizingauthority.nanaimo@gov.bc.ca

RE: I'm in opposition to Licence of Occupation Application #1413722 AQUA

Dear Authorizing Authority:

Attached please find my submission in opposition to Licence of Occupation Application #1413722 for 81 hectares of on-bottom aquaculture of the following species: Nuttall's cockles, Pacific oysters, Pacific Scallop X-patinopectin, and horseclams.

My reasons for opposing Application #1413722 AQUA are as follows:

(1) Application #1413722 is not appropriate since it is adjacent to treasured local parks such as Sandy Island Provincial Park, recreational areas, anchorage areas and residential homes.

(2) Secondly, how much is too much aquaculture in Baynes Sound? What is the actual carrying capacity for aquaculture industry in Baynes Sound? It is my belief that there should be a moratorium on further expansion until an up-to-date study is is done on Baynes Sound to determine whether we've surpassed the carrying capacity for aquaculture in our coastal waters.

90% of the coastline of Baynes Sound is already under shellfish tenure. See Attachment labeled Figure 14 which I obtained from scientist Dr. L I Bendell. The key of the diagram is as follows: estuarine habitat: blue; oyster grow-out: red; and anti-predator netting: yellow.

I was shocked when going on an aerial survey in July, 2013 by the expansive use of predator nets, marker buoys, as well as rafts in Baynes Sound as seen from the air! Please take a look at this video which I put together which shows the visuals of what I consider to be the over-expansion of the aquaculture industry in this area of Baynes Sound. See - http://www.youtube.com/watch?v=g5NSm3goUiA

(3) Why is this much public land being given over to one company? According to Centre for Shellfish Research/Vancouver Island University, the average tenure size throughout BC is 4.39 hectares. Approximately 35% of all tenures are less than 2 hectares in size, while less than 10% of the tenures are more than 10 hectares; only 5 are greater than 30 hectares. See - http://www.viu.ca/csr/industry/industrybackground.asp

This Applicant (Eric Gant of BC0846381, Seastainable Aquaculture Limited, Manatee Holdings and partner in Salish Seafarms Ltd) already has a large tenure (89.1 ha) off of the west side of Savary Island; is in partnership or is a partner in a 31.3 ha deep water geoduck tenure off of Cortes Island; and is in partnership for over 510 hectares by Salish Sea Farms Ltd.

Does the Applicant actually have the resources or ability to actually utilise such large areas for aquaculture? Or, is the Applicant's plan to sell off parts of this requested Licence of Operation to other companies, perhaps foreign companies?

Because this Application is much larger than the usual tenure, it seems more like a "land grab" to many in the community.

(4) The area of the north-most end of the Application at Amber Way has long been identified as a Biofiltration Wetland (see attached photo) where I believe no aquaculture industry should be permitted, judging by the "Danger! Shelfish area Closed" signs. Shellfish

The information on the signage is the description of the Amber Way area as follows:
"The function of this Biofiltration Wetland is to remove pollutants found in stormwater runoff. These pollutants are: Septic Field Leachate (fecal coliform bacteria, nitrogen/phosphates), Lawn & Garden Supplement (fertilizers, herbicides, pesticides), Oil & Gas from Paved Surfaces, and Heavy Metals from vehicles."

The signage continues as follows: "Water Quality Monitoring is being done by local volunteers. This is to assess the effectiveness of cleaning the runoff from the surrounding residential area."

This area at Amber Way was obviously set aside as a site to filter poisons that make the shellfish unfit for human consumption. It is a fresh water channelization and not "N/A" as declared on the Application.

With the recent clearing of 30 acres for future development (Union Bay has been identified as a settlement node in the Regional Growth Strategy) just upland from this area, this Biofiltration Wetland will be more crucial than ever to remove pollutants from stormwater runoff.

(5) The Tenure Area is the most important herring spawn area in BC. Has the impact on herring spawning behaviour been assessed? I have close friends who make their living in the herring industry; and I strongly believe that if these Applications are approved, it will create conflict issues with the commercial herring fishery such as entanglement of gear and nets and will also interfere with the herring spawning.

(6) Oyster farmers in BC are having problems obtaining enough oyster seed for current operations let alone the increase in production contemplated in this Application. The Application says they estimate their production of oysters to be 100 Tonnes per year. 2012 Oyster production for all of BC was 7,400 Tonnes per year. Where is the seed for this going to come from? This could be a carrying capacity issue.

(7) To my knowledge, there are no oyster farmers in BC doing "on bottom" oyster culture in deep water. Please have a look at the BC Shellfish Growers Association website which describes how oyster culture is done in BC - it is either intertidal beach culture or hanging culture. On bottom culture of oysters would be very expensive and difficult. See:
http://bcsga.ca/about/industry-encyclopedia/oysters/
I believe there is a reason that oysters aren't listed as an option in the species section of the "on bottom" section of the Application Form on Page 11 since nobody does it.

(8) Cockle culture in BC is in the beginning experimental stages. See:
http://viudeepbay.com/2010/05/27/developing-the-native-basket-cockle-for-aquaculture/
The only ways that Vancouver Island University is experimenting on to grow out this species are intertidal and hanging culture - they aren't even looking at deep water on bottom culture, most likely because of the expense (similar to oysters).
A January 2014 post from VIU addresses the question of why cockle culture hasn't taken off in BC. See:
http://viudeepbay.com/2014/01/12/why-has-commercial-culture-of-cockles-not-taken-off/
Note: the Applicant is only talking about the potential for raft grow out.

(9) To my knowledge, there are no scallop farmers doing "on bottom" culture in deep water in BC. This was tried by Island Scallops and didn't work for them. So they moved to suspended culture for the grow out of the scallops. Have a look at: http://bcsga.ca/about/industry-encyclopedia/scallops/

Again, there is a reason that Scallops aren't listed as an option in the species section of the "on bottom" section of the Application Form on Page 11.

(10) I'm also concerned that horseclams -- which are grown in rather shallow areas and in areas of eelgrass -- will need to be closer than the proposed depth in the Application. And how will the eelgrass areas be monitored to ensure that eelgrass is not damaged or destroyed? No one in BC is currently farming horse clams or producing them in a hatchery as far as I know. I've heard that horseclams are not valuable enough to farm given the expense of farming.

(11) 61% of the critical bird habitat is under predator netting on the west side of Denman island and the east side of Vancouver Island according to the GIS mapping as presented in "Application of aerial photography in combination with GIS for coastal management at small spatial scales: a case study of shellfish aquaculture" by Leah I Bendell and Peter C.Y. Wan (Springer Science and Business Media, BV, 2010).

(12) Exclusion predator netting over the clams trap will kill herring and other marine animals, and create entanglement hazards for all other commercial users i.e. herring fleet, prawn fleet, fishing fleet, crab fleet, recreation fishers, prawners, crabbers, etc. I strongly believe that the predator net canopies which are .5 metres off the sea floor as proposed in this Application would be a possible navigational hazard.

(13) There are other harmful practices in the aquaculture industry such as driving on the beach, beach modification, and killing of "predators" (starfish, moonsnails and crabs).

(14) The scallop industry is dependent on a vast network of marker buoys. The network of these buoys creates a transportation hazard. I also wonder if rafts will be introduced later even though the zoning of the area (AQ-1) does not allow rafts.

(15) There will be an increase in plastic debris leaching into the marine environment as well as increased garbage debris in Baynes Sound. Just a few days ago, there was an article in the Vancouver Sun entitled "Ocean Off Coast Awash with Plastic Particles" --
see http://www.vancouversun.com/technology/Waters+coast+awash+plastic+particles+says+head+ocean+pollution+program+with+video/9520815/story.html

In this Vancouver Sun article, it discusses that up to about 9,200 particles of plastic per cubic metre have been found in water samples taken off the B.C. coast. "Microplastics can be ingested by plankton, invertebrates and other marine life forming the base of the food chain; ingestion of plastics may make organisms think they are full casing them to starve. 'There is extensive contamination of sea water by microplastics,' confirmed Peter Ross, a former research scientist with the federal Institute of Ocean Sciences in Sidney on Vancouver Island..."

It is unknown where these microplastics come from. However, I have personally witnessed the styrofoam of six oyster rafts break up in a winter storm (on December 19-20, 2012) after which millions of styrofoam beads were found on the south tip of Denman Island. This story was covered by CHEK TV news and I have documenting photos of this event. Shouldn't we be trying to move in the other direction by limiting any future plastic biofouling in Baynes Sound?

From the above, one can reach a couple of possible conclusions:

First, that having not succeeded in making an application for the same deep water land (close to the Proponents hatchery) for sea cucumbers and geoduck, the Proponent has put down a multitude of species just to see what sticks.

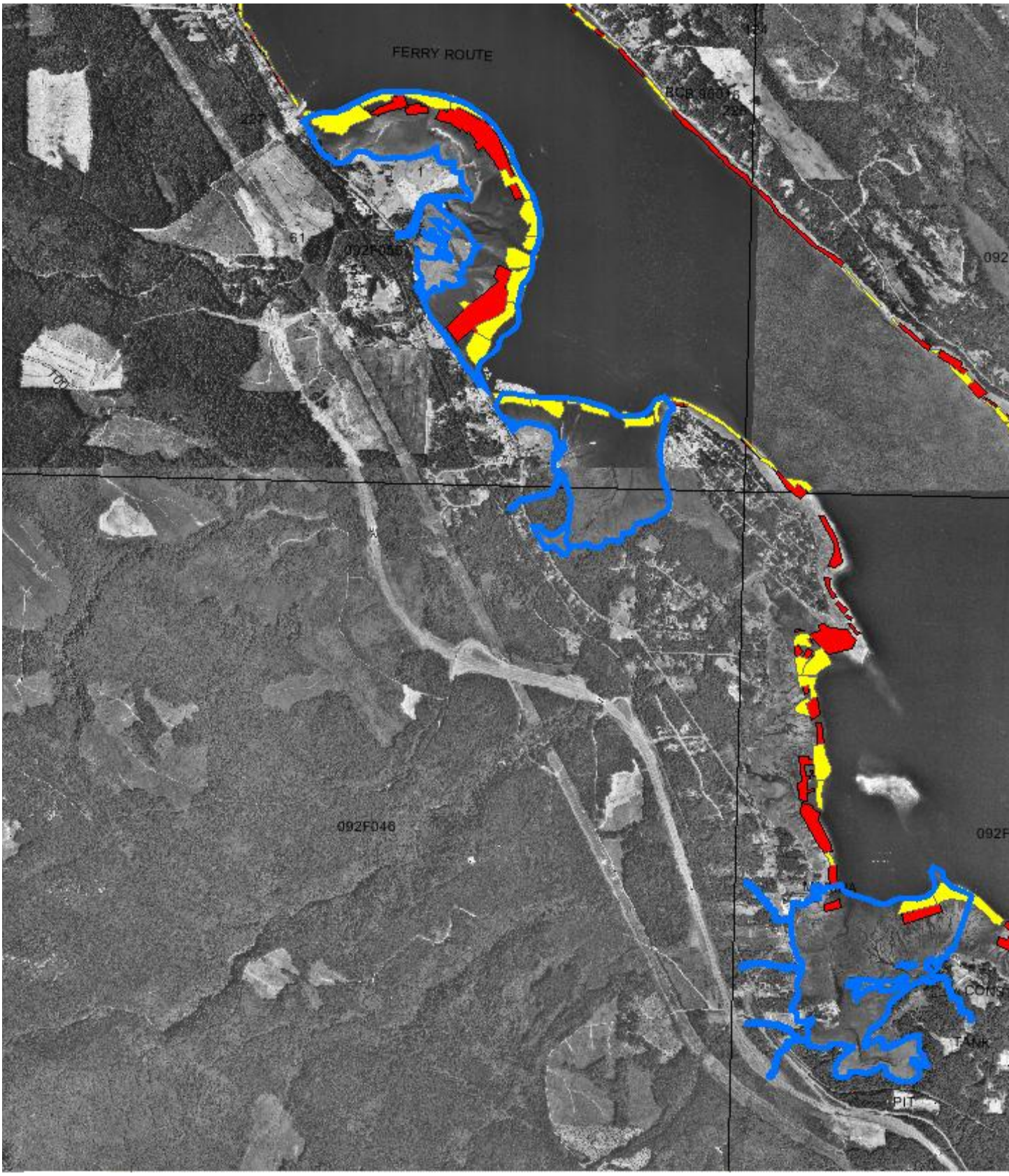
Second, if, as I believe, the deep water on bottom culture of all of the above species (oysters, cockles, horseclams and scallops) is not economic, then one of the following will happen: (a) new species will be added, (b) different grow out structures will be required (floating rafts, long lines or whatever) or (c) the area will not really be utilised.

The claims of this application in terms of what the applicant can do and how much they can produce are grandiose to say the least and should be turned down.

With best regards,

Janet E. Thomas
4810 Kilmarnock Drive
Courtenay, BC V9N 9S5

cc: Rudi Mayser - Manager, Authorization, Ministry of Forests, Lands and Natural Resource Operations - rudi.mayser@gov.bc.ca
cc: March Klaver, Senior Aquaculture Advisor, DFO - March.Klaver@dfo-mpo.gc.ca
cc: Michelle Manning - Aquaculture Management Coordinator, Aquaculture Resource Management, DFO - michelle.manning@dfo-mpo.gc.ca
cc: Diana Trager, Aquaculture Management Division, Director, DFO - diana.trager@dfo-mpo.gc.ca
cc: Transport Canada (general email address) - pacnwp-penpac@tc.gc.ca
cc: Brent Magee - NWP Officer/Navigable Waters Protection Program/Transport Canada - brent.magee@tc.gc.ca
cc: Bruce Jolliffe- Area "A" Director, Comox Valley Regional District - bjolliffe@comoxvalleyrd.ca
cc: The Honourable Don McRae - MLA, Minister of Social Development and Social Innovation - don.mcrae.mla@leg.bc.ca
cc: The Honourable John Duncan - MP, Vancouver Island North - john.duncan@parl.gc.ca
cc: Dennis Chalmers - Fisheries Management Officer Provincial Government - dennis.chalmers@gov.bc.ca
cc: Laura Busheikin, Islands Trust, Denman Island Trustee - lbusheikin@islands.bc.ca
cc: David Graham, Islands Trust, Denman Island Trustee - dgraham@islandstrust.bc.ca
cc: Peter Luckham, Denman Island LTC, Chair - pluckham@islandstrust.bc.ca


FERRY ROUTE
092F046


AMBER WAY
BIOFILTRATION WETLAND
COMOX VALLET PROJECT WATERSHED SOCIETY
THE FUNCTION OF THIS BIOFILTRATION WETLAND IS TO REMOVE POLLUTANTS FOUND IN STORMWATER RUNOFF. THESE POLLUTANTS ARE:
SEPTIC FIELD LEACHATE
LAWN & GARDEN SUPPLEMENT
OIL & GAS FROM PAVED SURFACES
HEAVY METALS FROM VEHICLES
WATER QUALITY MONITORING IS BEING DONE BY LOCAL VOLUNTEERS. THIS IS TO ASSESS THE EFFECTIVENESS OF THE WETLAND IN CLEANING THE RUNOFF FROM THE SURROUNDING RESIDENTIAL AREA. WATER ANALYSIS IS PROVIDED BY NORTH ISLAND LABORATORIES
BUILT WITH THE ASSISTANCE OF LOCAL VOLUNTEERS AND BUSINESSES
AMBER WAY
BIOFILTRATION WETLAND
IMPACTS OF POLLUTANTS
FECAL COLIFORM BACTERIA
NITROGEN
HERBICIDES/PESTICIDES
OIL/HEAVY METALS
FOREHORE ECOLOGY
BAYNES SOUND IS DESIGNATED AS AN IMPORTANT BIRD AREA. IT IS A GLOBALLY SIGNIFICANT SITE FOR 4 SPECIES OF BIRDS
DANGER
SHELLFISH AREA CLOSED
SECTEUR FERMÉ À LA RÉCOLTE DES MOLLUSQUES
HARVESTING PROHIBITED
RÉCOLTE INTERDITE

From: Ottmar Krauss [okrauss@me.com]
Sent: March 5, 2014 3:20 PM
To: AuthorizingAgency.Nanaimo@gov.bc.ca
Cc: Gabrielle.Kosmider@dfo-mpo.gc.ca; rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: I'm Opposed to Licence of Occupation Application #1413722 AQUA

TO: Authorizing Authority
Aquaculture, Ministry of Forests, Lands and Natural Resource Operations
2500 Cliffe Avenue
Courtenay, BC V9N 5M6
email address: authorizingagency.nanaimo@gov.bc.ca

I'm in opposition to Licence of Occupation Application #1413722 for 81 hectares of on-bottom aquaculture for Nuttall's cockles, Pacific oysters, Pacific Scallop X-patinopectin, and horseclams for the following reasons:

This Application is not appropriate since it is a residential area that is used for recreation and anchorage, where the inherent riparian rights of property owners apply to the foreshore, and is also adjacent to treasured local Provincial parks such as Tree Island. Homeowners around Baynes Sound's shoreline have been expressing concerns to local government and industry representatives for over a decade about conflicts with the shellfish aquaculture industry around 24/7 usage, illegally restricted beach access, noise and light pollution, and plastic debris from operations which washes ashore and fouls the beaches. The public trust is broken and we have reached the maximum social carrying capacity for aquaculture in this region. Further expansion jeopardizes existing viable operations – by escalating conflict and attempting to produce more than the ecosystems can handle.

Already 90% of applicable Baynes Sound shoreline is under aquaculture tenure. When is the tipping point of too much aquaculture? Where is the long-awaited report on carrying capacity of Baynes Sound? The last Management Plan for Baynes Sound was published in 2002 and is now 14 years out-of-date. Over the last several years, aquaculture has expanded dramatically here, according to the Deep Bay Marine Field Research Station, even though the 2002 Plan acknowledged that we may have already hit the threshold of ecological carrying capacity. Where is due diligence of oversight for protecting this invaluable resource?

We wonder if this request is primarily a "land grab" since the requested tenure area is so large. This Applicant (Eric Gant of BC0846381, Seastainable Aquaculture Limited, Manatee Holdings and partner in Salish Seafarms Ltd) already has extensive tenures on Savary Island and Cortes Island and is in partnership for over 510 hectares by Salish Sea Farms Ltd. Does the Applicant actually have the resources or ability to actually utilise such large areas for aquaculture? Or, is the Applicant's plan to sell off parts of this requested Licence of Operation to foreign companies? Because the applicant has appeared at past public hearings and made controversial claims, including his website statement “Profit from a Biological Goldmine”, the public is very skeptical and lacks trust in these operations and persons.

Sincerely yours

Alexandra Krauss

Alexandra Krauss
223 Argyle Road
Courtenay, BC
V9N 9S4
CANADA

Phone: 1-250 335 0528

From: Peggy [gayess@yahoo.ca]
Sent: March 11, 2014 1:11 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo.mpo.gc.ca; dianna.trager@dfo.mpo.gc.ca; brent.magee@tc.gc.ca; bjoliffe@comoxvallryrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham; pacnwp-penpac@tc.gc.ca
Subject: I'm Opposed to Licence of Occupation Application #1413722

I'm in opposition to Licence of occupation Application #1413722for 81 hectares of on- bottom aquaculture for Nuttall's Cockles, Pacific Oysters, Pacific Scalllop X-patinopectin, and Horseclams for the following reasons:

~~~As a beachfront property owner on Kilmarnock Drive, I am against having a commercial Aquaculture operation in the waters in front of what is supposed to be valuable residential property. The beach, and the view, and the wildlife, and the luxury of keeping our boats on the shore & out front in the summer are the reasons we moved here. We do not want our natural, undeveloped waterfront threatened by a commercial operation restricting our use of the beach; adding traffic & noise & pollution to our quiet rural residential area on Baynes Sound.

~~~Why is this Application for 81 hectares? This is a huge area, from our beach across to Tree Island, which is a Provincial Park, and is very busy in the summer with boaters anchored out front & people swimming and camping on the sandy beach. The Applicant Eric Gant (of BC0846381, "Seastainable Aquaculture Ltd, Manatee Holdings", and partner in "Salish Seafarms Ltd.) already has over 510 hectares in tenure in the area. Two years ago I attended all the public hearings concerning his application for 155 hectares for geoduck and sea cucumber aquaculture. Gant did not make a good impression on the public as he repeatedly contradicted himself, especially when answering questions, and he certainly didn't inspire trust from his audience.

~~~Why hasn't there been a more recent Management Plan for Baynes Sound.
The most recent plan was in 2002 and it acknowledged that we may have already "hit the threshold of ecological carrying capacity" for aquaculture, and this prediction was made twelve years ago. Obviously aquaculture has "expanded dramatically" since then.

~~~Proposed Tenure includes Amber Way which is a "Biofiltration Wetland"
which was sponsored by Project Watershed, and the Ministries of Environment & Transportation. This wetland has a very strong seasonal stream marked as riparian habitat, which empties into the proposed tenure area, affecting salinity and turbidity. Other sponsors of the Biofiltration Wetland Project are:
eco ACTION
CNF (Canadian Nature Federation)
Bird Studies Canada
Bird Life International
Endswell Foundation
local volunteers Conservation of shorebird habitat should be more important than allowing commercial ventures to destroy them.

~~~Baynes Sound is designatedas an important Bird Area. It is a globally significant site for six species of birds: Great Blue Heron, Western Grebe, Brant Geese, Thayers Gull, Glacaus Winged Gull & Black Turnstone.
~~~

This area is also an important habitat for many other birds including nineteen species of ducks. Some of these birds are designated as "Species at Risk".

~~~Growing acidification of the waters in this area is already causing problems with shellfish. The acidic ph can prevent the shells from hardening which is life-threatening to scallops, oysters, clams and cockles. More research needs to be done, especially as the problem seems to be increasing

~~~Other concerns are having nets, plastic containers, lines and marker buoys, styrofoam and other plastic garbage ending up on the beaches.

~~~What about the yearly herring fishery? Seineboats, herring skiffs, whales, porpoises, seal & sealions, eagles & gulls all fishing in Baynes Sound.

Signed: Margaret Carl, 4746 Kilmarnock Drive, Courtwnay BC V9N9S4 March 11th 2014
~~~

From: Eleanor Riddell [eeriddell@hotmail.com]
Sent: March 13, 2014 12:55 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: FLNR.Minister@gov.bc.ca; rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: File# 1413722 aqua/ opposition

I am opposed to further expansion of the shellfish industry in baynes sound; this proposed experiment has insufficient long-term unbiased scientific data to proceed. The balance of nature in these waters is at risk, particularly considering it involves the important herring industry, the second most important migratory bird area in B.C., salmon restoration and a host of other factors.
The recent debacle with Qualicum scallops clearly indicates that this industry has proceeded with insufficient knowledge of consequences. Without proper scientific data to conclude that there will be no further damage to these important waters, further expansion must be halted!
Eleanor riddell
4278 Island highway s.
Courtenay, B.C.

From: Ann Marie Tout [amt@northwestel.net]
Sent: March 14, 2014 3:36 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: Occupation Application 1413722 AQUA

4834 Kilmarnock Drive
Courtenay, B.C.

March 14, 2014

Authorizing Agency
Aquaculutre, Ministry of Forests, Lands and Natural Resource Operations
2500 Cliffe Avenue
Courtenay, B.C. V9N 5M6

Delivered electronically to authorizingagency.nanaimo@gov.bc.ca

Opposition to Licence of Occupation Application #1413722 AQUA

I'm in opposition to Licence of Occupation Application 21413722 for 81 hectares of on-bottom aquaculture for Nuttall's cockles, Pacific oysters, Pacific Scallop X-patinopectin, and horseclams for the following reasons:

1. This is a residential are used for recreation and anchorage where the inherent riparian rights of property owners apply to the foreshore.
2. This area is adjacent to treasured local Provincial pakrs.
3. For over a decade, homeowners around the shoreline of Bayne's Sound have expressed concerns to local government and industry representatives regarding conflicts with the shellfish aquaculture industry around 24/7 usage, illegally restricted beach access, noise and light pollution and plastic debris from operations washing ashore and fouling the beaches.
4. The average tenure in B.C. is 4.39 hectares. There is no justification for approving an application for 81 hectares.
5. The Management Plan for Baynes Sound has not been updated since 2002. There is insufficient information available to determine the carrying capacity of Baynes Sound and whether, in fact, it has already been exceeded. Approval of an additional tenure of this size is irresponsible without reviewing up to date information regarding the ecology of the area and its capacity.
6. The cockle culture in BC is in experimental stages and a totally new aquaculture operation in the proposed area (which is highly sensitive habitat) is not acceptable.
7. There are no currently no horseclam farming operations or horseclam production from hatcheries. Studies should be undertaken prior to granting tenures for horseclams.
8. This tenure area is a crucial herring spawn area in B.C. The presence of marker buoys and nets will create conflicts with the already proven herring industry and create navigational hazards.
9. Baynes Sound is designated as an Important Bird Area and is a globally significant sites for six species of birds (Great Blue Heron, Western Grebe, Brant Geese, Thayers Gull, Glaucous Winged Gull and Black Turnstone. The area is also an important habitat for many other birds including nineteen species of ducks some of which are designated Species at Risk.

In summary, the application should be denied until such time as management plans can be updated and reviewed, further studies undertaken and adequate and meaningful consultation held with impacted stakeholders. I believe that approval of this application without these processes would be environmentally and socially irresponsible. I urge you to deny this application at this time.

Sincerely yours

Ann Marie Tout

cc: Rudi Mayser, Manager, Authorization, Ministry of Forests, Lands and Natural Resource Operations
March Klaver, Senior Aquaculture Advisor, DFO
Michelle Manning, Aquaculture Management Coordinator, Aquaculture Resource Management, DFO
Diana Trager, Aquaculture Management Division, Director, DFO
Transport Canada
Brent Magee – NWT Officer/Navigable Waters Protection Program, Transport Canada
Bruce Joliffe – Area "A" Director, Comox Valley Regional District
Honourable Don McRae, MLA, Minister of Social Development and Social Innovation
Honourable John Duncan. MP, Vancouver Island North
Dennis Chalmers, Fisheries Management Officer Provincial Government
Laura Busheikin, Islands Trust, Denman Island Trustee
David Graham, Islands Trust, Denman Island Trustee
Peter Luckman, Denman Island LTC, Chair

From: Betty Davison [manager@bcnature.ca]
Sent: March 14, 2014 10:51 AM
To: gail.shea@parl.gc.ca
Cc: FLNR.Minister@gov.bc.ca; rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham; vanessa.x.scott@gmail.com
Subject: RE: Proposals to expand aquaculture development in Baynes Sound

Honourable Minister Shea;

Please find enclosed correspondence regarding proposals to expand aquaculture development in Baynes Sound

Betty Davison
BC Nature Office
604 985 3057
1620 Mt. Seymour Road
North Vancouver, BC V7G 2R9

BCnature
FEDERATION OF BC NATURALISTS

"Know Nature and Keep it Worth Knowing!"

BCnature
FEDERATION OF BC NATURALISTS

14 March 2014

The Honourable Gail Shea,
Minister of Fisheries and Oceans,
Ottawa, ON
Via Email: gail.shea@parl.gc.ca

RE: Proposals to expand aquaculture development in Baynes Sound

Dear Minister Shea,

I write to you on behalf of BC Nature (the Federation of BC Naturalists), to express our deep concern regarding proposals to expand aquaculture development in Baynes Sound on Vancouver Island.

BC Nature is a non-profit society of naturalists in British Columbia with over 5,000 members, and is the lead provincial group for the Important Bird Areas (IBA) Program in BC. This is an international program coordinated by BirdLife International and partnering with non-profit, environmental organizations in 170 countries around the world.

The ecological richness of Baynes Sound is demonstrated not only by its high suitability for aquaculture, but also by the globally significant K'omoks Important Bird Area located there. The Sound is one of the most important areas for wintering water birds in BC.

If aquaculture development increases incrementally in Baynes Sound, not only may aquaculture become unsustainable, but the ecosystem may be altered in detrimental ways. BC Nature therefore calls upon the Department of Fisheries and Oceans to halt all new aquaculture in Baynes Sound, until such time that a cumulative impact assessment can determine the viability of expanded shellfish farming and its broader impacts on the natural ecosystem.

We appreciate your attention to our concerns and our request for a moratorium on aquaculture in Baynes Sound, and look forward to hearing your intentions at your earliest opportunity.

Sincerely,

John Neville
President
Federation of BC Naturalists (BC Nature)

cc Honourable Steve Thomson, Minister of Lands, Forests and Natural Resource Operations - FLNR.Minister@gov.bc.ca

Rudi Mayser - Manager, Authorization, Ministry of Forests, Lands and Natural Resource Operations - rudi.mayser@gov.bc.ca
March Klaver, Senior Aquaculture Advisor, DFO - March.Klaver@dfo-mpo.gc.ca
Michelle Manning - Aquaculture Management Coordinator, Aquaculture Resource Management, DFO - michelle.manning@dfo-mpo.gc.ca
Diana Trager, Aquaculture Management Division, Director, DFO - diana.trager@dfo-mpo.gc.ca
Transport Canada (general email address) - pacnwp-penpac@tc.gc.ca
Brent Magee - NWP Officer/Navigable Waters Protection Program/Transport Canada - brent.magee@tc.gc.ca
Bruce Jolliffe- Area "A" Director, Comox Valley Regional District - bjolliffe@comoxvalleyrd.ca
The Honourable Don McRae - MLA, Minister of Social Development and Social Innovation - don.mcrae.mla@leg.bc.ca
The Honourable John Duncan - MP, Vancouver Island North - john.duncan@parl.gc.ca
Dennis Chalmers - Fisheries Management Officer Provincial Government - dennis.chalmers@gov.bc.ca
Laura Busheikin, Islands Trust, Denman Island Trustee - lbusheikin@islands.bc.ca
David Graham, Islands Trust, Denman Island Trustee - dgraham@islandstrust.bc.ca
Peter Luckham, Denman Island LTC, Chair - pluckham@islandstrust.bc.ca
Aquaculture, Ministry of Forests, Lands and Natural Resource Operations - authorizingagency.nanaimo@gov.bc.ca
Vanessa Scott - vanessa.x.scott@gmail.com

From: Ed Varney [evarney@shaw.ca]
Sent: March 14, 2014 11:49 AM
To: rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: Aquaculture application #1413722
March 14, 2014

I am adamantly opposed to Acquaculture Occupation Application #1413722 by Sustainable Acquaculture Ltd.

The 81 hectare application is for an area that is too large for many reasons.

There is no evidence in the actual application that and scientific experiments will be conducted and there is no methodology that any such experiments would follow.

The proponents obviously want the large tenure so that they can later convert it to cultivation of geoducks without public consultation.

The netting and debris from such an operation is unacceptable. You will notice from the map that the proposed area begins at the 2 meter depth isobar, much too shallow and a hazard to both navigation and recreation.

Geoducks are retain heavy metals and pollution for up to six months in their flesh and the cadmium levels in Baynes Sound are already very high compared to other jurisdictions.

This application is too large to be reasonable, is in the wrong place, and offers too many risks to be granted.

I think that this application, if converted to geoduck cultivation, would violate the terms of your recently released (last week) geoduck policy.

Yours,
Ed Varney
4426 Island Highway South,
Courtenay, BC, V9N 9T1
evarney@sghaw.ca

From: Biebach [biescout@axion.net]
Sent: March 14, 2014 2:42 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: FLNR.Minister@gov.bc.ca; min@dfo-mpo.gc.ca; rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: Licence of Occupation Application #1413722 AQUA

TO: Authorizing Agency
Aquaculture, Ministry of Forests, Lands and Natural Resource Operations
2500 Cliffe Avenue
Courtenay, BC V9N 5M6
email address: authorizingagency.nanaimo@gov.bc.ca

RE: I'm Opposed to Licence of Occupation Application #1413722 AQUA

I'm in opposition to Licence of Occupation Application #1413722 for 81 hectares of on-bottom aquaculture for Nuttall's cockles, Pacific oysters, Pacific Scallop X-patinopectin, and horseclams for the following reasons:

Already 90% of applicable Baynes Sound shoreline is under aquaculture tenure. When is the tipping point of too much aquaculture? Where is the long-awaited report on carrying capacity of Baynes Sound? The last Management Plan for Baynes Sound was published in 2002 and is now 14 years out-of-date. Over the last several years, aquaculture has expanded dramatically here, according to the Deep Bay Marine Field Research Station, even though the 2002 Plan acknowledged that we may have already hit the threshold of ecological carrying capacity. Where is due diligence of oversight for protecting this invaluable resource?
We do not want any more exclusion predator netting in our coastal waters which will kill herring and other marine animals and create entanglement problems for all commercial users (i.e. herring boats, prawn fleet, crabbers, etc. as well as recreational fishers). Herring are a keystone species of Baynes Sound and provide some of the most vital connections in the food web that supports iconic species like our eagles. This tenure would overlap with some of the last untouched 5% most vital herring spawn habitat in the entire sound. These most critical areas should take precedence for conservation and be excluded from tenure.
As stated on the Amber Way Biofiltration Wetland public information board: “Baynes Sound is designated as an Important Bird Area. It is a globally significant site for six species of birds: Great Blue Heron, Western Grebe, Brant Geese, Thayers Gull, Glaucous Winged Gull, [and] Black Turnstone. This area is also an important habitat for many other birds including 19 species of ducks.” Some of these are designated Species at Risk, even though the proponent has said that “SARA” species are “N/A” on their DFO submission. Yet shorebirds are facing steep decline in Canada and critical habitat must be conserved. This wetland was sponsored by the following: Environment Canada Shellfish Water Quality Program; ecoACTION; CNF (Canadian Nature Federation); Bird Studies Canada; BirdLife International; endswell foundation; Ministry of Transport; and local volunteers. Do these contributors know their wetland could now end in a commercial aquaculture tenure rather than habitat conservation? Under what management system is this considered appropriate?

We wonder if this request is primarily a "land grab" since the requested tenure area is so large. This Applicant (Eric Gant of BC0846381, Seastainable Aquaculture Limited, Manatee Holdings and partner in Salish Seafarms Ltd) already has extensive tenures on Savary Island and Cortes Island and is in partnership for over 510 hectares by Salish Sea Farms Ltd. Does the Applicant

actually have the resources or ability to actually utilise such large areas for aquaculture? Or, is the Applicant's plan to sell off parts of this requested Licence of Operation to foreign companies? Because the applicant has appeared at past public hearings and made controversial claims, including his website statement “Profit from a Biological Goldmine”, the public is very skeptical and lacks trust in these operations and persons.

Gabi Biebach
2071 Northwest Road
Denman Island, B.C.

date: March 14,2014

From: Biebach [biescout@axion.net]
Sent: March 14, 2014 10:36 PM
To: authorizingagency.nanaimo@gov.bc.ca
Cc: FLNR.Minister@gov.bc.ca; min@dfo-mpo.gc.ca; rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: Licence of Occupation Application #1413722 AQUA

TO: Authorizing Agency
Aquaculture, Ministry of Forests, Lands and Natural Resource Operations
2500 Cliffe Avenue
Courtenay, BC V9N 5M6
email address: authorizingagency.nanaimo@gov.bc.ca

RE: I'm Opposed to Licence of Occupation Application #1413722 AQUA

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and partner in Salish Seafarms Ltd) already has extensive tenures on Savary Island and Cortes Island and is in partnership for over 510 hectares by Salish Sea Farms Ltd. Does the Applicant actually have the resources or ability to actually utilise such large areas for aquaculture? Or, is the Applicant's plan to sell off parts of this requested Licence of Operation to foreign companies? Because the applicant has appeared at past public hearings and made controversial claims, including his website statement “Profit from a Biological Goldmine”, the public is very skeptical and lacks trust in these operations and persons.

Klaus Biebach
2071 Northwest Road
Denman Island, B.C.

March 14,2014

From: Charlie & Jennifer Schellinck [cjschellinck@gmail.com]
Sent: March 15, 2014 10:33 AM
To: AuthorizingAgency.Nanaimo@gov.bc.ca
Cc: kathy.evans@gov.bc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; gail.shea@parl.gc.ca; march.klaver@dfo-mpo.gc.ca;michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; steve.thomson.mla@leg.bc.ca; dennis.chalmers@gov.bc.ca; David Graham; Laura Busheikin; Peter Luckham

Subject: AquacultureApplication 1413722 AQUA

Attention:
Ministry of Forest, land, Natural Resources
Re: Aquaculture Application #1413722 AQUA

I strongly oppose the application made by the Salish Sea Farms Ltd. File number 1413722 Too often requests like these are pushed through with little thought of the negative impact which will be made on the general public of the region.

As a long time Valley resident I have made recreational use of this area for over 50 years. I still use this area for boating, fishing, and water sport with my family and hope to in the future with my grandchildren. I cannot accept losing some of the most precious coast line to the need of a sea food company. Points to consider are:

1. The negative impact on the wildlife in and around the water.
2. The loss of safe anchorage on the west side of the Georgia Straight.
3. The loss of recreational use by local residents and visiting tourists.

It is time we stop expanding business opportunities which benefit only a few while we lose a valued natural resource enjoyed by many.

Yours sincerely,

Charlie Schellinck

P.S. I am aware the First Nations interest is being considered which would likely benefit the few connected to the aquaculture company owned by the band. Has anybody discussed this proposal with the many First Nations people of the K'omoks band who care about the environment and the future use of these recreational sites?

From: Vanessa Scott [vanessa.x.scott@gmail.com]
Sent: March 15, 2014 11:05 AM
To: gail.shea@parl.gc.ca; authorizingagency.nanaimo@gov.bc.ca
Cc: rudi.mayser@gov.bc.ca; march.klaver@dfo-mpo.gc.ca; michelle.manning@dfo-mpo.gc.ca; diana.trager@dfo-mpo.gc.ca; pacnwp-penpac@tc.gc.ca; brent.magee@tc.gc.ca; bjolliffe@comoxvalleyrd.ca; don.mcrae.mla@leg.bc.ca; john.duncan@parl.gc.ca; dennis.chalmers@gov.bc.ca; Laura Busheikin; David Graham; Peter Luckham
Subject: Letter of Opposition re: 1413722 AQUA in Baynes Sound
To All it May Concern:

I am writing to register my opposition to application 1413722 AQUA in Baynes Sound. While this letter addresses this one application, I join with many concerns citizens, organizations and the BC Nature Federation and its affiliates in calling for a cumulative impact assessment to determine the viability of expanded shellfish farming and its broader impacts on the natural ecosystem.
One main concern with application 1413722 AQUA is that the northern extremity of the proposal area includes the foreshore of the Amber Way Biofiltration Wetland and Beacon Creek outflow, which is surrounded by sensitive marsh and estuarine habitat that is well-documented by government and other publicly available marine assessments. This diversity of sensitive and valuable marine vegetation includes not only eel grass beds, as noted by the proponent, but also red, brown and green algae and rockweed, which grow deeper than eelgrass and thus potentially closer to the proposed operation. The proponent map shows only eelgrass and could ignore the role that this other habitat provides as a nursery for larval and juvenile fishes, and therefore also as important foraging sites for seabirds.
The proponent states their installations of predator netting and other structures will be 10 m away from eelgrass beds – but is this the case for other equally valuable marine vegetation? Does this meet scientific best practices or the precautionary approach? And how can such spatial 'safeguards' be guaranteed or monitored in uncontrolled underwater conditions, especially with strong winter wave and tidal action, over an area of 81 hectares? When added together with the Beacon Creek outflow, variable unsurveyed bottom conditions and extreme proximities, I believe this general area represents inappropriate site selection for aquaculture expansion.

Two of the fish species most economically and culturally important to BC are salmon and herring, both of which rely on these nursery habitats at the most critical stages of their life cycles. Baynes Sound supports 15 salmonid streams, all of which are under stress or, like the nearby Trent River, fall under threat of "extirpation." This aquaculture application not only overlaps with diverse and important marine vegetation, these resources themselves provide some of the last remaining most vital herring spawn areas in Baynes Sound. As stated on the K'omoks IBA Canada website: "Many of the species using this IBA are dependent on herring spawn. Any activity that negatively impacts the herring spawn (e.g. reductions in water quality, foreshore development) could have significant impacts on the ability of this site to support a concentration of birds."

The creation of the Amber Way Biofiltration wetland was sponsored by the Ministries of Transport and Environment Canada – Shellfish Water Quality Monitoring Program, as well as a half dozen ENGOs including Birdlife International and the Canadian Nature Federation. The Amber Way Biofiltration Wetland is located within the recently amalgamated K'omoks IBA (Important Bird Area) in North Union Bay. How does it represent appropriate site selection to include the foreshore of a publically and privately funded Biofiltration Wetland within the footprint an experimental shellfish aquaculture tenure?

My family home is one of the properties closest to this wetland, though I am not a property owner here. The public sign explaining that this is a Biofiltration Wetland has been present for many years (please see the attached photo appendix). In addition to habitat concerns, doesn't the ongoing investment in

waterfowl habitat conversation and bioremediation also render this an inappropriate site for shellfish aquaculture? As stated on IBA Canada's website, "The recent demand for expanded aquaculture development will need to continue to be evaluated carefully for its impact on birds." What scientific evaluations have been done?

The project proponents told a local newspaper that their operation at Amber Way would be located "below the surface", as if to imply that would then have no impact on the wetland or the diversity of plants and animals it supports. But the definition of a wetland includes permanently submerged areas up to six metres below low tide, and aquatic beds like eelgrass in addition to intertidal marshes and marine vegetation that extends beyond this perimeter. All these surrounding "buffer" zones are highly important to the structure and function of the overall habitat. Because BirdLife International is a partner in the Amber Way Biofiltration Wetland, along with groups like Bird Studies Canada, I think it may, along with the rest of Baynes Sound, fall under the *Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat.*

According to the proponents' government submission, this project would involve laying down predator exclusion modules, cement blocks, marker buoys, cables, rebar and other underwater structures over a proposed experimental area of 81 hectares. However the average shellfish tenure size throughout BC is only 4.39 hectares; and only 5 tenures are larger than 30 hectares. They intend to harvest this area for four shellfish species, some of which have never been cultivated yet and are also experimental. Even if this is confirmed by DFO scientists as an "extensive" as opposed to "intensive" management plan, why do the proponents seek such a large and varied experimental field area? Is the project engineer's primary, secondary or tertiary field of expertise in aquaculture; and does this fulfill the "Qualified Individual" licensing clause of Pacific Aquaculture Regulations from Fisheries and Oceans Canada?

Having previously contacted the SFU School of Resource and Environmental Management concerning these applicants' previous attempt to secure this area for experimental sea cucumber 'ranching', I'm aware that marine research areas must be properly sited to control conditions. So I wonder why the proponents would include in their plan a riparian area with such a strong seasonal freshwater stream as Beacon Creek? It's my understanding that this outflow could negatively impact shellfish growth and survival rates due to variability in such conditions as salinity, turbidity and deleterious outflows.

In addition to sensitive habitats, the presence of pollution that requires wetland bioremediation is another reason I am concerned this is an inappropriate site. Due to impacts like paved surface runoff, upland development and septic wastewater systems, this entire area has been closed to shellfish harvesting by Fisheries and Oceans Canada. I understand that regional cases of paralytic shellfish poisoning (PSP) closures, anaerobic conditions and pollution runoff are not improving but worsening. How does this proposed expansion into sensitive habitat areas, and potentially polluted wildlife refugia, represent a scientific approach to marine resource management?

And how does this proposed expansion, with cumulative burdens on the ecosystem, stand to impact the viability of existing aquaculture operations? In addition to water quality concerns that impact 'grow out' operations in Baynes Sound, regional hatcheries are feeling the economic fallout of locally concentrated ocean acidification that has imbalanced PH levels and cost $10 million recent losses. This adds weight to the widespread concern that this area needs especially careful scientific stewardship from all stakeholders.

While the local sponsor group for the Amber Way Biofiltration Wetland still exists as the Comox Valley Project Watershed Society, it must be noted that one of the proponents now sits on the board of Project

Watershed Society. I understand that persons with a variety of backgrounds, and not always those with scientific credentials, may valuably inform local conservation work. However, Dan Bowen presents himself in part as an aquaculture consultant and project manager of the local Gartley Point Hatchery expansion, yet claims no conflict of interest when advising local environmental consortia and the public to support these aquaculture projects. I do not trust that there is no conflict of interest, until I'm told otherwise by non-financially entangled stakeholders.

Shellfish aquaculture is an important part of the local economy and needs to develop sustainably and with greater public trust and acknowledgement of a mutual – not adversarial – stance in marine conservation. The last CVRD Regional Growth Strategy (2011) acknowledged that these waters are no longer pristine and that adequate oversight must balance many interests including those of wildlife, the viability of existing wild and cultured fisheries, and that it is unknown whether further farms or tenures can be created here.

I would like to know if the authorizing agencies think it is appropriate to include the Amber Way Biofiltration Wetland area and/or its surrounding habitats in an experimental shellfish aquaculture proposal. I find it ironic that the proponents would now lay predator exclusion netting over and/or alongside an area that was literally funded to protect the habitat of these avian and other marine "predators" like sea lions, seals, diving birds and river otter.

I've attached a photo appendix of the Amber Way Biofiltration Wetland public signboards, which references the most recent CVRD Beach Inventory in which the Amber Way Biofiltration Wetland is identified as sensitive marsh habitat along with "Danger – Shellfish Area Closed by DFO" signage.

In order that you may review the maps of herring spawn habitat and other sensitive areas in Baynes Sound, and to convey some larger context, I've also attached a previous letter I submitted regarding these proponents' ongoing efforts to secure large geoduck shellfish tenures in surrounding areas. I've also attached some of the most relevant project maps for this application, recorded as 'screenshots' from the ministry website on March 4, 2014.

Thank you very much for your time, consideration and any feedback you may have to offer.

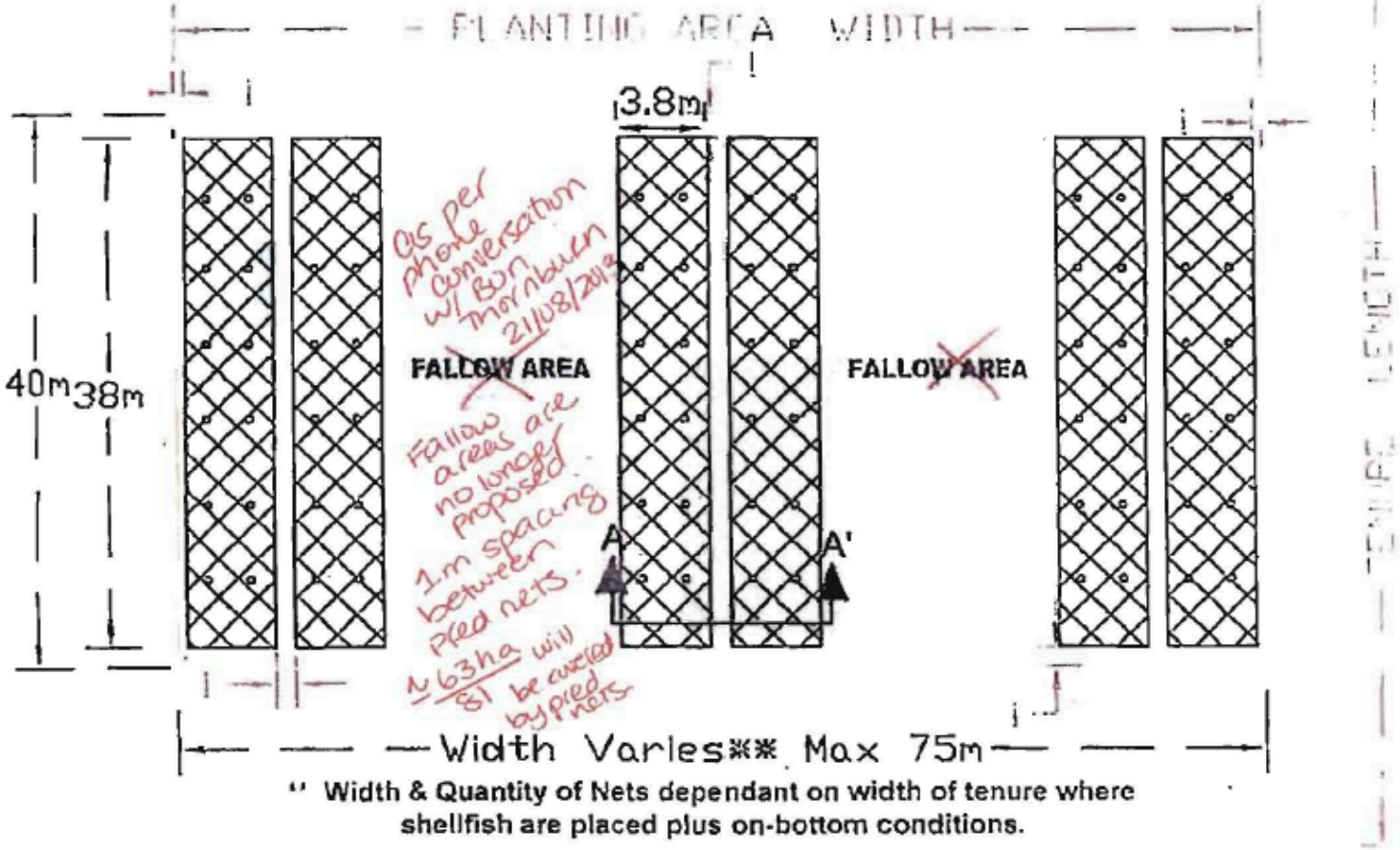
Sincerely,

Vanessa Scott

cell: 604-727-9201
Courtenay: 250-335-2062

DETAILS - TYPICAL 40m MULTICULTURE NET MODULE

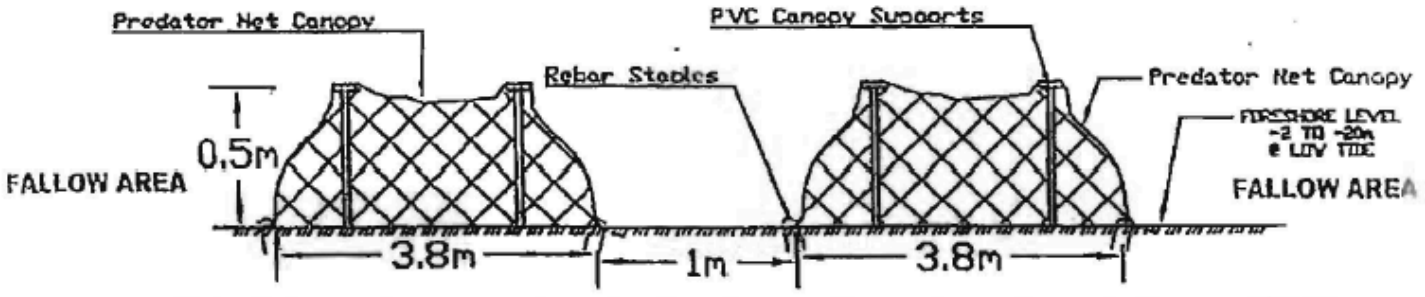
Note: PAs are shown as rectangular. Net Containment Shapes could vary considerably depending on bottom conditions



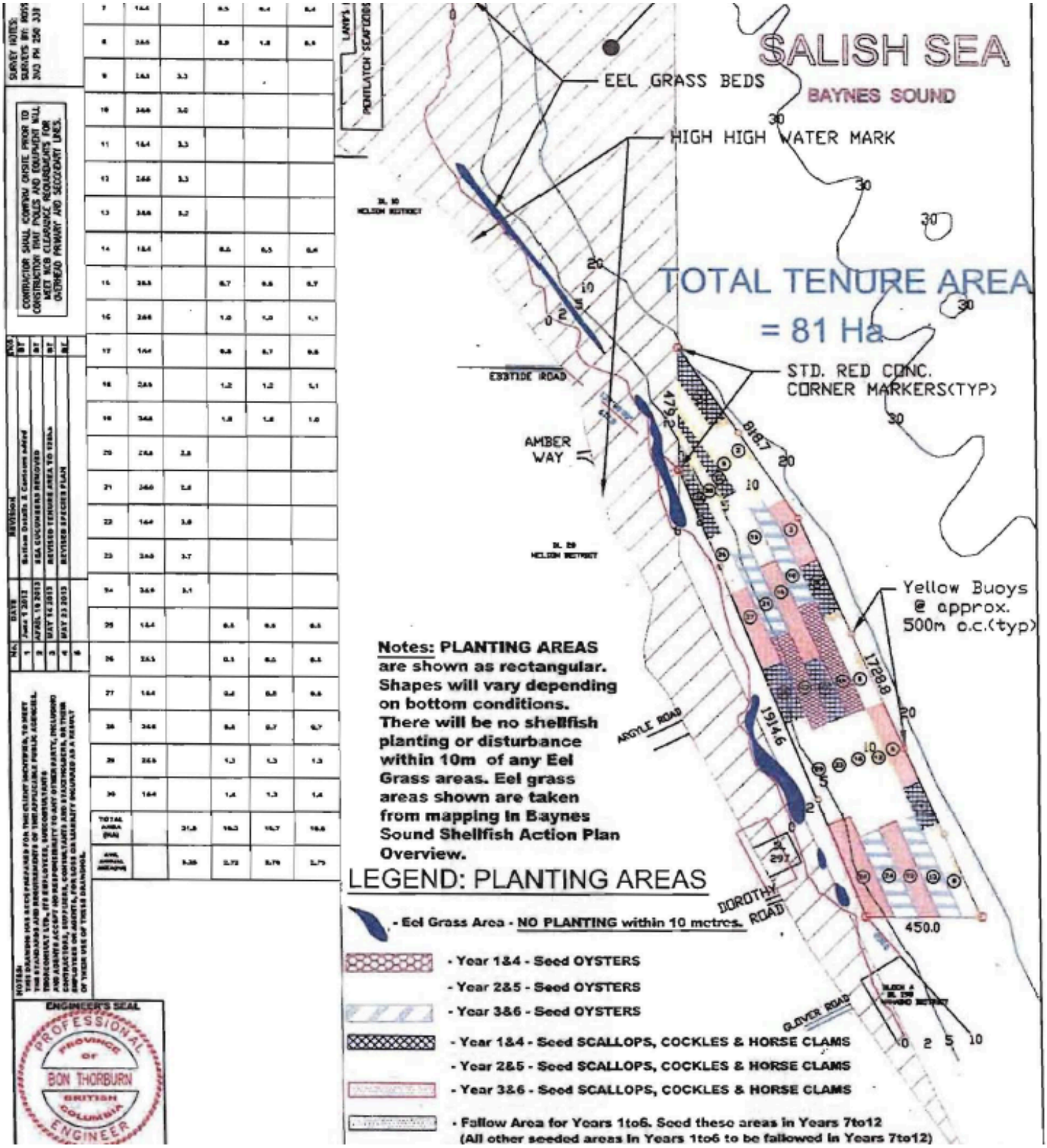
** Width & Quantity of Nets dependant on width of tenure where shellfish are placed plus on-bottom conditions.

PLAN

NOT TO SCALE



Note: Nets are shown as rectangular. Net shapes will vary depending on bottom conditions


SALISH SEA
BAYNES SOUND
EEL GRASS BEDS
HIGH HIGH WATER MARK
TOTAL TENURE AREA
= 81 Ha
STD. RED CONC.
CORNER MARKERS(TYP)
Yellow Buoys
@ approx.
500m o.c.(typ)
EBBTIDE ROAD
AMBER
WAY
ARGYLE ROAD
DOROTHY
ROAD
GLOVER ROAD
Notes: PLANTING AREAS
are shown as rectangular.
Shapes will vary depending
on bottom conditions.
There will be no shellfish
planting or disturbance
within 10m of any Eel
Grass areas. Eel grass
areas shown are taken
from mapping in Baynes
Sound Shellfish Action Plan
Overview.
LEGEND: PLANTING AREAS
- Eel Grass Area - NO PLANTING within 10 metres.
- Year 1&4 - Seed OYSTERS
- Year 2&5 - Seed OYSTERS
- Year 3&6 - Seed OYSTERS
- Year 1&4 - Seed SCALLOPS, COCKLES & HORSE CLAMS
- Year 2&5 - Seed SCALLOPS, COCKLES & HORSE CLAMS
- Year 3&6 - Seed SCALLOPS, COCKLES & HORSE CLAMS
- Fallow Area for Years 1to6. Seed these areas in Years 7to12
(All other seeded areas in Years 1to6 to be fallowed in Years 7to12)
ENGINEER'S SEAL
PROFESSIONAL
PROVINCE OF
BON THORBURN
BRITISH COLUMBIA
ENGINEER

SECTION D: SUBTIDAL ON/IN BOTTOM CULTURE

1. Estimated subtidal on/in bottom culture area ~~50~~ 81 hectares (for the area of the sea floor below chart datum)

MM PRT review

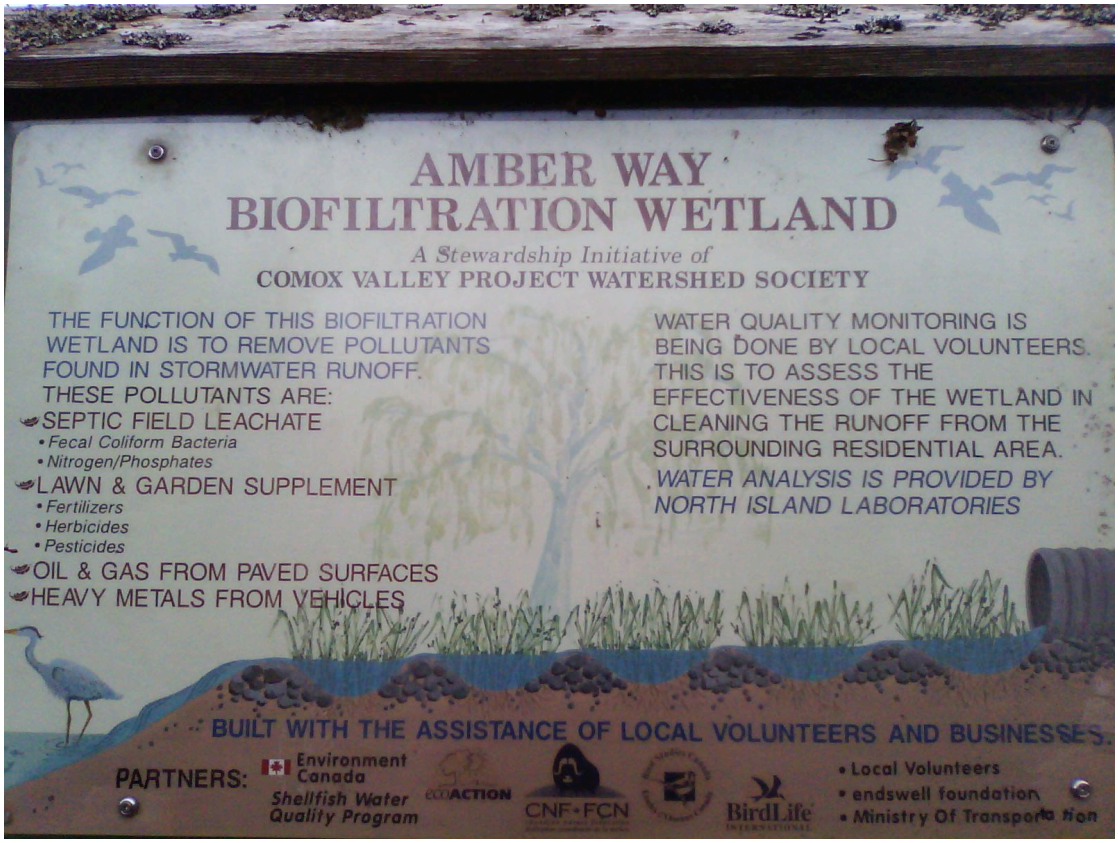
2. Subtidal On/In Culture Area Details by Species.

Check all that apply	Species Common Name	Species Latin Name	First year that production (sale) is anticipated to occur	Annual Production Estimate (MT)	Source of Stock by species for Culture at this Site (check all that apply)[1]		
					Hatchery	Natural Sets on Site	Other Stock Source[3]
☐	California Sea Cucumber	*Parastichopus californicus*			☐	☐	☐
☑	Nuttall's Cockle	*Clinocardium nuttallii*		54	☑	☐	☐
☐	Manila Clam	*Venerupis philippinarum*			☐	☐	☐
☐	Geoduck Clam[3]	*Panope generosa*			☐	☐	☐
☐	Red Sea Urchin	*Strongylocentrotus droebachiensis*			☐	☐	☐
☐	Green Sea Urchin	*Strongylocentrotus droebachiensis*			☐	☐	☐
☑	Pacific oyster			100	☑	☐	☐
☑	Pacific Scallop	X-Patinopectin		27	☑		
☑	Horse Clam.			80	☑		
		Total Annual Production Estimate:		261	(MT)		

PRT review mm

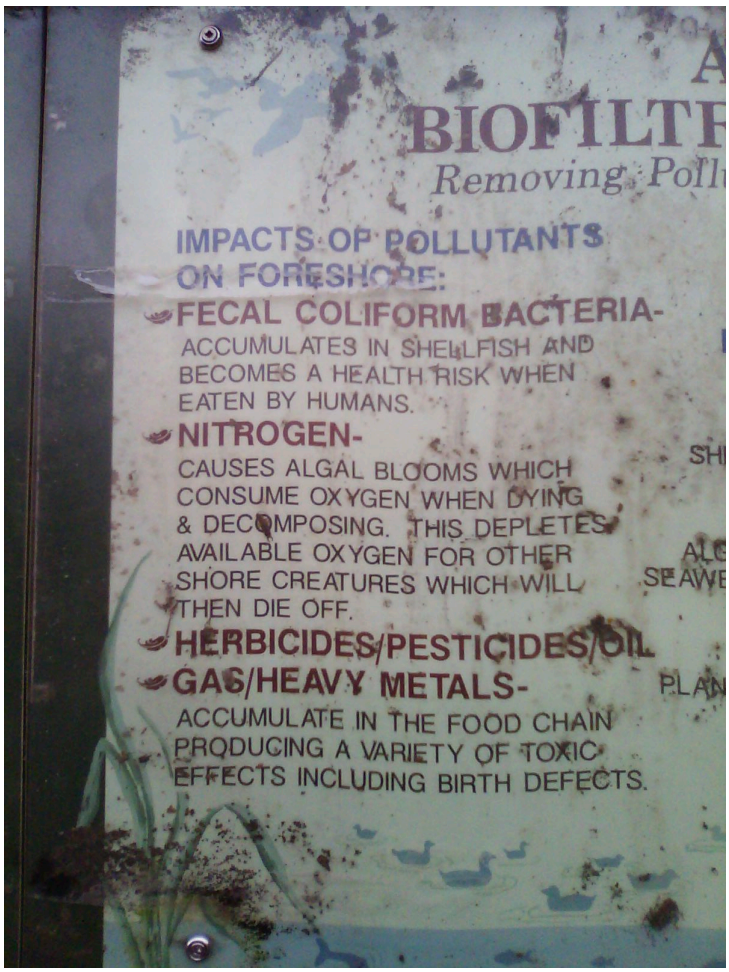
[1] Note: The source of stock for the licensed site may require additional authority to harvest wild fish from on or off your site for use as brood stock or for on-growing, as well as specific transfer and/or import licences from Canadian Food Inspection Agency (CFIA) and the Introductions and Transfers Committee (ITC). See Section H.

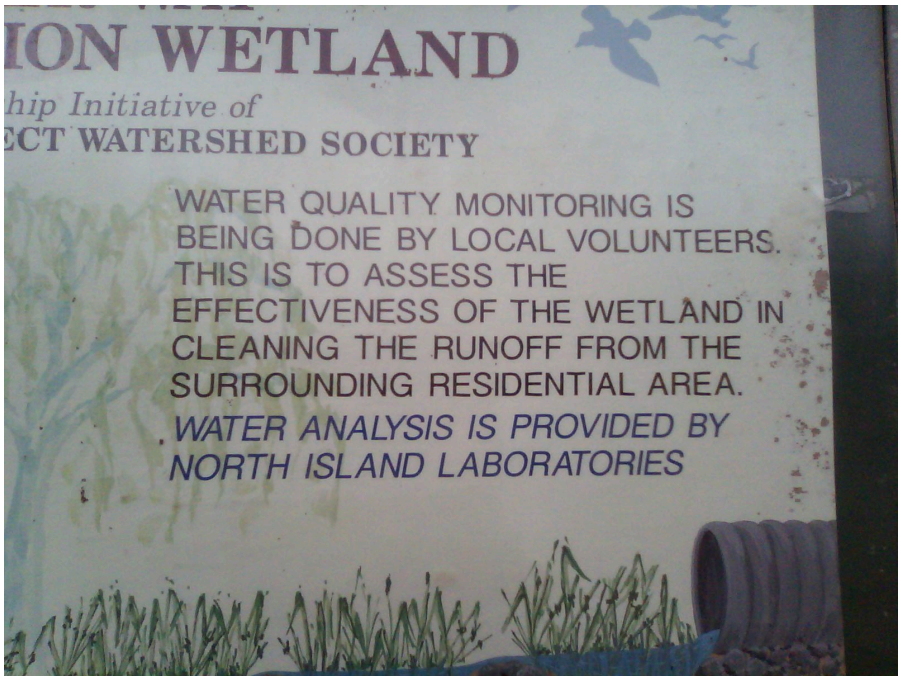
Photo Appendix for Baynes Sound Amber Way Biofiltration Wetland



Note: Partners are Environment Canada, the Ministry of Transportation, ecoACTION, the Canadian Nature Federation, Bird Studies Canada, BirdLife International and the Endswell Foundation.


VAY
WETLAND
rmwater Runoff
BAYNES SOUND IS DESIGNATED
AS AN IMPORTANT BIRD AREA.
IT IS A GLOBALLY SIGNIFICANT
SITE FOR 6 SPECIES OF BIRDS:
GREAT BLUE HERON
WESTERN GREBE
BRANT GEESE
THAYERS GULL
GLAUCOUS WINGED GULL
BLACK TURNSTONE
OGY
FISH
BIRDS
THIS AREA IS ALSO AN IMPORTANT
HABITAT FOR MANY OTHER BIRDS
LUDING 19 SPECIES OF DUCKS.
MAMMALS


BIOFILTR
Removing Poll
IMPACTS OF POLLUTANTS
ON FORESHORE:
FECAL COLIFORM BACTERIA-
ACCUMULATES IN SHELLFISH AND
BECOMES A HEALTH RISK WHEN
EATEN BY HUMANS.
NITROGEN-
CAUSES ALGAL BLOOMS WHICH
CONSUME OXYGEN WHEN DYING
& DECOMPOSING. THIS DEPLETES
AVAILABLE OXYGEN FOR OTHER
SHORE CREATURES WHICH WILL
THEN DIE OFF.
HERBICIDES/PESTICIDES/OIL
GAS/HEAVY METALS-
ACCUMULATE IN THE FOOD CHAIN
PRODUCING A VARIETY OF TOXIC
EFFECTS INCLUDING BIRTH DEFECTS.


ION WETLAND
hip Initiative of
ECT WATERSHED SOCIETY
WATER QUALITY MONITORING IS
BEING DONE BY LOCAL VOLUNTEERS.
THIS IS TO ASSESS THE
EFFECTIVENESS OF THE WETLAND IN
CLEANING THE RUNOFF FROM THE
SURROUNDING RESIDENTIAL AREA.
WATER ANALYSIS IS PROVIDED BY
NORTH ISLAND LABORATORIES

The Amber Way beach and Biofiltration Wetland are featured in the 2011 book *Secret Beaches of Central Vancouver Island* [1]. The 2011 Comox Valley Regional District Beach Access Inventory identifies Amber Way as a Sensitive Ecosystem "Wetland S1260 (primary ecosystem: marsh)" and cites this as a management issue; the Inventory also identifies Beacon Creek as having an "unconfirmed fish presence"[2]. Nearby Ebbtide Road, in a separate report section, identifies Beacon Creek as "within 200 m eagle buffer (E106-034)."[3] Dozens of eagles visit this area during the herring spawn, bullhead run and salmon run, and the resident eagles appear year-round. Beacon Creek and its tributaries lead into a second growth woodlot behind the houses where there is an active eagle nest tree.

References

[1] Dombrowski, Theo. 2011. *Secret Beaches of Central Vancouver Island: Campbell River to Qualicum*. Heritage Publishing Company Ltd. Toronto, Canada: p.151-152.

[2] Morgan, Hillary. 2011. Comox Valley Regional District Beach Access Inventory. Section X – Union Bay #91-102. Prepared by Hillary Morgan Consulting Service: p. 231. Accessed March 4, 2014 at http://www.comoxvalleyrd.ca/assets/Community/Documents/12_UnionBay.pdf

[3] Morgan, Hillary. 2011. Comox Valley Regional District Beach Access Inventory. Section IX Map: Royston #81-90. Prepared by Hillary Morgan Consulting Service: p. 227. Accessed March 4, 2014 at http://www.comoxvalleyrd.ca/assets/Community/Documents/11_Royston.pdf

To: BC Manager Aquaculture (MFLNRO)
Ministry of Forests, Lands & Natural Resource Operations
2500 Cliffe Avenue, Courtenay, BC V9N 5M6

Re: Applications within Denman Island Trust Zoning Jurisdiction: File # 1414124 File (Henry Bay) # 1414125 (Komas Bluff East Denman Island), File #1414126 (NE Side of Denman Island)
Re: Applications within Comox Valley Regional District Jurisdiction File #1414123 (S. Seal Bay), File #1414127 (Lazo Point) File #1414128 (NE Kye Bay)

The benefits of shellfish aquaculture in the Comox Valley range from the local food sector to tourism, jobs, research partnerships, investments, economic diversity and revenues. With recent increases in its development, Baynes Sound now supports 50% of BC's cultured shellfish[1] and that contributes around $20 million annually to the provincial economy[2]. **All stakeholders have a special interest to maintain water quality and protect local socio-ecological resilience. It's on these grounds that I raise concerns about the above applications and request that they be rejected by government as they currently stand**.

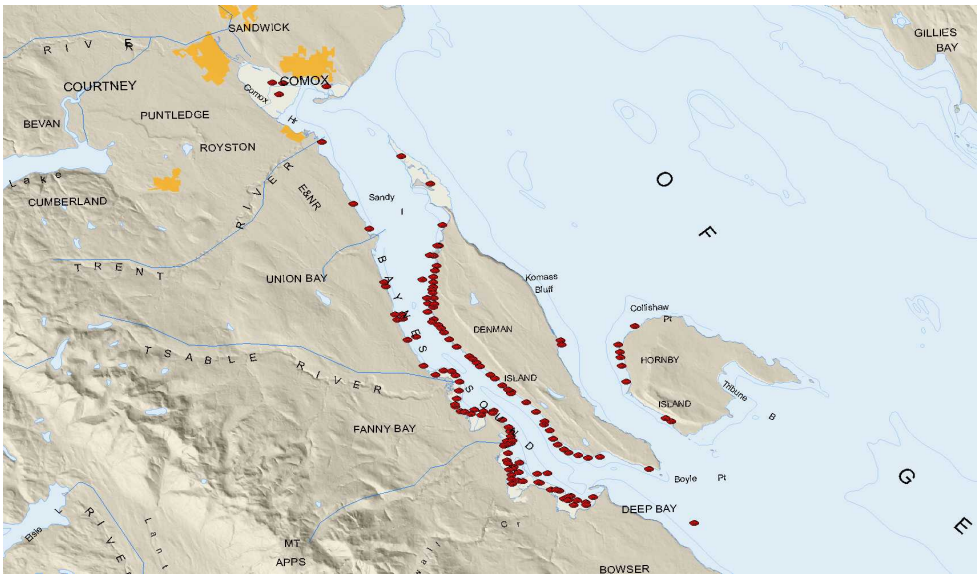
In 2012 the CVRD produced a summary on shellfish aquaculture from stakeholder input that identifies the "[k]ey challenge is the need for clean healthy water quality for Baynes Sound**.** Because the water in Baynes Sound is no longer pristine, it cannot be used in this context. Strive to maintain or improve the water quality of Baynes Sound – for the benefit of people, fish, birds and the aquaculture industry." [3]

The many pressures on the sound include population growth, new resource use patterns, upland development, deleterious inputs ranging from overuse of fertilizer and pesticides to untreated storm water and sewage overflows, as well as the impacts of climate change and ocean acidification. In this precarious situation, **without vital carrying capacity and baseline ecological data, the potential for over-expansion and inappropriate siting of aquaculture tenures cannot be allowed**.

The most recent data show that the 129 shellfish aquaculture licenses within Baynes Sound currently cover a total tenure area of 1,157 hectares.[4] **These six new tenure applications total over 500 hectares – if approved that would represent more than a 50% increase** of Crown Land under culture. How does such a massive increase of tenures in sensitive habitats constitute a 'precautionary approach' or 'sustainable development'? Considering recent cuts at DFO and the closure of its Comox offices, are enough staff and resources available to monitor and enforce policy over such a massive areal increase?

One of the proponents, Eric Gant, states on his website that the "basic value model" for geoduck aquaculture would plant 10 geoduck per sq. metre [5]. If this is part of the proposed Management Plan(s), is this approach known to be intensive or extensive, based on peer-reviewed science, or ecologically sustainable?

High Concentration of Tenures, Cumulative Impacts "Not Well Known"[1]



Existing tenure locations and resources within the Strait of Georgia around Baynes Sound. Map from the BC Shellfish Growers' Association [6]

Over a decade's worth of management plans, policy documents, government acts, action plans, research and discussion papers, and the CVRD Regional Growth Strategy all call on the shellfish aquaculture industry to follow sustainable development, including the application of a precautionary approach and ecosystem-based management.

While "[m]ost Baynes Sound resource users do not object to shellfish aquaculture in principle…some feel that the industry may be approaching its environmental and social carrying capacity and may have exceeded it."[7] As early as 2001, the "existing and planned expanded scale of this aquaculture in Baynes Sound has raised concerns" among government resource managers, who were advised that "practices in Baynes Sound may already be undermining ecosystem integrity, and changes may negatively be affecting bivalve aquaculture." [8]

Some Questions

- How do new geoduck tenure applications relate to cumulative impacts on Baynes Sound?
- What do the latest baseline ecological studies say about Baynes Sound's capacity to support more aquaculture development without negative impacts on the environment or existing shellfish production?
- What percentage of the shoreline ecosystem can be shifted to aquaculture without a significant disruption in natural ecosystem processes?
- Is fragmentation of the Baynes Sound ecosystem by aquaculture plots a concern with regards to important processes in the ecosystem?

***2010 Regional Growth Strategy* Says Tenure Expansion "Uncertain", Calls on Policymakers to Protect Existing Farms** [9]

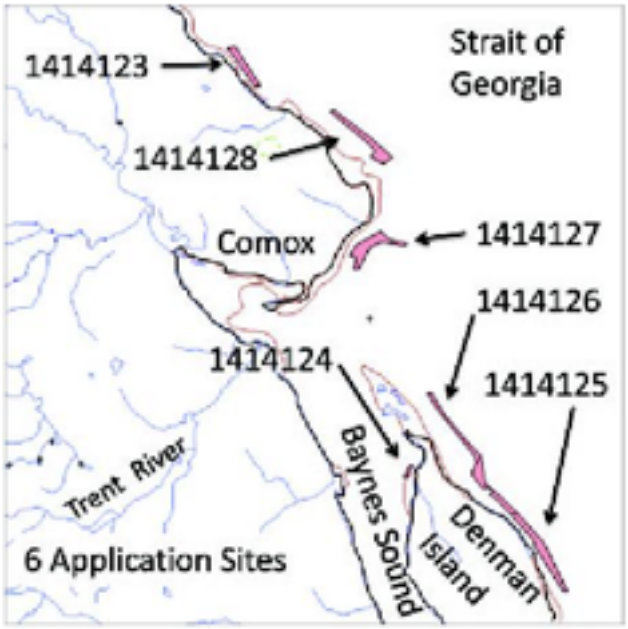
The 2010 Comox Valley RGS concluded "it is uncertain whether any further tenures or farms can be created" and emphasized that "[e]xisting tenures and farms should be protected to ensure no net-loss of farming activity." With multi-use resource conflict and lack of knowledge about how much aquaculture Baynes Sound can support, it's clear that trying to culture more than the ecosystem can handle benefits neither the aquaculture industry, society or the environment.

The RGS points out "the interest of the K'ómoks First Nation in existing and expanded aquaculture activities should be supported *where appropriate* [emphasis added]." Are all six tenures, their locations and sizes, considered 'appropriate' under best available knowledge? These newly proposed tenures overlap with an Islands Trust water conservation area, a variety of critical habitats and restricted management areas, and not all the proposals are located adjacent to existing KFN tenures.

Some Questions

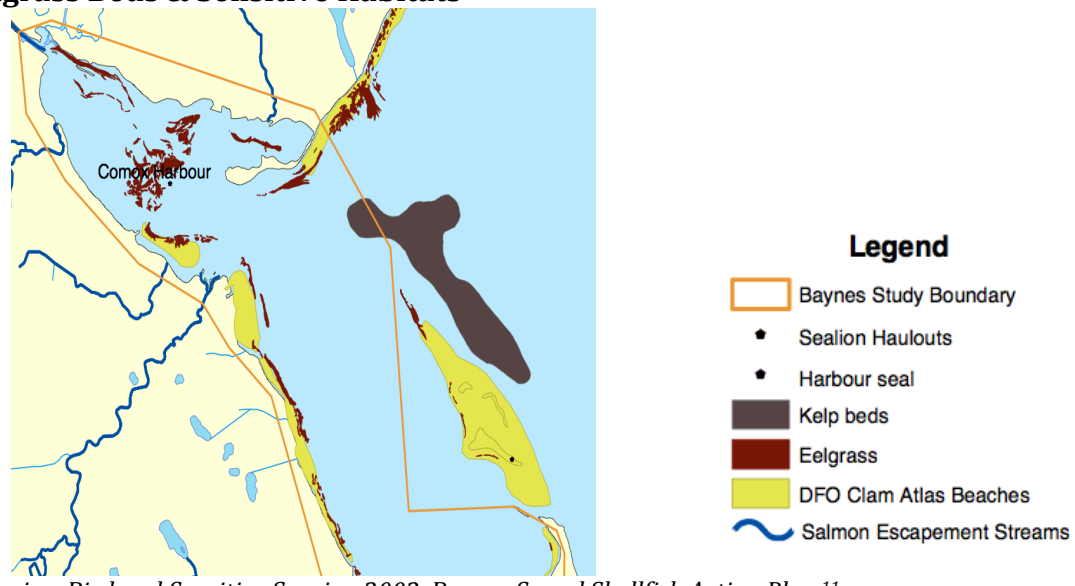
- How was site selection carried out on these proposed tenures?
- How does site interaction with critical habitat, such as native eelgrass beds and an internationally recognized Important Bird Area (IBA), constitute a 'precautionary approach' or 'sustainable development'?

New Tenure Applications Sites Overlap with Sensitive Habitats



Map of proposed geoduck tenures in Baynes Sound and Georgia Strait. Comox Valley Echo [10]

Eelgrass Beds & Sensitive Habitats



Overview Bird and Sensitive Species. 2002. Baynes Sound Shellfish Action Plan.[11]

"None of these biophysical features are unique to Baynes Sound, however the combination of these features within the sound is regionally significant and an ecosystem approach to the environmental management of Baynes Sound should recognize this significance and attempt to manage human activities in a manner which sustains ecological function."

- Emmett, Brian. *Activities and Potential Environmental Effects Associated with Shellfish Aquaculture in Baynes Sound: A Discussion Document.* 2002. [12]

Herring Spawn Habitat

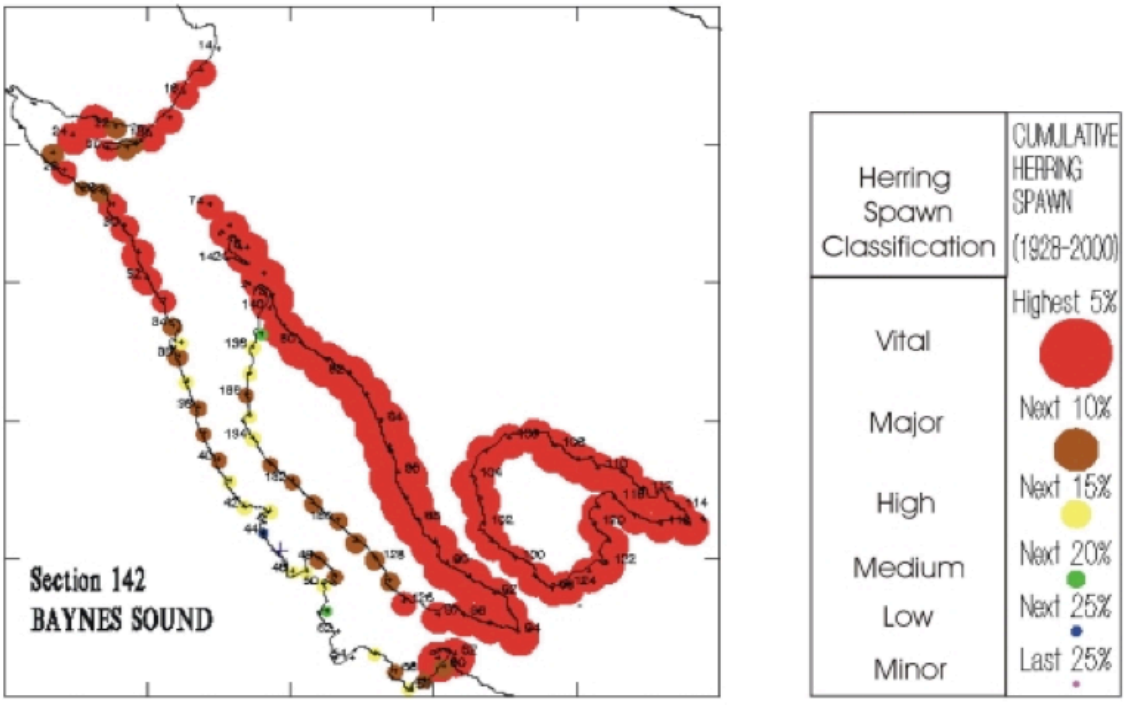


Fig. 7 Herring Spawn Habitat Sensitivity Map. Hay and McCarter, 2001 [13]

Next to salmon, few BC species are as ecologically, culturally or economically important as herring. They are a cornerstone of the marine food web in the Strait of Georgia and beyond. Some areas of Baynes Sound are more critical than others to the herring spawn – and these tenure applications overlap with some of the top 5% most vital habitat. The commercial herring fishery, and the species that herring directly support, also provide many jobs and revenues to the coastal economy. "Aquaculture impacts on herring in Baynes Sound are of considerable concern given the high habitat sensitivity of the area." [14]

Some Questions

- How do the proponents' proposed Management Plan(s) address the need to mitigate impacts on the herring spawn and fishery?
- How will on-bottom structures like anti-predator netting, PVC tubing, grid cables and other necessities interact with vital ecosystem functions?

Baynes Sound an Important Bird Area (IBA) Regionally and Internationally

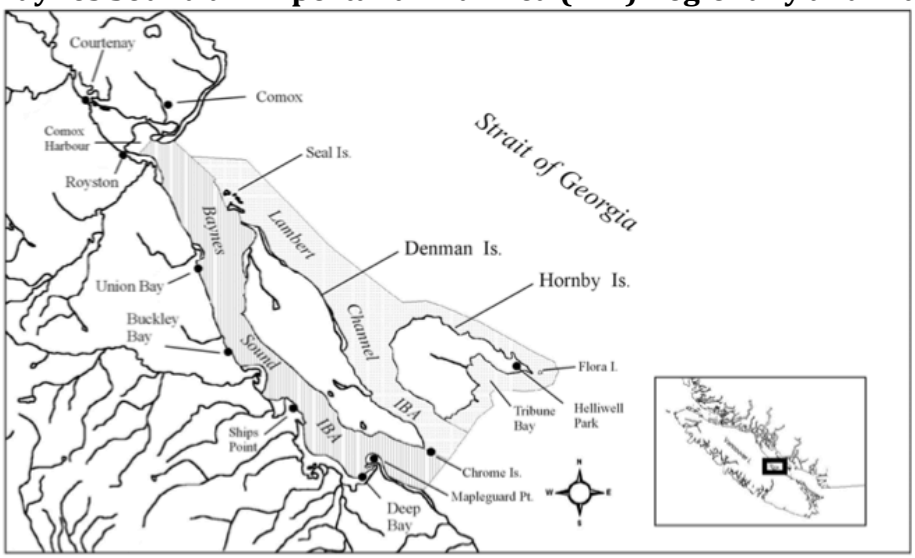


Fig. 1 Location of the Baynes Sound and Lambert Channel-Hornby Island Waters IBAs [8]

Baynes Sound is internationally recognized as important for migratory waterbirds and has been ranked as the most important wetland complex on Vancouver Island by two of the foremost conservation agencies, the Pacific Estuary Conservation Program (PECP) and the Pacific Coast Joint Venture (PCJV). [8]

The IBA provides essential year-round habitat and contains threatened species, endemic species and highly exceptional concentrations of birds. [15] At various times of the year the area has nationally and globally significant numbers of several waterfowl, shorebird and gull species. [12]

Aquaculture's requirements for boat and beach access is known to cause "behavioural disturbance (particularly birds)" [12] which "can adversely affect the energetic demands of seaducks, shorebirds and other migratory birds"[8]. This area of Georgia Strait is home to a critical variety of marine life, including animals designated by the *Species at Risk Act* as threatened and endangered, like the Great Blue Heron and Killer Whales [16].

Some Questions

- What environmental assessment of these proposals has been done to show positive or minimal impact on sensitive habitats and ecosystem processes?
- Basic aquaculture methodology requires an objective distinction between the culture of farmed product versus marine restocking programs. How does the proponents' Management Plan(s) address interactions with wild geoduck?
- How does the proponents' Management Plan(s) address potential impact of noise and disturbance during site preparation, research, monitoring and harvesting?

Mechanical Harvesting of Geoducks – Ecological Impacts and Restrictions?

Historically there has been concern that the mechanical harvesting of geoducks underwater with high-powered jets called 'stingers' can re-suspend toxic heavy metals such as cadmium into the surrounding habitat, and negatively impact wildlife and ecosystem function. The 2012 notes to the CVRD on aquaculture state: "Review prohibition and restrictions placed on mechanical harvesting….Request the CVRD to promote mechanical harvesting and to combat further future restrictions being placed on this method." [3]

Some Questions

- DFO has recently supported mechanical harvesting but what, if any, restrictions remain on this method in Baynes Sound and Georgia Strait?
- What impact will mechanical harvesting have in the proposed tenures on sensitive habitats, especially if coinciding with herring spawn or other important ecosystem, recreational and commercial functions?

Social Licence and Social Sustainability

'Profit from a Biological Gold Mine.' Logo from one of the proponent's websites has irked residents [17]

The industry not only depends on a healthy ecosystem to deliver world-class products and remain viable – it also needs to earn enhanced social licence. In late 2013, survey results from VIU's Institute of Coastal Research found that "[o]verall participants largely felt that there should not be more shellfish aquaculture in the sound" with "most common concerns related to the environment, waste, public use and aethetics."[4]

- How do these applications relate to the industry-wide goal of enhancing public engagement and social responsibility, and increasing social licence to operate?

Special Committee on Sustainable Aquaculture Report 2007[18]
Recommendations include 7.5: "No new species are to be approved for commercial aquaculture without a consensus of independent peer-reviewed science demonstrating that the potential impact on the marine environment is minimal."

- Does independent peer-reviewed science show that the impacts of geoduck production as described by the proponents' proposals are minimal?
- Is 'minimal impact' even acceptable in such sensitive habitats?

Recommendation 7.4: "Operations must not interfere with navigation in the waterways they occupy or make the coastline inaccessible or inhospitable to recreational boaters, swimmers or pedestrians."

- These proposals overlap with areas of high recreational value. Will any part of the coastline become inaccessible or inhospitable to these users as a result?

Report to Launch the Aquaculture Sustainability Reporting Initiative 2012
As part of "Risk Management and Access to Financing", this reporting initiative calls on all aquaculture operations to develop risk management and mitigation strategies based on Best Management Practices (BMP) and accompanying Standard Operating Procedures (SOP). [19]

- Are SOPs or BMPs in place for geoduck aquaculture in Baynes Sound?
- Do the proponents Management Plan(s) provide adequate risk management and mitigation strategies?

Thank you for taking the time to review these concerns. I offer these references to the best of my ability, in the very short period of time I had to consolidate this research.

Sincerely,

Vanessa Scott

References

[1] *Socioecological Resilience in Baynes Sound*. 2011. Project Description. Centre for Shellfish Research. Vancouver Island University.

[2] *Stephen Harper visits Deep Bay Marine Field Station*. 2010. News and events. Centre for Shellfish Research. Vancouver Island University. http://www.viu.ca/csr/index.asp

[3] Issues, strengths and opportunities for aquaculture food production. March 2012. Comox Valley Regional District. http://www.comoxvalleyrd.ca/assets/Department/Documents/Planning_AA_Aquaculture_notes_01March2012.pdf

[4] D'Anna, Linda and Murrany, Grant. 2013. *Baynes Sound Opinion Survey Findings.* Institute for Coastal Research. Vancouver Island University. http://www.viu.ca/icr/about-us/whats-new/

[5] Basic Value Model. 2011. Genuine Geoduck. http://genuinegeoduck.com/basic-value-model/

[6] *Shellfish Industry Tenures and Resources – Baynes Sound.* BC Shellfish Growers' Association. October 2009. http://bcsga.ca/wp-content/uploads/2011/02/Shellfish-Baynes-8x11-1.jpg

[7] Baynes Sound Coastal Plan for Shellfish Aquaculture. 2002. Ministry of Sustainable Resource Management. Resource Management Division. www.ilmb.gov.bc.ca/slrp/marine/south_island/**baynes**/index.htm

[8] Phase 0 Review of Environmental Impacts of Intertidal Shellfish Aquaculture in Baynes Sound. 2001. Research Document. Canadian Science Advisory Secretariat. http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_125e.pdf

[9] Schedule 'A' Comox Valley Regional Growth Strategy Bylaw No. 120. 2010. Comox Valley Regional District. http://www.comoxvalleyrd.ca/EN/main/community/regional-strategies/regional-growth-strategy.html

[10] *Land Act: Notice of Intention to Apply for a Disposition of Crown Land.* Comox Valley Record Advertisement. Republished by the Friends of Baynes Sound Society. Nov. 1 2013. http://friendsofbaynessound.wordpress.com/2013/11/01/salish-sea-farms-ltd-update/

[11] Overview Bird and Sensitive Species. 2002. Baynes Sound Shellfish Action Plan. Resource Maps. GeoBC. Ministry of Sustainable Resource Management. Coast & Marine Planning Branch. http://archive.ilmb.gov.bc.ca/cis/coastal/planning/baynes.htm

[12] Emmett, Brian. *Activities and Potential Environmental Effects Associated with Shellfish Aquaculture in Baynes Sound: A Discussion Document.* 2002. Marine Archipelago Research Ltd. Prepared for Mr. Joe Truscott, Coast and Marine Planning Office, Ministry of Sustainable Resource Management. http://archive.ilmb.gov.bc.ca/slrp/marine/south_island/baynes/docs/activity_review.pdf

[13] Herring Spawn Habitat Sensitivity Map. Hay and McCarter. 2001. Referenced in Phase 0 Review of Environmental Impacts of Intertidal Shellfish Aquaculture in Baynes Sound. 2001. Research Document. Canadian Science Advisory Secretariat. http://protectourshoreline.org/articles/CSASEnvImpactIntertidalAquaBaynesSound.pdf

[14] Hay, D.E. and P.B. McCarter. 2001. Herring Spawn Areas of BC: a review, geographic analysis and classification. Fisheries and Oceans Canada, Nanaimo, BC. http://www-sci.pac.dfo-mpo.gc.ca/herspawn/herspawn/project.htm

[15] Booth, B.P. 2001. *Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan.* Federation of BC Naturalists, Wild Bird Trust of BC Important Bird Areas Program. Canadian Nature Federation. http://www.ibacanada.com/conservationplans/bcbaynessoundlamberthornby.pdf

[16] List of 103 aquatic species currently protected under SARA. 2011. Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm

[17] http://genuinegeoduck.com/

[18] MacKay, Stewart et al. 2007. Special Committee on Sustainable Aquaculture Final Report, Third Session, Thirty-Eighth Parliament. BC Legislative Assembly. Special Committee on Sustainable Aquaculture. http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/411918/index.htm

[19] Report to Launch the Aquaculture Sustainability Reporting Initiative. 2012. *A process for describing environmental, social, and economic conditions and trends in the Canadian aquaculture sector*. Aquaculture Sustainability Reporting Initiative. Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/aquaculture/lib-bib/asri-irda/asri-irda-2012-eng.htm

Islands Trust

Top Priorities

Denman Island

No.	Description	Activity	Received/Initiated	Responsibility	Target Date	Status
1	Review of OCP section C3 with a view to addressing the impacts of shellfish farming on the natural marine environment and residential properties, and review of associated LUB regulations.	Investigate further with regard to alternate measures to address negative impacts of shellfish farming.	Oct-25-2011	Rob Milne	Oct-31-2014	On Going
2	Denman Housing Needs consultation. Review of housing policies with respect to secondary cottages and suites in residential designations.	Draft bylaws were reviewed by the APC at their February 11, 2014 meeting.	Nov-06-2012	Rob Milne	Sep-01-2014	On Going
3	Madrone Environmental to provide a summary and presentation of the RAR mapping project at the February 25th LTC meeting	Mapping of all streams and wetlands on Denman Island and amending DPA 4 to comply with RAR. RFP re-issued October 8th	Aug-03-2010	Rob Milne	Sep-01-2014	On Going

Islands Trust

Projects

Denman Island

No.	Description	Activity	Received/Initiated	Status
1	Bylaw amendments to address food security	Consider amendments based on "Exploring Food Security in the Islands Trust Area" final report dated November 16, 2010.	Mar-15-2011	On Going
1	A Protected Area Network on Denman Island		Mar-15-2011	On Going
1	Housekeeping project	1. Land Use Bylaw definition of intensive agriculture; remove "and excluding feedlots". 2. Formatting of Agriculture definition	Aug-15-2011	On Going
1	Regulations governing wind towers and Ocean Loop Geo-Exchange Systems.	Monitor recommendation from Trust Council.	Aug-15-2011	On Going
1	Affordable Housing Strategy		Oct-25-2011	On Going
1	Regulation limiting the gross floor area of a dwelling		Oct-25-2011	On Going
1	Regulations to promote greenhouse gas emissions reduction.		Oct-25-2011	On Going
1	Review and Update of Development Procedures Bylaw No. 71		Dec-11-2012	On Going
1	Review of OCP/LUB regarding implementation of Denman Island Farm Plan.		Apr-02-2013	On Going
1	DCLTA Rural Affordable Housing Project Final Report dated June 20, 2013	Consideration of recommendations	Oct-22-2013	On Going
1	Review of visitor accommodations regulations.	Focus of the review is to be on allowing the provison of cooking facilites for guests.	Nov-26-2013	On Going

Print Date: Mar-17-2014

Applications w/ Status - Denman Island Status: Open

Applications

Development Permit

File Number	Applicant Name	Date Received	Purpose
DE-DP-2006.2	Daniel/Debra Stoneman **Planner:** Courtney Simpson	Aug-31-2006	The use of presently cleared areas within the Komas Bluff permit area for agricultural use.

Planning Status

Status Date: Apr-04-2011

No change: waiting for info from applicant.

Status Date: Feb-04-2010

No change

Status Date: May-01-2009

No change

File Number	Applicant Name	Date Received	Purpose
DE-DP-2011.1	Denman Community Land Trust Association (Brons) **Planner:** Courtney Simpson	Mar-15-2011	2016 Northwest Road, Construction of affordable housing dwelling and associated land alteration in DP 2 Steep Slopes. Joint with SUP application DE-SUP-2011.10.

Planning Status

Status Date: May-26-2011

On hold until outcome of forthcoming rezoning application is known.

Status Date: Apr-04-2011

Planner Reviewing

File Number	Applicant Name	Date Received	Purpose
DE-DP-2011.2	Ella Day	Mar-21-2011	For barn sited within DP #1: Komas Bluff

Planner: Marnie Eggen

Planning Status

Status Date: Jul-29-2013

File passed on to Bylaw enforcement

Status Date: Oct-05-2012

Letter sent to applicant re: further info required

Status Date: Nov-01-2011

Awaiting info from applicant

File Number	Applicant Name	Date Received	Purpose
DE-DP-2013.1	Daniel & Debra Stoneman **Planner:** Courtney Simpson	Jun-17-2013	

Planning Status

Status Date: Jul-16-2013

Staff report to July 16 LTC meeting. LTC resolved to not issue permit but to amend 1999 development permit.

Status Date: Jul-16-2013

Staff preparing development permit amendment

Status Date: Jun-24-2013

Planner Reviewing File

Development Variance Permit

File Number	Applicant Name	Date Received	Purpose
DE-DVP-2011.1	Ella Day **Planner:** Marnie Eggen	May-13-2011	Barn on property line

Planning Status

Status Date: Jul-29-2013

no change; file passed on to bylaw enforcement

Status Date: Nov-09-2012

BCLS survey confirms barn sited on lot line; Applicant intends to apply for lot line adjustment

Status Date: Oct-05-2012

Letter sent to applicant requesting further information otherwise issue will be transfered over to bylaw enforcement

Rezoning

File Number	Applicant Name	Date Received	Purpose
DE-RZ-2011.1	Denman Community Land Trust Association **Planner:** Courtney Simpson	Aug-10-2011	Density transfer from density bank or density increase for one unit of affordable housing.

Planning Status

Status Date: Apr-24-2013

Agency / First Nation referrals sent in relation to bylaws

Status Date: Mar-12-2013

Legal review of houisng agreement complete

Status Date: Nov-29-2012

Reviewing results of legal review of housing agreement

Subdivision

File Number	Applicant Name	Date Received	Purpose
DE-SUB-2011.5	Steven Carballeira (Graeb/Charles King Medical Inc. (1691 Lacon Rd) **Planner:** Linda Prowse	Mar-28-2011	to create 2 lots

Planning Status

Status Date: Mar-21-2013

Water quality and quantity tests received as well as final subdivision plan. E-mail sent to MOTI signing off on subdivision

Status Date: Nov-24-2011

Preliminary Layout Approval received

Status Date: May-05-2011

Referral Response sent to MOTI, LTC and applicant

File Number	Applicant Name	Date Received	Purpose
DE-SUB-2013.1	David Critchley **Planner:** Courtney Simpson	Feb-19-2013	2 lot subdivision 2016 Northwest Road (I. Brons/Denman Community Land Trust)

Planning Status

Status Date: Jun-13-2013

PLA received

File Number	Applicant Name	Date Received	Purpose
DE-SUB-2013.2	Henning Nielsen	Dec-12-2013	

Planner: Linda Prowse

Planning Status

Status Date: Jan-14-2014

PLA with conditions received January 14, 2014

Status Date: Dec-23-2013

Subdivision referral report sent to DILTC, MOTI and applicant.

File Number	Applicant Name	Date Received	Purpose
DE-SUB-2014.1	Henning Nielsen	Feb-04-2014	Davidson Road 2 Lot subdivision

Planner: Marnie Eggen

Planning Status

Siting and use Permit

File Number	Applicant Name	Date Received	Purpose
DE-SUP-2006.7	Daniel/Debra Stoneman	Aug-31-2006	Agricultural (including buildings consistent with ALR legislation)

Planner: Courtney Simpson

Planning Status

Status Date: Jan-08-2009

On hold pending outcome of court case

File Number	Applicant Name	Date Received	Purpose
DE-SUP-2009.14	Jean Ella Day	Nov-02-2009	2900 SWAN RD One 26 foot high barn.

Planner: Marnie Eggen

Planning Status

Status Date: Jun-30-2011

On hold until outcome of DP and DVP.

Status Date: Mar-03-2011

New info submitted by applicant indicates bld sited on lot line; options provided to applicant

Status Date: Jan-20-2011

Applicant submitted partial application

File Number	Applicant Name	Date Received	Purpose
DE-SUP-2011.10	Denman Community Land Trust Association (Brons) **Planner:** Rob Milne	Mar-15-2011	2016 NORTHWEST RD one Residence, garage/workshop, wood shed, pump shed. Joint DP application DE-DP-2011.1

Planning Status

Status Date: May-26-2011

On hold until outcome of rezoning application is known.

Status Date: Mar-21-2011

Planner Reviewing File

Islands Trust

LTC EXP SUMMARY REPORT F2014

Invoices posted to Month ending February 2014

615 Denman	Invoices posted to Month ending February 2014	Budget	Spent	Balance
65000-615	LTC "Trustee Expenses"	1,100.00	470.95	629.05
LTC Local				
65200-615	LTC - Local Exp - LTC Meeting Expenses	2,500.00	3,295.16	-795.16
65210-615	LTC - Local Exp - APC Meeting Expenses	1,000.00	242.38	757.62
65220-615	LTC - Local Exp - Communications	500.00	26.65	473.35
65230-615	LTC - Local Exp - Special Projects	2,000.00	1,511.61	488.39
65240-615	LTC - Local Exp - Miscellaneous	500.00	0.00	500.00
TOTAL LTC Local Expense		6,500.00	5,075.80	1,424.20
Projects				
73001-615-3001	Denman RAR	42,000.00	18,498.42	23,501.58
TOTAL Project Expenses		42,000.00	18,498.42	23,501.58

Updated: October 22, 2013

Denman Island Local Trust Committee

POLICIES AND STANDING RESOLUTIONS

No	Meeting Date	Resolution No.	Issue	Policy
1.	May 1, 2012	DE-041-2012	Enforcement Policy on Guest accommodation	It was It was **MOVED** and **SECONDED**: 1. That as the Denman Island Local Trust Committee intends to review the home based guest accommodation regulations in Bylaw No. 186 bylaw enforcement activity is restricted where the guest accommodation provides the following unlawful facilities: 1. a second set of cooking facilities is provided in a lawful dwelling for the use of guests; 2. accessory buildings are used as bedrooms for guest accommodation provided that no more than three bedrooms exist in total; 2. That despite section 1 and 2 above bylaw enforcement activity will not be restricted if: 1. there are issues related to health, safety, or environmental damage; 2. there is a written complaint about bona fide serious nuisance issues such as noise or parking congestion related to the guest accommodation; 3. That nothing in this enforcement policy should be interpreted as giving permission to violate the Land Use Bylaw and the Denman Island Trust Committee may change this policy at any time and may give direction to expand enforcement activities at any time without notice; 4. That unless the Denman Island Local Trust Committee extends the effective period on this enforcement policy it expires on December 31, 2012 or when the guest accommodation regulation review is complete, whichever is the sooner.
2.	October 22, 2013	DE-065-2013	Enforcement Policy on Guest accommodation	**It was MOVED and SECONDED,** that the Denman Island Local Trust Committee renew Standing Resolution No. DE-041-2012 to be extended to December 31, 2014.

Islands Trust

ISLANDS TRUST FUND

Memorandum

200 1627 Fort Street, BC V8R 1H8
Telephone 250**. 405.5186** FAX: 250. 405.5151
Toll Free via Enquiry BC in Vancouver 604-660-2421.
Elsewhere in BC **1.800.663.7867**
itfmail@islandstrust.bc.ca
www.islandstrust.bc.ca www.islandstrustfund.bc.ca

Date: March 17, 2014

To: Denman 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 Denman Island Local Trust Area

Eelgrass Mapping for the Denman Island Local Trust Area was completed in December, 2013 by SeaChange Marine Conservation Society under contract with the Islands Trust (see attached report). Findings for the Denman Island Local Trust Area indicate that approximately 33.2% of the shoreline of Denman Island has eelgrass presence – of the islands surveyed, this is the highest shoreline coverage in the Islands Trust Area. Most of the eelgrass beds were located on northern shorelines and were flat, continuous beds which are wider and denser than fringing, patchy beds. The northeastern shoreline of Denman was predominantly patchy and was the secondmost patchy area of eelgrass in the islands, second only to areas in Howe Sound. A potential eelgrass restoration site was identified near Metcalf Bay. More eelgrass habitat was found around Sandy Island than was expected from the Shorezone Shoreline Classification (an earlier geophysical mapping of the shoreline).

Generally the backshore on Denman was not heavily impacted by development. This lack of development promotes better eelgrass health by reducing sediment, nutrient and pollutant runoff into eelgrass systems.

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

Most of Denman's shoreline remains naturalized. The 2012-2013 Nearshore Eelgrass Inventory Report contains several recommendations. Some of the relevant recommendations for local trust committees 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 has placed the eelgrass mapping and the associated report on its website at www.islandstrustfund.bc.ca and eelgrass mapping has been added to the MapIT public mapping site at http://mapit.islandstrust.bc.ca (links on Islands Trust and Islands Trust Fund websites). The Islands Trust Fund has also contracted some further eelgrass work on Denman the results of which will be available in April and shared with the Denman Island Local Trust Committee. 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 10. Eelgrass Presence, Denman Island Local Trust Area

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:

- Ballenas – Winchelsea (Executive Islands) Local Trust Area
- 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

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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 m^2 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 m^2 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 coves 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 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 m^2 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 ass 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 Thormanbies 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 $\leq$ 5m 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.

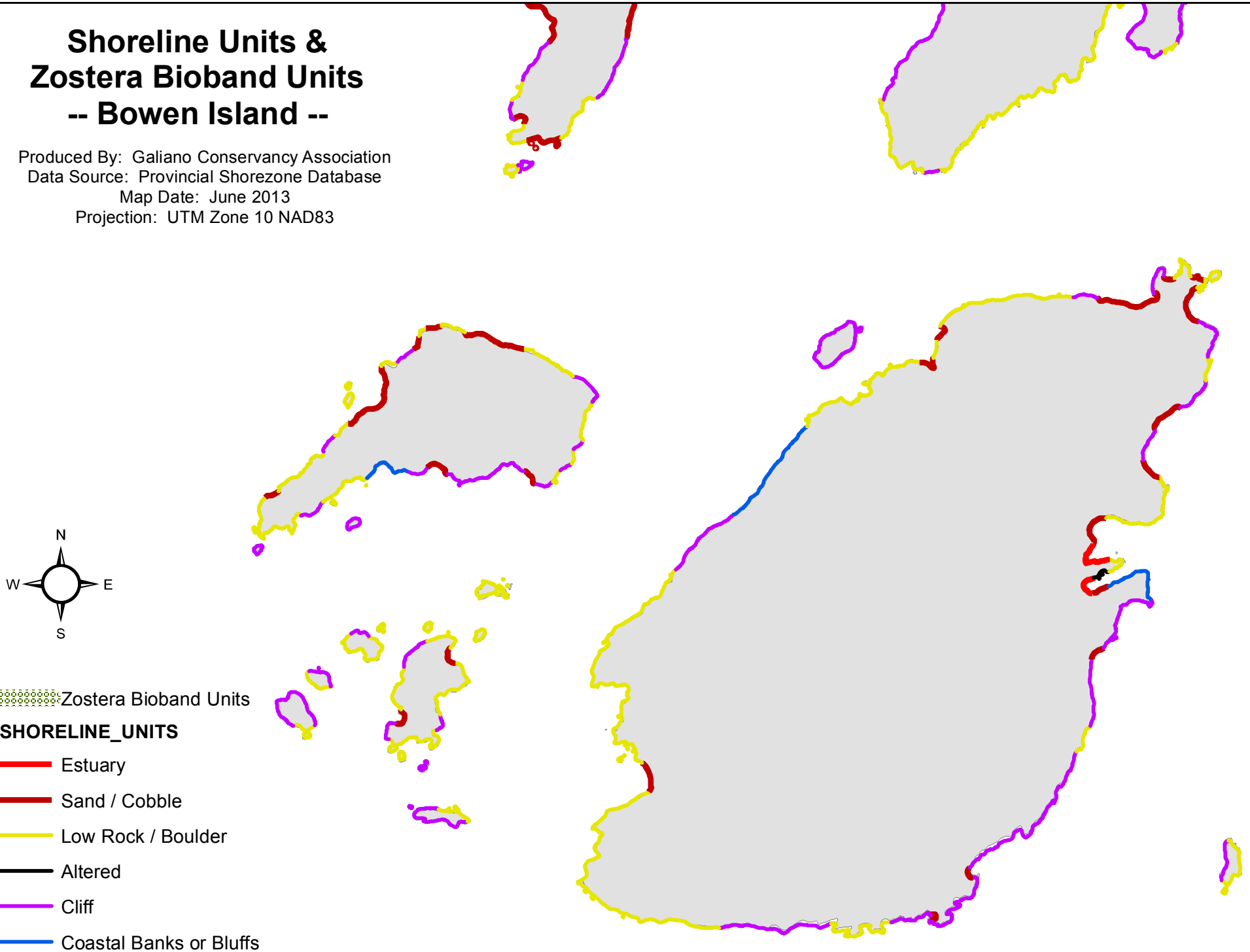
The following section was removed from the methodology for 2013:
Where marine charts indicated suitable conditions (a shallow bathymetric relief) for eelgrass but eelgrass was not present, waypoints and substrate type were recorded at 20 metre intervals. Where marine charts indicated unsuitable conditions 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 --

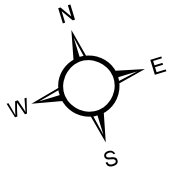
Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



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

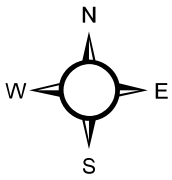
SHORELINE_UNITS

- 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

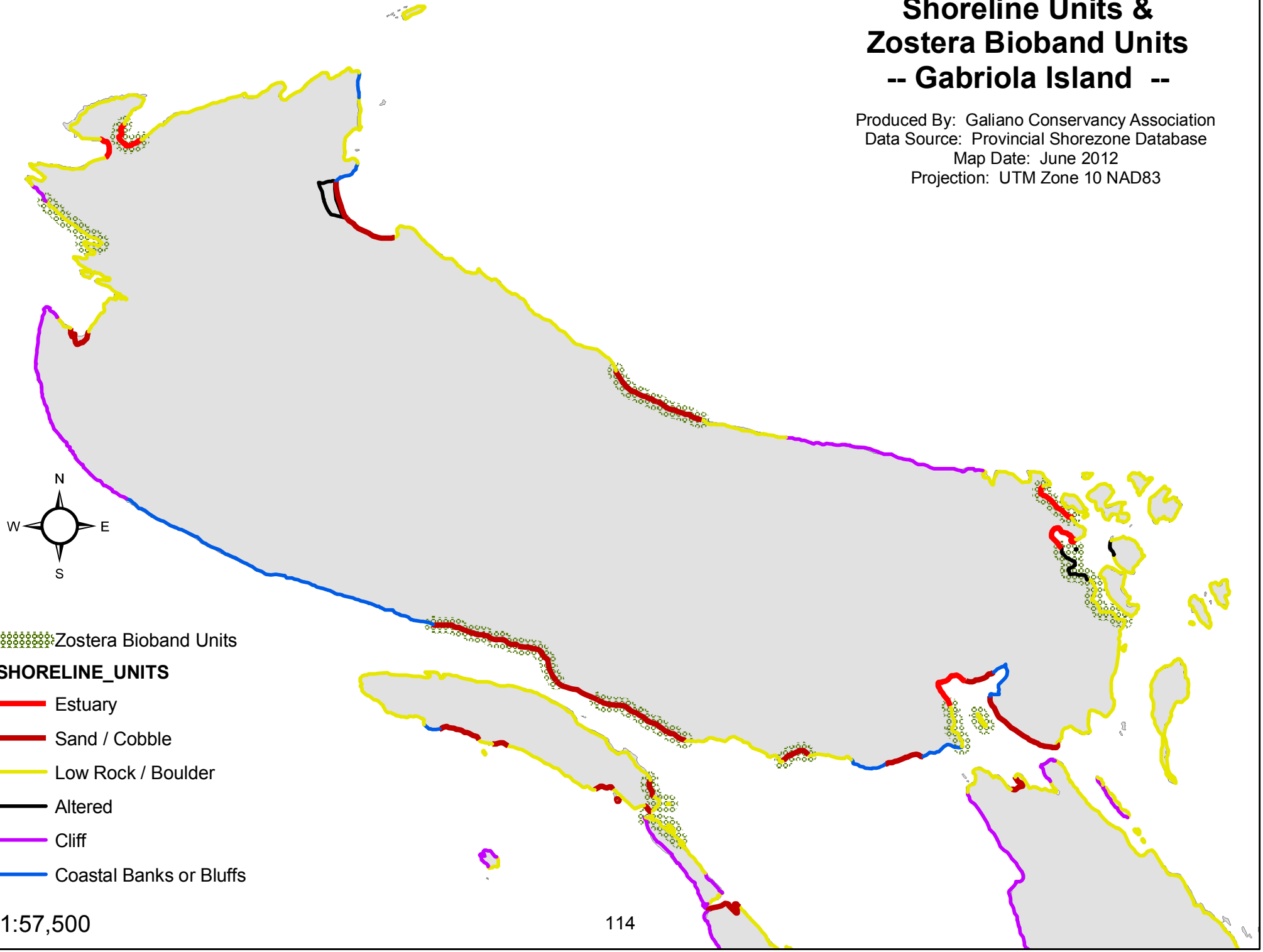
SHORELINE_UNITS

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

1:46,362

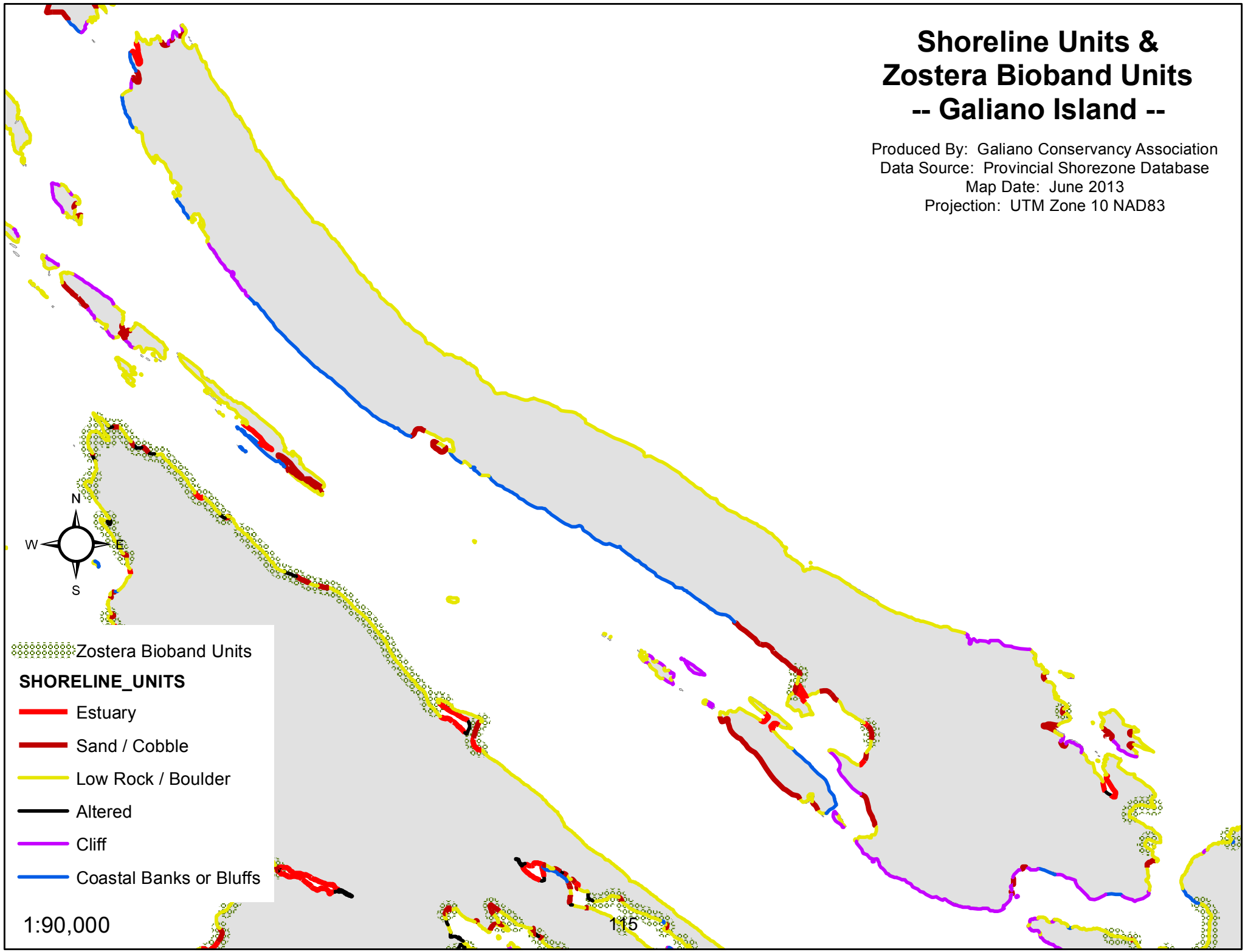
Shoreline Units & Zostera Bioband Units -- Gabriola Island --

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



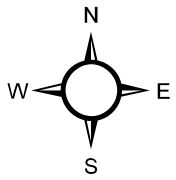
Shoreline Units & Zostera Bioband Units -- Galiano Island --

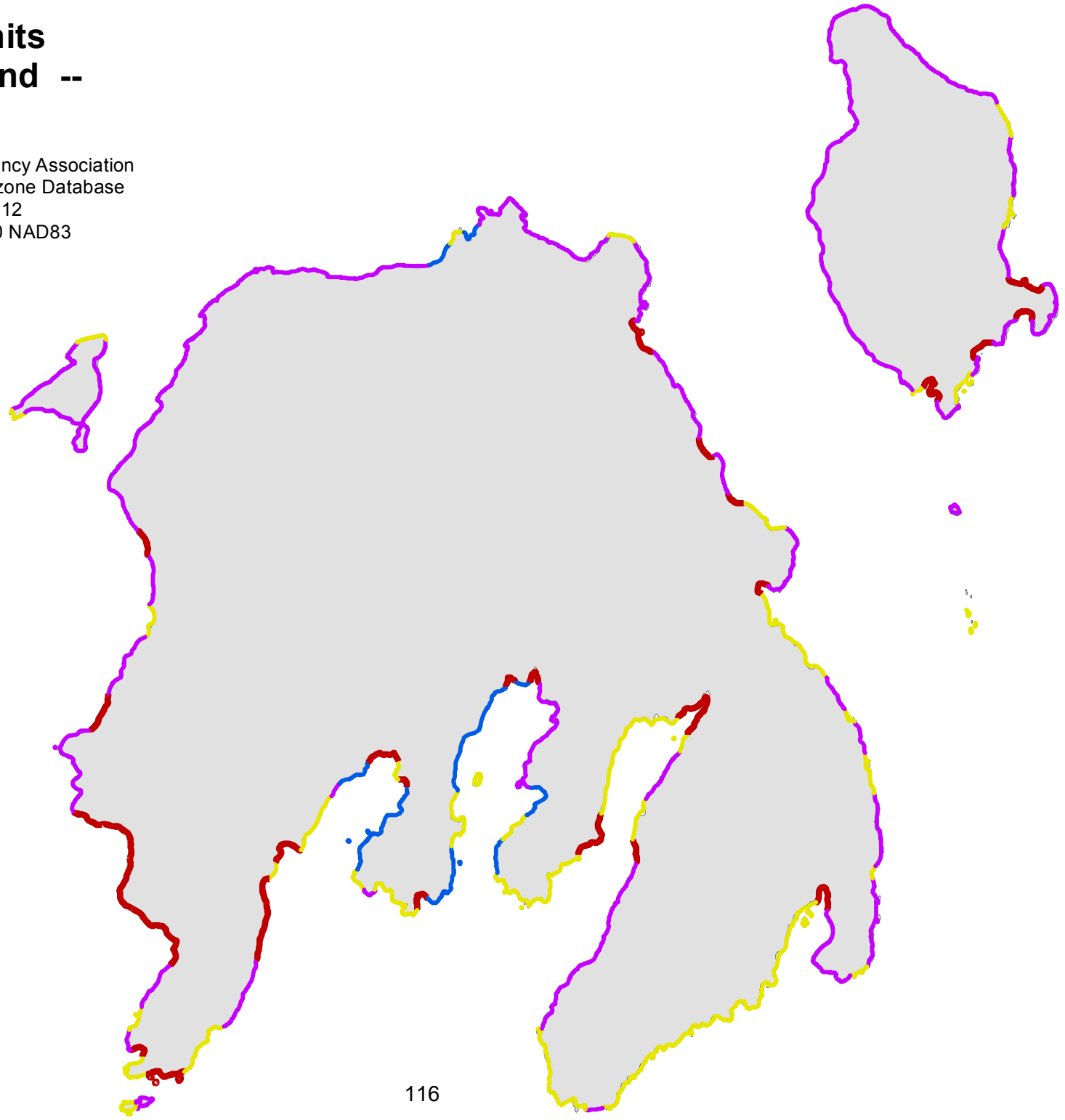
Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: June 2013
Projection: UTM Zone 10 NAD83



Shoreline Units
-- Gambier Island --

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





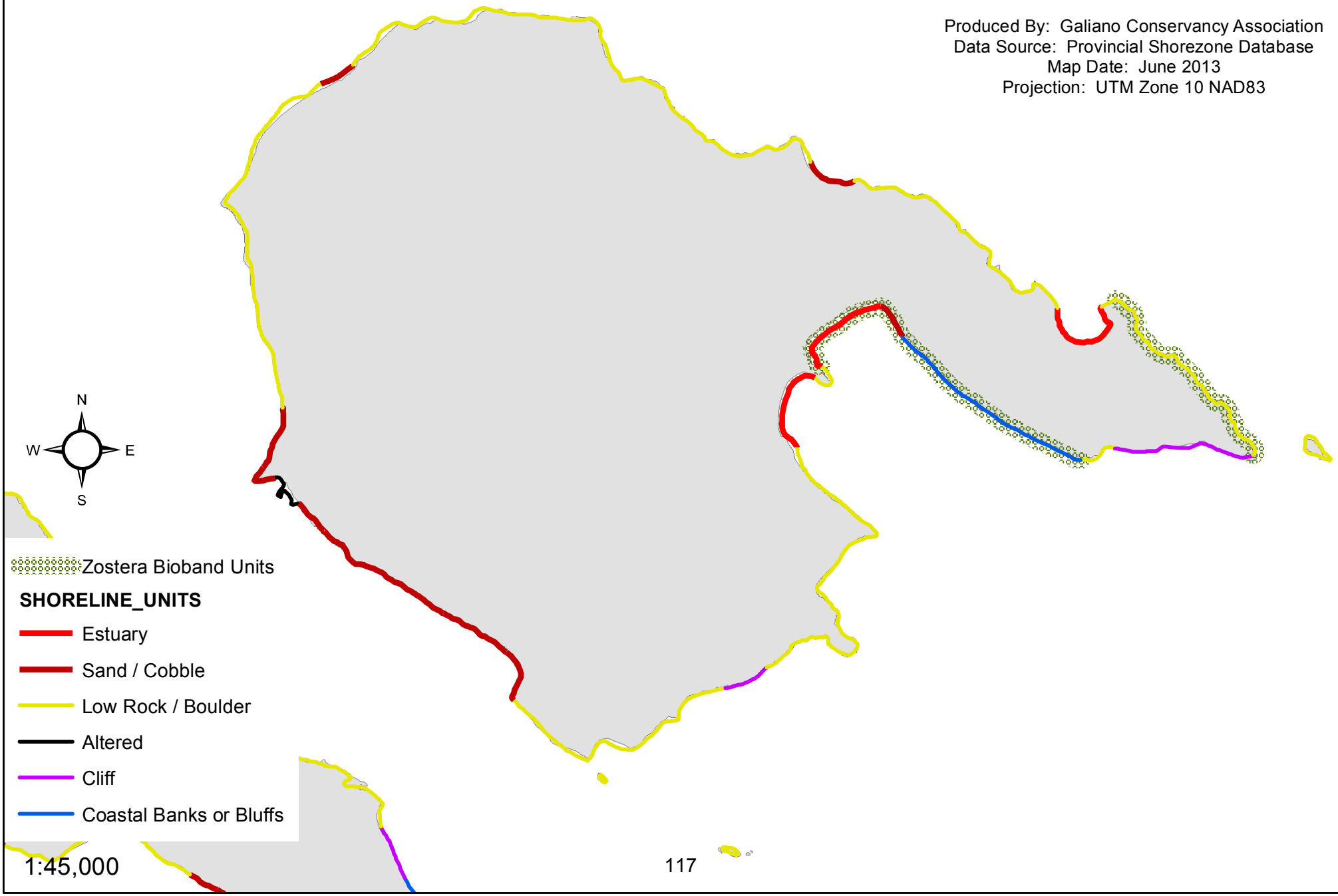
SHORELINE_UNITS

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

1:70,000

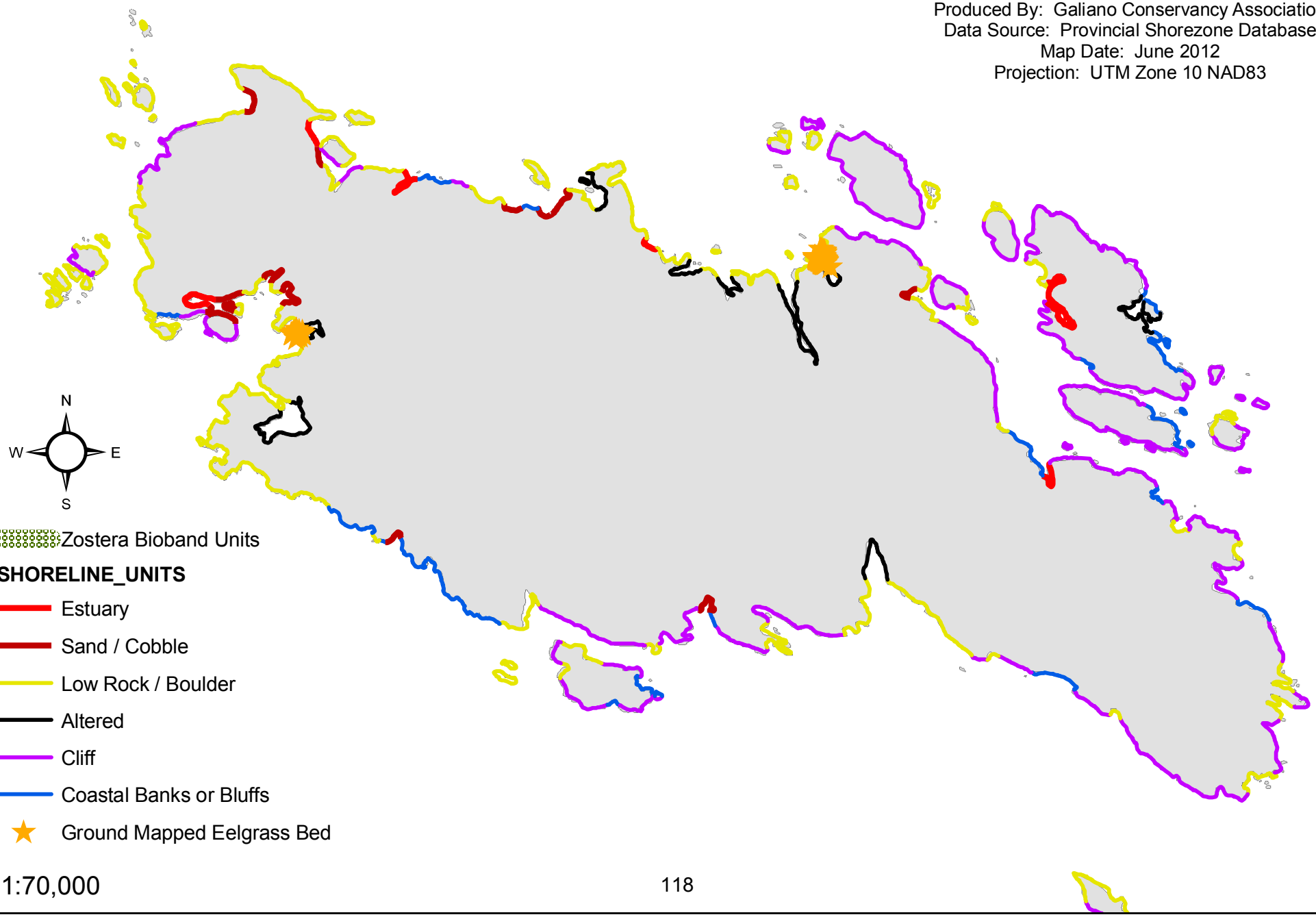
Shoreline Units & Zostera Bioband Units -- Hornby Island --

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



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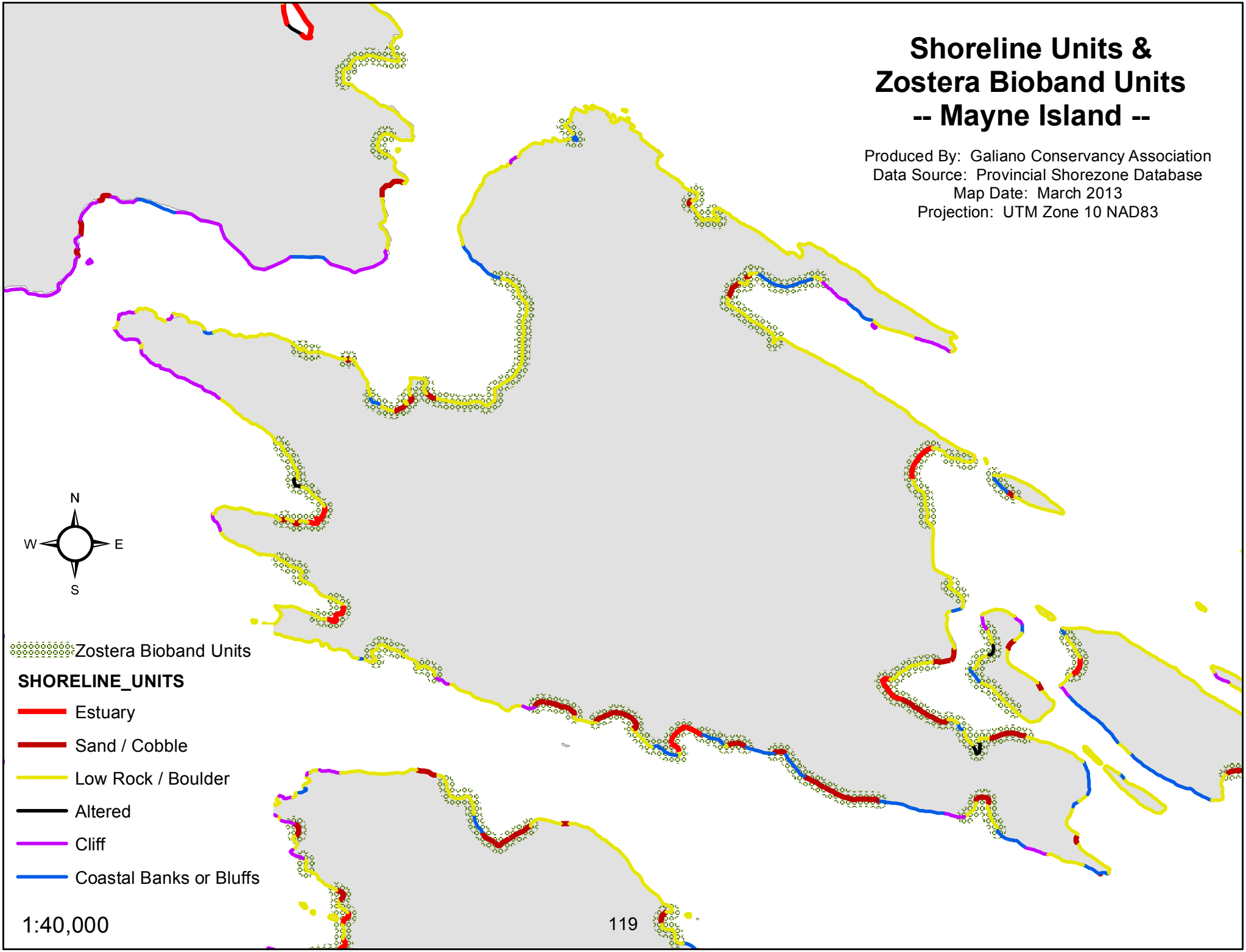
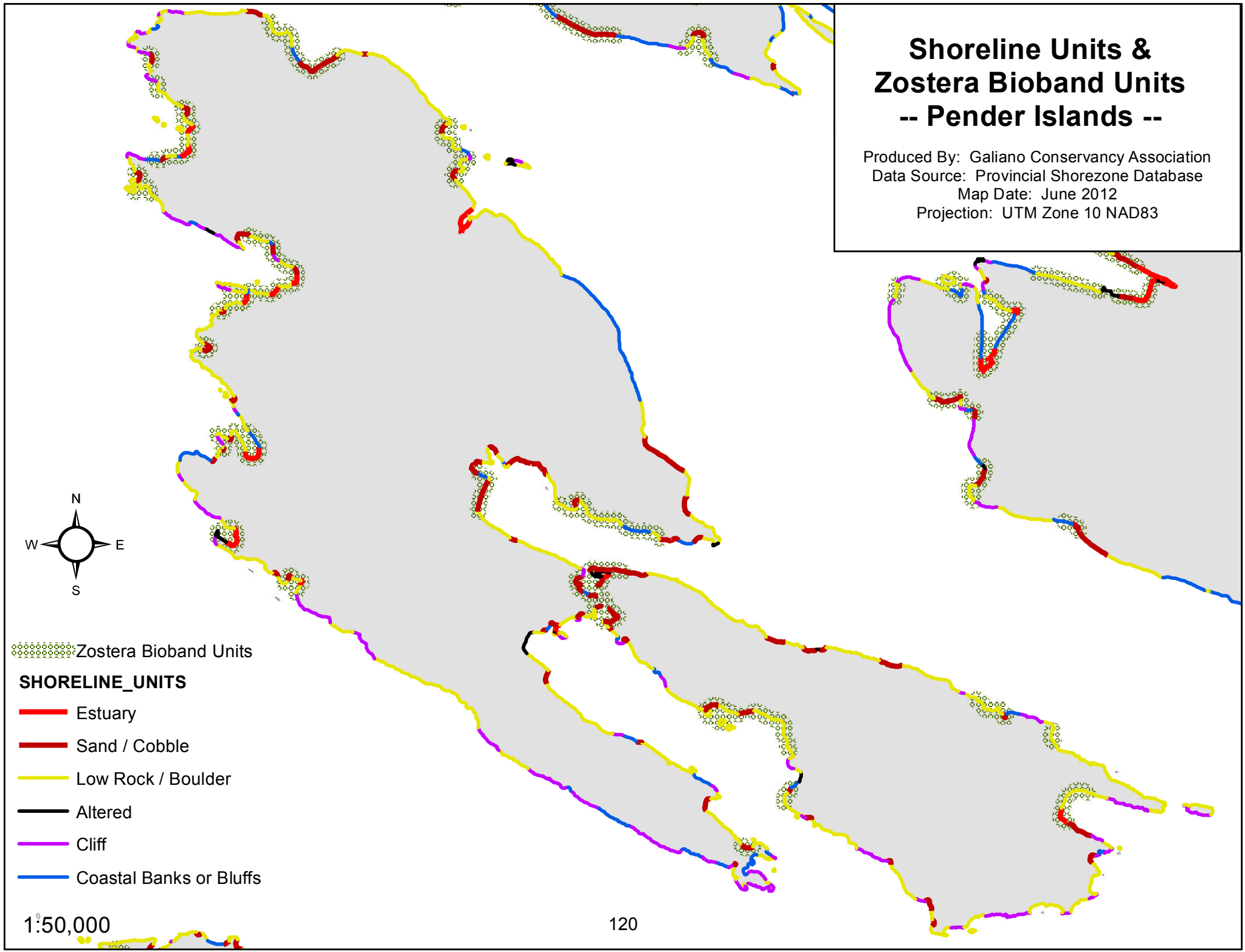

Shoreline Units &
Zostera Bioband Units
-- Mayne Island --
Produced By: Galiano Conservancy Association
Data Source: Provincial Shorezone Database
Map Date: March 2013
Projection: UTM Zone 10 NAD83
N
W
E
S
Zostera Bioband Units
SHORELINE_UNITS
Estuary
Sand / Cobble
Low Rock / Boulder
Altered
Cliff
Coastal Banks or Bluffs
1:40,000
119

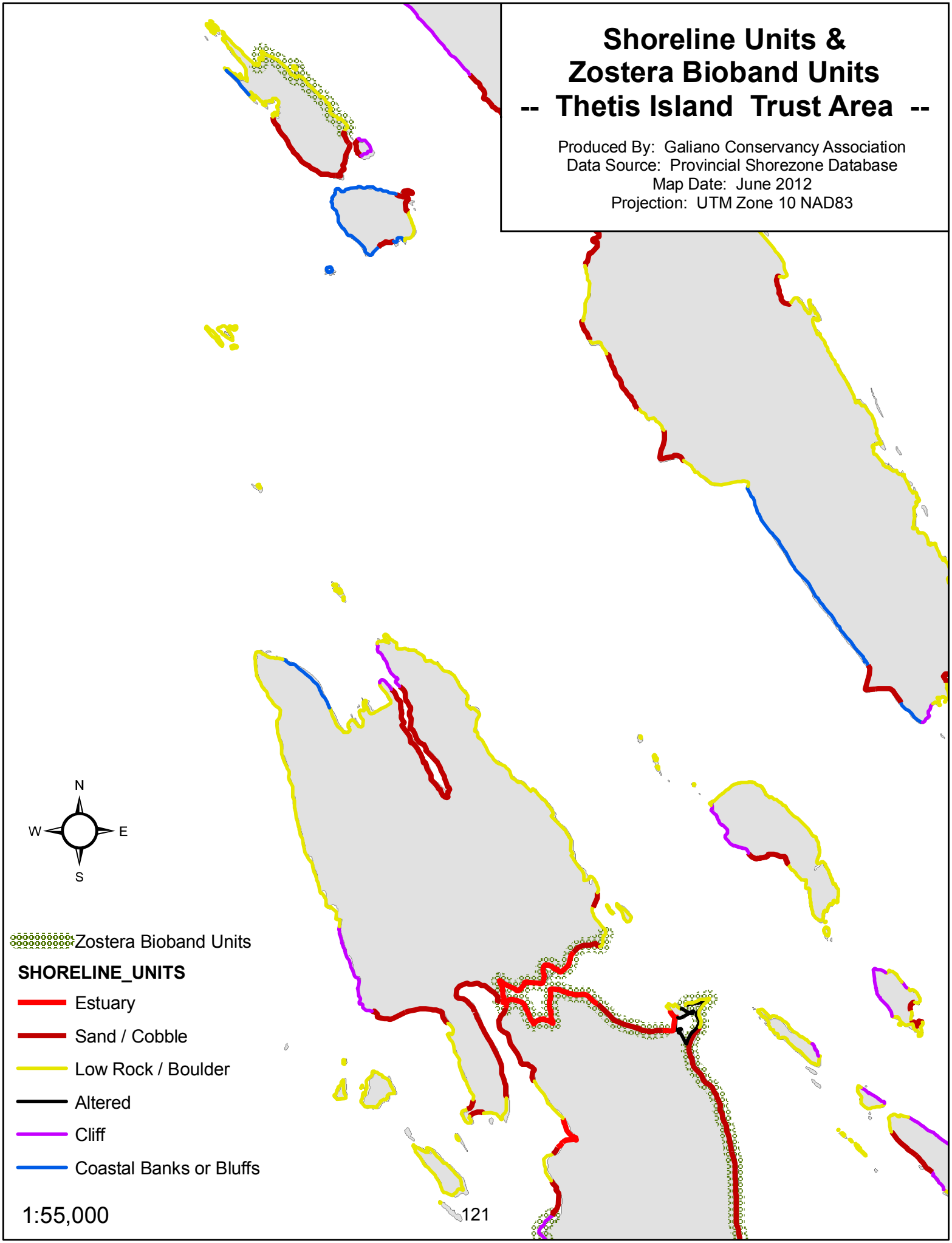
Shoreline Units & Zostera Bioband Units -- Pender Islands --

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



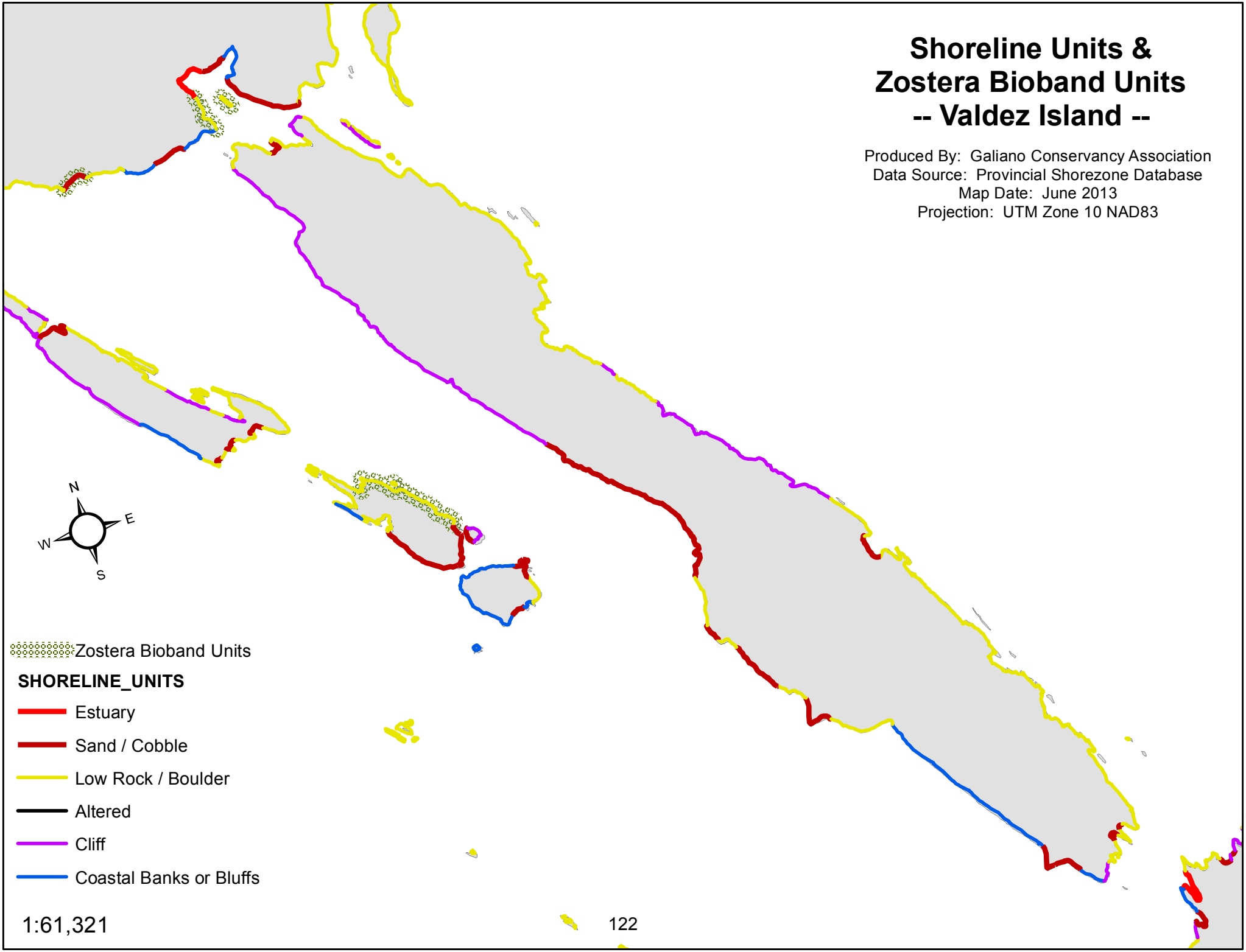
Shoreline Units & Zostera Bioband Units -- Thetis Island Trust Area --

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



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



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 2001[2] 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

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[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:

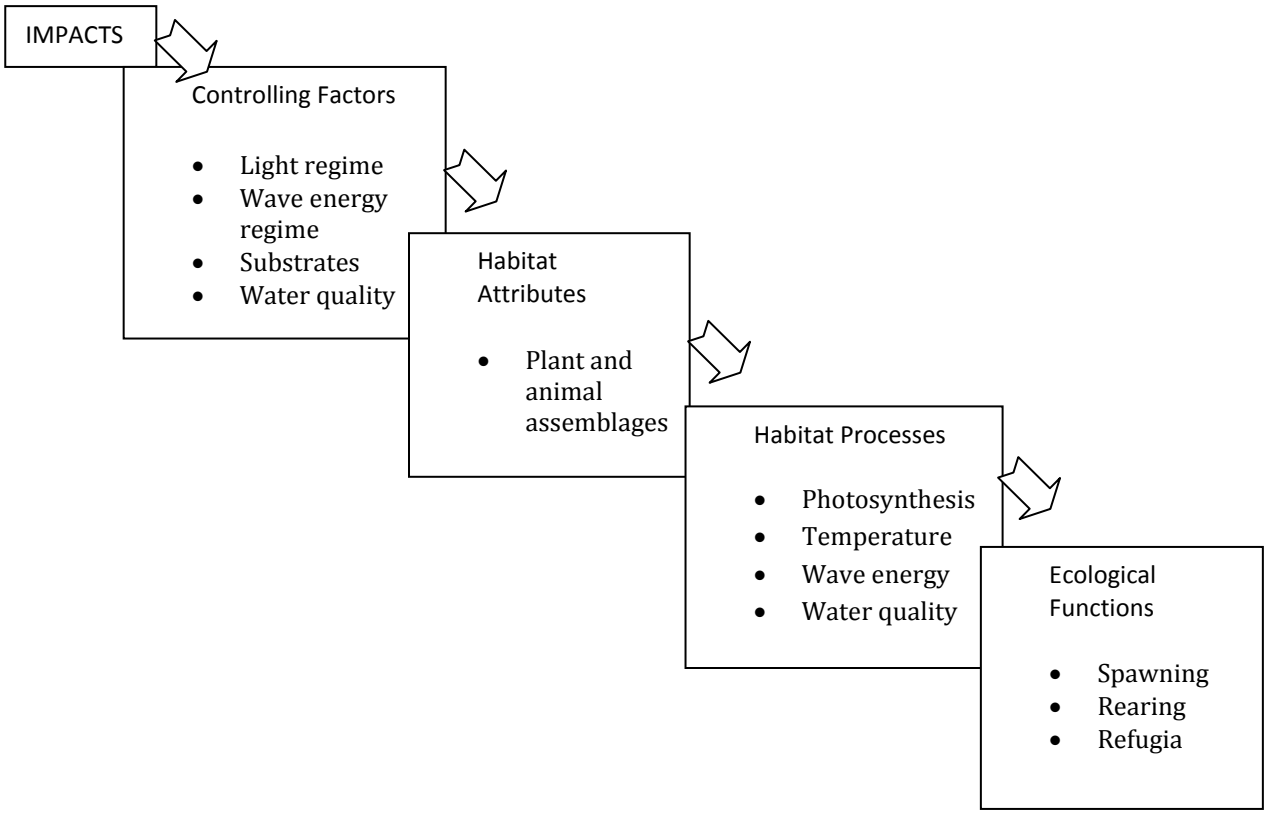
- Shading: Shading caused by the dock can affect the vigor of intertidal and subtidal plant communities, such as marsh plants, eelgrass and kelp beds. These impacts may be chronic (reduced productivity) or acute (wiping out plant communities, leaving the area barren).
- Disruption of shore drift patterns: 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).

13.1.3

Inset Map: North Denman, Sandy Island and Seal Islets

MAP 10: Eelgrass Presence Denman Island Local Trust Area

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

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

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

Produced by: Galiano Conservancy Assoc.
Map Date: December 12th, 2013
Orthophoto Date: 2011
Scale: 1 : 13,000 Inset Scale: 1 : 10,000
Map Projection: UTM Zone 10N, NAD83

PROPOSED

DENMAN ISLAND LOCAL TRUST COMMITTEE

BYLAW NO. 206

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A BYLAW TO AMEND DENMAN ISLAND OFFICIAL COMMUNITY PLAN, 2008

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The Denman Island Local Trust Committee, being the Trust Committee having jurisdiction in respect of the Denman Island Local Trust Committee Area under the *Islands Trust Act,* enacts as follows:

1. That Denman Island Local Trust Committee Bylaw No. 185 cited as “Denman Island Official Community Plan, 2008” is altered as shown on Schedule “A” of this amending bylaw.

2. This Bylaw may be cited as "Denman Island Official Community Plan, 2008, Amendment No. 1, 2013”.

READ A FIRST TIME THIS	2nd	DAY OF	April	, 2013
PUBLIC HEARING HELD THIS	4th	DAY OF	June	, 2013
READ A SECOND TIME THIS	16th	DAY OF	July	, 2013
READ A THIRD TIME THIS	16th	DAY OF	July	, 2013
APPROVED BY THE EXECUTIVE COMMITTEE OF THE ISLANDS TRUST THIS	20th	DAY OF	August	, 2013
APPROVED BY THE MINISTER OF COMMUNITY, SPORT AND CULTURAL DEVELOPMENT	11th	DAY OF	February	, 2014
ADOPTED THIS	_	DAY OF	_	, 2014

SECRETARY

CHAIRPERSON

DENMAN ISLAND LOCAL TRUST COMMITTEE

BYLAW NO. 206

Schedule A

Denman Island Local Trust Committee Bylaw No. 185, cited as “Denman Island Official Community Plan, 2008” is amended as follows:

1. Schedule C [Land Use Designations] be amended by changing the land use designation on a portion of land legally described as Lot 1, Sections 20 and 21, Denman Island, Nanaimo District, Plan 32301 from Rural to Sustainable Resources as shown on Plan No. 1 attached to and forming part of this bylaw.

DENMAN ISLAND LOCAL TRUST COMMITTEE

BYLAW NO. 206

Plan No. 1