A NOTICE OF A BUSINESS MEETING OF **THE DENMAN ISLAND LOCAL TRUST COMMITTEE**
to be held at 10:30 am on Tuesday, February 25, 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 January 21, 2014 – *for adoption*	1	
5.2	Section 26 Resolutions Without Meeting - *none*		
5.3	Denman Island Advisory Planning Commission Draft Minutes dated February 11, 2014 - *attached*	13	
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 February 13, 2014 - *attached*	16	
6.2	Beach Access and Vehicular Controls		
	6.2.1 Staff Report dated February 12, 2014 - *attached*	18	
7.	**APPLICATIONS AND PERMITS -** *none*		
8.	**PRESENTATION BY DEPARTMENT OF FISHERIES AND OCEANS CANDA (DFO)**		
	Compliance Inspections and Aquaculture Practices presented by Steven Schut, Senior Aquaculture Biologist		11:10 am
9.	**DELEGATIONS**		
10.	**TOWN HALL DISCUSSION**		
11.	**CORRESPONDENCE**		12:15 pm
	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.		
11.1	Email response dated January 29, 2014 from BC Ferry Commission regarding Denman Cable Ferry Proposal - *attached*	24	
11.2	Email dated January 23, 2014 from Wendy Boothroyd regarding Opposition to Aquaculture Applications - *attached*	25	
11.3	Email dated January 24, 2014 from Ken Madsen regarding Opposition to Aquaculture Applications - *attached*	26	

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 - *attached*	27	
12.	**REPORTS**		12:30 pm
12.1	**Work Program**		
	12.1.1 Top Priorities Report and Projects Report dated February 13, 2014 - *attached*	61	
12.2	**Applications Log**		
	12.2.1 Report dated February 13, 2014 - *attached*	63	
12.3	**Trustee and Local Expenses**		
	12.3.1 Expenses posted to month ending January, 2014- *attached*	68	
12.4	**Policies and Standing Resolutions**		
	12.4.1 Report – *attached for information*	69	
	BREAK		1:00 pm
13.	**LOCAL TRUST COMMITTEE PROJECTS -** *none*		
14.	**NEW BUSINESS**		1:15 pm
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.	70	
15.	**BYLAWS -** *none*		
16.	**CLOSED MEETING:** 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		2:00 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*.		
18.	**RISE AND REPORT** Rise and Report from the Closed Meeting		
19.	**ISLANDS TRUST WEBSITE**		
19.1	Denman Pages – *for discussion*		
20.	**NEXT MEETING** Tuesday, April 1, 2014 at 10:30 am at The Denman Seniors Centre, 1111 Northwest Road, Denman Island, BC		
21.	**TOWN HALL DISCUSSION – *time permitting***		
22.	**ADJOURNMENT**		3:30 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, January 21, 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 Vicky Bockman, Recorder
Media and Others Present:	Approximately nine (9) 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 10:32 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

By general consent the agenda was approved.

3. CHAIR'S REPORT

Chair Luckham noted briefly that he attended a Trust Council meeting where preliminary budget work was a focus. He reported that, along with Islands Trust staff, he met in January with members of the K'omoks First Nation and the chief negotiator representing the Band's interest in the treaty negotiations to discuss aquaculture matters. He commented that it was a good meeting with exchange of concerns and a general agreement reached to continue to have conversations.

4. TRUSTEES' REPORT

Trustee Busheikin reported that she attended the Denman Housing Coalition public meeting on affordable housing and two Denman Island Residents Association meetings, one of which focused on ferry issues. She commented on a telephone conversation she had with Ken Albrecht of the Integrated Land Management Bureau of the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), following up on his recent presentation to the Local Trust Committee. She noted that this conversation led her to conclude that future conversations with FLNRO need to contain clear, specific and relevant arguments about the environmental impacts of shellfish aquaculture as well as emphasizing the Islands Trust mandate. She reported that she will be attending the Department of Fisheries and Oceans Aquaculture Management Advisory meeting in Courtenay as an observer where they will be discussing geoduck farming guidelines.

Trustee Graham commented briefly on his understanding that the Raven Coal Mine proponents will be submitting an application in the spring. He noted that he has had many good conversations with islanders about matters of concern including ferry issues and affordable housing.

5. MINUTES

5.1 Local Trust Committee Meeting Minutes dated November 26, 2013

The following amendments to the minutes were presented for consideration:

- Page 2, item 3, first line: replace "Executive Committee" with "Trust Council";
- Page 2, item 4, first paragraph: delete the sentence "He noted that the Financial Planning Committee…";
- Page 2, item 4, second paragraph, second line: replace "becoming involved with RCMP" with "an annual meeting with the RCMP to discuss";
- Page 2, item 4, second paragraph, fourth line: replace "Comox Valley" with "Strathcona";
- Page 2, item 4, second paragraph, fifth line: replace "gain some direction on how to best proceed with dealing with such" with "learn how they had dealt with similar;";
- Page 3, fifth paragraph, third line: delete "regarding the use of second dwellings"; and
- Page 10, first paragraph: remove all quotation marks.

By general consent the minutes were adopted, as amended.

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

6.1 Follow-up Action List dated January 10, 2014

Planner Milne reviewed the Follow-up Action List dated January 10, 2014 and the following items were noted:

- the June 5, 2012 item will be removed from the report in the future as it has been replaced by a regular, new agenda item: Policies and Standing Resolutions;
- the Riparian Areas Regulation mapping is nearing completion and a presentation by Madrone Environmental to outline the report is tentatively scheduled for the February 25, 2014 Local Trust Committee meeting;
- committee members encouraged staff to move forward with tentative plans for a February 25, 2014 presentation by a Fisheries and Oceans Canada (DFO) Field Inspection Office representative to address topics such as inspection procedures, the role of the Field Inspector and what types of aquaculture might be involved in proposed or existing operations;
- an advertisement is currently running in the Grapevine requesting expressions of interest for three positions on the Advisory Planning Commission; and
- Planner Milne requested direction for advertising the three Marine Advisory Planning Commission positions that will expire in April, and Trustees recommended that current members be invited to remain in the positions, as a first step.

7. APPLICATIONS AND PERMITS - None

8. DELEGATIONS - None

9. TOWN HALL DISCUSSION

Shelley McKeachie, speaking on behalf of the Association for Denman Island Marine Stewards, acknowledged the importance of the ongoing treaty negotiations in resolving aquaculture concerns. She commented that a stated objective of the Ministry of Aboriginal Relations and Reconciliation is that communities must be consulted and local governments informed yet at stage five of a six-stage process, this has not happened. She urged the Islands Trust and Local Trust Committee to request an official seat on the Aquaculture Review Committee in order to have input in the treaty process and to advocate for environmental protection. She indicated that she would be sending a letter on this matter to Trust Council.

Edi Johnston asked if the K'omoks treaty has been sent to the Local Trust Committee or other agencies for referral. She asked the Committee to consider measures, such as

Marine Park zoning, to protect the remaining Denman shores unaffected by aquaculture tenures.

Graham Brazier urged the Islands Trust to be proactive, not to wait for an invitation to participate in the treaty negotiations as there is a critical need to provide protection for threatened ecosystems.

Trustees responded that they had not seen a referral of the treaty for comment, however, advised that Islands Trust staff has initiated steps to become involved. It was reported that there is a meeting scheduled with local treaty negotiators in February and an invitation to the provincial treaty negotiator to participate in the Trust Council meeting on Hornby Island in March. It was anticipated that these meetings will provide an opportunity to ask questions and clarify the possibility of further opportunity to participate in the treaty process.

Margie Gang requested that consideration of cooking facilities be removed from the definition of dwelling unit and suggested an alternate definition. She read an article regarding an amendment to a zoning regulation which illustrates difficulties with a definition that includes cooking facilities. She expressed support for the drafted amendments to the bylaw, however, noted that the amendments do not address the reality that some are providing cooking facilities in a part of a single family home that will never be a secondary suite.

Trustee Graham clarified that a second kitchen can be put in in a dwelling as long as it conforms to regulations.

Planner Milne responded that the Local Trust Committee has added "review of visitor accommodation regulations with a focus on allowing the provision of cooking facilities for guests" to the Projects List in response to concerns. He clarified that the intent of the draft bylaws to enable secondary suites and secondary dwelling units is for full time occupation rather than for visitor accommodations. He noted that the intent is to approach secondary suites/secondary dwelling units and visitor accommodations separately to minimize possible misunderstandings.

In response to an inquiry, Trustees advised that there is no new information regarding the bylaw enforcement process on the Henry Bay aquaculture operation.

Shelley McKeachie stated that she had received information from DFO staff recently that indicated that three aquaculture applications in the Denman Island jurisdiction area are in the initial stages of review prior to being forwarded to DFO, yet they have already been signed off on in the Interim Measures Agreement of the K'omoks First Nation treaty negotiation. She expressed concern with this process and offered that this might be a topic to address in the upcoming meetings.

10. CORRESPONDENCE

10.1 Correspondence regarding Aquaculture Tenure Applications

Committee members received the above correspondence.

10.2 Letter dated December 20, 2013 from Woodward & Co., for K'omoks First Nation regarding Assertion of K'omoks First Nation Aboriginal Rights and Title at *Xelikw'*, (Henry Bay)

Committee members received the above correspondence.

10.3 Letter dated January 1, 2014 from Association for Denman Island Marine Stewards regarding Proposed Bylaw 207

Trustee Graham responded to the correspondence which expressed disappointment with the decision to proceed no further with draft Bylaw No. 207. He summarized the difficulties with continuing with that approach, however, noted that the Golder Report had suggested that the issue of driving on the beach might be addressed by restricting access. He proposed that the Marine Advisory Planning Commission might be given a referral to identify possible beach accesses to consider for closure for this purpose. Discussion followed on the need to consult with the Ministry of Highways and Infrastructure and the Comox Valley Regional District on this strategy.

DE-2014-001
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee request 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.

CARRIED

DE-2014-002
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee request staff to consult with the Comox Valley Regional District on potential work on vehicular control structures at beach accesses.

CARRIED

10.4 Email dated January 6, 2014 from Duncan Stewart regarding Henry Bay and Pentlatch Seafoods

Committee members received the above correspondence.

10.5 Email dated December 4, 2013 from March Klaver, Regional Manager, Aquaculture Resource Management, Fisheries and Oceans Canada (DFO) regarding Aquaculture within the Denman Island Local Trust Area

Trustees discussed the correspondence which responds to concerns expressed by the Local Trust Committee with respect to aquaculture, including the request that a moratorium on new geoduck aquaculture sites be put in place and for the need for a research study on the potential impacts of geoduck aquaculture in the area. The letter references DFO's review of geoduck management and the current process of developing an Integrated Geoduck Management Framework, and indicates that a draft copy of the Framework could be distributed to the Islands Trust if requested.

DE-2014-003
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee instruct 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.

CARRIED

DE-2014-004
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee forward the letter from Fisheries and Oceans Canada dated December 4, 2013 from March Klaver to the Executive Committee of Islands Trust for their consideration.

CARRIED

10.6 Email dated November 29, 2013 from Allan Danks regarding Letters of Support for the Cross Island Trail

Committee members discussed the correspondence which requests a letter of support from the Local Trust Committee regarding structural improvements to the ferry hill and the big hill sections of the Cross Island Trail. The Trustees expressed support for prioritizing the work to be done as soon as possible and suggested that this might be the time to request improvements to the big hill which poses serious safety issues and does not currently meet Ministry of Highways and Infrastructure standards.

DE-2014-005
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee request Trustees Busheikin and Graham to prepare a letter for the Chair's signature supporting Comox Valley Regional District's request to the Ministry of Transportation and Infrastructure to make roadbed improvements to the ferry hill and the big hill.

CARRIED

10.7 Emails dated December 7 and 8, 2013 from Scott Donaldson regarding Secondary Dwellings

Trustees discussed the correspondence, acknowledging many worthwhile points made which may be considered further by the general public and the Advisory Planning Commission as the draft bylaws to enable secondary suites and secondary dwelling units proceed further. Trustee Graham will contact the writer regarding this submission.

11. REPORTS

11.1 Work Program Reports

11.1.1 Top Priorities and Projects List Report dated January 10, 2014

Planner Milne summarized the report. Trustees discussed the status of Top Priority No. 1 and determined that an updated description of the "Activity" would be warranted.

DE-2014-006
It was MOVED and SECONDED,
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.

CARRIED

Planner Milne was asked to correct the number of the last Project to "1".

11.2 Applications Log

11.2.1 Report dated January 10, 2014

The Applications Log was reviewed by the Trustees, and Planner Milne provided an update on the Denman Community Land Trust Association file.

11.3 Trustee and Local Expenses

11.3.1 Expenses posted to December, 2013

The expenses posted to December, 2013 were received for information.

11.4 Policies and Standing Resolutions

11.4.1 Report

The Policies and Standing Resolutions Report was received for information.

By general consent the meeting was recessed at 12:20 pm and reconvened at 12:35 pm.

12. LOCAL TRUST COMMITTEE PROJECTS

12.1 Housing Regulations Amendments for Land Use Bylaw

12.1.1 Staff Report dated December 16, 2013 regarding Draft Bylaws for the Implementation of Secondary Suites and Secondary Dwelling Units

Planner Milne summarized the report and the attachments were discussed. Trustee Busheikin provided Planner Milne with a list of suggested changes including grammatical, punctuation and minor modifications. The Trustees provided comments and suggestions for further revisions including the following:

Attachment 1

- Schedule A, Policy 10: add to the last sentence: “unless a secondary dwelling is otherwise approved by Temporary Use Permit.”;
- Schedule A, Policy 11, second paragraph: remove the section addressing secondary dwelling units and move it to the first paragraph;
- Schedule A, Policy 11: the effect of secondary dwelling units on density calculations was discussed and the need to track density increases from this source was recognized; and
- Planner Milne was requested to report back to the Local Trust Committee on the current status of what remains in the 5 percent density allowed for affordable housing.

Attachment 2

- Schedule A, item 3, Section 2.1, 5 d): remove this clause and renumber accordingly;
- Schedule A, item 3, Section 2.1, 6 a): there was debate on the permitted maximum floor area with Trustee Graham suggesting that 90 square metres be reduced to 600 square feet (expressed in metres) while Trustee Busheikin felt that 600 square feet is not a healthy size for a family of four;
- Schedule A, item 3, Section 2.1, 6 b): Trustee Busheikin advocated for reducing the distance of the secondary dwelling unit to the principal residence from 100 metres to 60 metres to promote a clustered housing effect. This item may be considered for community feedback;
- Schedule A, item 3, Section 2.1, 7: Trustees expressed a preference for Local Trust Committee discretion on this issue and requested this clause be deleted;
- Schedule A, item 3, Section 2.1, 8: Delete this clause and renumber accordingly; and
- Schedule A, Area 2 Objective: replace “needs” with “objectives”.

Attachment 3

- The Committee endorsed the Project Charter as presented.

Attachment 4

- The Committee endorsed the map as presented.

Planner Milne confirmed that he will redraft the bylaws, incorporating the comments and suggestions for changes provided and will send it to the Local Trust Committee for review.

DE-2014-007
It was MOVED and SECONDED,
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.

CARRIED

DE-2014-008
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee endorse version 1.3 of the Project Charter for Denman Island Consultation of Housing Policy Review.

CARRIED

Trustee Busheikin noted that she has particular items she would like to include for the Advisory Planning Commission's (APC) consideration in the referral and will forward these to Planner Milne. Discussion followed on the timing for the APC's response and the subsequent Community Information Meeting.

DE-2014-009
It was MOVED and SECONDED,
that the Denman Island Local Trust Committee requests the Advisory Planning Commission to provide their advice no later than February 21, 2014.

CARRIED

12.2 Aquaculture Practices

12.2.1 Bylaw Referral Response dated November 27, 2014 from Fisheries and Oceans Canada regarding Draft Bylaw No. 207

The Bylaw Referral Response was received for information at this time.

By general consent agenda items 15. Closed Meeting and item 16. Recall to Order were moved to follow after item 12.2.1.

15. CLOSED MEETING

15.1 Motion to Close the Meeting

DE-2014-010
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee closes the next part of the January 21, 2014 business meeting to discuss matters pursuant to Section 90(1) (i) (receipt of advice subject to solicitor-client privilege) of the *Community Charter* and that staff be invited to attend this meeting.

CARRIED

The Committee closed the meeting at 1:43 pm.

16. RECALL TO ORDER
Rise and Report from Closed Meeting

By general consent the Committee reconvened in open meeting at 1:59 pm.

Chair Luckham reported that while in closed meeting the Committee adopted *In Camera* minutes from a prior meeting and received updates on matters concerning Stoneman and Ellis.

13. NEW BUSINESS

13.1 On-Island Planner Office Hours
Memorandum dated December 18, 2013

Planner Milne outlined the memorandum which described the current limited utilization of on-island Planner office hours services and the costs involved, and requested consideration as to whether to continue this service. Trustees considered the matter and agreed that an information box or footnote included in the Trustee Notebook article, noting how to contact a planner with questions, might be an effective alternative.

DE-2014-011
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee instruct staff to discontinue On-Island Planner Office Hours for Denman Island.

CARRIED

13.2 Trustee Busheikin – Submission to Ferry Commissioner regarding the Cable Ferry

Trustee Busheikin presented a draft submission to the Ferry Commission regarding the Cable Ferry review process. Trustees discussed the submission and recommended that references to “our concerns” be changed to reference the views of the community.

DE-2014-012
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee endorse the letter from Trustee Busheikin as discussed and submit for staff signature to be forwarded to the Ferry Commission.

CARRIED

Trustee Busheikin referenced a letter from Trust Council expressing support for BC Ferry Coalition’s Fiscal Fairness campaign, a group that opposes the proposed cuts, and suggested the Local Trust Committee consider writing a letter of support as well.

DE-2014-013
It was MOVED and **SECONDED**,
that the Denman Island Local Trust Committee express support for the BC Ferry Coalition's Fiscal Fairness campaign, as its goals align with Denman Island's position that coastal communities depend on affordable fares and reliable service levels, that 25% fare rollbacks are needed to revitalize coastal economies, and that the Province should recognize the coastal ferry service as an essential and integral part of BC's transportation infrastructure and fund it accordingly.

CARRIED

DE-2014-014
It was MOVED and **SECONDED**,
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.

CARRIED

13.3 Jurisdiction over Aquaculture Operation
Draft Briefing from Linda Adams, Islands Trust, CAO

The preliminary briefing from Linda Adams, Chief Administrative Officer was received for information.

14. BYLAWS – None.

17. ISLANDS TRUST WEBSITE

17.1 Denman Page

There were no changes or additions requested.

18. NEXT BUSINESS MEETING DATE

The next meeting of the Denman Island Local Trust Committee will take place on Tuesday, February 25, 2014 at 10:30 am at the Denman Seniors Centre, 1111 Northwest Road, Denman Island, BC.

Trustees recognized that this meeting may include two presentations in addition to the review of the amended housing bylaws and APC recommendations, and requested that additional agenda items be kept to a minimum if possible to allow adequate time for a full engagement of these topics.

19. TOWN HALL DISCUSSION – None.

20. ADJOURNMENT

By general consent the meeting was adjourned at 2:25 pm.

_____
Peter Luckham, Chair

CERTIFIED CORRECT:

_____
Vicky Bockman, Recorder

DRAFT

Denman Island
Advisory Planning Commission
Minutes of a Regular Meeting

Date of Meeting:	Tuesday, February 11, 2014
Location:	Denman Island Old School Center 5901 Central Road, Denman Island, BC
Members Present:	Ralph McCuaig, Member Henning Nielsen, Member Jesse Edwards, Member Lindsey Graf, Member
Trustee:	Laura Busheikin
Staff Present:	Rob Milne, Island Planner Katherine Vogt, Minute Recorder

Members of the Public Present: 2

1. CALL TO ORDER

By general consent Ralph McCuaig was appointed as Chair for the purpose of this meeting and called the meeting to order at 12:35 pm.

2. APPROVAL OF AGENDA

The agenda was approved by consensus.

3. CHAIR'S REPORT

Chair McCuaig introduced himself and allowed all others present to introduce themselves. He noted that the present meeting was to allow for feedback and general informal discussion on the Memorandum and package dated January 29, 2014 provided by Island Planner Rob Milne. It was expected that the APC members would discuss package contents and make recommendations for the Denman Island Local Trust Committee regarding them.

4. CORRESPONDENCE

4.1 Email dated February 2, 2014 from Daryl McLoughlin regarding the Denman Island Affordable Housing Report.

Chair McCuaig read out a copy of this email which expressed regret at being unable to attend the meeting and contained 6 specific questions regarding practical considerations around affordable housing.

4.2 Letter dated February 2, 2014 from Ralph McCuaig regarding his thoughts on the proposed Draft Bylaws 185 and 186.

Chair McCuaig read out this letter at the meeting and submitted it for inclusion in the minutes.

5. NEW BUSINESS

Chair McQuaig invited discussion of the Draft Bylaws.

The ensuing discussion dealt with the following issues:

- implications of the Agricultural Land Reserve regulations
- spacing of secondary dwelling unit from the principle residence
- the use of Temporary Use Permits
- the 4 hectare parcel size requirement for secondary dwelling units
- rain water collection and septic disposal approaches
- the fit of visitor accommodation considerations in the housing need process and whether they were considered “in scope”.

Subsequent to the discussions the following motions were adopted:

DEAPC-01-2014
It was MOVED and SECONDED,
that the Denman Island Advisory Planning Commission direct the Denman Island Local Trust Committee to ensure that all R2 lots qualify for secondary suites and Temporary Use Permits for secondary dwellings.

CARRIED

DEAPC-02-2014
It was MOVED and SECONDED,
that the Denman Island Advisory Planning Commission recommend to the Denman Island Local Trust Committee that the Draft Land Use Bylaw point 6(a) be changed to 140 square metres and that point 6(b) be changed to 100 metres.

CARRIED

DEAPC-03-2014
It was MOVED and SECONDED,
that the Denman Island Advisory Planning Commission has the general sense that the bylaw changes contained in resolution DEAPC -01-2014 and DEAPC-02-2014 are a step in a continuing discussion of housing solutions on Denman Island. We recommend that density issues, zoning consideration, and permanent secondary dwellings be considered as part of the next Official Community Plan review.

CARRIED

6. NEXT BUSINESS MEETING DATE

There was no date set for the next meeting.

7. ADJOURNMENT

By general consent the meeting was adjourned at 3:45pm.

_____
Ralph McCuaig, Chair

CERTIFIED CORRECT:

_____
Katherine Vogt, Recorder

Print Date: Feb-13-2014

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 to be provided at February 25, 2014 LTC meeting.	Rob Milne	Jan-22-2013	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.			On Going

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

STAFF REPORT

Date February 12, 2014 **File No.:** 6930-20

To: Denman Island Local Trust Committee
For meeting of February 25, 2014

From: Rob Milne, M.C.I.P.
Island Planner

Re: Beach Accesses and Vehicular Controls

Problem/Issue:

At the January 21, 2014 meeting the Local Trust Committee directed staff to look into the issue of the installation of controls on vehicular access at beach access points. This report responds to that direction.

BACKGROUND:

At their January 21, 2014 the Local Trust Committee adopted the two resolutions below.

> **DE-001-2014**
> **It was MOVED and SECONDED**,
> *that the Denman Island Local Trust Committee request 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.*
>
> **DE-002-2014**
> **It was MOVED and SECONDED**,
> *that the Denman Island Local Trust Committee request staff to consult with the Comox Valley Regional District on potential work on vehicular control structures at beach accesses.*

Staff have now had an opportunity to discuss the issue with staff from both the Comox Valley Regional District (CVRD) and the Ministry of Transportation and Industry (MOTI). In addition, as directed by resolution DE-001-2014 a referral package will be prepared and provided to the Marine Advisory Planning Commission.

ISSUES SUMMARY:

As discussed at the January 21st LTC meeting the CVRD provides parks planning and development services to the Denman Island Local Trust Area and has completed an inventory of the location and status of various beach access points on Denman Island which are incorporated into in the Denman Island Official Community Plan as Schedules 'F' and 'G' (See attached).

In the context of the CVRD a number of beach access points have been licensed to the CVRD for beach access parks. Through discussions with CVRD parks staff it was identified that these beach access parks have been primarily developed to provide pedestrian access at locations where such access was not previously available and the issue of vehicle access to beach areas has not arisen. The licensing process includes the development of a management strategy for each access park as well as the prior development of a Letter of Agreement with MOTI to clarify roles and responsibilities of the two parties in the licensing of these access points. Principal amongst these is the responsibility for dealing with complaints which is delegated to the CVRD.

It appears that the interest of the LTC is in exploring the opportunity of installing barriers where road right–of-ways meet the beach at right-of-ways that are currently developed as roads and used for vehicular access to beaches (beach access points). This would have the effect of continuing to allow a vehicle to be driven to the end of a right-of-way for loading and unloading and perhaps parking, but would remove the ability to drive from the road onto the beach. If the CVRD were requested to become involved in such an initiative, it would be a new type of "park" use of a road right-of-way for the CVRD.

CVRD staff suggested that MOTI could be asked to consider the denial of vehicle access by way of current beach access points with a gate or chain if a sign were posted with an Islands Trust or CRVD phone number towards which complaints could be directed. The CVRD staff noted, though, that they thought this was unlikely as vehicular access is a historical use of the beach road accesses.

In discussion with MOTI staff from the Courtenay office it was also noted that although the Ministry might consider allowing the denial of vehicular beach access from such access points the Ministry would not be prepared to be an enforcement agency on the matter. It was further noted that in all likelihood any park created under a license of occupation would include a condition that denial of vehicular access, at least from points currently used for that purpose, would not be permitted.

STAFF COMMENTS:

In discussions with CVRD staff mention was made of two relevant BC court decisions, one in the provincial court and one in the Supreme Court which have dealt with the issue road accesses.

The provincial court case *Stevenson v. Surrey (District of), 1990 2251 (BCCA)* dealt with the proposed development of a park on a dead-end, bluff top road access. The proposed park would have included pedestrian traffic including bicycles and wheelchairs, but prohibit motor vehicle traffic. It was the conclusion of the court that any park created out of a road access must have as its *principal* function the provision of

access rather than the provision of a “recreational pleasance” which the court deemed to be the case with the proposed park. The authorizing bylaw for the creation of the park was declared invalid.

The BC Supreme Court decision *Burke v. Columbia Shuswap Regional District, 2008 BCSC 66* dealt with the proposed use by the Regional District of a lakefront road access for park purposes. The Regional District became involved when an adjacent property owner applied to MOTI to include the road access into their property. Although not identified on their parks plan the Regional District objected to the incorporation of the lake access point on the grounds that they wished to develop it as a park to provide public access to the beach. Although the overall case dealt with other legal implications such as jurisdiction the case turned upon the issue of the purpose for which the road allowance was dedicated. It was the determination of the court that although the Regional District had an interest in bringing the access road within its parks plan the evidence made it clear that the Columbia Shuswap Regional District (CSRD) did not want the land for the purposes of developing it as a park but rather did not want to lose the public access to the lake. This, the court determined supported the CSRD’s contention that they considered the plot “necessary for the purpose for which it was intended”.

These court decisions and the information from CSRD and MOTI staff would seem to indicate that the Ministry may be reluctant to issue a right-of-way license if the intent is to deny vehicular access from beach accesses which have been historically used for this purpose and should they agree to do so such denial of access may not survive a court challenge. It is difficult to predict how either MOTI would respond to a situation which did not deal with an established history of vehicular use.

Staff have been advised that the CSRD legal advice did not deal with the specific issue of vehicle access to the water but did caution that “park” improvements should be kept to a minimum and focus on the primary of purpose of the access which is to get people to the water.

Another aspect that should be kept in mind when considering applying for licenses for beach access rights of way is that this process would have to be done through the CVRD parks function and would be contingent upon their capacity as well as the budget available to the LTC. Further investigation would be required to assess the potential impacts of the diversion of resources to address the issue of beach access issue from other projects such as the Cross Island Trail.

RECOMMENDATIONS:

It is the recommendation of staff:

THAT the Local Trust Committee give consideration to the information contained within this report and provide direction to staff on how they wish to proceed with this matter.

Prepared and Submitted by:

Rob Milne	February 12, 2014
MCIP, RPP Island Planner	Date

Concurred in by:

Courtney Simpson	February 12, 2014
MCIP, RPP Regional Planning Manager	Date

Attachments:

Denman Island OCP Schedule ‘F’
Denman Island OCP Schedule ‘G’

Denman Island
Official Community Plan
Bylaw 185

Schedule F
BEACH RIGHTS-OF-WAY

N

RUNKLE ROAD
GLADSTONE ROAD
WHITNEY ROAD
KODAK ROAD
LANCE ROAD
DUNN ROAD
MCNABB ROAD
SCOTT ROAD
Denman Point
RADCLIFFE ROAD
BEADNELL ROAD
MABEL ROAD
JANET ROAD
DENAMN ROAD EAST
CORRIGAL ROAD
EAST ROAD #1
EAST ROAD #2
EAST ROAD #3
OWL CRESCENT
EAST ROAD #4
MCFARLANE ROAD EAST
EAST ROAD #5
COKELY ROAD
EAST ROAD #6
GRAVELLY BAY #1
GRAVELLY BAY #2
SEA LION ROAD
SOLE ROAD
CAPRI ROAD
BOYLE POINT
REGINALD DRIVE
REPULSE POINT
DUSTY ROAD
HINTON ROAD
PLETT ROAD
TANNER ROAD
LARGO ROAD
MCFARLANE ROAD
LACON ROAD SOUTH
LACON ROAD NORTH
MILLARD ROAD
GLEN GHORM ROAD
EASTCLIFFE ROAD
WESTCLIFFE ROAD
DIXON ROAD
DUSTIN ROAD
KELSEY ROAD
DENMAN ROAD WEST
KIRK ROAD
PIERCY ROAD

Islands Trust

Scale 1: 20,000
500 0 500 1000 Meters

D E N M A N I S L A N D

DENMAN ISLAND
LOCAL TRUST COMMITTEE

SCHEDULE F
BEACH RIGHTS-OF- WAY

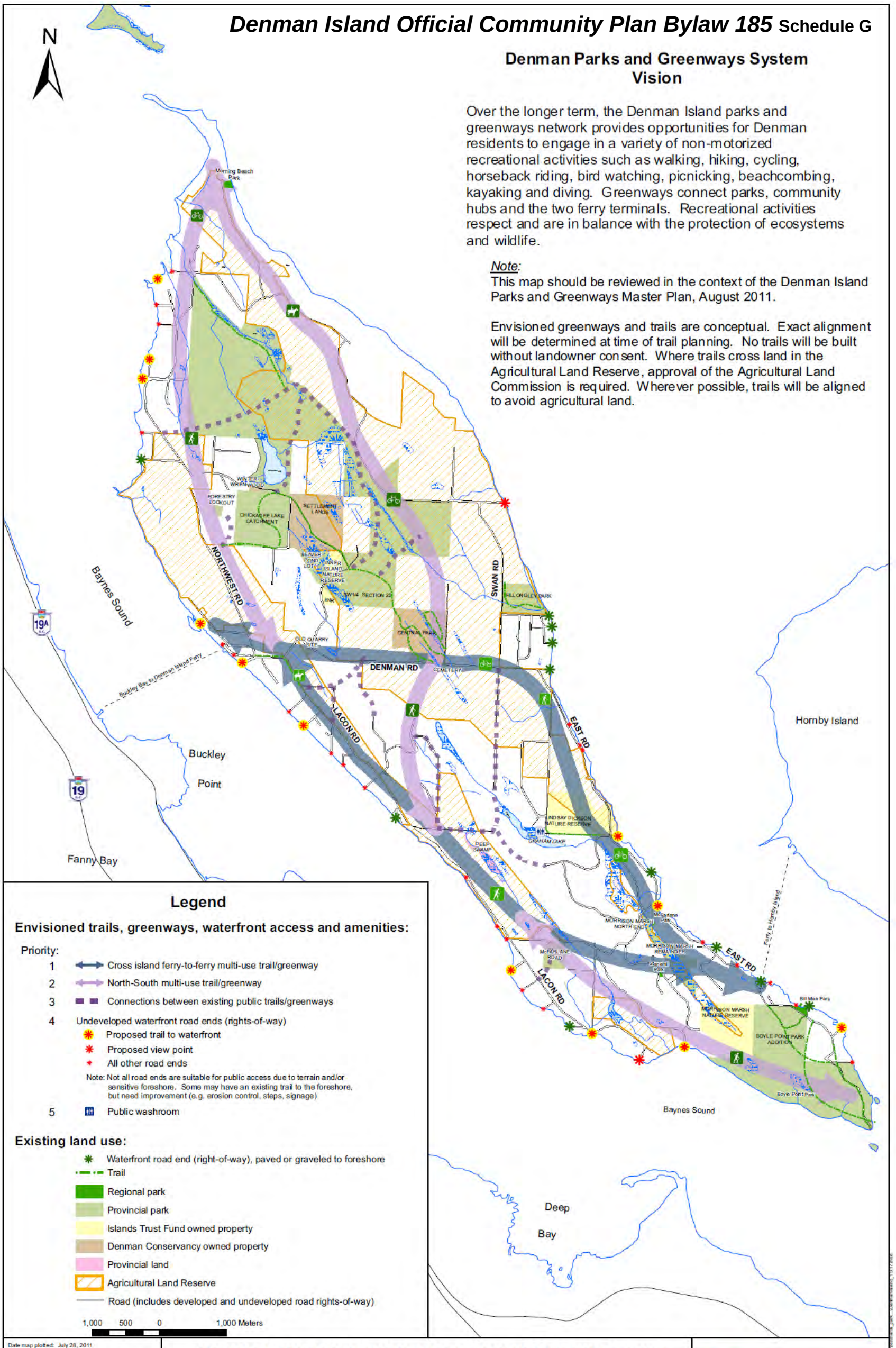
Denman Island Official Community Plan Bylaw 185 Schedule G

Denman Parks and Greenways System Vision

Over the longer term, the Denman Island parks and greenways network provides opportunities for Denman residents to engage in a variety of non-motorized recreational activities such as walking, hiking, cycling, horseback riding, bird watching, picnicking, beachcombing, kayaking and diving. Greenways connect parks, community hubs and the two ferry terminals. Recreational activities respect and are in balance with the protection of ecosystems and wildlife.

Note:
This map should be reviewed in the context of the Denman Island Parks and Greenways Master Plan, August 2011.

Envisioned greenways and trails are conceptual. Exact alignment will be determined at time of trail planning. No trails will be built without landowner consent. Where trails cross land in the Agricultural Land Reserve, approval of the Agricultural Land Commission is required. Wherever possible, trails will be aligned to avoid agricultural land.



Legend

Envisioned trails, greenways, waterfront access and amenities:

Priority:

1. Cross island ferry-to-ferry multi-use trail/greenway
2. North-South multi-use trail/greenway
3. Connections between existing public trails/greenways
4. Undeveloped waterfront road ends (rights-of-way)
   - Proposed trail to waterfront
   - Proposed view point
   - All other road ends

   Note: Not all road ends are suitable for public access due to terrain and/or sensitive foreshore. Some may have an existing trail to the foreshore, but need improvement (e.g. erosion control, steps, signage)
5. Public washroom

Existing land use:

- Waterfront road end (right-of-way), paved or graveled to foreshore
- Trail
- Regional park
- Provincial park
- Islands Trust Fund owned property
- Denman Conservancy owned property
- Provincial land
- Agricultural Land Reserve
- Road (includes developed and undeveloped road rights-of-way)

1,000 500 0 1,000 Meters

Date map plotted: July 28, 2011

This map was prepared by the CVRD for planning purposes only, and is not a legal document. This map is a composite of different data sets that were developed from different methods and dates. This map should be used with caution. The CVRD is not responsible for any damages resulting from any omissions, deletions or errors.

DENMAN ISLAND PARKS AND GREENWAYS PRIORITIES CONCEPTUAL PARKS PLAN

Comox Valley REGIONAL DISTRICT

From: Mary Stambulic [mailto:marystambulic@shaw.ca]
Sent: January-29-14 9:20 PM
To: Rob Milne
Subject: RE: Denman Cable Ferry Proposal submission

Good evening Rob.

On behalf of the BC Ferry Commission, thank you to the Denman Island Local Trust Committee for providing comment on BC Ferry Services' proposal to build and operate a cable ferry on Route 21.

Please be assured that the commissioners will be reviewing all written submissions received during this public comment period and appreciate the time the committee took to write to us regarding this issue.

Again, many thanks for the submission from the committee.

Kind regards,
Mary

Mary Stambulic
Assistant to the Commissioners
BC Ferry Commission
PO Box 9279 Stn Prov Govt
Victoria BC, V8W 9J7
E-mail: info@bcferrycommission.com
Website: www.bcferrycommission.com

From: Wendy Boothroyd [wboothroyd@yahoo.ca]
Sent: January 23, 2014 1:14 PM
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; Laura Busheikin; Peter Luckham; David Graham
Subject: I oppose Salish Sea Farms applications near Denman Island

Dear Manager of Aquaculture for BC,
This letter is to oppose the aquaculture applications of Salish Sea Farms
File numbers 1414123 through 1414127.
I live on Denman Island and am concerned about the increasing industrialization of our foreshore. Already much of the west shore of the island is leased for oyster culture, and walking on the beach we see the truck tire prints on the gravel and plastic garbage from the oyster operations. Predator nets designed to protect the shellfish threaten wild birds that pass through Baynes Sound, or live there.
These proposed geoduck operations pose a threat to the existing rich natural marine ecosystem. The waters surrounding Denman Island are renowned for their huge herring spawns, and the marine and bird life that follows the spawning of the herring is a wonder to observe. You don't know what effect geoducks will have on the ecosystem, and the possibly-unexpected results could be disasterous. I am alarmed by the size of the tenures that are being asked for; they are much larger that normal, with potential for correspondingly larger negative effects.
Also, allowing the economic development of these geoduck operations might have a negative effect on existing businesses in the area. Herring fishers' livlihoods may be jeopardized. Denman Island's economy benefits from tourism. Putting large industrial aquaculture operations near our provincial park will hurt tourism.
It seems to me unwise to allow such a huge amount of geoduck culture to take place in our waters.
Finally, it seems wrong that a lease was recently granted for an industrial aquaculture operation using 40 rafts in Henry Bay. This is an area supposedly protected under Islands Trust Bylaws, yet the provincial government granted the license anyway.

I hope that these licenses will be denied.

Yours truly,

Wendy Boothroyd
3680 Lacon Rd, Denman Island

cc: Kathy Evans: Aquaculture Manager (MFLNRO) kathy.evans@gov.bc.ca
cc: Bruce Jolliffe- CV Area "A" Director bjolliffe@comoxvalleyrd.ca
cc: The Honourable Don McRae - MLA, don.mcrae.mla@leg.bc.ca
cc: The Honourable John Duncan - MP, john.duncan@parl.gc.ca,
cc: The Honourable Gail Shea – MP Minister Fisheries & Oceans gail.shea@parl.gc.ca
cc: March Klaver - Senior Aquaculture Advisor, DFO march.klaver@dfo-mpo.gc.ca
cc: Michelle Manning - Aquaculture Management DFO michelle.manning@dfo-mpo.gc.ca
cc: Diana Trager- Aquaculture Management Division, DFO, diana.trager@dfo-mpo.gc.ca
cc The Honourable Steve Thomson, MLA, Minister of FLNRO steve.thomson.mla@leg.bc.ca
cc: Dennis Chalmers - Fisheries Management Officer BC dennis.chalmers@gov.bc.ca
cc: David Graham - Islands Trust, Denman Island Trustee dgraham@islandstrust.bc.ca
cc: Laura Busheikin -Islands Trust, Denman Island Trustee lbusheikin@islandstrust.bc.ca
cc: Peter Luckham, Denman Island LTC, Chair pluckham@islandstrust.bc.ca

Wendy Boothroyd
www.birdyear.blogspot.com - updated less often now we are home.

From: Ken Madsen [birdyearken@yahoo.ca]
Sent: January 24, 2014 6:57 PM
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; Laura Busheikin; Peter Luckham; David Graham
Subject: Re: I oppose Salish Sea Farms applications near Denman Island

To whom it may concern,
I am opposed to the Salish Sea Farm applications for commercial geoduck farming near Denman Island. There is already too much commercialization/industrialization of the Denman Island shoreline. There are many issues I am concerned about:
- garbage, particularly plastics that wind up in the marine ecosystem,
- pollution,
- disruption of the natural ecosystem with yet another invasive species.
sincerely,

Ken Madsen,
Denman Island, BC
email: birdyearken@yahoo.ca

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

Islands Trust Council
c/o Chair Sheila Malcolmson

Re: Islands Trust participation in the treaty negotiation process

Dear Ms. Malcolmson:

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. Thank you for this effort and commitment.

ADIMS has come to the realization (with the help of Linda Adams) that the 'big picture' re: aquaculture issues is now focused on the outcome of ongoing Treaty Negotiations with local First Nations. We recognize that the First Nations peoples of BC have many just claims that need to be addressed and the treaty process is a necessary step towards resolving these. However, if these treaty negotiations are conducted without meaningful local participation and input from knowledgeable scientists, and are then forced on communities, such a closed treaty process will only create new problems for the future. The Ministry of Aboriginal Relations & Reconciliation's stated objectives regarding public consultation and BC Treaty Negotiations supports this view -
"***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;"

As demonstrated by the K'omoks Interim Measure Agreement (IMA) for aquaculture, the focus of the

negotiations appears to be primarily economic in nature, with natural resource extraction and aquaculture being the medium and no clear process for attending to any subsequent impact on the environment or of the fragile marine ecosystem. As ADIMS and other environmental groups will attest, this could result in irreparable damage to the 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.

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, are contradictory to the designation of our waters as W1 Marine Conservation zoning. Furthermore their applications for industrial level shellfish aquaculture are in conflict with the established goals of the Islands Trust, and are potentially harmful to the fragile marine ecosystem.

The Islands Trust has a legislated commitment to preserve and protect the fragile ecosystem of the Islands, and surrounding waters within their jurisdiction. 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. Islands Trust and their Local Trust Committees, as the local government for the Trust islands, should have a voice for the thousands of residents who will be impacted. Therefore, ADIMS respectfully asks 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 Islands Trust 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.

We believe that 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'. It is our firm belief that the health of the environment and of our Province’s future should not be sacrificed. 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: Trustees Busheikin, Graham and Luckham

Rob Milne, Denman Island Trust Planner

Linda Adams, Islands Trust Chief Administrative Officer

Courtney Simpson, Islands Trust Regional Planning Manager, Northern Team

K'ÓMOKS AQUACULTURE INTERIM MEASURES AGREEMENT

K'ÓMOKS AQUACULTURE INTERIM MEASURES AGREEMENT

This Agreement is dated for reference this ____day of _____, 2011

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, as represented by the Minister of Aboriginal Relations and Reconciliation and the Minister of Forests, Lands and Natural Resource Operations

("British Columbia")

AND:

K'ÓMOKS FIRST NATION, on behalf of itself and its members, as represented by its Chief and Council

("KFN")

(collectively referred to as the "Parties" and individually referred to as a "Party")

BACKGROUND:

A. The Parties, together with Canada, are engaged in negotiating an Agreement-in-Principle in accordance with Stage 4 of the British Columbia Treaty Commission process;

B. The Parties previously agreed to the provision of economic measures to KFN under a Memorandum of Understanding, entered into in 2002 and subsequently amended by agreement of the Parties in 2003 and again in 2005 (MOU), which addresses some of KFN's interests in shellfish aquaculture development;

C. The Parties acknowledge that after December 18, 2010, in accordance with the 2009 BC Supreme Court decision in *Morton* v. *British Columbia,* British Columbia will no longer issue aquaculture regulatory operational licences under the province's *Fisheries Act,* those licences previously issued under that Act will no longer regulate and manage the activity of aquaculture, and on December 19, 2010 Canada will assume management and regulation of aquaculture activities as a fishery; and

D. The Parties wish to enter into this Agreement to create greater certainty within the KFN Traditional Territory with respect to land use for aquaculture purposes, to provide a role for KFN with respect to aquaculture management and confirm the conclusion of consultation with respect to certain outstanding aquaculture application referrals and to provide interim benefits related to aquaculture to KFN in advance of a Final Agreement.

THEREFORE THE PARTIES AGREE AS FOLLOWS:

1. Definitions

1.1. In this Agreement and the Background, unless the context requires otherwise:

(a) **"Agreement"** means this interim measures agreement;

(b) **"Aquaculture Application"** means an application for an authorization under the *Land Act* for aquaculture purposes relating to land within the KFN Traditional Territory and referred to KFN in accordance with the Nanwakolas/British Columbia Framework Agreement and "Aquaculture Applications" means more than one such application;

(c) **"Aquaculture Review Committee"** or **"ARC"** means a committee to be established by the Parties on, or as soon as reasonably practical after, the Effective Date;

(d) **"Aquaculture Tenures"** means, as listed in Schedule A to this Agreement, the shellfish tenures issued under the MOU for the Designated Sites, and, on their issuance, includes the Tenures and any aquaculture tenure for a Designated Site that, pursuant to this Agreement, may be issued after the Effective Date;

(e) **"*BC Fisheries Act*"** means the *Fisheries Act*, RSBC 1996, c. 149, as amended from time to time;

(f) **"Designated Sites"** means, as listed in Schedule A to this Agreement, those sites previously designated under the *Land Act* in accordance with the MOU, and will include any sites designated under sections 6.3, 6.4, 6.8 or 6.10, which following their designation will be added to the list in Schedule A;

(g) **"Effective Date"** means the date on which this Agreement is signed and delivered by each of the Parties;

(h) **"Final Agreement"** means KFN Final Agreement to be concluded by KFN, British Columbia and Canada at the conclusion of Stage 5 of the British Columbia Treaty Commission process;

(i) **"KFN"** means the band, as that term is defined by the *Indian Act*, RSC 1985, c. I-5, previously named the Comox Indian Band, now K'ómoks First Nation;

(j) **"KFN Corporation"** means a corporation that has been incorporated or registered under the laws of British Columbia, and with issued and outstanding shares carrying votes sufficient, if exercised, to elect or appoint a majority of the directors of the corporation and which shares are owned:

(1) legally and beneficially by KFN, or

(2) legally by one or more persons, each of whom is acting as a bare trustee on behalf of KFN as sole beneficial owner, or

(3) by one or more corporations, all of the shares of which are owned as provided in subclauses (1) or (2) above;

(k) **"KFN Traditional Territory"** means the geographic area as shown on the map attached as Schedule G;

(l) **"*Land Act*"** means the *Land Act*, RSBC 1996, c. 245, as amended from time to time;

(m) **"Minister"** means the British Columbia minister, or designate, having responsibility, from time to time, for the exercise of powers of decision set out in the *Lands Act* or *Fisheries Act*, as applicable in the circumstances;

(n) **"MOU"** means the Memorandum of Understanding entered into by British Columbia and the Comox Indian Band in 2002 and subsequently amended by agreement of the Parties in 2003 and again in 2005 and by further agreement of the Parties in 2009 as set out in the Nanwakolas/British Columbia Framework Agreement;

(o) **"Nanwakolas/British Columbia Framework Agreement"** means the agreement dated December 16, 2009 and entered into by British Columbia, the Nanwakolas First Nations, which includes KFN, and the Nanwakolas Council Society;

(p) **"Shellfish Aquaculture Licences"** means the licences, on the terms and conditions specified therein, issued under section 13 of the *BC Fisheries Act* for each of the Tenures prior to the signing of this Agreement as acknowledged in section 5.1 and which licences expired on December 18, 2010;

(q) **"Subject Area"** means either of, and "Subject Areas" means both of, the areas outlined on the maps attached as Schedule B (Comox Bar and Baynes Sound) and Schedule C (Salmon River);

(r) **"Tenure"** means either of, and **"Tenures"** means both of, the following licences of occupation on the terms and conditions specified therein to be issued prior to or concurrently with the signing of this Agreement as provided in section 5.1:

(1) a *Land Act* licence of occupation:

(a) of land within the area outlined on the maps attached as Schedule D and being unsurveyed foreshore as described by metes and bounds as set out in Schedule D, and

(b) in total area consisting of approximately 3.82 hectares;

and

(2) a *Land Act* licence of occupation:

(a) of land within the area outlined on the maps attached as Schedule E, being unsurveyed foreshore as described by metes and bounds in Schedule E, and

(b) in total area consisting of approximately 27.5 hectares.

1.2. All references in this Agreement to a designated Article, section, subsection or other subdivision or to a Schedule are to the designated Article, section subsection or other subdivision of, or Schedule.

1.3. The following Schedules are attached to this Agreement and form part thereof:

Schedule A – Designated Sites and Aquaculture Tenures,

Schedule B – Comox Bar and Baynes Sound,

Schedule C – Salmon River,

Schedule D – Map and Description of the Henry Bay Tenure,

Schedule E – Map and Description of Comox Bar Tenure,

Schedule F – List of Application Referrals,

Schedule G – KFN Traditional Territory, and

Schedule H – KFN Areas of Interest.

2. Purposes

2.1. The purposes of this Agreement are to:

(a) demonstrate the commitment of the Parties to concluding a Final Agreement;

(b) provide interim benefits to KFN, in particular with a view to the KFN's interests in aquaculture development, in advance of a Final Agreement;

(c) provide greater certainty around the exercise of authority by British Columbia in relation to land resource development activities for aquaculture purposes within the KFN Traditional Territory; and

(d) provide a role for KFN with respect to aquaculture management within the KFN Traditional Territory.

3. Other Agreements

3.1. This Agreement supersedes and replaces the MOU with respect the designation of shellfish aquaculture sites and the issuance of aquaculture tenures as may be applied for by KFN after the Effective Date.

3.2. The Parties will, in accordance with the terms of reference to be developed by them, co-ordinate the role of the Aquaculture Review Committee in reviewing Aquaculture Applications with the engagement framework established under the Nanwakolas/ British Columbia Framework Agreement.

3.3. The Parties agree that the Aquaculture Review Committee's engagement process for Aquaculture Applications under section 4 will be considered an Engagement Level 5 process consistent with and as set out in the Nanwakolas/British Columbia Framework Agreement.

3.4. If required to implement this Agreement, amendments will be proposed to the Nanwakolas/British Columbia Framework Agreement.

4. Aquaculture Review Committee

4.1. On or before the Effective Date, the Parties agree to establish the Aquaculture Review Committee or ARC, consisting of a maximum of four members in total, with an equal number of representatives appointed by KFN and British Columbia, respectively.

4.2. Subject to section 3.2, the purposes of the ARC will be to provide a mechanism for KFN input with respect to:

(a) the management of aquaculture land use within the KFN Traditional Territory by British Columbia; and

(b) decisions on Aquaculture Applications.

4.3. ARC will meet within 30 days of the Effective Date to develop its terms of reference.

4.4. ARC's terms of reference will include that the ARC members:

(a) will review and seek to make consensus recommendations in writing to the applicable statutory decision maker with respect to Aquaculture Applications; and

(b) may submit separate written recommendations, if consensus on recommendations with respect to an Aquaculture Application is not reached by the ARC.

4.5. If, as contemplated by section 4.4 (b), a separate written recommendation is made by KFN's representatives and that recommendation is not accepted by the applicable statutory decision maker, after consideration in accordance with the principles of administrative fairness, the statutory decision maker will provide written reasons to KFN.

5. Shellfish Tenures and Licences

5.1. British Columbia will issue, prior to or concurrently with the signing of this Agreement, the Tenures, and has issued, for the Tenure sites, Shellfish Aquaculture Licences for a term ending December 18, 2010.

5.2. British Columbia has not given any warranty or representation concerning the provisions of any enactments or bylaws of any governmental body having jurisdiction in any way affecting the use or occupation of the Tenures or any other aquaculture tenures, including, without limitation, the authorization of the conduct of shellfish aquaculture or any other activities on the Tenures or any other of the aquaculture tenures.

6. *Land Act* Designations

6.1. The Parties acknowledge that pursuant to the MOU, British Columbia designated under section 17(1) of the *Land Act* as Crown land to be used for the purpose of establishing shellfish aquaculture tenures for KFN the lands listed in Schedule A, and the designation of the sites listed in Schedule A continues in effect in accordance with the terms of designation, whether or not a tenure has been issued to KFN for the subject site, or if issued, a tenure subsequently expires, or otherwise terminates, unless otherwise agreed to by KFN.

6.2. KFN may submit applications for *Land Act* tenures to the Ministry of Forests, Lands and Natural Resource Operations for any of the Designated Sites for which tenures have not been issued to it as of the Effective Date or for any Designated Sites which may subsequently be designated under the provisions of this Agreement.

6.3. If an application by KFN for an aquaculture tenure with respect to a Designated Site as contemplated under section 6.2 is not approved, British Columbia in discussion with KFN may designate another site within a Subject Area.

6.4. With respect to Crown land within either of the Subject Areas, if, during the term of this Agreement, a disposition of Crown land to a party other than KFN or its designate for aquaculture purposes is:

(a) finally cancelled by the Minister under section 43 of the *Land Act*, or

(b) abandoned and terminated under section 45(1) of the *Land Act*,

then, following such final cancellation or abandonment and termination and any period determined by the Minister under section 47 of the *Land Act* with respect to the disposition, British Columbia will advise KFN of the cancellation or abandonment and termination. KFN may request the designation of the previously disposed Crown land for the purposes of developing aquaculture tenures.

6.5. The Minister acknowledges that the policy applicable to any tenure issued for a Designated Site includes the following terms:

(a) the production requirements in the tenure agreement will allow for staged implementation with reduced production requirements for the first five years after the date of issuance of the tenure and any policy for diligent use will be applied in a manner consistent with such staged implementation; and

(b) a tenure granted to KFN may be assigned to a KFN Corporation, but otherwise will be subject to the generally applicable restrictions on assignment, sublease or other transfer to any other party.

6.6. Subject to section 6.5 all standard terms and conditions will apply to tenures issued to KFN as contemplated by the provisions of this Agreement.

6.7. British Columbia will establish within the Crown Land Registry Notations of Interest over Crown lands within the Subject Areas for those sites identified by KFN in Schedule H as potential aquaculture sites. The notations will recognize that the Ministry of Forests, Lands and Natural Resource Operations has identified KFN interests in relation to the potential sites for future aquaculture purposes.

6.8. British Columbia will work with KFN to identify sites within the Notations of Interest areas established pursuant to section 6.7 for recommendation to the Minister for designation under section 17(1) of the *Land Act* as Crown land to be used for the purpose of aquaculture.

6.9. For greater certainty, the Parties acknowledge that the designation of Crown land under section 17(1) of the *Land Act* does not preclude British Columbia from continuing to administer the designated Crown land as provided under the *Land Act* and granting dispositions of the designated land, so long as the purpose of any disposition is, as provided in section 17(2) of the *Land Act*, compatible with the purpose for which the land has been designated as a Designated Site.

6.10. If the designation of a Designated Site is cancelled by the Minister during the term of this Agreement, the Parties will work collaboratively to identify another site within KFN Traditional Territory, having characteristics similar to those of the cancelled site, and on identification of a suitable alternate site will recommend it to the Minister for consideration for designation under section 17(1) of the *Land Act*.

7. Funding and Support to KFN

7.1. British Columbia will provide KFN with $140,000 toward the cost of consulting fees necessarily incurred by KFN for site assessment and development costs, which sum will be payable in accordance with the Transfer Under Agreement signed by the Parties on November 18, 2010 and amended in March 2011.

7.2. British Columbia agrees to provide KFN reasonable access to Ministry of Forests, Lands and Natural Resource Operations professional staff to assist with site investigations and planning related to future *Land Act* disposition applications as may be submitted by KFN and will seek through access to the Ministry's professional staff to assist KFN in its goal of acquiring a processing or depuration facility.

8. Acknowledgements

8.1. KFN acknowledges that with respect to governmental actions by British Columbia relating to the referral applications listed in Schedule F, the Crown has adequately and meaningfully consulted with KFN.

8.2. During the term of this agreement, KFN will not bring a legal challenge with respect to any of the decisions made on the referral applications listed in Schedule F.

9. Not a Treaty

9.1. This Agreement is not a Treaty or a Land Claims Agreement for the purposes of sections 25 and 35 of the *Constitution Act, 1982*.

10. Term

10.1. The term of this agreement is from the date it is signed by both Parties until the earlier of:

(a) ninety (90) days of the date of written notice by either party to terminate the Agreement;

(b) ten (10) years following the signing of this Agreement by both Parties; or

(c) the effective date of a Final Agreement.

10.2. Termination of this Agreement will not terminate or prevent any renewal, as may be provided for under the terms and conditions thereof, of any aquaculture tenure issued to KFN, in effect on the date of such termination, and that was issued during the term of this Agreement or, previously, under the MOU.

11. Renewal

11.1. This Agreement may be renewed by written agreement of the Parties.

12. Notice

12.1. Any notice or other communication that is required to be given or that a Party wishes to give to the other Party with respect to this Agreement, will be in writing and will be effective if delivered, sent by registered mail, or transmitted by facsimile to the address of the other Party as in this section.

K'ómoks First Nations

Chief Ernest Hardy
K'ómoks First Nation
3320 Comox Road
Courtenay, BC V9N 3P8

Facsimile 250 339-7053

British Columbia

Duncan Williams
Executive Director, Regional Operations,
Ministry of Forests, Lands and Natural Resource Operations
PO BOX 9352
STN PROV GOVT
Victoria, BC V8W 9E2

Facsimile 250 952-0223

12.2. Any notice or other communications will be deemed to have been given on the date it is actually received, if received before 4:00 p.m.

12.3. The address of either Party may be changed by notice in the manner set out in this section.

13. General Provisions

13.1. This Agreement, including the Schedules to it constitutes the entire Agreement between the Parties with respect to the subject matter of this Agreement.

13.2. This Agreement shall be interpreted in a manner consistent with provincial, federal and constitutional law.

13.3. Except as set out in this Agreement, this Agreement will not limit the positions that a Party may take in future negotiations or court actions.

13.4. This Agreement does not define or amend aboriginal rights, or limit any priorities afforded to aboriginal rights, including aboriginal title.

13.5. This Agreement and any decisions made during the term of this Agreement do not change or affect the positions either Party has, or may have, regarding jurisdiction and authorities.

13.6. Nothing in this Agreement shall be interpreted in a way that fetters the discretion given to any statutory decision maker in an enactment.

13.7. This Agreement does not address or prejudice conflicting interests or competing claims between First Nations.

13.8. There will be no presumption that any ambiguity in any of the terms of this Agreement should be interpreted in favour of either Party.

13.9. Time is of the essence under this Agreement.

13.10. Each of the Parties will, upon the reasonable request of the other, make, do, execute or cause to be made, done or executed all further and other lawful acts, deeds, things, devices, documents, instruments and assurances whatever for the better and absolute performance of the terms and conditions of this Agreement.

13.11. Any reference to a statute in this Agreement includes all regulations made under that statute and any amendments or replacement of that statute and its regulations.

13.12. This Agreement may be entered into by each Party signing a separate copy of this Agreement (including a photocopy or facsimile copy) and delivering it to the other Party by facsimile transmission.

Signed on behalf of:

K'ÓMOKS FIRST NATION Date: _____

_____
Chief

_____
Councillor

_____
Councillor

_____
Witness of K'ómoks First Nation signatures

Signed on behalf of:

Government of British Columbia Date: March 21, 2011

_____
Steve Munro, Deputy Minister of Aboriginal Relations and Reconciliation

_____
Doug Konkin, Deputy Minister of Forests, Lands and Natural Resource Operations

_____
Witness of Deputy Ministers' signatures

13.12. This Agreement may be entered into by each Party signing a separate copy of this Agreement (including a photocopy or facsimile copy) and delivering it to the other Party by facsimile transmission.

Signed on behalf of:

K'ÓMOKS FIRST NATION Date: March 18, 2011

Chief

Councillor

Councillor

Witness of K'ómoks First Nation signatures

Signed on behalf of:

Government of British Columbia Date: _____

Steve Munro, Deputy Minister of Aboriginal Relations and Reconciliation

Doug Konkin, Deputy Minister of Forests, Lands and Natural Resource Operations

Witness of Deputy Ministers' signatures

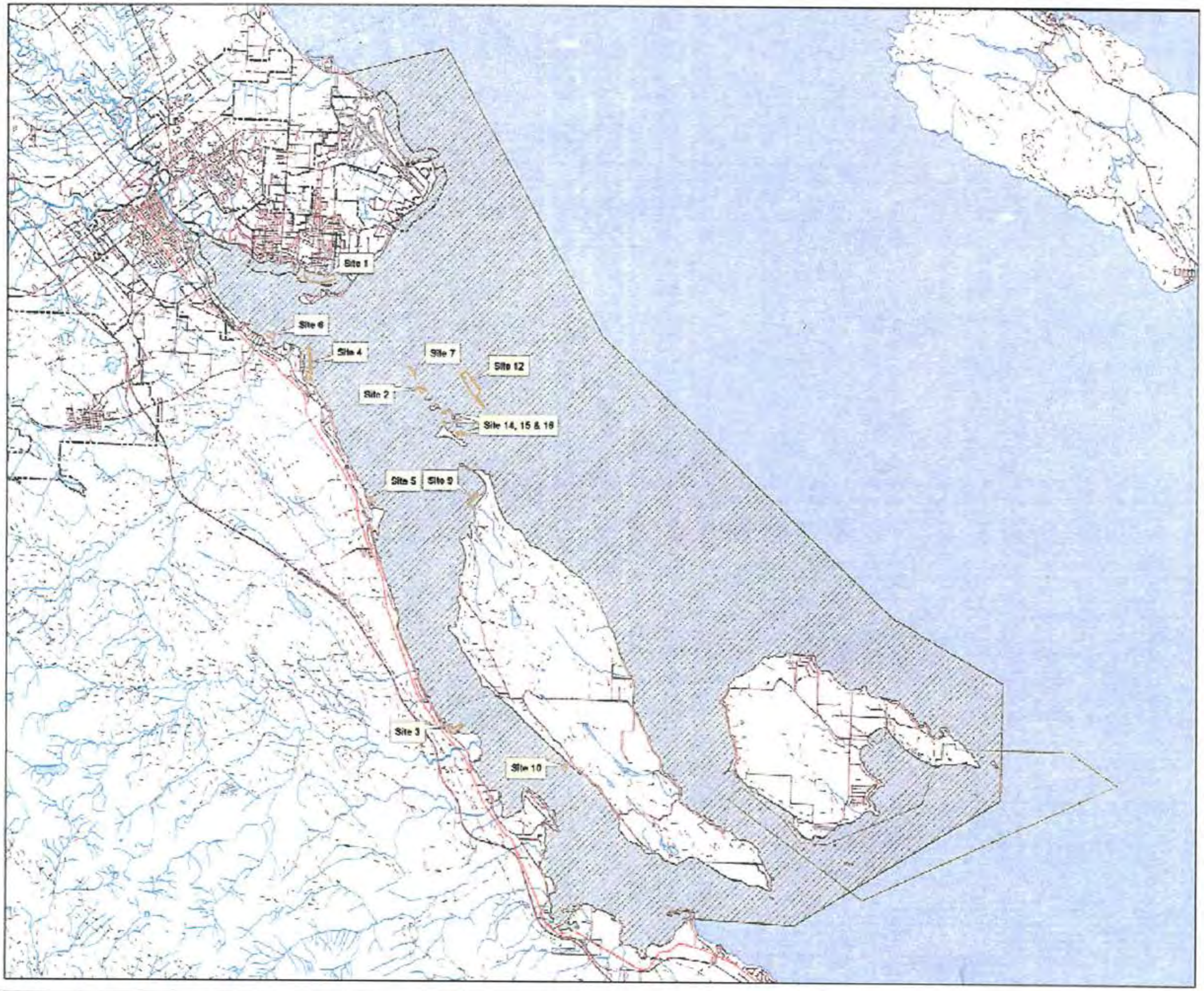
Schedule A
Designated Sites and Aquaculture Tenures

MOU Reserve Sites		Active aquaculture tenures		
Number	**Name**	**File**	**Type**	**Holder**
Site 1	Intertidal site in Comox Marina of no more than 27.07 hectares	1411090	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 2	Inter-tidal site called Kw'ulh oyster beach northwest of Tree Islets of no more than 2.9 hectares	1411091	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 3	Inter-tidal site in Buckley Bay of no more than 6.6 hectares	1411093	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 4	Inter-tidal site at Kingfisher/Gartley Point of no more than 8.7 hectares	1411104	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 5	Inter-tidal site Union Point Coal Bed of no more than 1.9 hectares	1411103	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 6	Inter-tidal site at Royston of no more than 5.0 hectares	1411159	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 7	Inter-tidal site at White Spit of no more than 2.0 hectares	N/A	N/A	N/A
Site 9	Deepwater site in south Henry Bay of no more than 3.8 hectares	1411213	Accepted application for aquaculture Licence of Occupation	Pentlatch Seafoods Ltd
Site 10	Deepwater potential site in Metclalf Bay to secure a fair apportionment of the 1.1 hectares allotted in the Bay	N/A	N/A	N/A
Site 12	Deepwater site at Comox Bar of no more than 27.5 hectares	1411212	Accepted application for aquaculture Licence of Occupation	Pentlatch Seafoods Ltd
Site 14	Inter-tidal site at Kw'ulh (Seal Islets) of no more than 0.7 hectares	1411109	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 15	Inter-tidal site at jaji7em (Sandy Islets) of no more than 0.6 hectares	1411109	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd
Site 16	Inter-tidal site at jaji7em (Sandy Islets) of no more than 2.1 hectares	1411109	Licence of Occupation - Shellfish Aquaculture	Pentlatch Seafoods Ltd

The sites listed above are all Designated Use Areas under *Land Act* reserve 1411158.

Schedule B
Map of Subject Area Comox Bar and Baynes Sound

K'ómoks First Nation Subject Area Comox Bar and Baynes Sound



Legend

- Subject Areas
- K'ómoks First Nation Indian Reserve
- Land Act Reserve 141158
- Provincial Protected Area
- Municipality

Transportation

- Road (Paved)
- Road (Gravel)
- Railway

1:100,000

0 2 4

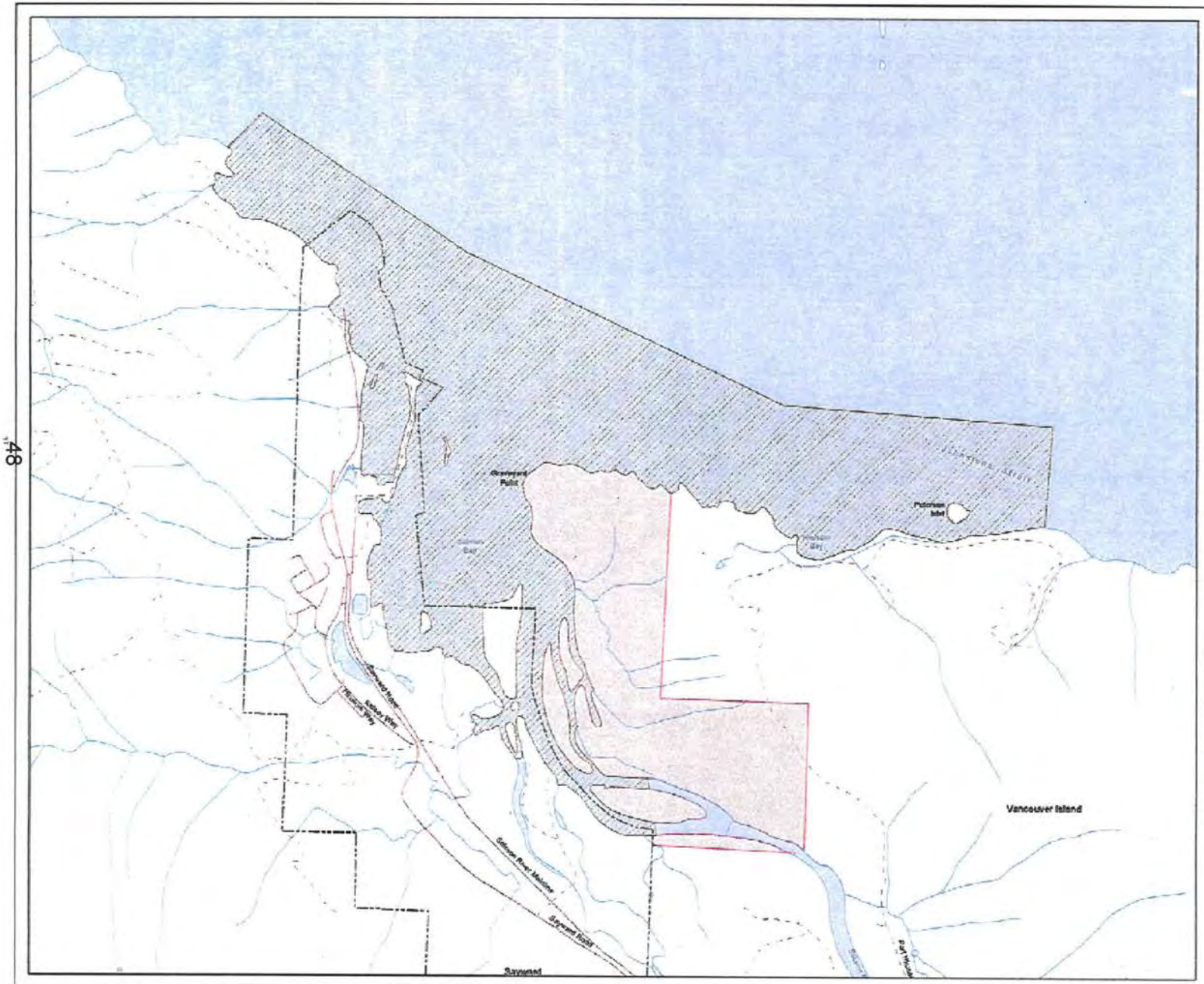
Kilometers

Key Map

Base map derived from 1:20,000 TRIM data
Cadastre derived from Crown Land Registry Services and Land Title Office
Land District:
BCGS Mapsheet No.:
UTM Zone 10

Schedule B:
Subject Area
Comox Bar and Baynes Sound

Schedule C
Map of Subject Area Salmon River



K'ómoks First Nation
Subject Area
Salmon River

Legend

- Subject Areas
- K'ómoks First Nation Indian Reserve
- Provincial Protected Area
- Municipality

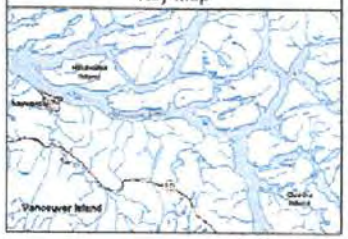
Transportation

- Road (Paved)
- Road (Gravel)
- Railway

THIS MAP IS NOT TO BE USED FOR DEFINING K'ÓMOKS FIRST NATION LAND BOUNDARIES OR FOR THESE LEGAL DESCRIPTIONS. DEFINITIONS OF K'ÓMOKS FIRST NATION LAND

1:15,000
0 200 400
Metres

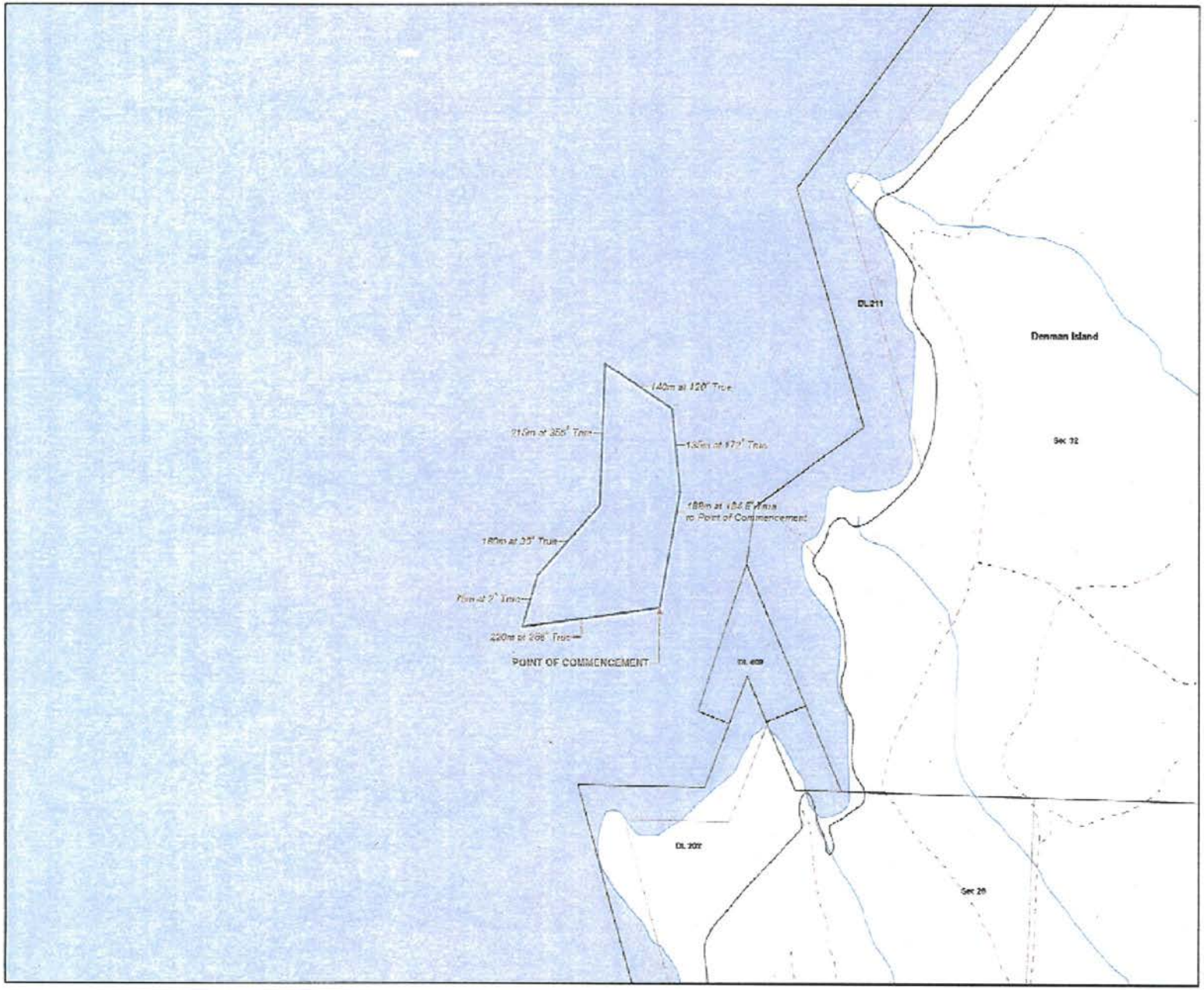
Key Map



Base map derived from 1:20,000 TRIM data
Cadastre derived from Crown Land Registry Services and Land Title Office
Land District:
BCGS Mapsheet No.:
UTM Zone 10

Schedule C:
Subject Area
Salmon River

Schedule D
Map showing proposed Henry Bay tenure site



K'ómoks First Nation
Proposed Tenure Site
Henry Bay

Legend

- Proposed Tenure Site
- K'ómoks First Nation Indian Reserve
- Land Act Reserve 141158
- Provincial Protected Area
- Municipality

Transportation

- Road (Paved)
- Road (Gravel)
- Railway

THIS MAP IS NOT TO BE USED FOR DEFINING K'ÓMOKS FIRST NATION LAND DESCRIPTIONS. DEFINITIONS OF K'ÓMOKS FIRST NATION LAND

1:5,000
0 100 200
Metres

Point of Commencement

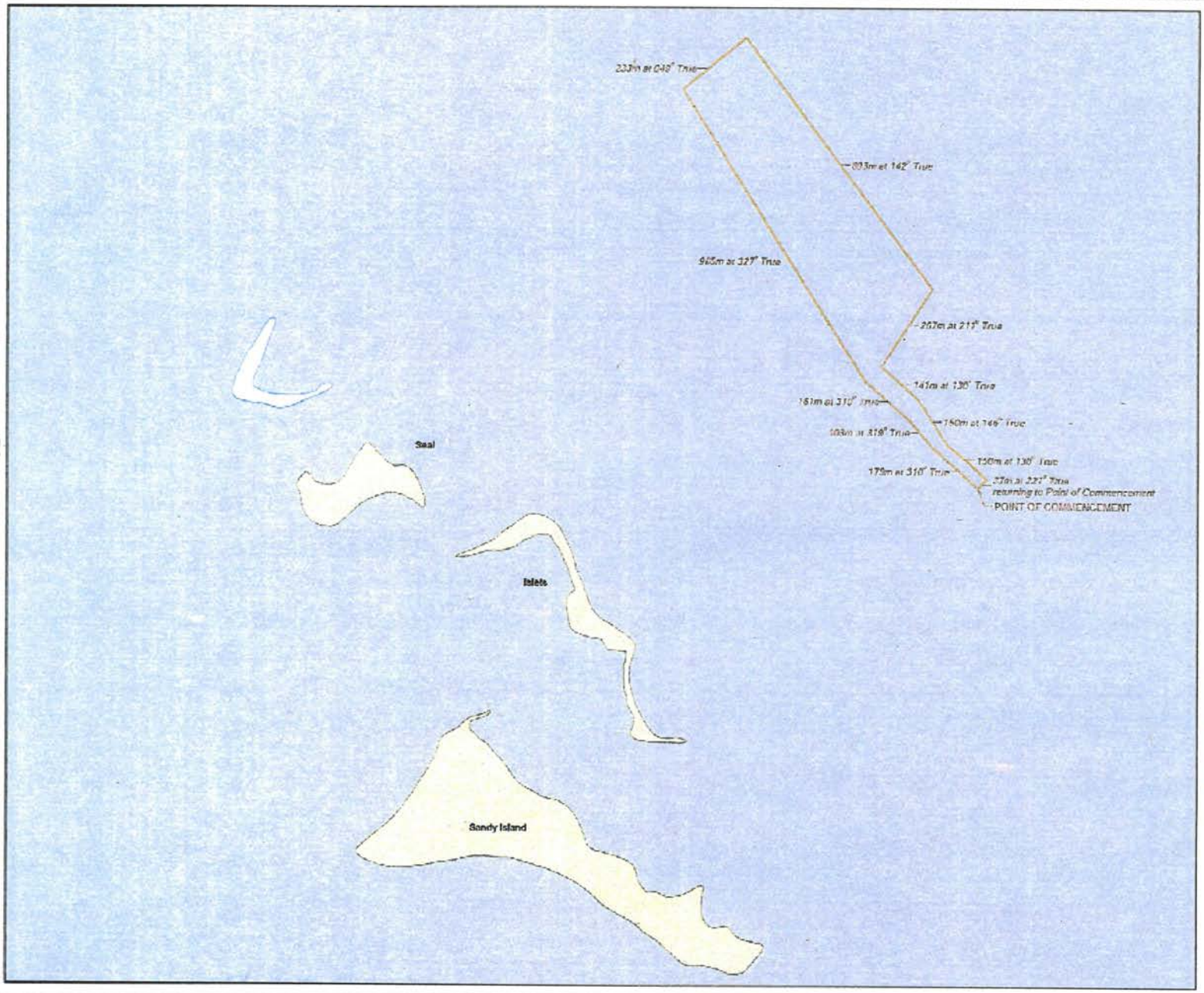
152 metres at 237.3° from the northernmost corner of DL 409, Nanaimo District, thence clockwise

Key Map

Base map derived from 1:20,000 TRIM data
Cadastre derived from Crown Land Registry Services and Land Title Office
Land District:
BCGS Mapsheet No.:
UTM Zone 10

Schedule D:
Proposed Tenure Site
Henry Bay

Schedule E
Map showing proposed Comox Bar tenure site



K'ómoks First Nation
Proposed Tenure Site
Comox Bar

Legend

- Proposed Tenure Site
- K'ómoks First Nation Indian Reserve
- Land Act Reserve 141158
- Provincial Protected Area
- Municipality

Transportation

- Road (Paved)
- Road (Gravel)
- Railway

THIS MAP IS NOT TO BE USED FOR DEFINING K'ÓMOKS FIRST NATION LAND BOUNDARIES OR FOR THEIR LEGAL DESCRIPTIONS. DIRECTIONS OF K'ÓMOKS FIRST NATION LAND

1:8,000
0 100 200
Metres

Point of Commencement

2364 metres at 006° from the northernmost corner of Blk A, DL 211, Nanaimo District, thence clockwise

Key Map

Base map derived from 1:20,000 TRIM data
Cadastre derived from Crown Land Registry Services and Land Title Office
Land District:
BCGS Mapsheet No.:
UTM Zone 10

Schedule E:
Proposed Tenure Site
Comox Bar

52

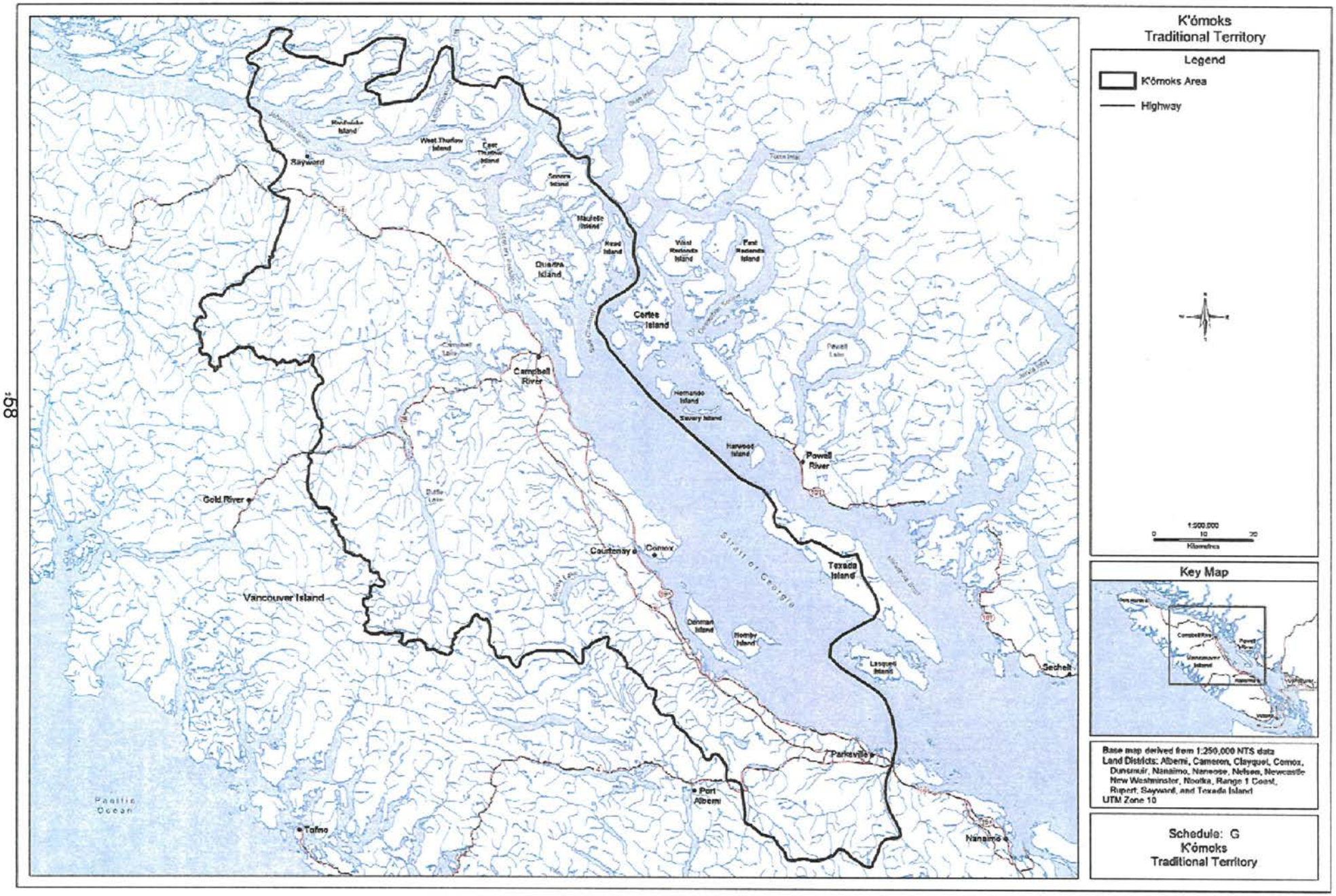
Schedule F
List of Referrals

Facility Type	Ref #	File #	Company/Applicant	Site Name	Tenure Replacement	Amendment Application	New Site Application	Assignment
Finfish	137	1401597	Marine Harvest Canada Inc.	Conville Bay	Y			
Finfish	248	1403859	Marine Harvest Canada Inc.	Conville Point	Y			
Finfish	306	1403267	Mainstream Canada	Venture		Y		
Finfish	377	1404309	Marine Harvest Canada Inc.	Bickley	Y			
Finfish	377	1404309	Marine Harvest Canada Inc.	Bickley		Y		
Finfish	378	1403300	Marine Harvest Canada Inc.	Thurlow Point	Y			
Finfish	380	1401611	Marine Harvest Canada Inc.	Sonora Point	Y			
Finfish	388	1403301	Marine Harvest Canada Inc.	Brougham	Y			
Finfish	547	1401611	Marine Harvest Canada Inc.	Read Island		Y		
Finfish	733	1406292	Marine Harvest Canada Inc.	Cyrus Rocks	Y			
Finfish	769	1405768	Marine Harvest Canada Inc.	Young Pass		Y		
Finfish	790	1405245	Marine Harvest Canada Inc.	Chancellor Channel	Y			
Finfish	1031	1402924	Marine Harvest Canada Inc.	Owen Point	Y			
Finfish	1136	1406628	Marine Harvest Canada Inc.	Shaw Point	Y			
Finfish	1300	1407426	Marine Harvest Canada Inc.	Althorp		Y		
Finfish	1401	1407983	Mainstream Canada	Brent Island		Y		
Finfish	1847	1411142	Grieg Seafood BC Ltd.	Gunner Point			Y	
Finfish	1855	1411169	Grieg Seafood BC Ltd.	Yorke Island			Y	
Shellfish	15	1400483	Paradise Oyster Company Ltd.	S.W. Deep Bay, Baynes Sound		Y		
Shellfish	45	170801	Hesketh, L.J. & M.W. James	Denman Island, Baynes Sound		Y		
Shellfish	46	1401880	Hesketh, L., M. James & R. Vowles	Denman Island, Baynes Sound	Y			
Shellfish	46	1401880	Hesketh, L., M. James & R. Vowles	Denman Island, Baynes Sound		Y		
Shellfish	59	320360	Hesketh, L. & Cape St. James Hldng	Denman Island, Baynes Sound		Y		

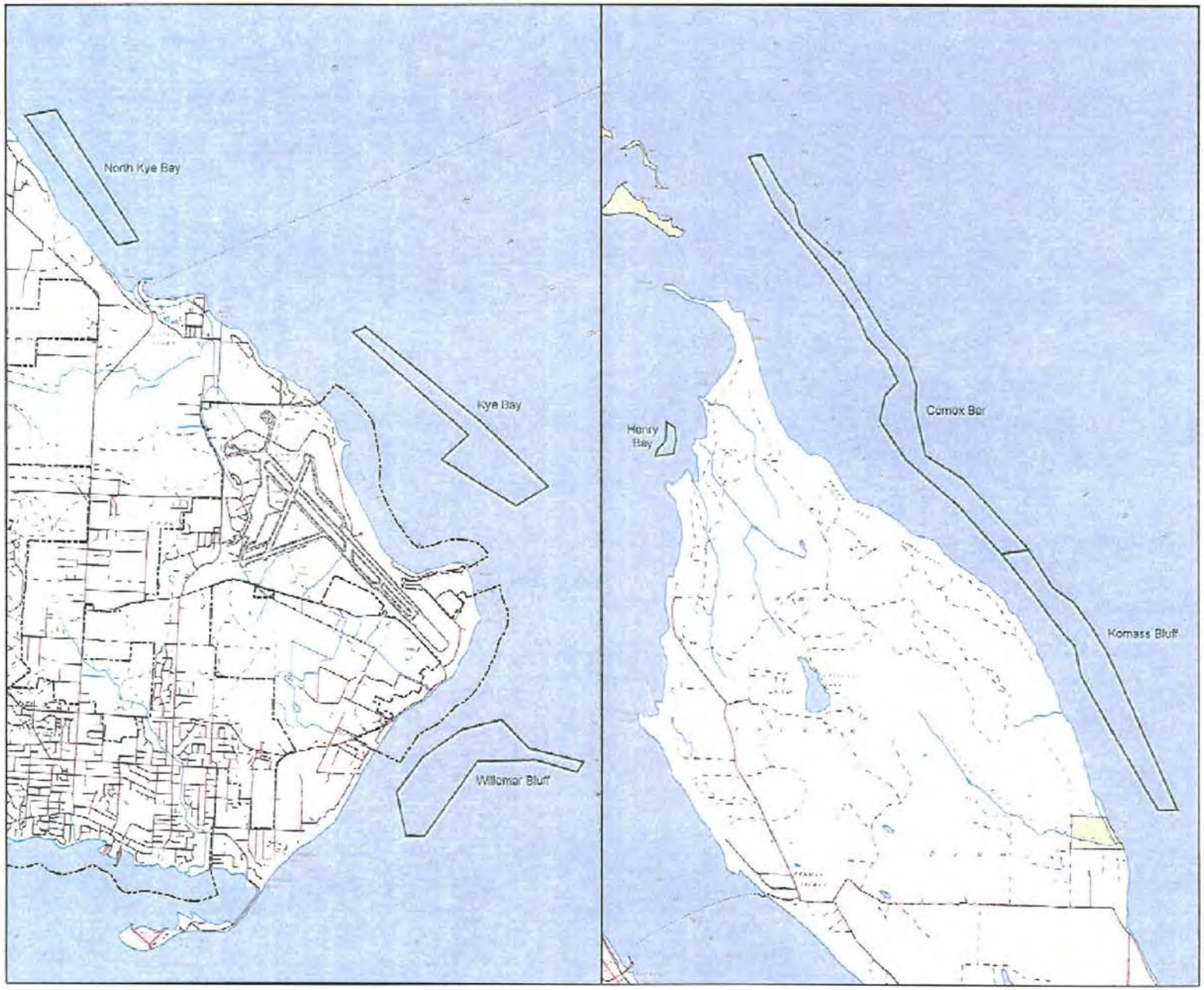
Facility Type	Ref #	File #	Company/Applicant	Site Name	Tenure Replacement	Amendment Application	New Site Application	Assignment
Shellfish	62	356449	Kang, Shao Ping, Ba Mei Xie	Denman Island, Baynes Sound				Y
Shellfish	66	278750	Taylor Shellfish Canada ULC	Mud Bay, Baynes Sound	Y			
Shellfish	76	1403802	D. Richie Holdings Ltd.	Whiterock Passage, Maurelle Island	Y			
Shellfish	87	325943	Hesketh, L. & Cape St. James Hldng	Mud Bay, Baynes Sound		Y		
Shellfish	97	278763	Pacific Northwest Shellfish Co. Ltd	Fanny Bay, Baynes Sound	Y			
Shellfish	120	298458	Sand Dollar Oyster Ltd.	Denman Island, Baynes Sound		Y		
Shellfish	127	1403139	Cook, Warren C.	Deep Bay, Baynes Sound		Y		
Shellfish	127	1403139	Cook, Warren C.	Deep Bay, Baynes Sound		Y		
Shellfish	131	1403060	Tran G. Holdings & Hadden S,G,W & D	Denman Island, Baynes Sound		Y		
Shellfish	132	1404998	Fraser, Margaret	Denman Island, Baynes Sound		Y		
Shellfish	133	185965	Taylor Shellfish Canada ULC	Northwest Shore of Denman Island		Y		
Shellfish	197	1401594	Guy, James	Evans Bay, Read Island		Y		Y
Shellfish	250	1405492	Larson, Bill	Metcalf Bay, Baynes Sound		Y		
Shellfish	272	278761	Ngo, Hien, Le, Thi, Tien, Huong	Fanny Bay, Baynes Sound		Y		
Shellfish	278	262525	Hicks, Dustin J. & Jordan A. Hicks	Denman Island, Baynes Sound	Y	Y		Y
Shellfish	323	1406063	377331 British Columbia Ltd.	N. Denman Point, NW Denman Island		Y		
Shellfish	343	356450	Chui, Keith & Ammy, Jia Tian, Huan Zhang	Denman Island, Baynes Sound		Y		
Shellfish	461	1402446	Ron's Oysters Ltd.	W. Coast Denman Island, Baynes Sound		Y		
Shellfish	519	278753	McLellan, Gordon D. and Pamela A.	Fanny Bay	Y			
Shellfish	521	278767	Mac's Oysters Ltd.	Baynes Sound		Y		
Shellfish	763	319716	Tran, Sinh Thi & Tan Van Tran	Deep Bay, Cook Creek	Y			
Shellfish	784	1405567	Sketchley, C. & T. Brooks	East Thurlow Island, NW of Jackson Point		Y		
Shellfish	840	1404374	Coertze, Tim	West Hornby Island	Y			

Facility Type	Ref #	File #	Company/Applicant	Site Name	Tenure Replacement	Amendment Application	New Site Application	Assignment
Shellfish	962	159019	Taylor Shellfish Canada ULC	Henry Bay, Denman Island	Y			
Shellfish	997	256966	Baker, Discovery Diving, Manatee Hldng	Comox Harbour	Y			
Shellfish	999	260058	Tarnowski, Joe L.	West side of Hornby Island	Y			
Shellfish	1004	1400036	Tarnowski, Joe L.	Denman Point, Denman Island		Y		
Shellfish	1261	1407063	Odyssey Shellfish Ltd.	Deep Bay, Baynes Sound		Y		
Shellfish	1428	1408149	Le, John, T.Le, B.Le, and T. Nguyen	Mud Bay, Baynes Sound		Y		
Shellfish	1826	1411153	Malaspina University, CSR	Deep Bay		Y		
Shellfish	1897	1413888	Venh Sui Hoong	Metcalf Bay, Baynes Sound			Y	
Shellfish	1928	1411206	Westbeach Shellfish Ltd.	S.W. Deep Bay, Baynes Sound			Y	
Shellfish	1975	1411212	Pentlatch Seafoods	North of Denman Island			Y	
Shellfish	1976	1411213	Pentlatch Seafoods	Henry Bay, Denman Island			Y	

Schedule G
KFN Traditional Territory


K'ómoks
Traditional Territory
Legend
K'ómoks Area
Highway
1:500,000
0 10 20
Kilometres
Key Map
Base map derived from 1:250,000 NTS data
Land Districts: Alberni, Cameron, Clayquot, Comox, Dunsmuir, Nanaimo, Nanoose, Nelson, Newcastle New Westminster, Nootka, Range 1 Coast, Rupert, Sayward, and Texada Island
UTM Zone 10
Schedule: G
K'ómoks
Traditional Territory
Rayward
West Thurlow Island
East Thurlow Island
Sonora Island
Maulelle Island
Read Island
Quadra Island
West Redonda Island
East Redonda Island
Cortes Island
Campbell River
Hernando Island
Savary Island
Harwood Island
Powell River
Gold River
Courtenay
Comox
Vancouver Island
Strait of Georgia
Texada Island
Denman Island
Hornby Island
Lasqueti Island
Sechelt
Parksville
Port Alberni
Pacific Ocean
Tofino
Nanaimo

Schedule H
KFN Areas of Interest



K'ómoks First Nation
Areas of Interest

Legend

- Area of Interest
- K'ómoks First Nation Indian Reserve
- Provincial Protected Area
- Municipality

Transportation

- Road (Paved)
- Road (Gravel)
- Railway

THIS MAP IS NOT TO BE USED FOR DEFINING K'ÓMOKS FIRST NATION LAND BOUNDARIES OR FOR THOSE LEGAL TRANSCRIPTIONS IN RESTRICTIONS OF K'ÓMOKS FIRST NATION LAND

1:36,000
0 800 1,600
Meters

Key Map

Base map derived from 1:20,000 TRIM data
Cadastre derived from Crown Land Registry Services and Land Title Office
Land District:
BCGS Mapsheet No.:
UTM Zone 10

Schedule H:
Areas of Interest

Print Date: Feb-13-2014

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

Print Date: Feb-13-2014

Islands Trust

Top Priorities

Denman Island

No.	Description	Activity	Received/Initiated	Responsibility	Target Date	Status
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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: Feb-13-2014

Applications w/ Status - Denman Island Status: Open

Applications

Agricultural Land Reserve

File Number	Applicant Name	Date Received	Purpose
DE-ALR-2013.2	Dean Ellis **Planner:** Linda Prowse	Apr-17-2013	Subdivision in ALR

Planning Status

Status Date: Aug-27-2013

Agricultural Land Commission wrote to applicant asking for further information from applicant and the Islands Trust. Copy of minutes with Denman LTC resolution sent to ALC.

Status Date: Aug-12-2013

Staff report and application sent to Agricultural Land Commission

Status Date: Jul-30-2013

Requested ALC review cheque from Fin. Clerk

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 **Planner:** Marnie Eggen	Mar-21-2011	For barn sited within DP #1: Komas Bluff

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	Feb-19-2013	2 lot subdivision 2016 Northwest Road (I. Brons/Denman Community Land Trust)

Planner: Courtney Simpson

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)	Mar-15-2011	2016 NORTHWEST RD one Residence, garage/workshop, wood shed, pump shed. Joint DP application DE-DP-2011.1

Planner: Rob Milne

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 January 2014

615 Denman	Invoices posted to Month ending January 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	3,028.05	-528.05
65210-615	LTC - Local Exp - APC Meeting Expenses	1,000.00	0.00	1,000.00
65220-615	LTC - Local Exp - Communications	500.00	21.32	478.68
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	4,560.98	1,939.02
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.

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DENMAN ISLAND RIPARIAN AREA REGULATION STREAM IDENTIFICATION –

CHICADEE LAKE, VALENS BROOK, BEADNELL (LITTLE GEORGE) CREEK AND GRAHAM LAKE WATERSHEDS

Prepared for:

Mr. Rob Milne, M.A., RPP, MCIP
Island Planner
Islands Trust Northern Office
700 North Road, Gabriola Island, BC, V0R 1X3

Prepared by:

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Justin Lange, B.Sc., R.P.Bio., A.Sc.T.
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1081 Canada Avenue, Duncan, BC, V9L 1V2

January 21, 2014 Dossier 13.0315

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1.0 INTRODUCTION AND OBJECTIVES

The Riparian Areas Regulation (RAR) is the basis of streamside protection in British Columbia. The RAR was enacted in 2004 under Section 12 of the Fish Protection Act. The RAR is a joint initiative with Fisheries and Oceans Canada (DFO), the Ministry of Environment (MoE) and local government. The RAR uses a science-based approach to help ensure land development activities do not result in a harmful alteration, disruption or destruction (HADD) of fish habitat.

In BC, the definition of fish habitat includes all aquatic and terrestrial areas that affect fish life processes. Fish habitat, therefore, includes the area directly adjacent to a stream (*i.e.*, the riparian area) because it provides food, nutrients, and other functions vital to fish survival.

It is understood that the MoE identified five watersheds on Denman Island with either confirmed fish habitat or potential fish habitat: Chicadee Lake; Graham Lake; Little George Creek; Morrison Marsh; and Valens Brook. Of these watersheds, the Morrison Marsh system had been fully mapped prior to the completion of this project. The spelling for "Chicadee" Lake, which appears incorrect, is consistent with all references to the water body found during the background research phase.

In order to continue the process of becoming compliant with the provincial RAR, Islands Trust contracted Madrone Environmental Services Ltd. (Madrone) to conduct fieldwork to identify RAR-applicable drainages on Denman Island.

The target watersheds included: Beadnell (Little George) Creek; Chicadee Lake; Graham Lake; and Valens Brook. Islands Trust will use the stream-mapping data to develop a process that recognizes focus areas adjacent to applicable streams (e.g. by incorporating Development Permit Areas or implementing other regulations) to ensure the protection of fish habitat.

The primary objective of the project was to map the centre-line of streams with a high level of accuracy (within 1 m – 5 m), to allow Islands Trust to accurately identify RAR applicable watercourses. As per the RAR, any development within the Riparian Assessment Area (RAA) triggers the requirement for an assessment completed by a Qualified Environmental Professional (QEP). The RAA occurs within 30 m of applicable watercourses, and is measured from the Top of Bank (TOB), or in the case of ravines, from the High Water Mark (HWM) to a point that extends either 10 m or 30 m back from the Top of Ravine Bank (TORB), depending on the width of the ravine. The RAA for wetlands is measured from the HWM. The scope of this project did not include locating the TOB, TORB, or HWM, but the linear extent of ravines was identified during the fieldwork.

Under the Detailed Assessment methodology of the RAR, bankfull widths are used to determine the width of the riparian setback area (referred to under the regulation as Streamside Protection and Enhancement Areas – SPEAs). In order to help determine the extent of riparian setbacks and the dimensions of future management areas, bankfull stream width measurements were taken during fieldwork. The objective of this exercise was to supply Islands Trust with additional data to help with the implementation of planning tools to manage riparian areas. As per the RAR, SPEAs are measured as horizontal distances from the HWM.

2.0 METHODOLOGY

2.1 Background Research

Background research was carried out using the Fisheries Information Summary System (FISS) (http://www.env.gov.bc.ca/fish/fiss/index.html) and Habitat Wizard (http://webmaps.gov.bc.ca/imf5/imf.jsp?site=moe_habwizdatabases) to determine whether any documented stream information existed for the study area. Background stream mapping data contained in Schedule E of the Denman Island Official Community Plan (Bylaw 185), which indicates Development Permit Area No. 4 (streams, lakes, and wetlands) was also used as an additional tool in determining the drainage network prior to the completion of fieldwork.

Sensitive Ecosystem Inventory (SEI) maps specific to Denman Island were also assessed to determine the known distribution of wetland and riparian ecosystems on the islands. These maps were accessed through the Islands Trust Denman Island Planning Bylaws webpage (http://www.islandstrust.bc.ca/islands/local-trust-areas/denman/bylaws.aspx). The Denman Conservancy Association webpage (http://www.denmanconservancy.org/) was also accessed to help obtain background information related to the ecology of Denman Island. A provincial Water Allocation Plan relevant to Denman Island (Pitt and Bryden, 1994) was also accessed to gain an insight into the local hydrology.

2.2 Assessment Area

The Beadnell (Little George) Creek, Chicadee Lake, Graham Lake and Valens Brook watersheds comprised the study area, with boundaries of the four focus watersheds provided by Islands Trust (Figures 1 – 2). The main outflow stream from the "Little George" watershed has numerous aliases, including "Little George Creek", "Beadnell Creek" and "Fillongley Creek". Based on local creek naming, this watershed will be referred to as the Beadnell Creek watershed. No assessments were carried out on streams flowing through any other watershed beyond the focus watershed boundaries identified in Figures 1 – 2.

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Figure 1: Beadnell Creek Watershed & Chicadee Lake Watershed Overview

PROJECT:
Denman Island Riparian Area
Stream Mapping

CLIENT:
Islands Trust

MAP SCALE:	MAPPING DATE:
1:25,000	January 3, 2014
DOSSIER NO:	DRAWN BY:
13.0315	Erin Philip

LEGEND

- Watershed Boundary
- Streams
- Not Field Verified

N

Wetlands Observed in Field

- Lakes
- Wetlands
- Seasonally Flooded Fields

Base Symbols

- Roads
- Parks and Protected Areas

0 100 200 400 600 800 1,000 1,200 m.

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Figure 2: Valens Brook Watershed & Graham Lake Watershed Overview

PROJECT:
Denman Island Riparian Area Stream Mapping

CLIENT:
Islands Trust

MAP SCALE:	MAPPING DATE:
1:25,000	January 3, 2014
DOSSIER NO:	DRAWN BY:
13.0315	Erin Philip

LEGEND

- Watershed Boundary
- Streams
- Not Field Verified

N

Wetlands Observed in Field

- Lakes
- Wetlands

Base Symbols

- Roads

2.3 Landowner Contact

Using stream data collated as part of the research phase, field maps were produced with imagery and cadastral information provided by Islands Trust. Where known streams intersected with private properties, landowner contact information for the affected properties was recorded in a data base. Prior to fieldwork occurring, landowners with streams on their property were contacted by telephone. Landowners were advised of the objectives of the mapping project and asked for access permission.

Field maps were modified accordingly to reflect those properties where access was permitted and those where access had been denied. Attempts were made to contact all affected property owners, although there were several instances where landowners were absent during the landowner contact phase. Sections of streams that could not be field verified, based on lack of access permission, have been identified in the map products (Figures 3 – 5). Where field verification was not possible, the location of streams was delineated using imagery and/or contour interpretation (where appropriate).

During fieldwork, further efforts were made to make contact with property owners by knocking on doors and explaining the objectives of the mapping work. This approach was not always practical, based on the spatial extent of some of the properties and/or landowners being absent during the field assessment. Each field crew also carried copies of a letter from Islands Trust explaining the purpose of the project, for distribution to the public during fieldwork.

2.4 Definition of a "Stream" under the RAR

In order to identify applicable drainages in the field, the definition of a "stream" as listed under the provincial RAR, was used as a standard. As per Section 1.4.2 of the RAR Assessment Methodology; (http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/documents/assessment_methods.pdf), a "stream" is defined as follows:

"…any watercourse – natural or human made – that provides fish habitat that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, or has a continuous channel bed including a watercourse that is obscured by overhanging or bridging vegetation or soil mats. A watercourse may not itself be inhabited by fish, but may provide water, food and nutrients to streams that do support fish."

The RAR further identifies a stream as:

"…any of the following that provides fish habitat:

(a) a watercourse, whether it usually contains water or not;

(b) a pond, lake, river, creek, brook;

(c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

If a barrier (either definitive or non-permanent) to the migration of fish occurs on a stream, a watercourse is classified as a "stream" above the barrier if there is potential fish habitat downstream of the barrier. A watercourse can also support resident fish above a barrier if suitable perennial habitat exists. Any part of a watercourse that is not inhabited by fish (e.g. above a barrier with no perennial habitat available) that connects by surface flow to fish habitat is considered a stream under the RAR process.

Watercourses that do not support fish or connect by surface flow to fish habitat (e.g. isolated wetlands) are not considered "streams" under the RAR process. No focused mapping of isolated wetlands was carried out as part of this assessment. It should be noted that wetland ecosystem types still provide benefits to a range of species and provide important functions (e.g. stormwater retention).

Where encountered in the field, constructed ditches were identified. The definitions under the RAR Assessment Methodology were used as a basis in determining whether a watercourse qualified as a stream or ditch. This additional classification was carried out in order to provide Islands Trust with information that could affect the planning phase, as ditches are associated with narrower riparian setbacks under the RAR.

2.5 Field Assessment Procedures

2.5.1 Fieldwork Timing

The field assessment was completed using two field crews (two people per crew), one of which remained on Denman Island for 5 days between November 25th and 29th 2013. Another crew joined the first crew between November 27th and 29th. Personnel involved in fieldwork included Trystan Willmott, B.Sc., A.Sc.T., Kyle Rezansoff, B.Sc., B.I.T., A.Sc.T., Justin Lange, B.Sc., R.P.Bio., A.Sc.T., and Jennifer Morgen, M.Sc., B.I.T., A.Sc.T. All members of the field crew have completed the provincial

RAR-implementation training course and are all Qualified Environmental Professionals (QEPs) under the RAR. All crew members have also completed the Resources Information Standards Committee (RISC) field operator GPS training course.

Stream surveys were carried out during the late fall, during a time of year that typically corresponds with high stream flow conditions. The fall of 2013, however, was unseasonably dry, with very little rain falling during October 2013, which was followed by a drier than average November. As a result, streams on Denman Island appeared to be flowing at a relatively low level for the time of year. Nonetheless, stream flow was adequate to allow the full drainage network to be depicted. Streams were followed to their source, which necessitated the determination of the point where no further evidence of surface flow (including ephemeral flow) could be detected.

2.5.2 Tidal Boundary Considerations

The upper limit of tidal influence is relevant in the implementation of the RAR, as the regulation does not apply to marine or estuarine habitats, as per Page 14 of the RAR assessment methods:

"The Riparian Areas Regulation does not apply to marine or estuarine shorelines; these waters are still considered fish habitat under the Fisheries Act and DFO should be contacted regarding appropriate setback widths to ensure that development activities do not result in a harmful alteration, disruption or destruction of fish habitat. The boundary between freshwater habitats and estuarine habitats is considered the upstream extent of tidal influence."

The stream mapping commenced at the interface between the foreshore riparian vegetation and the intertidal area. Traversing the streams from the upper limit of tidewater allowed for the identification and subsequent mapping of all tributary drainages entering the main-stem.

2.5.3 Collection of Field Data

Concurrently with stream mapping, basic habitat data was also collected along each stream. Data collected included gradient, channel morphology (e.g. riffle-pool/cascade pool or step-pool), extent of riparian vegetation and fish habitat potential. Fish habitat attributes such as cover/security, Large Woody Debris (LWD) and spawning substrate were also noted.

Representative site photographs were taken during each stream traverse (Appendix I). GPS way points were collected to depict the location of features such as barriers to upstream fish movement (e.g. waterfalls). The downstream and upstream boundaries of ravines were also identified with GPS way points.

The edges of wetlands and lakes were not mapped in the field, although their dimensions and attributes were recorded during the assessment. The level of detail shown on the orthophoto coverage, in addition to ground-truthing, allowed for the accurate digitizing of wetland/lake edges on the final maps.

2.5.4 Bankfull Stream Widths and Implementation of the RAR Methodology for Planning Purposes

As part of the field assessment, bankfull widths were taken along each stream traverse in order to provide Islands Trust with more data for planning purposes. As per the RAR methodology (using the "Detailed Assessment"), SPEA dimensions for streams are based on multiplying the average channel width by 3. The "Simple Assessment" is another standard used under the RAR, which derives the SPEA from the depth of potential riparian vegetation, stream periodicity and fish presence/absence. Under the Simple Assessment, the SPEA is measured from the TOB or TORB, and is generally more than 15 m wide, but cannot be greater than 30 m.

Using the Detailed Assessment, the SPEA can never be less than 10 m, with the maximum being 30 m, and is measured as a horizontal distance from the HWM. Bankfull widths taken in the field were used to determine the estimated SPEA dimensions for each stream segment indicated in the map product, using the Detailed Assessment procedure (Figures 3 – 5). Wetlands (including lakes and ponds) are associated with default 15 m – 30 m SPEAs depending on aspect. North facing banks receive a maximum 30 m SPEA, based on the function provided by shade, where-as south, west and east facing banks are associated with 15 m SPEAs.

It should be noted that the SPEAs shown on the maps should only be used as a guide for planning purposes, as the scope of the project did not include the completion of a full detailed RAR assessment on the mapped streams. It should also be noted that the scope of the project did not include the identification of the HWM, TOB, or TORB.

Under the RAR, the 30 m RAA is measured as a horizontal distance from the TOB in the case of a stream, and from the HWM when considering wetlands and lakes. As per the regulation, any developments within the RAA trigger the completion of an

assessment using the RAR methodology. When assessing ravines, the RAA extends from the HWM to a point that is either 10 m or 30 m back from the TORB. If a ravine is less than 60 m wide, the RAA is 30 m from the TORB; ravines that are greater than 60 m wide are associated with a RAA that extends 10 m back from the TORB.

While mapping the streams, the downstream and upstream extent of ravines (as defined in the RAR methodology – http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/documents/assessment_methods.pdf) was identified. The purpose of this exercise was to provide Islands Trust with data for planning purposes, based on the fact that the RAA for ravines extends from the TORB, as discussed in detail above. As stated, the scope of the project did not include the identification of the TORB, or measuring the width of ravines.

2.5.5 GPS Data Collection Parameters

Each field crew collected data using a Trimble GEOXH6000 GPS unit connected to an external receiving antenna. These units have the capability of receiving position data from GPS and GLONASS satellites, which results in increased accuracy. Data collection thresholds were set on the GPS units to fit within the standards required by Islands Trust, including: a minimum elevation angle to satellites of 15° above the horizon; a maximum Horizontal Dilution of Precision (HDOP) of 5; a maximum Position Dilution of Precision (PDOP) of 8; and a minimum number of 4 satellites for position fixes. As per RISC standards, a minimum of 45 individual fixes were taken for static features such as tributary confluences and barriers. During each stream traverse, position fixes were taken every second. Terra Sync software was used for the collection of field data.

2.6 Assessing for Fish Presence or Potential Fish Presence

While background research using databases is useful in determining the general distribution of fish, it cannot be relied upon as a complete inventory. For example, a lack of data for any given stream or watershed cannot be interpreted as indicating that the stream or watershed does not contain fish. Proving non fish presence generally requires rigorous sampling procedures during optimal seasons. Given the fact that the project was focused on identifying fish bearing or potentially fish bearing drainages, no detailed sampling procedure was carried out. Fish sampling, therefore, was beyond the scope of this assessment.

Background research was valuable in this case, however, as it allowed for the known distribution of fish to be identified. Web-based data sources indicated that for the Chicadee Lake, Graham Lake and Beadnell Creek watersheds, either anadromous fish were known to occur in the lower reaches of the watershed outlet streams, or that resident fish occurred in lakes located in the upper reaches. This knowledge of fish distribution meant that all tributaries and branches of tributaries identified while traversing the main-stem of these watersheds were applicable to the RAR (as long as connectivity by surface flow occurred).

No documented fish occurrence was found for the Valens Brook watershed. As Valens Brook had already been included as a "RAR watershed", it was assumed that potential fish habitat existed. For any stream where there is no documented fish occurrence, if no barrier occurs at tidewater, there is the potential that the stream could contain anadromous fish. Even if a stream flows on a seasonal basis, there is still the potential for the occurrence of species that do not require a perennial source of water to complete their life cycle, such as chum salmon (*Oncoryhnchus keta*) and pink salmon (*O. gorbuscha*). If a definitive barrier were to occur at tidewater preventing anadromous fish access, the watershed would not be able to support fish, unless suitable perennial fish habitat exists upstream of the barrier.

In order to provide Islands Trust with more data and help determine the distribution of fish throughout each watershed, barriers to the upstream movement of fish were mapped on streams that provided attributes necessary to support fish. It should be noted, however, that the identification of barriers or high gradient reaches that could potentially limit the distribution of fish through a system was not the main focus of this assessment, as a "stream" under the RAR is not necessarily fish bearing. If a watercourse connects by surface flow to fish habitat, it is considered a "stream" under the RAR. Information regarding the location and description of barriers observed during the fieldwork could be used to help with future enhancement initiatives, such as providing fish passage around barriers, which would increase the length of habitat available for fish.

2.7 Field Assessment Limitations

In some instances, the density of vegetation growing in the watercourse did not make it feasible to follow the drainage with the GPS, as the external antenna would become significantly fouled and/or impeded, leading to poor GPS operating conditions. In these cases, the GPS data collection was paused briefly and resumed where access to the stream channel was possible.

Lack of access permission prevented the complete ground mapping of all streams throughout the target watersheds. Where feasible, orthophoto interpretation was used to determine the location of the stream channel for areas that could not be accessed. The properties that could not be accessed due to lack of access permission have been identified in Figures 3 – 5.

Despite the relatively low flow conditions in the target watersheds, portions of the upper Beadnell Creek main-stem could not be safely waded, based on water depth and the occurrence of deep organic deposits. In such cases, individual points were taken where conditions allowed, or the stream was identified through orthophoto analysis where feasible to do so.

The timing of the project coincided with the spawning period of Pacific salmon. During the fieldwork, therefore, areas which likely contained salmon redds (e.g. pool tail-outs consisting of suitably sized and distributed gravel) were avoided. In some cases, this avoidance of suitable spawning habitat meant that instead of wading the centre line of the stream, diversions were made to prevent disturbance to potential spawning areas. Encountering sensitive salmonid spawning gravel only occurred in the lower reaches of Beadnell Creek.

2.8 GPS Data Management and GPS Limitations

After field assessments were completed, the GPS data was downloaded and post-processed using the closest base station relative to the study area (located in Nanoose). The post-processed data was then viewed in Pathfinder Office software, which is used in conjunction with Trimble GPS units and the Terra Sync field collection software. The data were converted to shapefile format and imported into ArcGIS10, which included the creation of a metadata report of all the data collected, including Dilution of Precision (DoP) values, Horizontal Precision and number of satellites used for each position fix.

Traversing obstacles in the creek, or ducking under overhead obstructions (e.g. vegetation) can lead to temporary loss of locational accuracy, based on the fact that the external antenna is forced out of the optimal position. For example, when climbing over a log, the antenna can either be on a horizontal plane, or pointing towards the ground, leading to poor accuracy. The temporary "zingers" created when the antenna was in a sub optimal position that prevented an accurate location fix were readily identifiable in the data set. Based on the high data logging interval (one

locational fix per second), the correct line of the stream could easily be identified in the data by ignoring the "zingers".

It should be noted that the vast majority of data collected met the required accuracy standards. The GPS units performed well, even under tree canopy, and accuracy in open areas (following post-processing) was generally sub-metre.

Having a high data logging interval allowed for an increased number of points to be taken along each stream traverse, leading to increased accuracy. It should be noted, however, that it was generally not possible to follow the exact centre of the stream, unless the stream was completely open, with a uniform depth and no obstructions. During the stream traverses, there would often be the need to move sideways in the creek bed to avoid an obstruction, sections of deep water, or areas of sensitive spawning gravel (*i.e.*, it was not possible to walk in a smooth line). The high accuracy of the GPS units allowed for these sideways movements to be depicted in the data, often leading to a "jagged" appearance to the mapped stream line. The creek lines were, therefore, smoothed using the Smooth tool in the Advanced Editing Toolbar in ArcGIS. Smoothing the line features created a more natural stream appearance, while not losing the locational accuracy (sideways movements around obstacles were always within the confines of the channel).

3.0 RESULTS

3.1 Documented Fish Distribution Data

The background research phase (Habitat Wizard and FISS 2013) indicated that the Beadnell Creek main-stem is known to support coho salmon (*O. kisutch*). Background research using the Denman Conservancy Association web page (http://www.denmanconservancy.org/) confirmed this occurrence, with an associated video clip of coho salmon entering the creek from the ocean during early November 2013, accessed via the following web link: http://www.youtube.com/watch?v=yxXWAOLCRJQ.

Adult coho salmon were observed in the very lower reaches of Beadnell Creek, in the deep, slow water to the west of the shingle spit close to tidewater during the assessment. It is assumed that these fish were waiting for adequate water flows to access suitable spawning areas upstream. No other coho salmon were observed throughout the mapping of Beadnell Creek, either on redds or holding in deeper pools. No carcasses were observed either, which is likely an indication of the relatively low numbers of fish returning to this system. Several redds were observed

in the lower reaches of the creek, however, especially in riffle habitat units. Resident trout were observed in the lower reaches of the stream during the assessment, which were likely coastal cutthroat trout (*O. clarki clarki*).

Background research also confirmed the occurrence of coho salmon in Birkenhead Creek, which represents the outflow stream from Chicadee Lake. Rainbow trout (*O. mykiss*) and cutthroat trout are listed as occurring in Chicadee Lake, with records of stocking information for rainbow trout between 1958 and 1960 and for coastal cutthroat trout between 1992 and 2006. Fish (resident trout) were observed surface feeding on emerging insects (likely chironomids given the time of year) in Chicadee Lake during the assessment.

Graham Lake was confirmed as providing habitat for coastal cutthroat trout during the background research phase. No documented fish occurrences were noted for Graham Lake Creek, although it is assumed that fish from the lake would also make use of the habitat in the outlet stream.

3.2 Watershed Summaries

Figures 3 – 5 depict the mapped drainage network in each of the target watersheds. All drainages shown on the maps are considered "streams" under the RAR. The maps also indicate the locations of barriers to upstream fish movement and the extent of ravines. The streams have been colour-coded to indicate the estimated SPEA range (as per the Detailed Assessment process under the RAR), which is based on bankfull channel measurements taken in the field.

The following descriptions summarize the characteristics of each watershed outlet stream and associated tributaries. In all cases, streams are described in an upstream direction, starting from the confluence with the ocean. Representative photographs are included in Appendix 1.

3.2.1 Beadnell Creek Watershed – Figure 3

Where it meets the ocean, Beadnell Creek flows out as a shallow stream over a gravel/cobble beach. Immediately upstream of the confluence with the ocean, the stream flows from south to north as a wide, deep "canal" to the west of an elongated shingle spit. This segment of the stream was too deep to allow safe wading during the assessment, and was digitized using orthophoto imagery. Mapping commenced where the depth of the water decreased close to the point where the stream flows in a west-east direction by the Fillongley Park parking area.

The lower reaches of the stream flow through Fillongley Park, where the riparian vegetation consists of uninterrupted mature forest, with western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Douglas-fir (*Pseudotsuga menziesii*) and sitka spruce (*Picea sitchensis*) occurring. This riparian vegetation is providing proper biological function in the form of bank stability, shade, provision of Large Woody Debris (LWD), litter fall and insect drop. The quality of the riparian vegetation equates to good quality fish habitat, with a stable riffle-pool channel morphology, ample spawning gravel, stable LWD, deep pools and undercut banks. Where it flows through the park area, Beadnell Creek is up to 7 m wide (bankfull width).

The stream flows underneath Swan Road via an arch structure, which allows for unimpeded fish passage. The substrate throughout the crossing structure resembles the natural stream bed and the width of the structure is similar to the natural width of the stream channel.

The morphology of the stream remains similar throughout the lower reaches, up to the Tributary 4 confluence. From this point upstream, the substrate becomes interspersed with longer sections of scoured bedrock and the stream width decreases to a maximum of 6 m.

The morphology of Beadnell Creek changes abruptly upstream of the North Central Road crossing, where extensive linear wetlands occur along the length of the stream. Beaver (*Castor canadensis*) activity is extensive throughout these wetlands. In comparison to the broad width of mature riparian vegetation downstream, riparian vegetation adjacent to the wetlands becomes narrower, with younger red alder (*Alnus rubra*), Douglas fir and western redcedar occurring. The wetlands will likely provide perennial habitat for resident fish and also potential rearing habitat for juvenile coho salmon (although spawning habitat for coho salmon is limited to those reaches downstream of the wetlands).

The open water wetlands extend up to a point immediately downstream of the Tributary 5 confluence, where the open water component decreases and the wetlands become characterized by extensive slough sedge (*Carex obnupta*) and rush (*Juncus* sp.) growth throughout seasonally flooded areas. The stream continues as a deep, slow moving system upstream of the wetland complex, where it is up to 2 m wide. The stream appears to have been historically ditched throughout this area, given the lack of natural sinuosity and consistent depth. A swath of slough sedge and reed canary grass (*Phalaris arundinacea*) suggests seasonal inundation for a distance of

approximately 10 m on both sides of the stream. Beyond the slough sedge and reed canary grass, riparian vegetation consists of a fringe of mature coniferous trees, with western redcedar, Douglas-fir and western hemlock occurring. Recent regenerating forest occurs beyond the immediate fringe of mature trees.

A significant wetland complex occurs to the west and south of the Tributary 6 confluence. This area is known as The Swale (as per the nomenclature in Pitt and Bryden, 1994). The area has been historically ditched and modified, with agricultural activities occurring throughout. Based on the extent of the wetland area, orthophoto analysis, along with ground-truthing, were used to identify the main wetland areas and those areas representing seasonally flooded fields used for agriculture.

The fact that both Tributary 6 and Beadnell Creek have been ditched throughout this area and the wetland has been modified to shed water more quickly (by extensive ditching) has likely resulted in significant changes to the original hydrology. Despite the historical modifications, however, the entire area represented by The Swale (including agricultural fields) represents an important feature, as it will retain water over an extensive area, helping to modify flows in the main-stem.

Around the margins of the seasonally flooded fields, dense hardhack (*Spiraea douglasii*) and slough sedge occurs, with isolated occurrences of Pacific crab apple (*Malus fusca*). This typical wetland vegetation increases in extent to the north of the seasonally flooded fields, with an extensive wetland occurring in between the confluence of Tributary 7 to the west and Tributary 8 to the east. Upstream of this wetland complex, Beadnell Creek continues as a linear wetland characterized by slough sedge and Labrador tea (*Ledum groenlandicum*). A short section of the watercourse could be identified as a "channel" in these upper reaches, immediately downstream of a gravel road crossing, where the culvert under the road was concentrating and confining the flow. The watercourse was followed up to an extensive wetland close to the northern-most extent of the watershed. This seasonally inundated wetland consists of a fringe of dense hardhack, with extensive sedge (*Carex* sp.) occurring throughout. This wetland represents the main source of Beadnell Creek.

As with the seasonally flooded areas representing The Swale, the wetland areas in the northern portion of the Beadnell Creek watershed represent extremely important features. These wetlands will supply the system with water, by retaining stormwater during the winter months and releasing it slowly during the drier periods of the year.

No definitive barriers were located along the Beadnell Creek main-stem. The diversity of fish habitat decreases in the upper reaches of the watershed, based on the historical modifications associated with ditching. The most likely segments of the stream to support fish occur in the lower reaches downstream of the Tributary 5 confluence. As per the description in Section 3.1, resident trout (likely coastal cutthroat trout) were observed in the lower reaches of the creek, and adult coho salmon were observed in the creek close to tidewater. Redds, presumably from coho salmon, were also observed in the lower reaches, especially where the stream flows through Fillongley Park.

3.2.1.1 Tributary 1

This watercourse enters Beadnell Creek on the left bank immediately downstream of the Swan Road crossing. At the confluence, the watercourse is approximately 1 m wide (bankfull width) and consists of a gravel substrate. The stream represents marginal fish habitat, but fish could potentially gain access during high flows. The watercourse crosses underneath Swan Road via a closed metal pipe prior to flowing adjacent to the western side of the road as a roadside ditch. From the point where it flows adjacent to Swan Road, the gradient of the watercourse would prevent any fish from moving further upstream. The roadside ditch contained significant flow during the assessment and at the very least supplies the main-stem with water and nutrients.

The watercourse was mapped up to a point where evidence of surface water flow could no longer be identified, close to the height of land. The ditch extends well beyond the mapped extent of the watershed, which indicates the current watershed boundary is incorrect (refer to Figure 3).

3.2.1.2 Tributary 2

Tributary 2 enters the Beadnell Creek main-stem on river-right immediately upstream of the Swan Road crossing. At the confluence, the watercourse drops over a near-vertical bedrock lip, which represents a barrier to fish. As a result, fish do not occur in this watercourse. Tributary 2 contained significant flow during the assessment, and will contribute water and nutrients to the main-stem. The watercourse is less than 1 m wide.

Significant down-cutting and head-cut erosion is occurring on the watercourse close to the top of bank adjacent to Swan Road. The watercourse has cut back to a bedrock face, with undercutting occurring beneath the bedrock. The watercourse continues as a well-defined roadside ditch adjacent to Swan Road, and was mapped up to the

height of land, which (as with Tributary 1) occurs well beyond the mapped extent of the watershed (refer to Figure 3).

3.2.1.3 Tributary 3

This watercourse enters Beadnell Creek on the left bank and is less than 1 m wide. Due to a lack of fish habitat attributes, it is unlikely that Tributary 3 will support fish, even on a seasonal basis. The watercourse comprises of a poorly defined channel, with shallow surface flow over organic deposits. The watercourse was followed up to a moist depression consisting of red alder, salmonberry (*Rubus spectabilis*) and slough sedge.

3.2.1.4 Tributary 4

Tributary 4 enters Beadnell Creek on river-left and is less that 1.5 m wide at the confluence. Fish could gain access to the watercourse during high flows, although fish habitat attributes are generally lacking. A definitive barrier occurs approximately 40 m upstream of the confluence, which consists of a vertical waterfall over a bedrock lip approximately 2 m high. Any fish entering the watercourse from the main-stem would be unable to pass upstream of this barrier.

The majority of Tributary 4 flows adjacent to open fields, where it flows as a straight historically ditched watercourse. A seasonally-inundated wetland consisting of extensive slough sedge occurs close to the head of the watercourse. Upstream of the wetland, the ditch is very poorly defined. The watercourse was followed up to the point where no further evidence of seasonal water flow could be identified.

Tributary 4-1 enters as a poorly defined watercourse over an organic substrate. It was followed up to a moist seepage area to the west of Tributary 4.

3.2.1.5 Tributary 5

This watercourse enters the Beadnell Creek system as a poorly defined seepage area through slough sedge. At the confluence point, Beadnell Creek consists of an extensive seasonally inundated slough sedge wetland. Tributary 5 continues as a very poorly defined watercourse flowing in a shallow swale over grass. The watercourse was partially mapped, with the remainder identified through orthophoto interpretation, based on the landowner's request not to proceed further along the stream. As a result of a lack of fish habitat attributes, it is very unlikely that this watercourse will support fish, even on a seasonal basis. The watercourse was less than 1.5 m wide throughout the mapped section.

3.2.1.6 Tributary 6

This watercourse is a significant tributary to the Beadnell Creek system. During the assessment, the main watercourse and all connecting tributaries contained flowing water. Tributary 6 enters the main-stem on river-right as a high sided, historically ditched watercourse. It appears that the ditch originated as a result of the requirement to drain the area known as The Swale, effectively cutting a path for water to overflow into. The ditched segment continues along the eastern boundary of the seasonally flooded fields (part of The Swale), where it could not be practically followed due to water depth. The route of the ditch was delineated using orthophoto interpretation.

The watercourse was mapped in the field from the point where it joins an open water pond in the south-eastern corner of The Swale. An extensive connected wetland consisting of dense red alder, hard hack and reed canary grass extends to the south-east close to the point where Tributary 6 drains into the open water pond.

From the open water pond, Tributary 6 flows as a deep, slow moving historically-straightened ditch through open fields, where the bankfull width is up to 3 m. Riparian vegetation consists of a fringe of dense shrub and herb growth, consisting of willows (*Salix* sp.), red alder, Himalayan blackberry (*Rubus discolor*) and slough sedge.

Upstream of the modified agricultural area, Tributary 6 flows through a park, where the riparian vegetation consists of continuous mature forest, with western redcedar, western hemlock and Douglas-fir occurring. The stream is stable, with a riffle-pool channel morphology, deep pools, undercut banks and stable LWD. The substrate consists mainly of large gravel and cobbles, with sections of scoured bedrock in slightly higher gradient segments. The stream represents moderate fish habitat potential in this area, based on the in-stream habitat attributes and quality of the surrounding riparian habitat. Downstream of the Tributary 6-1 confluence, the stream is up to 4 m wide (bankfull width) where it flows through the park. Upstream of the Tributary 6-2 confluence, the width decreases to less than 2 m.

The stream was followed up to its confluence with the extensive wetland area referred to as Pickles Swamp (as per the nomenclature in Pitt and Bryden, 1994). At the outlet from the wetland, Tributary 6 is characterized by shallow surface flow through dense slough sedge.

Tributary 6-1 is less than 1 m wide at the confluence with Tributary 6. It is poorly defined and consists of an organic substrate. The watercourse represents very low potential fish habitat, based on a lack of fish habitat attributes. It was followed up to a moist depression consisting of slough sedge and red alder.

Tributary 6-2 is 2.5 m wide at the confluence with Tributary 6 and consists of a well-defined channel with a cobble substrate. The stream steepens immediately downstream of the Pickles Road crossing, with bedrock chutes occurring with gradients up to 10%. Upstream of the Pickles Road crossing, the gradient decreases and the watercourse is characterized by shallow surface flow over slough sedge. The watercourse originates at a beaver dam on the main Pickles Swamp. The stream represents potential fish habitat, especially in the lower gradient reaches downstream of the higher gradient bedrock-controlled segment.

Tributary 6-3 is less than 2 m wide at the confluence with Tributary 6. The substrate consists of a mix of gravel and organics. The watercourse is relatively steep at 4% downstream of the Pickles Road crossing. The stream connects with Pickles Swamp immediately upstream of the Pickles Road crossing, where it consists of shallow surface flow over slough sedge and organic deposits. Based on a lack of habitat diversity, this watercourse represents low fish habitat potential.

As with the wetland ecosystems in the northern portion of the watershed, Pickles Swamp represents a very important feature, as it will help regulate water flow throughout the system.

3.2.1.7 Tributary 7

This watercourse joins the extensive wetland area to the north of the seasonally flooded fields in The Swale. During the assessment, the watercourse contained flowing water in the lower reaches, but was dry in the middle to upper reaches. The lower segments represent a natural stream channel, with a riffle-pool channel morphology and a gravel/cobble substrate. The upper segments have been historically ditched, evidenced by a lack of natural sinuosity and consistent width. Riparian vegetation consists of continuous young coniferous forest, which is providing proper biological function.

Immediately downstream of Chicadee Lake, the watercourse becomes very poorly defined through slough sedge and patches of cattail (*Typha latifolia*). The bankfull width of the stream does not exceed 2.5 m.

The watercourse originates at the eastern edge of Chicadee Lake, where the stream flows through a culvert draining the lake. It should be noted that Tributary 7 flows over the eastern divide of the Chicadee Lake watershed (as it is currently mapped), which represents an inaccuracy in the mapped watershed boundary. During the assessment, the outlet culvert from Chicadee Lake was plugged (likely as a result of beaver activity). As Chicadee Lake provides confirmed habitat for fish, it is possible that fish could enter Tributary 7 from the lake (especially during high flows).

The best potential fish habitat occurs downstream of the ditched segment of the watercourse. Fish were observed in deep pools close to the confluence of the stream with the extensive wetland. Based on appearance and behaviour, these fish were likely three spine sticklebacks (*Gasterosteus aculeatus*).

3.2.1.8 Pickles Swamp Inflow

This watercourse flows into the north western edge of Pickles Swamp. A poorly defined channel (less than 1 m wide) through slough sedge widens into a wetland area downstream of the Chickadee Road crossing. Upstream of the Chickadee Road crossing, the watercourse is extremely poorly defined and likely only flows during heavy rain events (it is an ephemeral watercourse). Evidence of scour over the forest floor was followed up to the height of land close to the edge of the Beadnell Creek watershed. Based on a lack of habitat attributes, this watercourse will not support fish.

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Figure 3: Beadnell Creek Watershed

PROJECT:
Denman Island Riparian Area
Stream Mapping

CLIENT:
Islands Trust

MAP SCALE:	MAPPING DATE:
1:16,000	January 3, 2014
DOSSIER NO:	DRAWN BY:
13.0315	Erin Philip

LEGEND

Watershed Boundary

Dimensions of SPEA, Detailed Assessment
(Based on measurements of bankfull width)

- 2m. (Non Fish-Bearing Ditch)
- 5m. (Potentially Fish-Bearing Ditch)
- 10m.
- 12m.
- 18m.
- 21m.
- Not Field Verified (Due to physical constraints)
- Not Field Verified (Due to lack of access permission)
- Barrier to Upstream Fish Movement
- Obstruction to Upstream Fish Movement
- Ravine Downstream Extent
- Ravine Upstream Extent

Wetlands Observed in Field

- Lakes
- Wetlands
- Seasonally Flooded Fields

Base Symbols

- Roads
- Parcel Boundaries
- Inaccessible property (no access permission)
- Parks and Protected Areas

0 100 200 400 600 800 m.

3.2.2 Chicadee Lake Watershed – Figure 4

3.2.2.1 Birkenhead Creek

In the provincial Water Allocation Plan for Denman and Hornby Islands (Pitt and Bryden, 1994) the Chicadee Lake outflow stream flowing to the north is referred to as Birkenhead Creek. The other main outflow from Chicadee Lake is to the east via Tributary 7 (as described in Section 3.2.1.7), which connects to the Beadnell Creek system. The Pitt and Bryden (1994) report states that water from Chicadee Lake would only flow to the north through Birkenhead Creek if a beaver dam located on the "main" outflow (Tributary 7) raises water levels, allowing water to flow over a low divide and into Birkenhead Creek. During the assessment, it was apparent that the culvert draining Chicadee Lake to the east via Tributary 7 was plugged (likely as a result of beaver activity). This may have contributed to the fact that during the assessment, more water was draining from the lake to the north through Birkenhead Creek as opposed to flowing east via Tributary 7.

At the tidal boundary, Birkenhead Creek flows out onto a sand and cobble beach via a bedrock waterfall. During the assessment, the tide was low, which created a vertical drop of approximately 2.5 m from the top of the waterfall to the creek flowing through the intertidal area. This feature may be passable at high tide for anadromous fish, given the depth of water that would be present at the base of the waterfall, and the burst swimming speed of species such as coho salmon. There are documented occurrences of coho salmon in this creek, which suggests that the waterfall obstacle at tidewater is passable.

The lower reaches of the creek flow through mature coniferous forest, with western redcedar and Douglas-fir occurring. This vegetation is continuous adjacent to both banks of the creek and it is providing proper biological function. The creek is stable, with (predominantly) a riffle-pool channel morphology, with short segments exhibiting cascade flow over scoured bedrock. Deep pools with stable LWD will provide adequate security habitat for fish. The stream is up to 5.5 m wide in the lower reaches downstream of the Northwest Road crossing.

Approximately 200 m downstream of the Northwest Road crossing, the gradient decreases through a depression consisting of extensive slough sedge, where it appears that the stream has been historically ditched, based on the lack of natural sinuosity and consistent width. The natural riffle-pool morphology quickly returns, with a cobble/gravel substrate.

An obstacle to the upstream movement of fish occurs downstream of the North West Road crossing, where the stream flows over a steep (15%) bedrock cascade. Shallow flow over the surface of the bedrock likely represents a velocity barrier at certain flow regimes.

The crossing under Northwest Road is represented by a double closed metal pipe culvert, which also represents a potential obstacle to the passage of fish. There is a slight outlet drop associated with each culvert and neither culvert is embedded with natural substrate. The culverts are also relatively long (approximately 15 m).

Upstream of the Northwest Road crossing, the morphology of Birkenhead Creek and the characteristics of the riparian area change significantly. The stream flows through recent regenerating forest, with very little functioning riparian vegetation remaining. Stumps and trees from blow down criss-cross the stream, which flows as a poorly defined channel through extensive slough sedge. Fish habitat potential decreases in this segment of the stream, due to a lack of habitat diversity. The stream continues up to an extensive open water wetland known as Railway Marsh. The stream has been dammed by beaver activity at the outlet of the marsh, which represents another obstacle to the passage of fish. Railway Marsh has the potential of supporting fish, as it will likely contain adequate water during the summer months.

Birkenhead Creek flows into the north western corner of Railway Marsh, where it is poorly defined over an organic substrate through extensive slough sedge. The stream continues through recent regenerating forest, with minimal functioning riparian vegetation. The stream is generally poorly defined, although slightly higher gradient segments contain alluvial deposits and a riffle-pool channel morphology. Where the channel is defined, the bank full width is less than 2 m.

Close to the outlet of the stream from Chicadee Lake, the stream flows through a swath of slough sedge and common rush (*Juncus effusus*) approximately 20 m – 30 m wide. Water flows throughout this area, but the main stream through the centre of the slough sedge was followed during the assessment. At the outlet of the lake, the stream is well defined and consists of a deep channel, which then narrows through the extensive slough sedge community immediately downstream.

Despite a general lack of fish habitat attributes, fish from Chicadee Lake could gain access into Birkenhead Creek, especially during periods of high flows. Despite the relatively low water levels during the assessment, the length of Birkenhead Creek from the Chicadee Lake outlet to tidewater was flowing. At the very least, the upper

reaches of the stream above Railway Marsh represent potential seasonal habitat for fish coming from the lake. Fish from the lake could also gain access into Railway Marsh, where potential perennial habitat exists. The best fish habitat in Birkenhead Creek occurs downstream of the Northwest Road crossing. Spawning habitat for any salmon entering the system, and for resident fish, is generally limited to the area downstream of Northwest Road.

3.2.2.2 Tributary 1

This watercourse enters the western side of Railway Marsh as a very poorly defined system flowing over an organic substrate through slough sedge. It is less than 1 m wide and contains no habitat attributes for fish. It was followed up to a moist depression consisting of slough sedge, young red alder, lodgepole pine (*Pinus contorta*), western white pine (*Pinus monticola*) and western hemlock.

3.2.2.3 Tributary 2

This watercourse enters the south eastern side of Railway Marsh. It is well defined and contained significant flow during the assessment. At the confluence, the watercourse is less than 1 m wide. The watercourse contains minimal fish habitat attributes, and a definitive barrier to the upstream movement of fish occurs approximately 50 m from the wetland confluence. At this point, a sequence consisting of a bedrock cascade (15% gradient) headed by a 1.25 m vertical drop over a bedrock lip occurs. Immediately upstream of this waterfall, a second waterfall occurs, which is 2 m high. Above the high gradient segment containing the barrier, the stream gradient decreases significantly, and the stream becomes poorly defined through slough sedge and flows over an organic substrate.

The origin of the stream consists of a slough sedge/cattail wetland, which is seasonally inundated with standing water. This wetland occurs beyond the mapped extent of the watershed, which represents an inaccuracy in the current watershed boundary.

3.2.2.4 Tributary 3

This very poorly defined watercourse flows on an ephemeral basis through a shallow draw into the south eastern corner of Railway Marsh. During the assessment, the watercourse was not flowing, nor were there any pockets of standing water. The path of water could be intermittently identified by evidence of scour and occasional accumulations of alluvial deposits.

The watercourse was followed up to an extensive wetland area known locally as Eagle Marsh, which consists mainly of sedge (*Carex* sp). Based on unseasonably low water levels, no water from the wetland was feeding Tributary 3 during the assessment. It is likely that during high flows, water will connect on an ephemeral basis from Eagle Marsh into Tributary 3.

Eagle Marsh extends up into a forested swamp ecosystem consisting of western redcedar, sitka spruce, lodgepole pine and western hemlock. Labrador tea, cattail, sedge and red alder occur in moister pockets, with salal (*Gaultheria shallon*) and deer fern (*Blechnum spicant*) occurring on drier hummocks.

Both Railway Marsh and Eagle Marsh represent important habitat features that provide essential hydrological functions to the watershed. These wet areas will retain stormwater, releasing it slowly during the drier months to help sustain flows in Birkenhead Creek while helping to moderate peak flows in the winter months.

Chicadee Lake also represents a very important source of water for Birkenhead Creek, while also providing confirmed habitat for resident trout. The western arm of Chicadee Lake extends to Lake Road as a slough sedge/hard hack wetland ecosystem. Water is directed underneath Lake Road via a culvert, which was entirely plugged during the assessment. As a result, water will likely flood over the road as the lake levels rise over the winter months.

On the southern side of Lake Road, the moist conditions continue, with open water occurring amongst slough sedge and hard hack. This moist area continues to the south before becoming confined by slopes surrounding the moist depression. The southern extension of this wet area consists of very wet patches consisting of deep organic deposits, with skunk cabbage (*Lysichiton americanum*), slough sedge and red alder. Mature western hemlock and western redcedar occur throughout.

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Figure 4: Chicadee Lake Watershed

PROJECT:
Denman Island Riparian Area
Stream Mapping

CLIENT:
Islands Trust

MAP SCALE:	MAPPING DATE:
1:16,000	January 3, 2014
DOSSIER NO:	DRAWN BY:
13.0315	Erin Philip

LEGEND

Watershed Boundary

Dimensions of SPEA, Detailed Assessment
(Based on measurements of bankfull width)

- 10m.
- 16m.
- Not Field Verified (Due to physical constraints)
- Barriers to Upstream Fish Movement
- Obstructions to Upstream Fish Movement

Wetlands Observed in Field

- Lake
- Wetlands
- Seasonally Flooded Fields

Base Symbols

- Roads
- Parcel Boundaries

0 100 200 400 600 800 m.

3.2.3 Graham Lake Watershed – Figure 5

Where Graham Lake Creek meets the ocean, it flows as a shallow stream over a gravel/cobble beach. At the natural boundary of the intertidal environment, the creek flows over a bedrock chute that is approximately 10 m long. This feature does not represent a barrier to anadromous fish. Mapping of Graham Lake Creek was initiated at the top end of the bedrock chute. Immediately upstream, the creek emerges from a culvert under East Road and flows over bedrock. West of East Road, the creek lacks channel definition and contains deep, slow moving pools due to extensive beaver activity (*i.e.,* dam construction). This area is approximately 15 m wide and 40 m long.

Upstream of the beaver dam, the creek flows through a "Return to Crown" corridor that contains relatively undisturbed riparian vegetation. The mature forested ecosystem is composed mainly of Douglas-fir, western hemlock and western redcedar. The shrub layer is dominated by salmonberry and the herbaceous understory component of the terrestrial ecosystem is composed of sword fern, lady fern (*Athyrium filix-femina*), deer fern, reed canary grass and slough sedge. This riparian vegetation is providing proper biological function in the form of bank stability, shade, provision of Large Woody Debris (LWD), litter fall and insect drop. The diversity and status of the riparian vegetation helps support good quality fish habitat, with a stable riffle-pool channel morphology, ample spawning gravel, stable LWD, deep pools and undercut banks.

It should be noted that portions of the lower reaches may be classified as having cascade-pool channel morphology based on the stream widths and slopes. The lower reaches of Graham Lake Creek range between 2.25 m and 5.8 m (bankfull width).

The stream flows underneath Beaver Drive via a 1400 mm culvert, which allows for unimpeded fish passage. The substrate throughout the crossing structure is composed of organic materials and the width of the structure is similar to the natural width (2 m) of the stream channel.

Approximately 30 m upstream of Beaver Drive, beavers have constructed a dam that is between 3 m and 4 m in height. The dam has created an expansive wetland that contains both marsh and open water habitat. The wetland will likely provide perennial habitat for resident fish that move downstream throughout the system from Graham Lake, but based on the presence of the beaver dam, it is unlikely that anadromous salmonids will enter the wetland. In addition, spawning habitat in the vicinity of the wetland is limited for anadromous fish.

Mapping of Graham Lake Creek resumed at the inlet of the wetland. Upstream of the wetland, the stream flows through an incised channel that is approximately 1 m deep and 2 m wide on average. At the time of the assessment, the stream was shallow and slow moving. Based on the morphology of the creek, it appears as though the channel has been excavated.

At Owl Crescent the creek flows under the road via a 1400 mm culvert, which does not appear to impede upstream fish migration. The morphology of the watercourse upstream of the road crossing (middle reaches) shifts back to a riffle-pool/cascade-pool system with cobbles and gravel dominating the stream bed. The quality and composition of the riparian vegetation throughout the middle reaches is similar to the lower reaches. Ample spawning gravel, stable LWD, deep pools and undercut banks also occur. The middle sections of Graham Lake Creek range between 3 m and 6 m (bankfull width).

Near the upper extent of the middle reaches, the stream flows over a series of bedrock cascades. At low flows it is unlikely that fish can pass upstream through these features, but at higher flows upstream migration is possible as there is a plunge pool located at the bottom of each cascade. Immediately downstream of the Graham Lake outlet, the right bank of the stream has been altered through the placement of rip-rap boulders. This rip-rap has likely been placed as a measure to mitigate erosion of the right bank.

Mapping of Graham Lake and the extensive wetland to the northwest were completed using the orthophoto base map. It should be noted that the portions of the stream that join these two water features, including The Maddigan, could not be mapped, as residential property owners in these areas denied crews access.

Mapping of the upper reaches of Graham Lake Creek resumed upstream of a significant wetland complex. This portion of the creek is typical of a riffle-pool system. The channel is 2 m wide on average and possesses a gradient of approximately 4%. Throughout the upper reaches the stream bed is composed mainly of mixed organics and small gravel; however, cobbles were also noted in some areas. The riparian zone is intact on both the left and right banks of the stream and noted as providing proper biological function. Red alder, western redcedar and western hemlock are the dominant tree species. Albeit sparse, salmonberry comprises the majority of the shrub layer. Herb growth adjacent to the upper reaches is extensive and dominated by slough sedge and sword fern.

As the stream enters agricultural land, there is a shift to organic substrate and the channel narrows to approximately 1 m (bankfull width). The channel also appears to have been excavated as it is straight and possesses a consistent depth of approximately 0.5 m. Riparian vegetation is composed entirely of reed canary grass and slough sedge. Approximately 40 m downstream of the creeks' terminus, a pond has been constructed. The pond is approximately 30 m wide, 50 m long, and 2 m deep. Upstream of the pond, the drainage ends on an adjacent property to the north.

The Graham Lake watershed is known as a fish bearing system, with documented occurrences of coastal cutthroat trout. There are no permanent barriers to prevent fish from dispersing throughout the watershed. Also, there is potential for anadromous fish to migrate up from the ocean into the lower reaches and spawn. The cascade at tidewater likely does not represent a barrier to the upstream migration of adult anadromous fish. Rearing habitat for juvenile salmonids is abundant in the lower reaches of the creek.

3.2.3.1 Tributary 1

Tributary 1 enters Graham Lake Creek on river left, to the north of Owl Crescent. The drainage is approximately 70 m long and flows in a westerly direction immediately adjacent to Owl Crescent. As a result, Tributary 1 is considered a roadside ditch. At the confluence with Graham Lake Creek, the bankfull width of the ditch is approximately 1.0 m and the substrate is composed mainly of organic materials with a minor component of small gravel.

Upstream of the confluence, the gradient of the ditch is approximately 5% and the average bankfull width lessens to 0.5 m. Substrate throughout the middle and upper reaches of the ditch is composed entirely of organic materials. Grasses extend up to the HWM and in some sections to the bed of Tributary 1. The upper reach of Tributary 1 originates at a reed canary grass wetland, the outlet of which flows under Mallard Way via a cement culvert approximately 300 mm in diameter.

Tributary 1 represents an ephemeral drainage and likely only contains water after significant rainfall. Fish habitat attributes are lacking throughout Tributary 1; however, it is contributing water to Graham Lake Creek. During high flows there is the potential for fish to enter Tributary 1, as there is no barrier at the confluence.

3.2.3.2 Tributary 2

This watercourse flows into the northern end of an expansive open water wetland in the northwest portion of the Graham Lake Watershed. Immediately upstream of the confluence with the wetland, Tributary 2 flows adjacent to and over an inactive access road. The lower reach of the watercourse is approximately 30 m long, does not exceed 1 m wide (bankfull width) and has been historically ditched. The substrate is almost entirely composed of organic materials; however, areas with notable scour contain small amounts of gravel.

Upstream of the access road, the middle reach of Tributary 2 is typical of a riffle-pool system. This portion of the stream consists of a low gradient (2% – 3% slope) and has an average bankfull of approximately 1.5 m. The stream bed within this portion of the stream is composed of small gravel and organics. The riparian zone is intact on both the left and right banks of the stream and is providing proper biological function. Red alder, western redcedar and western hemlock are the dominant tree species. Albeit sparse, salmonberry comprises the majority of the shrub layer. Herb growth adjacent to the middle reach of Tributary 2 is extensive and dominated by slough sedge and sword fern.

As the drainage nears the interface between the forested ecosystem and an agricultural field, defining the main channel was not possible as multiple braids flow amongst an area of dense slough sedge and salmonberry. At the northern end of the slough sedge/salmonberry wetland complex the main channel was located and mapped into the agricultural field. Mapping of Tributary 2 was ceased in the southeast portion of the field as the area represents critical habitat for a species of butterfly known as Edith's Checkerspot (*Euphydryas editha taylori*). This particular butterfly is provincially red-listed. Based on conversations with local landowners and stewards, there were concerns that traversing the stream may negatively impact the habitat and potentially kill butterfly larvae. It was noted that the upper-most reach of Tributary 2 represents a ditched system that originates in the northwest portion of the field.

Tributary 2 is an ephemeral drainage and is unlikely to support fish. Given that there is no definitive barrier at the confluence with the open water wetland, however, there is the potential for fish to enter the watercourse during periods of high flow.

3.2.3.3 Tributary 3

This watercourse flows into the upper-most reach of Graham Lake Creek. Tributary 3 is a low gradient (2% – 3%) drainage that is approximately 100 m long that was excavated as a perimeter ditch to drain an agricultural field. The lower reach of Tributary 3 is approximately 40 m long and flows through a young Douglas-fir/western hemlock forest. The channel was excavated to a depth of approximately 0.5 m and is less than 1 m wide (bankfull width).

Upstream of the forested ecosystem, the ditch flows for approximately 60 m along the eastern boundary of the agricultural field, which is farmed for hay. The upper reach of the channel, which was excavated to a depth of approximately 0.3 m, is inundated with grasses. The width of the upper reach does not exceed 0.5 m.

Tributary 3 represents an ephemeral drainage that was dry at the time of the assessment. Based on a lack of habitat attributes, it is unlikely that fish occur in Tributary 3. There is the potential, however, for fish to enter during periods of high flow.

3.2.4 Valens Brook Watershed– Figure 5

Where Valens Brook meets the ocean south of Lacon Road, it flows as a shallow stream over a gravel/cobble beach. Immediately upstream, the creek emerges from a cement box culvert positioned under Lacon Road. The cement box culvert is approximately 2 m wide. Mapping of Valens Brook Creek was initiated immediately upstream of Lacon Road, due to the fact the habitat downstream of the road is considered intertidal.

Upstream of Lacon Road, the stream flows through a series of residential properties in a deep (approximately 1.5 m) incised channel. Throughout the lower reach, the sidewalls of the channel are composed of clay based soils and display evidence of erosion and sloughing. It was noted that the stream bed throughout the lower reaches is composed of both cobbles and clay soil. Over time, it is likely that any alluvium substrate will be buried by the deposition of clay based sediment being transported downstream.

Riparian vegetation is dominated by shrub growth, which grows in a thin strip along the top of the stream bank. The shrub layer is composed mainly of black hawthorn (*Crataegus douglasii*), common snowberry (*Symphoricarpos albus*) and salmonberry. Invasive shrub growth consisting of dense evergreen blackberry (*Rubus laciniatus*) was also documented.

At the northern extent of residential property influence, there is a shift to herbaceous vegetation dominating the riparian vegetation. Common horsetail (*Equisetum arvense*), common rush, reed canary grass and slough sedge extend approximately 25 m from the top of the stream bank. It is likely that these areas dominated by hydrophytes are part of the flood-plain of Valens Brook. The riparian vegetation that exists is providing minimal biological function.

The lower reach of Valens Brook possesses a riffle-pool channel morphology; however, the watercourse lacks spawning gravel, stable LWD, and undercut banks. The lower reaches of Valens Brook range between 1.5 m and 2.5 m (bankfull width). Two tributaries (Tributary 1 and Tributary 2) flow into the lower reaches of Valens Brook (see descriptions below).

Upstream of the residential influence (middle reaches), the creek flows through an area that contains undisturbed riparian vegetation. The mature forested ecosystem is composed mainly of Douglas-fir, western hemlock and western redcedar. The shrub layer is dominated by red huckleberry (*Vaccinium parvifolium*), salmonberry and salal. The herbaceous understory component of the terrestrial ecosystem is composed mainly of sword fern and deer fern. This riparian vegetation is providing proper biological function in the form of bank stability, shade, provision of Large Woody Debris (LWD), litter fall and insect drop. The quality of the riparian vegetation equates to good quality fish habitat. The morphology of the stream remains consistent with that of a riffle-pool system. This portion of the stream contains spawning gravel, stable LWD, deep pools and undercut banks. It should be noted that juvenile salmonids (unknown species) were observed within a deep pool in the middle reaches of the stream during the assessment.

In the middle reaches, the creek is confined within a ravine for approximately 200 m. On river left, the gradient of the bank is between 50% – 60% and on river right the bank is approximately 70% – 80%. Throughout portions of the ravine there is a shift in substrate composition from cobble to bedrock.

Upstream of the ravine to McFarlane Road, Valens Brook meanders through a red alder/sedge complex. The channel is incised and the substrate composition shifts to organics. At McFarlane Road, the creek flows through a cement box culvert that is approximately 2 m wide. This culvert does not impede the upstream migration of fish. Approximately 20 m upstream of McFarlane Road, the stream flows through a mature Douglas-fir/western redcedar forest. Gravel and cobbles dominate the substrate and the morphology of the stream represents a riffle-pool system. The creek ranges in width from 2 m to 4.25 m and has a gradient of approximately 4%.

There is an abundance of LWD upstream of McFarlane Road and several log jams composed of mature trees were observed while traversing the stream. Within this reach, multiple access road crossings exist and culverts have been installed to direct water flow under each of the roads. The culverts that have been installed range in diameter from 600 mm to 1200 mm and it does not appear that any currently present a barrier to upstream fish migration.

Mapping of the stream continued up to the edge of an expansive open water wetland. Beaver activity within the wetland is extensive and multiple dams have been established. Due to a lack of property access upstream of the wetland, an area known as The Maddigan could not be accessed. The orthophoto base map was used to delineate watercourses in this area.

Mapping of Valens Brook resumed in an area northwest of The Maddigan where channel definition could be established. The upper portion of the stream first flows through wetland habitat that is dominated by red alder and slough sedge. The stream channel consists of a low gradient (1% – 2%) and is less than 2 m wide. Adjacent to Triple Rock Road, the stream is directed under an access road via dual 400 mm round plastic culverts. Upstream of the access road, channel definition is lacking as the watercourse is represented by a long, narrow (20 m wide and 150 m long) wetland.

The upper-most reaches of the stream flow through a mature Douglas-fir/western redcedar and western hemlock forest. Throughout this area, the stream regains definition and morphology is consistent with a riffle-pool system. The riparian vegetation is providing proper biological function. Throughout the upper reaches, the stream bed is composed of a mix of organics and small gravel. On average the bankfull width is between 1 m and 1.5 m. Valens Brook was mapped to a point in a seasonally wetted area where the stream channel could no longer be delineated.

Valens Brook is a stream that possesses diverse habitat characteristics and provides suitable habitat for fish. The best habitat for supporting both anadromous and resident salmonids is located in the middle and lower reaches of the creek. It is unknown whether fish can migrate through The Maddigan due to past alterations resulting from farming activities. However, the upper reaches are not suited to fish as habitat diversity is lacking.

According to the Denman and Hornby Islands Water Allocation plan (Pitt and Bryden 1994), Valens Brook is described as being a tributary to the Lacon Lake outlet stream. The Denman Island OCP Schedule E, Map 2, also indicates a tributary from Lacon Lake entering Valens Brook close to the Dusty Road/Lacon Road intersection.

While traversing Valens Brook, no confluence with the Lacon Lake outlet stream was noted. The area where the confluence is shown on the base maps was investigated for any sign of a connection underneath Dusty Road, but no confluence could be found. The property to the East of Dusty Road could not be assessed, as there was no access permission. The current watershed maps provided by Islands Trust do not support the occurrence of the tributary, and it is not clear why Pitt and Bryden (1994) would refer to Valens Brook being a tributary to a higher magnitude system.

During the assessment, a culvert was noted to be draining a watercourse flowing adjacent to the northern side of Lacon Road, in the area identified on the base maps as being the lower reaches of the Lacon Lake outflow. However, the culvert is positioned in a north-south direction and water from this watercourse does not flow into Valens Brook. It is believed that this watercourse is likely the outlet drainage of Lacon Lake, but at no point connects to Valens Brook. Based on the observations made in the field and the watershed boundary that was provided, it is likely that Lacon Lake and its tributaries are contained within a separate watershed.

3.2.4.1 Tributary 1

This watercourse flows into Valens Brook, over a vertical ledge, which at the very least represents an obstacle to the upstream movement of fish. The ledge, which is approximately 1 m high, is on the left bank of Valens Brook. Tributary 1 is approximately 50 m in length and composed of two reaches. The lower reach of Tributary 1 flows over a relatively flat (1% – 2% gradient) "bench-like" area that is composed of common rush, grasses and slough sedge. The stream bed is composed of organic substrate and the average bankfull width is less than 1 m.

The upper reach of Tributary 1 flows through a mature Douglas-fir/western redcedar forest. At the transition to the forested ecosystem it was noted that the gradient of the stream increases to approximately 15% and a greater amount of scour was observed. Within the upper reach of this watercourse there is also a shift to mixed (alluvial and organic) substrate.

Tributary 1 was mapped to an area where the channel could no longer be determined. It was noted that the drainage is seasonal and likely only contains water during the winter months when the soil has reached its holding capacity and is saturated. Overall, Tributary 1 represents low quality fish habitat as it will not contain water for long enough to support any phase of a fish's lifecycle.

3.2.4.2 Tributary 2

Tributary 2 is a short watercourse (approximately 30 m in length) that enters Valens Brook on river left. At the confluence the watercourse flows over a lip that is approximately 0.75 m in height. The stream channel consists of a low gradient (1% – 2%) and at its widest point is 0.5 m wide (bankfull width). The stream is inconspicuous and flows through an area that is composed of common rush and slough sedge. The substrate throughout the channel is composed of organics and clay-based soil.

Tributary 2 originates from two constructed ponds, both of which are approximately 5 m wide and 8 m long. The vegetation composition (extensive slough sedge growth) adjacent to the ponds indicates an abundance of ground water, which likely maintains water levels within the ponds.

It is unlikely that Tributary 2 supports fish, as habitat attributes are lacking. However, during high flows there is the potential for fish to enter the stream.

3.2.4.3 Tributary 3

This watercourse flows into the middle reach of Valens Brooks on river right. At the confluence, the gradient of Tributary 3 is 4% and the stream is approximately 1 m wide (bankfull width). Immediately upstream of the confluence the gradient of the stream increases to 20% and the channel narrows to an average bankfull width of 0.5 m. Over the length of Tributary 3, the stream bed is composed of mixed organics and small gravel. Adjacent to either side of the stream, riparian vegetation remains undisturbed and is dominated by Douglas-fir, western redcedar, red alder, salmonberry and sword fern.

The source of water for Tributary 3 is approximately 40 m upstream of Valens Brook and represents an expansive sedge (*Carex* sp.) wetland that is approximately 30 m wide and 100 m long. The wetland is confined to the north, west and south by intact forest composed mainly of red alder. Understory vegetation is dominated by salmonberry and sword fern. Although the watercourse connects to Valens Brook by surface flow, it is unlikely that fish occur, as suitable spawning, rearing and refuge habitat is non-existent.

3.2.4.4 Tributary 4

This stream flows into Valens Brook on river right. The lower reach of the stream ranges between 1 m and 1.5 m in width (bankfull) and has a gradient of 5%. The lower reach of the watercourse is consistent with that of a riffle-pool system and the

stream bed is composed entirely of organic materials. Riparian vegetation adjacent to both river left and right is intact and providing biological function in the form of insect drop/nutrient input, provision of LWD and shade. The tree layer is dominated by Douglas-fir, red alder and western redcedar. Understory shrub growth is composed mainly of dull Oregon-grape (*Mahonia nervosa*) and salal. Sword fern comprises the majority of the herbaceous growth adjacent to the lower reaches of the stream.

Within the middle reach of Tributary 4, channel definition is lacking. Substrate throughout the middle reach consists entirely of organics and water was noted as flowing under the root systems of trees. An abundance of LWD was also observed throughout the middle reach of Tributary 4.

The channel morphology of the upper reach shifts back to a riffle-pool system. The channel widens to an average bankfull width of 3.25 m and the gradient increases to approximately 4%. Cobbles and organic materials make up the substrate composition of the stream bed. Approximately 20 m from Triple Rock Road, Tributary 4 flows over a vertical ledge that is 1 m in height. At Triple Rock Road the stream flows through a 400 mm diameter culvert. Immediately upstream of the road, the source of the drainage is a slough sedge/red alder wetland that is approximately 20 m wide and 100 m long.

Generally, Tributary 4 possesses low quality fish habitat. Spawning habitat is lacking due to the abundance of organic substrate, but the presence of pool habitat units may provide rearing and refuge habitat for juvenile fish.

3.2.4.5 Tributary 5

Tributary 5 is a short (approximately 30 m long) ephemeral drainage. This watercourse flows into Tributary 4 on river right. Tributary 5 is a steep drainage with a gradient of approximately 30% – 35%. The drainage likely only contains water during periods of heavy rainfall, with the source being run-off from Triple Rock Road. Substrate throughout the channel is composed entirely of organics and the bankfull width is less than 0.5 m. It is unlikely that fish occur in this watercourse, as it only contains water for short periods of time; fish habitat diversity is also lacking.

MADRONE environmental services ltd

Figure 5: Valens Brook Watershed & Graham Lake Watershed

PROJECT:
Denman Island Riparian Area Stream Mapping

CLIENT:
Islands Trust

MAP SCALE:	MAPPING DATE:
1:16,500	January 3, 2014
DOSSIER NO:	DRAWN BY:
13.0315	Erin Philip

LEGEND

Watershed Boundary

Dimensions of SPEA, Detailed Assessment
(Based on measurements of bankfull width)

- 5m. (Potentially Fish-Bearing Ditch)
- 10m.
- 12m.
- 15m.
- Not Field Verified (Due to physical constraints)
- Not Field Verified (Due to lack of access permission)
- Ravine Downstream Extent
- Ravine Upstream Extent

Wetlands Observed in Field

- Lakes
- Wetlands

Base Symbols

- Roads
- Parcel Boundaries
- Inaccessible property (no access permission)

0 100 200 400 600 800 m.

4.0 DISCUSSION AND RECOMMENDATIONS

Stream mapping performed in four target watersheds on Denman Island resulted in the identification of 28 km of streams that are applicable to the provincial RAR process. Connected wetlands, lakes and ponds located along each mapped stream are also applicable to the RAR.

Based on background research using appropriate databases, salmonid fish were documented as occurring in three of the four target watersheds (Beadnell, Chicadee and Graham Lake). Potential fish habitat was also located in the lower and middle reaches of Valens Brook. Due to the RAR methodology, any watercourses that connect by surface flow to fish bearing or potentially fish bearing systems, including modified watercourses and ditches, are subject to the regulation. A stream may not itself be inhabited by fish, but if it has a reasonable connection by surface flow to fish habitat, it is considered a stream under the RAR.

The best fish habitat on Denman Island was found throughout the lower reaches of Beadnell Creek, where both resident trout and coho salmon were observed. It appears that this habitat will be protected in perpetuity, as this area flows through Fillongley Park (provincial park designation).

All streams were mapped for inclusion into appropriate bylaws to be set up by Islands Trust to allow conformance with the provincial RAR process. The edges of lakes, wetlands and ponds located along the stream traverses were not mapped in the field as part of the assessment process, but the edges were delineated using field observations and orthophoto interpretation. It is important that these features are included as RAR-applicable water bodies.

Background research was valuable in that it allowed the known distribution of streams to be determined and provided a foundation to work from. Schedule E of the Denman Island Official Community Plan (Bylaw 185), which indicates Development Permit Area No. 4 (streams, lakes and wetlands) was particularly useful, as was the provincial Water Allocation Plan relevant to Denman Island (Pitt and Bryden, 1994).While all efforts were made to establish a complete representation of the stream network in each of the target watersheds using background research, coupled with field assessments and discussions with land owners during the fieldwork, it is possible that additional streams occur that are applicable to the RAR. For example, determining the stream network was challenging in some cases, based on lack of access permission.

The scope of the project was limited to the four remaining target watersheds identified by the MoE as being applicable to the RAR, which assumes that no fish occur in any other watershed. It should be noted, however, that while walking along the beach to access the Chicadee Lake outflow stream (Birkenhead Creek), a stream was observed at tidewater, which appeared to provide potential fish habitat. This stream flows from south to north in a narrow watershed to the west of the Chicadee Lake watershed. The provincial Water Allocation Plan (Pitt and Bryden, 1994) identifies this stream as "Gladstone Creek". Further research may be required to confirm that this watershed, or any others on Denman Island, do not contain potential fish habitat. Communication with local stewardship groups (e.g. the Denman Conservancy Association) would be valuable in this regard to check that all potential fish bearing watersheds have been included. In several instances, the watershed boundaries provided were inaccurate, as indicated in the watershed summaries and associated figures.

As part of the project scope, bankfull widths were measured on each applicable stream to help determine the width of the SPEA under the RAR methodology (using the detailed assessment), as displayed on the stream maps. This information can be used by Islands Trust as a planning tool to help implement Development Permit Areas (DPAs) that "meet or beat" the RAR. If this option is chosen, it is important to note that any bylaw that is set up would need to account for the fact that under the detailed RAR assessment methodology, a suite of measures are considered that help ensure the integrity of the SPEA during development activities. These measures include, but are not limited to: slope stability; erosion and sediment control; encroachment; management of danger trees; and windthrow.

One potential planning opportunity would be to add depth to the edge of the minimum SPEA DPA boundary (*i.e.,* increasing the DPA beyond the widths that have been provided in this project). This would help ensure the integrity of the setback area is maintained in the absence of detailed assessment measures. Landowners could then be given the opportunity to have a detailed assessment completed by a QEP if they were not prepared to accept the default bylaw riparian setback. If the default "meet or beat" setback option is accepted by a landowner, a site visit by a planner, building inspector or QEP may be required to ensure that the setback is being maintained and is being measured from the correct location. If a landowner chooses to complete a detailed assessment by a QEP, the precise location of the HWM and SPEA would be identified as part of the reporting procedure.

Setting up permanent riparian setbacks that would "meet or beat" the RAR would also need to take into account the fact that numerous riparian areas are currently

developed, or encroached upon. Landowners should be encouraged to enhance riparian areas, especially adjacent to sensitive areas, or areas that are experiencing erosion due to the removal of riparian vegetation.

It is important that landowners are aware of the benefits of riparian areas. Landowners adjacent to streams often do not realize the financial incentives of maintaining a functioning riparian zone. For example, intact riparian vegetation can help prevent lateral bank movement, thus protecting valuable property from erosion. Potential hazards associated with flooding can also be ameliorated as a result of maintaining a functioning riparian area.

The SPEA dimension data could also be used to educate the public about the extent of riparian setbacks should 30 m DPAs be set up, which represents the maximum extent of the Riparian Assessment Area (RAA). Any new development proposed within any RAA would trigger the completion of a detailed assessment under the RAR methodology. Based on the low magnitude of the mapped streams on Denman Island, the majority of SPEAs under the detailed assessment would be 10 m.

Under the detailed assessment, wetlands and lakes that either provide fish habitat or connect by surface flow to fish habitat receive either a 30 m or 15 m setback, depending on aspect. Southern edges of wetlands and lakes are associated with 30 m setbacks, based on the function of shade, where-as north, west and east banks are associated with 15 m setbacks. In some cases where smaller ponds and wetlands are located on a main stream channel, a QEP may decide that the feature is part of the lotic system as opposed to being a separate lentic system. In such cases, the pond or wetland may be associated with the SPEA derived for the stream under the detailed assessment, as opposed to the default 15 m or 30 m setbacks associated with ponds and wetlands.

Four ditches were identified during the assessment – Tributaries 1 and 2 in the Beadnell Creek watershed and Tributaries 1 and 3 in the Graham Lake watershed. These ditches represent potential fish habitat, or connect to fish bearing, or potentially fish bearing watercourses. As a result, the ditches are associated with SPEAs under the RAR. The identified ditches are constructed waterways, with no significant headwaters or springs. All but one of the ditches (Tributary 2 in the Beadnell Creek watershed) consist of potential fish habitat. Tributary 2 (Beadnell Creek watershed) does not represent potential fish habitat, as there is a definitive barrier to the upstream movement of fish at its confluence with Beadnell Creek. No perennial habitat exists upstream of this barrier to support resident fish.

Under the RAR, fish bearing ditches can receive SPEAs up to a maximum width of 10 m (based on ditch width). The SPEAs indicated on the maps in this report are based on the average width of the ditches and the SPEA dimensions shown in the RAR Assessment Methodology for fish-bearing and non-fish bearing ditches. Based on the fact that ditches are associated with narrower SPEAs, the DPA that is implemented by Islands Trust could be less than the DPA associated with watercourses that are not classified as ditches.

The scope of the project involved the identification of stream centre lines. Under the RAR methodology, the RAA is measured as a horizontal distance from the TOB or TORB, where-as the SPEA is measured from the HWM. In the case of wetlands, lakes and ponds, the RAA and SPEA are measured as a horizontal distance from the HWM. During the fieldwork, the lateral extent of ravines was identified, in order to identify those sections of streams where the RAA (or DPA) would extend back from the TORB. In the case of wide ravines that exceed a width of 60 m, the RAA extends from the HWM to a point that is 10 m back from the TORB; ravines that are less than 60 m wide are associated with a RAA that extends 30 m beyond the TORB from the HWM. The scope of the project did not include surveying the width of ravines.

A means of addressing the issue of recognizing the TOB, TORB, or HWM at the bylaw implementation stage would be to ensure that any proposed development that is close to a point that is 30 m from the stream would trigger site specific confirmation. On extensive acreages, it would be a relatively straightforward task to determine whether the proposed development occurs within a DPA. Smaller properties may require a site visit by a building inspector, planner or QEP to determine whether the proposed development occurs within a DPA.

Due to the expanse of agricultural land on Denman Island, numerous streams and wetlands were mapped on land designated under the ALR (Agricultural Land Reserve). Farming activities are not subject to the RAR, but are subject to the federal Fisheries Act. The RAR does apply, however, to non-farming activities on ALR land. Streams were also mapped through parks and protected areas, where the implementation of DPAs based on the RAR process may not be necessary

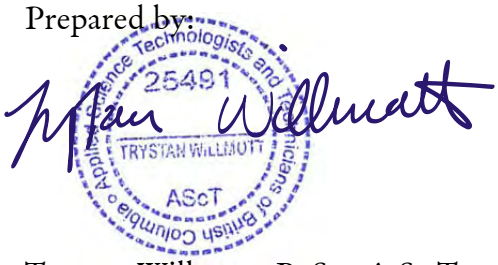
The RAR does not apply to existing land uses and structures, as these are considered legally non-conforming. Any new developments inside a previously developed SPEA or RAA would trigger the RAR, and the new development would be subject to the RAR. Enhancement of riparian areas using appropriate techniques (e.g. replanting

with native vegetation to stabilize banks) is encouraged in previously impacted riparian areas.

As part of the RAR bylaw planning and implementation phase, Islands Trust should liaise with the provincial government. Liaison with appropriate government personnel will help ensure that the bylaws that are enacted meet or beat the standards of the RAR.

If you have any questions or comments about the mapping project, please do not hesitate in contacting the undersigned.

Prepared by:



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5.0 REFERENCES

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APPENDIX I – PHOTOS

Beadnell Creek Watershed

Beadnell Creek

Beadnell Creek at the confluence with the ocean.

Looking upstream towards the "canal" segment of Beadnell Creek to the west of the shingle spit.

Looking upstream along the "canal" section of Beadnell Creek to the west of the shingle spit. Adult coho salmon were observed in this section of the creek during the assessment.

Sign indicating the significance of Beadnell Creek where it flows through Fillongley Park.

Looking upstream along Beadnell Creek where it flows through mature forest associated with Fillongley Park.

Veteran Douglas-fir occurring in the riparian zone of the lower reaches of Beadnell Creek where it flows through Fillongley Park.

Excellent example of a fish-friendly crossing structure where Beadnell Creek passes under Swan Road.

Looking downstream along Beadnell Creek showing typical characteristics immediately upstream of Swan Road.

Open water wetlands on the middle reaches of Beadnell Creek upstream of the Central Road crossing (looking upstream).

Extensive seasonally-inundated wetland on the Beadnell Creek system close to the Tributary 5 confluence (looking upstream).

Above and below: historically ditched, straight segment of Beadnell Creek flowing through seasonally-inundated slough sedge and reed canary grass downstream of The Swale.

Looking upstream along Beadnell Creek immediately upstream of the Tributary 6 confluence.

Looking south over the extensive wetland area known as The Swale.

Linear wetland area close to the headwaters of Beadnell Creek.

Looking north west over the extensive wetland at the northern most extent of the Beadnell Creek watershed.

Tributary 1

Looking upstream along Tributary 1 close to the confluence with Beadnell Creek.

Looking upstream along Tributary 1 where it flows as a roadside ditch adjacent to Swan Road.

Tributary 2

Steep inflow over bedrock into Beadnell Creek represents a barrier to the upstream movement of fish on Tributary 2.

Significant head-cut erosion back to a bedrock lip and associated undercutting on Tributary 2 close to Swan Road.

Looking upstream along Tributary 2 where it flows as a roadside ditch adjacent to Swan Road.

Tributary 3

Poorly defined characteristics of Tributary 3 close to the confluence with Beadnell Creek.

Tributary 4

Looking upstream along Tributary 4 from the confluence with Beadnell Creek.

Vertical drop over bedrock represents a barrier to the upstream movement of fish on Tributary 4.

Looking upstream along Tributary 4 where it flows as a constructed ditch through open fields.

Seasonally-inundated wetland close to the headwaters of Tributary 4.

Tributary 5

Looking downstream along Tributary 5 where it flows as a poorly defined watercourse through a grassy swale.

Tributary 6

Looking upstream along Tributary 6 close to the confluence with Beadnell Creek.

Steep banks and deep water indicate the ditched nature of Tributary 6 immediately downstream of The Swale.

Outflow of Tributary 6 from The Swale.

Looking west over The Swale, showing the seasonally-inundated fields. Tributary 6 has been ditched along the eastern edge of the wet area (ditch line and flow direction highlighted in blue).

Looking downstream over an open water pond drained by the ditched portion of Tributary 6.

Looking upstream along Tributary 6 where it flows through agricultural land immediately upstream of the open water pond.

Looking downstream along Tributary 6 where it flows through park land upstream of The Swale.

Outlet of Tributary 6 from the eastern edge of Pickles Swamp.

Tributary 6-1

Looking upstream along Tributary 6-1 close to the confluence with Tributary 6.

Tributary 6-2

Looking downstream along Tributary 6-2 close to the confluence with Tributary 6.

Looking upstream on Tributary 6-2 along a bedrock cascade downstream of the Pickles Road crossing.

Outflow of Tributary 6-2 from a beaver dam on the eastern edge of Pickles Swamp.

Looking west over Pickles Swamp from the outlet of Tributary 6-2.

Tributary 6-3

Looking upstream along Tributary 6-3 close to the confluence with Tributary 6.

Tributary 7

Looking upstream along Tributary 7 from its confluence with the extensive wetland complex represented by The Swale.

Looking east over The Swale from the confluence of Tributary 7.

Looking downstream along the relatively well defined lower reaches of Tributary 7.

Looking downstream along the dry middle reaches of Tributary 7.

Looking upstream through the plugged outlet culvert from Chicadee Lake representing the origin of Tributary 7.

Inlet end of culvert draining Chicadee Lake and into Tributary 7.

Pickles Swamp

Looking south east over Pickles Swamp from the Pickles Road bridge crossing.

Looking north west over Pickles Swamp from the Pickles Road bridge crossing.

Chicadee Lake Watershed

Birkenhead Creek

Looking downstream along Birkenhead Creek towards its confluence with the ocean.

Bedrock waterfall at tidewater representing an obstacle to fish passage on Birkenhead Creek.

Looking downstream from the top of the waterfall towards the intertidal area on Birkenhead Creek.

Looking downstream along Birkenhead Creek where it flows through continuous forest downstream of Northwest Road.

Cascade over scoured bedrock representing an obstacle to upstream fish passage downstream of the Northwest Road crossing.

Double culvert under Northwest Road represents another obstacle to the upstream movement of fish on Birkenhead Creek.

Looking upstream along Birkenhead Creek where it flows through recent regenerating forest immediately upstream of Northwest Road. Note change in morphology to shallow flow through hydrophytes, lack of riparian vegetation and blow down over the creek.

Beaver dam representing the north western extent of Railway Marsh represents another obstacle to fish passage on the Birkenhead Creek system.

Looking upstream (south east) over Railway Marsh from the beaver dam outlet.

Looking upstream along Birkenhead Creek where it flows underneath a walking trail close to its confluence with Railway Marsh.

Typical poorly-defined nature of Birkenhead Creek where it flows through extensive slough sedge immediately upstream of the trail crossing pictured above.

Upstream and downstream: looking downstream along Birkenhead Creek showing typical characteristics in the middle reaches downstream of Chicadee Lake.

Looking downstream along Birkenhead Creek where it flows through extensive slough sedge and rush downstream of Chicadee Lake.

Above and below: looking downstream along Birkenhead Creek where it is more defined close to where it flows out of Chicadee Lake.

Tributary 1

Looking upstream along Tributary 1 close to the confluence with Railway Marsh.

Tributary 2

Looking upstream along Tributary 2 from the confluence with Railway Marsh.

First waterfall barrier to upstream fish movement over bedrock located on Tributary 2.

Looking south east over the wetland located at the head of Tributary 2.

Tributary 3

Looking upstream along the Tributary 3 close to its confluence with Railway Marsh.

Looking west over Eagle Marsh, which feeds Tributary 3 when it overflows.

Typical conditions of the treed swamp extending to the south east of Eagle Marsh.

Chicadee Lake

Looking west over Chicadee Lake towards the wetland in the distance extending from the western corner of the lake. The disturbance on the surface of the water in the foreground indicates surface-feeding trout.

Looking east over the wetland that extends from the south western corner of Chicadee Lake from Lake Road.

Looking towards the point where the wetland extending from the southwestern corner of Chicadee Lake enters a culvert (plugged during the assessment) underneath Lake Road.

Looking south from Lake Road along the continuation of the wetland that extends from the south western corner of Chicadee Lake.

Typical moist conditions in the collection area to the south of Lake Road indicating the southern limit of the wetland that extends from the south western corner of Chicadee Lake.

Graham Lake Watershed

Looking down at the confluence of Graham Lake Creek and the ocean.

Looking west at Graham Lake Creek and the outlet of the culvert directing the creek under East Road.

Looking upstream (west) from East Road at a portion of the creek that has flooded its banks due to beaver activity.

An example of the pool habitat units of Graham Lake Creek. Note the presence of LWD, which increases the diversity of the habitat and provides refuge for fish.

Looking west at the outlet of the wetland/marsh complex adjacent to Beaver Road. Note the beaver dam, which is approximately 4 m in height.

Looking northwest at a portion of open water habitat within the wetland/marsh complex.

Looking northwest at the portion of Graham Lake Creek immediately upstream of Owl Crescent.

Looking upstream at a series of bedrock cascades within the middle reaches of Graham Lake Creek.

The section of creek immediately downstream of Graham Lake. Note the rip-rap boulders, which were likely placed on river right as a measure to address bank erosion.

Looking northwest at the outlet of Graham Lake.

Typical channel morphology of the creek upstream of Graham Lake. Note the incised channel, which is an indication of high velocity flows.

Looking upstream at the upper reaches of Graham Lake Creek as it flows through an agricultural field.

Looking north at the pond that represents a portion of the headwaters of Graham Lake Creek.

A photo depicting the channel morphology (historically ditched) of the upper-most reaches of Graham Lake Creek.

Tributary 1

Looking down at the confluence of Tributary 1 and Graham Lake Creek, immediately adjacent to Owl Crescent.

Looking upstream at Tributary 1 from the confluence with Graham Lake Creek.

Tributary 2

Looking upstream at Tributary 2 from the confluence with Graham Lake Creek. Note the lack of channel definition, which is consistent throughout the lower reaches of Tributary 2.

Looking north at the upper reaches of Tributary 2. Note the vegetation composition, which is indicative of a wetland complex.

Tributary 3

Looking downstream from the terminus of Tributary 3. Anecdotal evidence indicates the channel is a part of an agricultural field drainage system.

The ditch-like channel morphology of Tributary 3 immediately upstream of its confluence with Graham Lake Creek.

Valens Brook Watershed

Looking upstream at the cement box culvert positioned under Lacon Road.

Looking upstream at the lower reaches of Valens Brook. Note the substrate composition is composed entirely of clay.

A photo of one of the pool habitat units that exist throughout Valens Brook. Note the abundance of LWD providing refuge habitat for fish. At the time of the assessment, salmonids were observed within this pool.

A representative photo of the run/glide habitat on Valens Brook.

The outlet of the box culvert positioned under McFarlane Road.

A representative photo of the riparian vegetation adjacent to the middle reaches of Valens Brook, upstream of McFarlane Road.

Looking north at the west arm of the large open water/marsh complex in the central portion of the Valens Brook Watershed. It should be noted that several beaver dams at the outlet of the marsh have resulted in an expansion of the open water component.

The east arm of the open water/marsh complex.

A photo depicting the channel morphology and composition of riparian vegetation immediately upstream of the Maddigan wetland complex.

Looking upstream at the dual culverts that direct Valens Brook under a residential access road near Triple Rock Road.

Looking upstream (north) at the wetland complex that represents the headwaters of Valens Brook.

Tributary 1

Looking downstream at the area where the lower reach transitions into the upper reach.

Looking upstream at the terminus of Tributary 1. At this point there was no evidence of a definitive channel.

Tributary 2

Looking downstream at the confluence of Tributary 2 and Valens Brook.

Looking upstream at the two constructed ponds, which represent the source (headwaters) of Tributary 2.

Tributary 3

A photo of Tributary 3, immediately upstream of the confluence with Valens Brook. Note the substrate composition of Tributary 3 is mainly composed of organic materials.

Looking west from the outlet of the sedge wetland, which represents the headwaters of Tributary 3.

Tributary 4

Tributary 4 as is flows into Valens Brook. The riparian vegetation adjacent to the stream is undisturbed and provides proper biological function.

Looking north at the sedge wetland representing the source of Tributary 4.

Tributary 5

Looking downstream at the confluence of Tributary 5 and Valens Brook.