



By Email and In Hand

April 6, 2016

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S.J.C. DEPARTMENT OF
APR 06 2016
COMMUNITY DEVELOPMENT

Re: After-the-fact applications for unpermitted bulkhead--PSJ000-12-0019,
PSJXMP-15-0028

Dear Ms. McEnery:

Friends of the San Juans ("Friends") submits this letter and the attached materials to address a request by Whaleback LLC for after-the-fact approval of an unpermitted rock bulkhead built in January 2011 on the southeastern shores of Blakely Island, along tax parcels no. 151024002 and 151024003 ("Property"). The San Juan County Department of Community Development ("DCD") file for the project includes applications for both an exemption and a permit for the bulkhead. Both applications rely on the same consultant reports, so this letter refers to them both as the Application.

A review of the Application gives rise to concerns about both of its substance and the process that led to the Property's recent development. In February 2011, just a few months after the County granted approval to develop the shoreline parcel, and at a time when the house was little more than a foundation, Washington Department of Fish & Wildlife ("WDFW") officials unexpectedly discovered the newly constructed bulkhead during a boat patrol in San Juan County. Notwithstanding the County's express prohibition against locating houses where they will require shoreline armoring within the foreseeable future, and the fact that WDFW caught the construction of the bulkhead at an early stage in the development of the site, the development of the Property continued to completion after finding the unauthorized bulkhead. More than 5 years

have passed, and no entity has required its removal. No entity has required the relocation of the new house or driveway in that 5 years. Instead, and notwithstanding the initial identification of upland runoff as the cause of the erosion at the site, an application now seeks to retain the bulkhead on the grounds that it is needed to prevent normal erosion along the shoreline. Paradoxically, the reports that now seek to justify the bulkhead should have been provided to the County in 2010 to demonstrate that the applicants needed to construct their development farther inland to prevent them from claiming the need to bulkhead in the foreseeable future.

Regardless of this series of events, the unauthorized bulkhead does not satisfy the bulkheading criteria established by the San Juan County Shoreline Master Program (“SMP”) or Critical Areas Ordinance (“CAO”). The Property enjoys a minimal long-term erosion rate that does not warrant a rock wall. It also enjoys suitable forage fish spawning habitat and has not been adequately surveyed to determine the presence or absence of surf smelt. The bulkhead will impact that habitat by impeding natural geological and ecological processes, and has impacted the shoreline aesthetically. In addition, early reports from the site identified inadequate upland drainage control as a primary cause of the erosion in 2011, and more recent reports explain that the drainage has been improved, possibly addressing the concern that gave rise to the bulkhead. Last, the SMP prohibits residential construction just like that at issue here, where it will lead to armoring in the foreseeable future. The County should not now approve a bulkhead that the applicants presumably believed unnecessary when they constructed their development.

This letter also asks the County to review its files for documentation regarding the stretch of bulkhead that the Application identifies as “older bulkhead.” A survey of aerial photographs suggests that this structure was installed between approximately 2006 and 2008 and Friends has not been able to locate approval for a bulkhead in that timeframe in the County’s online database.

A. BACKGROUND.

The sections below identify salient characteristics of the development that gave rise to the unpermitted bulkhead, as well as local ecological and coastal geological characteristics of the shoreline on which it was built.

1. Site History.

On September 21, 2010, Whaleback LLC applied to the DCD for a permit to construct a beach house approximately 50 feet from the top of bank on southeast Blakely Island.¹ Although limited vegetation existed between the proposed building location and the shoreline, on October 11, 2010, DCD approved the 50-foot setback authorized only for structures with “screening.”² The permit became final on December 27, 2012.³ According to the Application’s SEPA Checklist, the house and access road lie approximately 75 feet landward of the bulkhead described below.⁴

On February 4, 2011, not long after the approval to construct the house, WDFW officials observed the construction of an unpermitted rock wall bulkhead and newly placed gravel and rock below high tide on or near parcels 151024003000, 151024002000, and 151050017000.⁵ On February 10, 2011, WDFW officers returned to the area and “observed an excavator working on a rock bulkhead well below the Ordinary High Water Line...along the beach on the southern end of Blakely Island,” on parcel 151024003000.⁶

A survey included with the Application identifies this portion of the rockery on the site as “newer bulkhead.”⁷ Application materials vary significantly in their description of the bulkhead’s length. The SEPA Checklist estimates the length at 413 feet.⁸ A Riparian Enhancement Plan prepared by Hart Crowser identifies the rock wall as approximately 500 feet in length.⁹ That report states that approximately 275 feet of the bulkhead was excavated into the bank.¹⁰ The Application does not provide cross

¹ San Juan County Online Services, Permits and Inspections website, https://services.sanjuanco.com/Default.asp?Build=PM.pmPermit.MainTab&SetKey=ESMPRMTR.PERM IT_ID=1857&FallBack=PM.pmPermit.MainTab (last visited March 17, 2016); also Coastal Geologic Services, Inc., Memorandum regarding Runstad Property, SE Blakely Island – Unpermitted Bulkhead and Application Parcel no. 151024002000, 3 (Jan. 27, 2016) (hereafter “CGS Memo”), attached hereto as Attachment A.

² *Id.*

³ *Id.*

⁴ SEPA Checklist (Nov. 25, 2012), at § B.8.c.

⁵ Affidavit for Search Warrant, Christopher Rosenberger, San Juan County Case No. 11-1018, 3 (March 18, 2011).

⁶ *Id.* at 4 (emphasis added).

⁷ San Juan Surveying, Preliminary Topographic Survey for Jon Runstad (Nov. 23, 2015).

⁸ SEPA Checklist, at § A.11.

⁹ Hart Crowser, Draft Riparian Enhancement Plan – Runstad Shoreline, Blakely Island, 3 (Aug. 8, 2014).

¹⁰ *Id.*

sections that would identify the height and depth of the wall.

The survey also does not show the bulkheading that has occurred in front of the beach house. A Hart Crowser report describes that rockery as a “rounded boulder embankment.”¹¹ Jim Johannessen notes the existence of this same unidentified rockery in his attached memorandum.¹²

2. The “older bulkhead” Appears To Have Been Constructed Between 2006 and 2008 Without County Approval.

In addition to the unpermitted rockery constructed in winter 2010-11, much of the armoring extending east of that bulkhead appears to have been constructed without a permit just a few years earlier. A comparison of the photographs attached as Attachments C and D shows the evolution of bulkheading at the site from September 19, 2003 to February 2011, when WDFW discovered the bulkhead. The 2003 photograph shows the central and eastern portion of the shoreline along the bay, without any visible bulkheading. The 2011 photograph shows a darker gray rock bulkhead transitioning to a bright white rock bulkhead up to and beyond the rock drainage bed seen at the far right side of the 2003 photograph.

The CGS memorandum narrows the date of this bright rock bulkheading to between 2006 and 2008. Mr. Johannessen compared aerial photographs from August 2006 and June 2008 and concluded that the “older bulkhead” was constructed on the site between those dates.¹³ The CGS Memo states that “[a]erial photos show that this eastern rock wall was constructed between 2006 and 2008, which concurs with direct observation of construction by this author.”¹⁴ Mr. Johannessen states that he was not aware of a permit for that bulkhead and Friends has not been able to locate a permit for that bulkhead in the 2006-08 timeframe.¹⁵

Although a shoreline exemption exists for some rockery in 1986, materials attached to that exemption show a more limited structure than the bulkhead identified

¹¹ Hart Crowser, Fish and Wildlife Habitat Conservation Area Report, Runstad Property on Blakely Island, San Juan County, Washington 17921-00, photograph 1 (Dec. 17, 2015).

¹² See also CGS Memo, at 3.

¹³ CGS Memo, at 15, 19.

¹⁴ *Id.* at 2.

¹⁵ *Id.*

by the Application as “older bulkhead.”¹⁶ The site drawing does not include a scale, but it shows the bulkhead extending just a short distance northwest of a property line that appears to separate current lot 151050018000 on the east from lot 151024003000 to the west. Attachment C shows a small amount of rock on the far right side of the photograph – this may have been associated with the 1986 rocking. The Topographic Survey attached to the Application as Exhibit K shows the “older bulkheading” extending nearly to the western border of parcel number 151024003000, approximately three hundred (300) feet or so beyond the furthest extent of the bulkheading exempted in 1986.¹⁷ Consequently, it appears that the “older bulkhead” is an additional expanse of unpermitted armoring.

3. The shoreline enjoys a slow rate of erosion and high stability.

Although Application materials suggest that an unstable slope exists at the site, they also agree that the parcel enjoys a slow long-term erosion rate. The Coast & Harbor Engineering Technical Memorandum regarding Runstad Property Beach Nourishment states that bluff erosion at the Runstad property should be assumed to be approximately one inch per year.¹⁸ A subsequent memorandum by the same consultants notes that the shoreline along the Runstad property is sheltered by Armitage Island, which reduces direct wave impact and the associated rate of erosion, and that the estimated erosion rate would therefore be much smaller than the 1.7 inches per year measured at a more exposed East Lopez shoreline.¹⁹ That supplemental report suggests a future rate of erosion between 1 and 2 inches per year in the absence of the bulkhead.²⁰

Jim Johannessen confirmed a slow erosion rate for the site in his discussion of the lack of serious erosion at the site, noting that 1 inch/year is a very low erosion rate.²¹ He also identifies landscape features that indicate very minor erosion, including a vegetated bank in the vicinity of the new house, trees along the majority of the bank

¹⁶ Exemption from Shoreline Substantial Development Permit for H. Jon Runstad (July 31, 21986).

¹⁷ See also CGS Memo, at 2, 15, 19.

¹⁸ Coast & Harbor Engineering Technical Memorandum regarding Runstad Property Beach Nourishment, 2-3 (April 23, 2015) (hereafter “Coast & Harbor Memo”).

¹⁹ Coast & Harbor Engineering Technical Memorandum regarding Runstad Property – Supplemental Coastal Geological Analysis, 5 (Dec. 17, 2015).

²⁰ *Id.* at 6.

²¹ CGS Memo, 5-6.

face, and low growing vegetation elsewhere.²²

The site's coastal geology and limited wave exposure explain its slow erosion rate. The glacial till that composes the bank along the shoreline is the strongest glacial deposit in San Juan County and has been mapped by the Washington Department of Ecology ("Ecology") as stable along the shoreline.²³ The absence of appreciable net drift in the pocket beach system also indicates a slow erosion rate. Further, the site enjoys lower wave energy because Armitage Island provides partial shelter from waves that are already smaller in size due to the lack of significant fetch at the site.²⁴ And the waves generally approach the site directly onshore, limiting their erosive effect.²⁵ Mr. Johannessen notes that the slopes along the property lie flatter than typical erosional banks in San Juan County.²⁶

The CGS memorandum applies the recently-established Marine Shoreline Design Guidelines ("MSDG") to conclude that the most appropriate option for the property is bulkhead removal.²⁷ Washington state resource agencies created the MSDG in an effort to promulgate objective guidelines for determining when a site warrants bulkheading.²⁸ Given the available information, the MSDG criteria result in the parcel qualifying as sufficiently low risk that it does not warrant a rockery.²⁹ This low risk is due to a relatively large setback given the very low 1 inch/year erosion rate.³⁰ As a result, the MSDG alternatives analysis suggests that techniques for the site include: bulkhead removal (equivalent to no action in the event that an analysis had been conducted prior to installing the unpermitted bulkhead), and if action had been necessary, possibly beach nourishment, large wood, and bank reslope and revegetation.³¹

²² CGS Memo, at 3.

²³ CGS Memo, at 3.

²⁴ CGS Memo, at 4.

²⁵ CGS Memo, at 5.

²⁶ CGS Memo, at 3.

²⁷ CGS Memo, at 4-5.

²⁸ Jim Johannessen, *et al.*, Marine Shoreline Design Guidelines, prepared for WDFW, Washington Department of Ecology, Washington Department of Natural Resources, the Puget Sound Partnership, Washington Department of Transportation, and Washington Recreation and Conservation Office (2014), available at <http://wdfw.wa.gov/publications/01583/wdfwo1583.pdf> (last visited March 17, 2016).

²⁹ CGS Memo, at 4-5.

³⁰ CGS Memo, at 5.

³¹ CGS Memo, at 5.

4. The erosion that occurred at the time of residential construction appears to be attributable to upland stormwater runoff.

Application materials, the attached Coastal Geologic Report, and Ecology correspondence indicate that upland stormwater drainage contributed significantly to the bank erosion.

Although more recent Application materials, drafted further along in the regulatory process, deemphasize the role that stormwater played in the shoreline erosion, earlier materials identify it as a leading cause. Hart Crowser's November 26, 2012 memorandum identifies stormwater flow first as the cause, stating "[a]pparently, overland stormwater flow had eroded portions of the bank which resulted in an oversteepening of portions of the slope."³² The SEPA Checklist noted that soils are in an oversteepened condition "as a result of overland stormwater flow."³³ More recently, even a 2015 Application document still attributes at least some of the responsibility for the erosion to "heavy rainfall."³⁴

WDFW records confirm that upland runoff played a central role in the shoreline erosion. In his affidavit, WDFW Peace Officer Christopher Rosenberger recalled a conversation with a David Needham who stated that "heavy rain a few weeks prior had created problems with the new road and culvert that they had installed for the residence located on parcel 151024002000" and that "[t]he excess water created two washed out areas along the shoreline in the area of parcel 151024002000."³⁵ Consequently, according to Mr. Needham, a rock retaining wall was initially constructed as an emergency measure.³⁶ Mr. Needham stated that although the rock wall started as an emergency wall, the owner later decided to expand it.³⁷

The Stormwater materials submitted for the site also indicate that upland runoff

³² Site Reconnaissance, at 1 (noting as well that wave runup at high tide likely served as another cause of slope distress).

³³ SEPA Checklist, at § B.1.d.

³⁴ Unidentified author, Runstad Bank Stabilization, stamped received by SJC Community Development & Planning June 10, 2015, at 1.

³⁵ Affidavit for Search Warrant, Christopher Rosenberger, San Juan County Case No. 11-1018, 5 (March 18, 2011).

³⁶ *Id.*

³⁷ *Id.*

led to the erosion. The Stormwater Plan anticipated that “[t]ributary runoff toward the home site is from the steep hillside above and could be significant.”³⁸ Factors like uphill soil cover with high runoff potential and clay material at a shallow depth that could inhibit surface infiltration at many locations were cited as contributors to runoff.³⁹ The Stormwater Plan indicated that this potentially heavy drainage would continue to flow in the vicinity of the home site, channeled to a new culvert beneath the driveway at the east end of the home and south toward the shoreline.⁴⁰

The Stormwater Addendum, drafted in November 2012 after the erosion event, confirmed that substantial runoff did occur, noting that site construction coincided with “unusually heavy early season wet weather [that] created more uphill runoff toward the site than anticipated from the tributary drainage course that was described in [the stormwater plan].”⁴¹ The Stormwater Addendum states that “[h]igh flows and sediment movement present made application of normal controls described in Page 15 of the SWPP plan unfeasible, and construction had not yet progressed to completion of the planned permanent runoff handling facilities – including rock erosion protection – at the time when heavy runoff occurred.”⁴² As a result, water was directed to an “unprotected soil ‘ditch’ with some steep slopes” that had not been considered a reliable diversion, which then “directed more flow to the upper driveway culvert crossing than had been anticipated and created some overflow problems.”⁴³ This upper driveway culvert lies uphill of two erosion areas identified on the survey.⁴⁴

The Stormwater Addendum states that the unanticipated volume of stormwater required project redesign by mid-December 2010.⁴⁵ The project increased the culvert capacity and directed the discharge to the southeast along a new rock-lined channel so

³⁸ Stormwater Plan, at 6.

³⁹ *Id.*

⁴⁰ *Id.* at 10.

⁴¹ *See, e.g.*, Gossett Consulting LLC, Stormwater Site Plan ADDENDUM for Runstad Beach House, TPN 151024002000, Blakely Island, Washington, 3 (Nov. 2012) (hereafter “Stormwater Addendum”) (referencing Gossett Consulting LLC, Stormwater Site Plan for Runstad Beach House, TPN 151024002000, Blakely Island, Washington (Aug. 2010) (hereafter “Stormwater Plan”).

⁴² Stormwater Addendum, at 3.

⁴³ *Id.*

⁴⁴ *Compare* Stormwater Addendum, Figure 1 at page 4 of 9 *with* San Juan Surveying, Preliminary Topographic Survey for Jon Runstad on Blakely Island (Nov. 23, 2015).

⁴⁵ Stormwater Addendum, at 3.

that it would avoid discharging toward “the steep shoreline bank immediately south of the culvert where some sloughing had been experienced.”⁴⁶

The Stormwater Addendum thus suggests that the bulkhead could have been avoided if the development had initially incorporated an understanding of historic runoff and erosion at the site.⁴⁷ After the stormwater overloaded the original stormwater measures, the project took remedial action by combining uphill discharge with the east culvert discharge channel to send the water east of the development.⁴⁸ The Addendum notes that this significantly increases flow at the easterly channel discharge location, which has experienced historic adverse effects from discharge at the steep shoreline bank due to its sensitivity to bank sloughing or erosion, but that the flow is now directed further east than the more sensitive shoreline.⁴⁹ The new drainage was designed to “avoid[] discharge at the more conventional steep bank location that has existed along the historic driveway ditch alignment, and the membrane liner helps assure that discharge flows will not saturate the adjacent steep shoreline bank and further contribute to sloughing.”⁵⁰

The Stormwater Addendum also attributes a significant amount of the runoff to unpredictable groundwater discharges.⁵¹

Similarly, the CGS Memo concludes that poor drainage management likely led to the minor toe erosion experienced at the Property. The CGS report concludes that “[i]t is this author’s professional opinion that the extensive clearing and lack of drainage management was likely the cause of the small ‘sloughing’ events mentioned in the reports, and not coastal erosion, as the site is in a relatively low wave energy location.”⁵² The CGS Memo notes that the site enjoys a lower energy shoreline and that the erosion at the site “appears to have been associated with clearing and constructing/enlarging the access road and utilities leading southwestward to the house.”⁵³ The memorandum

⁴⁶ *Id.*

⁴⁷ Compare Stormwater Addendum, at 5-6 with Preliminary Topographic Survey for Jon Runstad (Nov. 23, 2015).

⁴⁸ Stormwater Addendum, at 5.

⁴⁹ *Id.* at 5.

⁵⁰ *Id.* at 6.

⁵¹ Stormwater Addendum, at 5.

⁵² CGS Memo, at 12.

⁵³ CGS Memo, at 4.

continues that “[i]t appears that this amount of clearing relatively close to a marine bank without drainage control could have caused what appears to have been several very small and shallow surficial slides.”⁵⁴

An Ecology staff member also came to the conclusion that stormwater served as the cause of bank sloughing.⁵⁵ In his May 13, 2013 letter, Paul Anderson states that “[t]he project submittal indicates that improperly controlled stormwater led to bank failure in 2010 and two consulting firms have concluded that a rock bulkhead is the appropriate stabilization.”⁵⁶ Thus, from the beginning, upland stormwater has been recognized as the cause of erosion along the bank.

5. The Application’s Slope Stability Analysis Suffers from Several Flaws.

A December 17, 2015 report by Hart Crowser titled Geotechnical Engineering Conclusions and Recommendations Runstad Property, Blakely Island, Washington declares that “the uphill residence, roadway, utilities, and other appurtenances will likely suffer damage from shoreline erosion without the Project’s bank stabilization to prevent further erosion of the bank.”⁵⁷ However, the document does not identify a time frame for that projected damage and it bases its conclusion of deep seated instability on faulty assumptions without directly investigating the soils at the site, as explained by the Western Geotechnical Consultants, Inc. memorandum attached to this letter.⁵⁸ The presence of a stable forest above strong, dense glacial till on the property indicates that it likely enjoys relative stability.⁵⁹

The Hart Crowser slope stability modeling omits important information and relies on assumptions that are contradicted by the physical characteristics of the site.⁶⁰ First, the Hart Crowser report did not provide a map showing the location of the soil

⁵⁴ *Id.*

⁵⁵ Letter from Paul S. Anderson to Lee McEnery re: SEPA comments on the proposed Runstad bulkhead, PSJ000-12-0009 (May 13, 2013).

⁵⁶ *Id.* at unnumbered page 1.

⁵⁷ Hart Crowser, Geotechnical Engineering Conclusions and Recommendations Runstad Property, Blakely Island, Washington, 17921-00, 1 (Dec. 17, 2015).

⁵⁸ Western Geotechnical Consultants, Inc., Review of Hart Crowser Report, Runstad Property, Blakely Island, Washington (Jan. 21, 2016) (hereafter “Western Geotech Memo”) (attached hereto as Attachment B).

⁵⁹ Western Geotech Memo, at 4.

⁶⁰ Western Geotech Memo.

samples or their depth below grade.⁶¹ Second, the report did not rely on subsurface soil investigation, which is fatal because its assumed failure plane of 11 feet below the surface conflicts with indicators of slope stability from the Application, like typically stable glacial till extending up to within 3 feet of the surface, covered by a forested slope that would be expected to provide natural protection from erosion.⁶² Third, the report assumed several additional factors inconsistent with the physical characteristics at the site, like unit weight, cohesion, and internal friction figures that would be more appropriate for loose beach deposits than they are for a bank composed largely of glacial till.⁶³ Using figures for the glacial till that the Application identifies at the site would have significantly increased the calculated slope stability.⁶⁴

Because Hart Crowser's modeling assumptions contrast with its stated site conditions, Western Geotechnical Consultants emphasize the need for a backhoe or boring investigation to verify the soil strength and density figures used for the model.

In its review of the same modeling, the CGS Memo further emphasizes the absence of any basic geology or field evidence to support the conclusion that the bank experiences significant instability.⁶⁵ Johannessen also notes that glacial till is fairly resistant to erosion and not typically subject to larger slope failures.⁶⁶

6. The Ordinary High Water Mark Likely Extends Up to the Original Toe of the Bank Along Much of the Bulkheaded Area.

According to the CGS Memo, most professionals would have mapped the Ordinary High Water Mark ("OHWM") along the toe of the bank based on the information provided by Hart Crowser because:

- OHWM is typically mapped within the zone of dense drift logs rather than at the waterward edge of sparse logs and photos show few drift logs waterward of the rockery;
- A change in the bed or the presence of relatively dense vegetation is

⁶¹ Western Geotech Memo, at 2.

⁶² Western Geotech Memo, at 2.

⁶³ Western Geotech Memo, at 2-3.

⁶⁴ Western Geotech Memo, at 2-3.

⁶⁵ CGS Memo, at 12.

⁶⁶ CGS Memo, at 12.

- typically required for locating OHWM, rather than the scattered ephemeral vegetation seen in the photos of the site;
- Photographs show a fairly consistently sloping beach right up to the rockery toe, with no apparent backshore;
 - Photographs like nos. 4 and 8 from the Fish and Wildlife Habitat Conservation Area report show an active beach without drift logs and with very recent wrack deposits; and
 - Photographs like figure 7 in the Coast and Harbor 2015 Supplemental memorandum show tidal waters in the absence of storms reaching up to the face of the bulkhead.⁶⁷

Therefore, the rockery very likely was constructed waterward of the OHWM.⁶⁸ The 2013 Hart Crowser memorandum improperly relied on the presence of ephemeral vegetation on the upper beach, particularly given the timing of the site visit on September 10, 2013, a late summer date that would exhibit the maximum extent of seasonal vegetation.⁶⁹ Although the Application indicates that WDFW agreed with its erroneous location of the OHWM, the only evidence is a brief email concluding that WDFW agreed with the OHWM in a report. The email does not identify any of the factors applicable to determining OHWM or explain how WDFW reached its conclusion.

7. The Forage Fish Spawn Surveys Omit Necessary Data.

Surf smelt can spawn at any time of year in the San Juan Islands, with peak spawning occurring from May through September.⁷⁰ They lay eggs that adhere to beach materials and require approximately two to five weeks to incubate, depending on seasonal temperature.⁷¹ Perhaps due to this year-round spawning pattern, the SEPA Checklist declared that the Applicants would “monitor the site monthly for a period of

⁶⁷ CGS Memo, at 11.

⁶⁸ CGS Memo, at 11.

⁶⁹ CGS Memo, at 11; *see* Hart Crowser, Memorandum regarding Ordinary High Water at Runstad Property on Blakely Island, 17921-00 (Nov. 8 2013).

⁷⁰ Department of Ecology, Puget Sound Shorelines, <http://www.ecy.wa.gov/programs/sea/pugetsound/species/smelt.html> (last visited Feb. 16, 2016); pers. communication with Tina Whitman, Science Director, Friends of the San Juans.

⁷¹ Washington State Surf Smelt Fact Sheet, 1, <http://wdfw.wa.gov/publications/01219/wdfwo1219.pdf> (last visited Feb. 17, 2016).

one year for the presence of forage fish (sand lance or surf smelt) spawning.”⁷²

Notwithstanding this known life history, the Application’s surveys did not occur year-round.⁷³ The surveys occurred from January through April 2015 and then took a six-month hiatus before resuming for three months starting in November 2015.

In the absence of year-round surveys taken at least every two weeks, the Application does not demonstrate the absence of spawning forage fish along the beach. This is particularly important here because a 2012 study found surf smelt and sand lance in fish seines along the Property shoreline.⁷⁴

8. The Shoreline Provides Important Habitat for Salmon Recovery.

Local research reveals that impacts to the pocket beach could harm one of the most important types of shoreline in San Juan County. A 2012 study funded by the Washington State Salmon Recovery Funding Board compiled biological and geological data for San Juan County shorelines and determined that the shoreline along the site qualifies as a highest fish use region and highest fish use priority shoreform for the recovery of salmon listed as threatened under the Endangered Species Act.⁷⁵ Underlying research found that pocket beaches were the most important type of shoreline for salmon, surf smelt, Pacific herring, Pacific sand lance, greenlings, and cods, all of which use shallow water habitats associated with pocket beaches.⁷⁶ Both the likelihood of finding Chinook salmon and the number of salmon found were substantially higher along pocket beaches than nearby rocky shorelines.⁷⁷ Consequently, armoring impacts to the shoreline in question could interfere with efforts to recover salmon already

⁷² SEPA Checklist, at B.5.b.

⁷³ Exhibit H.

⁷⁴ Skagit River System Cooperative Research Program, Summary of Fish Catch Results for Runstad Cove, 2008 and 2009 (May 2012) (attached hereto as Attachment E).

⁷⁵ Tina Whitman, et al., Strategic Salmon Recovery Planning in San Juan County Washington: The Pulling It All Together (PIAT) Project, Report to the San Juan County Lead Entity for Salmon Recovery and the Washington State Salmon Recovery Funding Board, 20, 23 (July 17, 2012), available at <http://www.sanjuans.org/documents/PIATFinalReport.pdf> (last visited March 15, 2016); see http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/chinook/puget_sound/puget_sound_chinook.html (last visited March 15, 2016).

⁷⁶ Eric Beamer and Kurt Fresh, *Juvenile Salmon and Forage Fish Presence and Abundance in Shoreline Habitats of the San Juan Islands, 2008-2009: Map Applications for Selected Fish Species*, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 55 (Dec. 2012), available at http://skagitcoop.org/wp-content/uploads/Beamer_Fresh_2012_Final1.pdf (last visited April 1, 2016).

⁷⁷ *Id.* at 16, 37.

suffering from threats to their continued existence.

In addition, although Application materials state that shoreline vegetation remained during the bulkhead construction, bulkheads typically lead to the loss of shoreline vegetation, and the associated litter and insect fall essential for juvenile Chinook salmon. A 2008 assessment by the San Juan Initiative confirmed that: (1) shoreline properties developed since 1977 had lost an average of 20% of their shoreline vegetation; (2) armored parcels lost twice as much forest as unarmored parcels and had 20% less overhanging vegetation; and (3) of 71 parcels studied, 1/2 had armoring and of that armoring, 1/2 lay on forage fish spawning beaches.⁷⁸ Aerial photographs of the site like that in Figure 4 of the CGS Memo show a similar development pattern along the property and bulkhead to the east of the Property, with lawn sloping down to the rocked shoreline.⁷⁹ The insects that inhabit shoreline vegetation serve as an important part of the diet of juvenile salmon.⁸⁰ Thus, to the extent that the bulkhead leads to a long-term decrease in vegetation along the Property's shoreline, it will decrease insect prey necessary for juvenile Chinook salmon in an area of highest importance for the recovery of threatened salmon.

B. DISCUSSION

The unpermitted bulkhead does not satisfy the requirements of the SMP or CAO. As explained in detail below, it does not qualify for an exemption and is inconsistent with SMP and CAO ecological, aesthetic, and need analysis criteria.

1. The Unpermitted Bulkhead is Inconsistent with the SMP.

The bulkhead does not meet SMP policies or regulations that apply to shoreline uses, conservation, environmental and aesthetic protection, or bulkheading.

⁷⁸ San Juan Initiative, *An Assessment of Ecosystem Protection: What's Working, What's Not*, 9-10 (June 16, 2008) (attached hereto as Attachment F).

⁷⁹ CGS Memo, at 16, figure 4.

⁸⁰ See James S. Brennan, *Marine Riparian Vegetation Communities of Puget Sound*, Puget Sound Partnership Report No. 2007-02, 2 (2007) ("stating that "[r]iparian vegetation may support substantial populations of insects, which are important in the diet of marine fishes such as juvenile salmonids. In areas with healthy riparian communities, terrestrial insects in marine waters are diverse and abundant... As riparian vegetation is eliminated, the food supply and carrying capacity of the nearshore ecosystem are likely to be reduced."), available at http://www.pugetsoundnearshore.org/technical_papers/riparian.pdf (last visited March 21, 2016).

a. The SMP prohibits residential construction that will require a bulkhead in the foreseeable future.

The SMP proscribes the residential development that occurred at the site in 2010-12. The SMP expressly states that “residential structures which will require bulkheads or other shoreline fortifications at the time of construction or in the foreseeable future are prohibited.”⁸¹ The County’s Comprehensive Plan further states that all residential development should include building setbacks to preserve the natural character of the shoreline and to protect bank stability and natural vegetation at the bank edge.⁸²

The Application justifies its request for a bulkhead on site characteristics that existed at the time of the application to develop the Property. For example, Hart Crowser’s one-page, 2012 Site Reconnaissance opines that weathered till soils likely washed down from higher elevation over the years.⁸³ That one-pager also opines that oversteepened scarps and leaning and pistol-butted trees indicate “long term instability.”⁸⁴ The Stormwater Addendum further references historic stormwater drainage to steeper slopes that had experienced sloughing.⁸⁵ These conditions presumably would have been observable at the time of application for the building permit and should have been identified during the application process.

Notwithstanding that this information was available to the applicants at the time that they applied to build the house, they chose to build it as close as permitted to the shoreline. Investigation photographs then show that the unpermitted bulkhead was constructed while the house remained in an early stage of development.

Based on the applicant’s consultant reports, information available at the time they applied for the building permit would have required construction of the residential development further from the shoreline. The appropriate remedy now requires the

⁸¹ SJCC 18.50.330.B.2.

⁸² Comp. Plan § 3.5.M.4.

⁸³ Hart Crowser, Memorandum from Garry Horvitz to Joe Brogan re: Summary of Site Reconnaissance, Runstad Residence, Blakely Island, 13-3-1100-011, 1 (Nov. 26, 2012) (noting as well that wave runoff at high tide likely served as another cause of the slope distress).

⁸⁴ *Id.*

⁸⁵ Stormwater Addendum, at 5-6.

removal of the unpermitted bulkhead. Allowing the retention of that structure would merely condone the circumvention of local rules.

b. The bulkhead does not qualify for an exemption.

Exemptions are narrowly construed under the SMA. WAC 173-27-040(1)(a). “Only those developments that meet the precise terms of one or more of the listed exemptions may be granted exemption from the substantial development permit process.” *Id.* Exemptions must be interpreted to give effect to all language without rendering any portion of it meaningless or superfluous. *Dept. of Ecology v. City of Spokane Valley*, 167 Wn. App. 952, 964, 275 P.3d 367 (2012). And an applicant bears the burden of proving that a development is exempt from the permit requirement. WAC 173-27-040(1)(c).

The SMP authorizes an exemption for “[c]onstruction of the normal protective bulkhead common to single-family residences subject to WAC 173-27-040(2)(c).”⁸⁶ Those state regulations, in turn, define a “normal protective bulkhead” to mean “those structural and nonstructural developments installed at or near, and parallel to, the ordinary high water mark for the sole purpose of protecting an existing single-family residence and appurtenant structures from loss or damage by erosion.”⁸⁷

The information presented by the Application, when read in conjunction with the attached coastal geology and geotechnical reports, demonstrates that the bulkhead was not constructed for the sole purpose of protecting an existing single-family residence and appurtenant structures and that it was not necessary to respond to loss or damage by erosion. First, there was no “existing” single-family residence and appurtenant structure at the time the bulkhead was constructed. The building permits and photos of the site indicate that all of the development on the property occurred at or after the time that the bulkhead was constructed, and thus it did not serve to prevent erosion near an “existing” residence or appurtenant structure. Second, the Application does not demonstrate that the 1 inch/year erosion rate poses the threat of loss or damage. It does not identify any actual harm or a time frame for that harm. Third, documents like the Application’s stormwater reports indicate that the erosion occurred in conjunction with

⁸⁶ SJCC 18.50.020.F.2.c.

⁸⁷ WAC 173-27-040(2)(c) (emphasis added).

development of a new stormwater system, new driveway, and new house, and likely resulted from improper drainage conditions, not shoreline erosion. Last, even if a portion of the bulkhead prevented erosion from affecting the new development, the entire structure would not have been built for the sole purpose of impeding erosion near the new development because much of the bulkhead lies at a significant distance from development.

c. The bulkhead is inconsistent with SMP policies for shoreline uses.

The bulkhead conflicts with several general shoreline use policies established by the Comprehensive Plan, as well as the County's policies for its shorelines of statewide significance. The Comprehensive Plan provides goals and policies that apply to marine water areas and activities within the area that extends 200 feet from shorelines of the state.⁸⁸

The Comprehensive Plan establishes shoreline use policies to:

- (1) foster uses that protect the potential long-term benefits to the public against compromise for reasons of short-term economic gain or convenience;⁸⁹
- (2) allow only uses that would not adversely alter the shoreline or conflict with or preempt water-dependent uses;⁹⁰
- (3) accommodate preferred shoreline uses while protecting and preserving shoreline resources and avoiding hazardous or sensitive areas;⁹¹ and
- (4) ensure that the location, density, configuration, setback, and other aspects of all shoreline developments are appropriate to the site and vicinity and respond to the physical limitations of the site.⁹²

By impeding natural erosion and redirecting wave energy, the bulkhead would cause long-term impacts to shoreline geological and ecological functioning, allow a use that adversely alters the shoreline, fail to protect and preserve valuable shoreline resources by impounding sediment that would otherwise naturally erode and nourish the beach, and increase erosion of the beach.

⁸⁸ Comp. Plan § 3.1.A.

⁸⁹ Comp. Plan § 3.2.A.1.

⁹⁰ Comp. Plan § 3.2.A.2.

⁹¹ Comp. Plan § 3.2.A.3.

⁹² Comp. Plan § 3.2.A.8.

In addition, the bulkhead would not ensure that the location, setback, and other aspects of the shoreline development were appropriate to the site and responded to the physical limitations of the site. Instead of locating the residential construction at a distance from the shoreline that would prevent the applicants from believing that they needed a bulkhead, the new development led to the immediate construction of a bulkhead in conjunction with the residential structure.

d. The bulkhead is inconsistent with the SMP's bulkhead policies and regulations.

The SMP strongly discourages the construction of bulkheads, and expressly prohibits them where they are unnecessary. The Application demonstrates that the proposed bulkhead is inconsistent with both the policies and regulations that must be met for bulkhead approval.

(1) The bulkhead is inconsistent with the SMP's bulkhead and shoreline armoring policies.

The bulkhead would be inconsistent with the SMP's bulkhead policies to:

- (1) locate, design, and construct bulkheads in a manner that will not result in adverse effects on nearby beaches or the shore process corridor and its operating systems, and which will minimize alterations of the natural shoreline;⁹³
- (2) locate, design, and construct bulkheads in a manner that will minimize damage to fish and shellfish habitats;⁹⁴ and
- (3) design and locate bulkheads so as to minimize their impact on the scenic quality of the shorelines.⁹⁵

The construction of the sediment-impounding bulkhead at OHWM on a beach that has not been ruled out for spawning forage fish would adversely affect the beach and shore process corridor. The failure to adequately explore the options of removing the bulkhead, relocating the new development, revegetating the upland area, or constructing softer shoreline armoring, demonstrates a failure to locate, design, and construct the bulkhead in a manner that minimizes its damage to habitats, the natural

⁹³ Comp. Plan § 3.6.B.1.

⁹⁴ Comp. Plan § 3.6.B.2.

⁹⁵ Comp. Plan § 3.6.B.3.

shoreline, and scenic shoreline qualities and avoids adverse effects to the beach.

In addition, the bulkhead would contravene the stabilization policies to:

- (1) locate and design all new development to prevent the need for shoreline stabilization measure and flood protection works. New development that requires shoreline stabilization should not be allowed;⁹⁶
- (2) use stabilization and protection works that are more natural in appearance, more compatible with on-going shore processes, and more flexible for long-term streamway management, such as protective berms or vegetative stabilization, over structural means such as bulkheads, concrete revetments or extensive riprap;⁹⁷
- (3) permit structural solutions to reduce shoreline damage only after it is demonstrated that nonstructural solutions would not be able to achieve the same protective purpose;⁹⁸
- (4) encourage supplementary beach nourishment where existing shoreline stabilization is likely to increase impoverishment of existing beach materials at or down drift from the project site;⁹⁹
- (5) conduct an analysis of off-site and cumulative impacts for all proposed bank stabilization, restoration and enhancement, and flood protection activities. Such activities should be prohibited if they would result in beach or bank erosion along nearby shorelines.¹⁰⁰

The construction of a bulkhead in conjunction with the pouring of the foundation for a new house demonstrates its inconsistency with the goal to locate new development to prevent the perceived need for armoring. The applicants also have not evaluated revegetation of the uplands as a viable alternative to the bulkheading, or analyzed whether their remedial stormwater measures have eliminated the stimulus for the bulkheading in the first instance. Last, as explained by Coastal Geologic Services, the Application does not adequately evaluate the cumulative impacts to the beach of the 600 feet or more of armoring along its shores. Consequently, the bulkhead is inconsistent with these policies.

⁹⁶ Comp. Plan § 3.6.D.1.

⁹⁷ Comp. Plan § 3.6.D.3.

⁹⁸ Comp. Plan § 3.6.D.4.

⁹⁹ Comp. Plan § 3.6.D.10.

¹⁰⁰ Comp. Plan § 3.6.D.11.

(2) The bulkhead is inconsistent with the SMP's bulkhead regulations.

The bulkhead must be removed because it does not meet the strict SMP requirements for bulkhead approval.¹⁰¹ The SMP recognizes that bulkheads can cause significant destruction to the marine environment, and thus prohibits their construction in circumstances such as those identified in the Application.¹⁰²

The bulkhead is proscribed because it would cause significant erosion or beach starvation and because it does not meet the SMP's threshold determination that it is needed to address serious erosion. Bulkheads can be permitted "only when nonstructural shoreline protection, restoration, or modification techniques have been shown to be ineffective and it can be shown that one or more of the following conditions exist:

(a) [s]erious erosion is threatening an established use on the adjacent uplands; and

(b) [a] bulkhead is needed and is the most reasonable method of stabilizing an existing beach condition...."¹⁰³

(a)The unpermitted bulkhead is prohibited because it will cause beach starvation.

As an initial matter, the bulkhead is prohibited because it would cause significant erosion or beach starvation over time.¹⁰⁴ As stated by the CGS Memo, bank and bluff erosion supply approximately 90% of the beach sediment in the region generally and even more of the beach sediment on islands that do not derive sediment from streams or rivers.¹⁰⁵ Johannessen concludes that the bulkheaded bank likely serves as the only source of sediment for the beach on the property.¹⁰⁶ Cumulatively, with the additional, possibly unpermitted, bulkheading to the east, the unpermitted bulkhead will cause significant beach starvation over time and must be removed. In addition, the near-

¹⁰¹ See SJCC 18.50.210.

¹⁰² See *id.*

¹⁰³ SJCC 18.50.210.A.2.

¹⁰⁴ SJCC 18.50.210.A.8. See also SJCC 18.50.360.A.7. (general shoreline modification regulation prohibiting shoreline stabilization where it "will permit scouring of the beach at the toe of protective devices [or] erosion on the level of the seaward beach.").

¹⁰⁵ CGS Memo, at 8.

¹⁰⁶ CGS Memo, at 8.

vertical face of the rock wall likely will cause some amount of beach scouring as it reflects wave energy toward the toe of the armor.¹⁰⁷ Although the Coast & Harbor supplemental memorandum attempts to show that redirected erosion did not occur between 2014 and 2015, as Johannessen states, “the use of such an incomplete data set over such a short period of time to suggest that a new near vertical face bulkheads has had a positive impact on the beach is highly questionable, and goes against the Best Available Science for the region.”¹⁰⁸

(b) The Application does not show that nonstructural shoreline protection techniques will be ineffective.

An alternatives analysis conducted pursuant to the most recent armoring science for Washington reveals that the most feasible alternative for the site is to remove the bulkhead.¹⁰⁹ The CGS Memo applies the MSDG scoring system to find that the site qualifies as low risk and then identifies the no action/bulkhead removal option as the most appropriate technique for the site based on the MSDG alternatives analysis at Table 5-8.¹¹⁰ Mr. Johannessen also notes that even if some action were necessary, beach nourishment, large wood, and bank reslope and revegetation could possibly serve as appropriate alternatives.¹¹¹

Although the Coast & Harbor Memo asserts that “only a structural solution can protect against shoreline erosion,” it fails to justify that conclusory statement with more than a photograph showing minor toe erosion and flawed wave modeling.¹¹² Indeed, Coast & Harbor’s summary analysis, without any initial determination of an erosion rate or distance from shoreline to development, is reminiscent of its work in *Friends of the San Juans v. San Juan County, et al.*, which the Shorelines Hearings Board (“SHB”) found insufficient to demonstrate that nonstructural alternatives would be ineffective.¹¹³ A more recent decision by the SHB found a similar inability to identify an erosion rate

¹⁰⁷ CGS Memo, at 8.

¹⁰⁸ CGS Memo, at 10 (citing Shipman et al. (2010), Clancy et al. (2009), Simenstad et al. (2011) and MacDonald et al. (1994)).

¹⁰⁹ CGS Memo, at 5.

¹¹⁰ CGS Memo, at 5.

¹¹¹ CGS Memo, at 5.

¹¹² Coast & Harbor Memo, at 4.

¹¹³ SHB No. 14-008, Findings of Fact, Conclusions of Law, and Order, 28-29 (Oct. 17, 2014).

inadequate to demonstrate that a bulkhead was needed.¹¹⁴

First, regardless of the wave modeling, Coast & Harbor fails to identify an erosion rate or explain how the typical shoreline erosion requires the extreme response of erecting a 400-foot-long rock wall. In the absence of a reasoned understanding of the natural erosion occurring at the site, it is not possible to rule out non-structural techniques at the site. Indeed, Jim Johannessen applies the most current science to conclude otherwise.

Second, even if it were appropriate to interfere with the natural erosion at the site, Coast & Harbor only reference two options, and summarily discard them. In rejecting the idea of large wood, Coast & Harbor cite two well-known examples of failed armoring that never should have been addressed with large wood.¹¹⁵ The CGS Memo explains that those projects are not applicable because they included “areas of substantial shoreline fill (placement of soil and other materials to extend dry land into the tidelands), which moved the shore considerably waterward. This situation is explicitly listed as inappropriate for the use of large wood in the MSDG and this situation is not present at the subject property and has been used as an example by professionals.”¹¹⁶ Moreover, the use of rigid and fixed vertical posts at one of those sites does not satisfy MSDG criteria.¹¹⁷ As Mr. Johannessen notes, “[t]his is literally a textbook example of how not to anchor large wood, so it is inappropriate to use this example to dismiss the use of anchored large wood at this site.”¹¹⁸

Thus, the Application materials do not adequately demonstrate that non-structural techniques would be inadequate in the event that the site warranted some form of erosion control. Furthermore, as explained above, recent stormwater reports indicate that the landowner altered the stormwater path after 2011 and the shoreline has not experienced significant erosion since that time. Consequently, the proper alternative is to remove the rock bulkhead.

¹¹⁴ *Hudson v. Dept. of Ecology*, SHB No. 15-007, Findings of Fact, Conclusions of Law, and Order, 19-21 (Sept. 28, 2015).

¹¹⁵ CGS Memo, at 7.

¹¹⁶ CGS Memo, at 7.

¹¹⁷ CGS Memo, at 7.

¹¹⁸ CGS Memo, at 7.

(c) The site is not experiencing serious erosion that is threatening an established use of the adjacent uplands.

To obtain a permit to erect a rock bulkhead, an applicant must demonstrate that serious erosion is threatening an established use on the adjacent uplands.¹¹⁹ The Application does satisfy any of the three elements: (1) serious erosion; (2) an established upland use; and (3) a threat to the use of the property for the established use.¹²⁰

First, there is no evidence that “serious erosion” is occurring at the project site. The SMP does not define “serious” erosion, so it is necessary as a matter of statutory construction to resort to a dictionary.¹²¹ The Merriam-Webster online dictionary defines serious as “excessive or impressive in quality, quantity, extent, or degree.”¹²² In a decision reviewing a similar erosion rate on a more exposed shoreline, the SHB rejected the argument that one inch/year constitutes serious erosion. In *Friends of the San Juans v. San Juan County, et al.*, the SHB found that an erosion rate of six inches per decade, even if it occurred via episodic landslide events, did not constitute serious erosion.¹²³ In an earlier decision, *Bhatia v. Department of Ecology*, the SHB similarly held that erosion at approximately two (2) inches a year was an insignificant amount of erosion.¹²⁴ Thus, the one inch/year erosion rate at the site does not constitute erosion that is “excessive” or “impressive in quality, quantity, extent, or degree.” Indeed, nowhere does the Application suggest that erosion at the site is out of the ordinary. And to the extent that any unusual erosion occurred in 2010 or 2011, the stormwater reports indicate that it likely can be attributed to improper upland drainage practices rather than shoreline wave and wind energy.

Although the 2012 Coast & Harbor memorandum suggests that serious erosion is occurring along the shoreline, it relies for support on only a photograph showing minor toe erosion and wave modeling, rather than a direct assessment of erosion rates at the

¹¹⁹ SJCC 18.50.210.A.2.a.

¹²⁰ SJCC 18.50.210.A.2.a.

¹²¹ See, e.g., *Burton v. Lehman*, 153 Wn.2d 416, 423, 103 P.3d 1230 (2005) (noting that a statutorily undefined term should be given its plain meaning, and that “[i]f the undefined statutory term is not technical, the court may refer to the dictionary to establish the meaning of the word.”).

¹²² Merriam-Webster, “serious” available at <http://www.merriam-webster.com/dictionary/>.

¹²³ SHB No. 14-008, Findings of Fact, Conclusions of Law, and Order, 17 (Oct. 17, 2014).

¹²⁴ SHB No. 95-34, Final Findings of Fact, Conclusions of Law, and Order, FOF No. 40 (Jan. 9, 1996).

site.¹²⁵ For example, the Coast & Harbor Memo does not attempt to measure the toe erosion or its distance to the new development.¹²⁶ Instead, it speculates that high tide brings waters 2 to 4 feet deep to the shoreline and then argues that a computer model based on incomplete bathymetry data and remote wind data show significant wave energy approaching the bank.¹²⁷ As Mr. Johannessen notes, the Coast & Harbor Memo does not explain the inconsistency between its conclusion that tides reach 2-4 feet up the bank and the conclusion by Hart Crowser that the bulkhead was constructed at least in some portions above the OHWM.¹²⁸ As explained in the CGS Memo, the property's shoreline "is generally among the less exposed areas of the San Juan County marine shore."¹²⁹ In the absence of an analysis of the likely erosion rate, demonstrated use or improvements, or extent of erosion, Coast & Harbor mistakenly concludes that wave impacts threaten an established use.

Second, the lethargic shoreline erosion rate did not threaten an established use at the time that the bulkhead was constructed. To be established means "entrenched," "settled," "deep-rooted," or "permanent."¹³⁰ The new development at the property had not become entrenched there; on the contrary, it was being constructed at the time the unpermitted bulkhead was installed. Consequently, even if serious erosion had occurred from the shoreline it did not approach an established use.

Third, the Application does not demonstrate that erosion is "threatening" a use on the Property. To threaten means to "be a menace or source of danger to."¹³¹ The normal, minimal shoreline erosion is not a menace or source of danger to development lying at some distance from the shoreline, particularly given the remedial measures taken to address the upland stormwater runoff. The Application does not identify the proximity of the new house or driveway to the shoreline or evaluate any risk associated with a 1 inch/year erosion rate.

¹²⁵ CGS Memo, at 5 (citing Coast and Harbor 2012 Figure 1, Exhibit D to the application).

¹²⁶ Coast & Harbor Memo.

¹²⁷ CGS Memo, at 5-6; Coast & Harbor Memo, at 1.

¹²⁸ Compare Coast & Harbor Memo with Application Exhibit G, Hart Crowser Memorandum regarding Ordinary High Water at Runstad Property on Blakely Island (Nov. 8, 2013).

¹²⁹ CGS Memo, at 6.

¹³⁰ See Thesaurus.com, at www.thesaurus.com/browse/established?s=t (last visited March 18, 2016).

¹³¹ Dictionary.com Unabridged, "threaten." (Random House, Inc. 2013) available at <http://dictionary.reference.com/browse/threaten>.

For the same reasons, and as explained further below under the analysis of the bulkhead's inconsistency with the County's critical areas regulations, the Application also does not demonstrate that a bulkhead is needed, or that it is the most reasonable method of stabilizing an existing beach condition.¹³²

e. The Bulkhead is inconsistent with SMP environmental protections.

In addition to the shoreline use and modification policies and regulations that apply to bulkheads, the SMP establishes protections against environmental and aesthetic impacts. The proposed bulkhead contravenes the environmental policies to:

- (1) assure the preservation, reclamation, rehabilitation, and where possible, the enhancement of unusual, fragile and/or scenic elements, and of non-renewable natural resources;¹³³
- (2) preserve critical marine and terrestrial wildlife habitats;¹³⁴
- (3) avoid interference with natural, dynamic processes of shoreline formation and change except for reasons of public necessity or benefit;¹³⁵
- (4) encourage the preservation of scenic views, open space, and vistas;¹³⁶ and
- (5) minimize the adverse environmental impacts of shoreline development and to require that shoreline use and development minimize erosion, siltation, and interference with the natural shoreline geophysical processes.¹³⁷

The bulkhead armored a natural shoreline that already hosted a significant amount of bulkheading to the east. It obstructs natural erosion by blocking sediment behind it, starving the pocket beach of new material. It redirects wave energy to erode suitable forage fish spawning habitat. It established a large rock wall in the midst of scenic vistas along southeastern Blakely Island, the gateway to the San Juans. And it occurred in conjunction with new development and thus did not minimize interference with natural processes. Therefore, it conflicts with the policies above.

¹³² SJCC 18.50.210.A.2.b.

¹³³ Comp. Plan § 3.2.F.1.

¹³⁴ Comp. Plan § 3.2.F.2.

¹³⁵ Comp. Plan § 3.2.F.3.

¹³⁶ Comp. Plan § 3.2.F.4.

¹³⁷ Comp. Plan §§ 3.4.C.1, .2.

The bulkhead also contravenes the following regulations that reflect the above policies:

- (1) shoreline development must be located, designed, constructed, and managed in a manner that minimizes adverse impacts to surrounding land and water uses and must be aesthetically compatible with the affected area.¹³⁸
- (2) shoreline development must be located, designed, constructed, and managed to avoid disturbance of and minimize adverse impacts to fish and wildlife resources, including spawning, nesting, rearing and habitat areas, and migratory routes;¹³⁹
- (3) shoreline uses and activities must be designed to minimize and prevent the need for shoreline defense and stabilization measures and flood protection works, such as bulkheads, other bank stabilization, landfills, levees, dikes, groins, jetties, or substantial site regrades.¹⁴⁰

The bulkhead does not minimize impacts to surrounding areas and is not aesthetically compatible with the undeveloped shoreline to the west or the apparent lack of authorization to armor the stretch to the east. The Application's insufficient forage fish surveys do not demonstrate that it avoids disturbing spawning and nesting areas and the long-term cumulative impacts with the likely unauthorized armoring to the east may adversely impact migratory routes for threatened salmon by similarly extending lawn down to the shoreline over time. The bulkhead will interfere with the natural shoreline erosion that feeds the pocket beach fronting it. Last, the residential use of the shoreline property was not designed to minimize the need for a bulkhead; indeed, the development promoted the installation of the unpermitted bulkhead.

The bulkhead must be removed because it frustrates the SMP's environmental protection policies and regulations.

2. The Unpermitted Bulkhead Is Inconsistent With the County's Critical Areas Regulations.

In addition to compliance with the SMA and SMP, shoreline armoring must be consistent with the County's critical areas regulations.¹⁴¹ These regulations establish

¹³⁸ SJCC 18.50.070.D.

¹³⁹ SJCC 18.50.070.F.

¹⁴⁰ SJCC 18.50.070.J.

¹⁴¹ SJCC 18.50.080.

strict fish and wildlife habitat protection standards for marine shorelines like that along the site.¹⁴² The Application indicates that the bulkhead does not satisfy the criteria established by those protections.¹⁴³

First, the Application does not include a geotechnical analysis that demonstrates that the new development on the shoreline was set back sufficiently to ensure that shoreline stabilization would not be necessary for 75 years.¹⁴⁴ Second, even if the armoring had been demonstrated to be necessary to interfere with erosion, it would need to be limited in size to the “minimum necessary.”¹⁴⁵ Written reports created shortly after the discovery of the unpermitted bulkhead indicate that the landowners requested the expansion of the rock wall. Thus, not only is the bulkhead unnecessary generally, its substantial girth extends well beyond the minimum necessary.

Third, and as explained in detail above, the Application omits crucial information and fails to demonstrate that the new bulkhead satisfies critical areas criteria.¹⁴⁶ As an initial matter, like the SMP, critical areas regulations do not allow for the construction of a bulkhead in conjunction with new development.¹⁴⁷ Bulkheads are authorized only “[t]o protect existing primary structures” -- the bulkhead could not have been constructed to protect an existing primary structure because the house did not exist at the time that the bulkhead was constructed. Moreover, a new bulkhead could be constructed for an existing residence only if “conclusive evidence, documented by geotechnical analysis, [showed] that the structure is in danger and will suffer damage from shoreline erosion caused by tidal action, currents, or waves and where no alternatives, including relocation or reconstruction of existing structures, are found to be feasible and less expensive than the proposed stabilization measure.”¹⁴⁸ Moreover, none of the consultant memoranda “contain[s] a determination that in the absence of such measures, there is a significant possibility that the structure to be protected will be damaged by shoreline

¹⁴² SJCC 18.35.115-.130.

¹⁴³ SJCC 18.30.160.B.

¹⁴⁴ SJCC 18.35.130.G.3.a.ii.

¹⁴⁵ SJCC 18.35.130.G.3.b.1.

¹⁴⁶ SJCC 18.35.130.G.3.e.

¹⁴⁷ SJCC 18.35.130.G.3.e.i.

¹⁴⁸ SJCC 18.35.130.G.3.e.i(A).

erosion within three years.”¹⁴⁹ The Application materials do not identify erosion within three years.

In addition, although subsequent geotechnical reports¹⁵⁰ downplay upland drainage concerns, the Application concedes the existence of upland drainage issues – for example, stormwater reports for the project state that the shoreline has not encountered erosion since remedial measures redirected runoff. In the absence of a proper analysis of upland runoff, the Application cannot conclusively show risk due to shoreline waves and tides. Further, the Application does not evaluate relocating or reconstructing the house, driveway, or any other unidentified new development believed to be threatened. As Johannessen explains “[a]n erosion rate of 2 in/yr will not threaten the house, access road (if that is what is intended to be protected), or other improvements. No mechanism for larger or deep-seated slides has been defensibly put forward, as the memo by Mr. Hammer addresses.” Thus, the Application does not satisfy the most essential showing required by the critical areas regulations—that development be threatened by erosion within three years.

In addition, the Application does not explain how the normal shoreline erosion constitutes a need for a drastic response like armoring when the critical areas regulations expressly state that “[n]ormal sloughing, erosion of steep bluffs, or shoreline erosion itself, without a scientific or geotechnical analysis, is not demonstrate of need.”¹⁵¹ And the geotechnical reports attached to the Application did not conduct any meaningful evaluation of on-site drainage issues to address those problems away from the shoreline edge before considering the armoring, which is particularly notable given that the photos show small toe erosion in conjunction with the initial development of the site.¹⁵²

Last, the Application does not demonstrate that it satisfies the mitigation sequence. As an initial matter, the Application’s undated narrative declares on the last page that “[b]ecause this is an after-the-fact permit, avoidance of taking any action

¹⁴⁹ SJCC 18.35.130.G.3.f.vii(F).

¹⁵⁰ *E.g.*, Hart Crowser, Memorandum regarding Geotechnical Engineering Conclusions and Recommendations Runstad Property, Blakely Island, Washington, 17921-00 (Dec. 17, 2015).

¹⁵¹ SJCC 18.35.130.G.3.d.i(B).

¹⁵² SJCC 18.35.130.G.3.e.i(C).

whatsoever is inapplicable.”¹⁵³ This statement presumes that the applicants’ unlawful shoreline development should afford them the benefit of circumventing the initial and essential step in the mitigation sequence, avoidance of impacts. However, the Application omits any legal authority for the proposition that a development should gain an advantage by disregarding local laws.

Further, the Fish and Wildlife Habitat Conservation Area Report misstates several important areas of information in addressing the mitigation sequence analysis required by the critical areas regulations.¹⁵⁴ First, that report erroneously states that the bulkhead occurred above the OHWM. As explained above, Johannessen identified the bulkhead at or below OHWM.¹⁵⁵ Second, the report asserts that “[i]ntertidal access to the work areas was conducted during low tides and over temporary work pads designed to prevent bank and beach erosion and removed following completion of work.”¹⁵⁶ WDFW photographs taken in 2011 do not show the use of pads on the shoreline.¹⁵⁷ Instead, they show scraped portions of the beach for use in the bulkhead.¹⁵⁸ The report also erroneously asserts that previous surveys by Friends and Hart Crowser indicate that surf smelt do not spawn on the beach.¹⁵⁹ However, Friends surveyed the beach only one time, in 2003, and Hart Crowser failed to conduct a series of surveys sufficient to demonstrate the absence of spawning habitat. Last, although the report acknowledges that “upland erosion” occurred at the site, it does not fully examine whether that erosion warrants armoring and fails to explore the long-term impacts of unnecessarily impounding sediment behind the bulkhead.¹⁶⁰

3. The Adjacent Stretch of Armoring to the East Should be Enforced Against to the Extent It Was Not Permitted.

In addition to the concerns with the Application identified above, a comparison

¹⁵³ Document titled Runstad Bank Stabilization and marked received by SJC Community Development & Planning on June 10, 2015.

¹⁵⁴ SJCC 18.35.130.G.1.b.

¹⁵⁵ Hart Crowser Memorandum re: Fish and Wildlife Habitat Conservation Area Report, Runstad Property on Blakely Island, San Juan County, Washington, 17921-00, 2 (Dec. 17, 2015) (hereafter “FWHCA Report”).

¹⁵⁶ FWHCA Report, at 3.

¹⁵⁷ See Attachment G.

¹⁵⁸ See Attachment D (large equipment on beach without pads, tracks along beach).

¹⁵⁹ FWHCA Report, at 3.

¹⁶⁰ FWHCA Report, at 2.

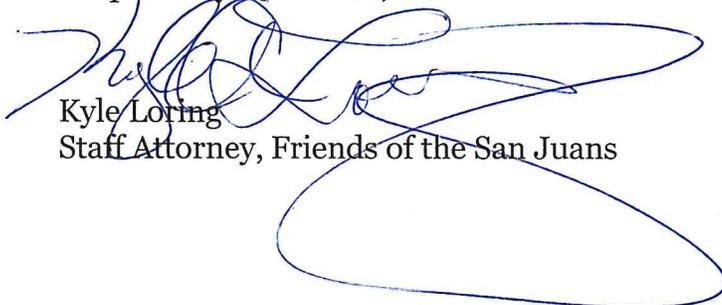
of aerial photos dated 2006 and 2008 with County records suggests that the stretch of bulkheading identified by the Survey as “older bulkhead” has not been approved by the County. The CGS Memo states that “[a]erial photos show that this eastern rock wall was constructed between 2006 and 2008, which concurs with direct observation of construction by this author.”¹⁶¹ Mr. Johannessen states that he was not aware of a permit for that bulkhead and Friends has not been able to locate a permit for that bulkhead in the 2006-08 timeframe.¹⁶² Consequently, unless authorization exists for that bulkheading, it must be removed.

C. CONCLUSION

The Application must be denied and the bulkhead finally ordered for removal. Notwithstanding the SMP’s high priority for preventing bulkheads for new development, the bulkhead here was constructed in conjunction with new development of a raw parcel of land on Blakely Island. And although the Application asserts post-hoc slope instability, those same studies should have been conducted prior to the development to guide it to a location that would not have raised concerns about shoreline erosion. The Property enjoys typical, slow long-term erosion and a bulkhead would impede that natural function and impact suitable surf smelt spawning habitat and natural coastal geological functions. The bulkhead therefore must be removed for its inconsistency with the SMP and CAO.

Thank you for your careful consideration of these comments.

Respectfully submitted,



Kyle Loring
Staff Attorney, Friends of the San Juans

¹⁶¹ CGS Memo, at 2.

¹⁶² *Id.*

ATTACHMENT A

memorandum

Date: January 27, 2016

To: Kyle Loring, Friends of the San Juans

From: Jim Johannessen, Licensed Engineering Geologist, MS

Re: **Runstad Property, SE Blakely Island – Unpermitted Bulkhead and Application**

Parcel no. 151024002000

Introduction and Purpose

We understand a shoreline bulkhead was constructed in 2011 at the Runstad property. We have received supporting consulting reports prepared for the applicants concerning the property's wave energy, ordinary high water mark, ecological resources, proposed beach nourishment, and similar. Following this, we received additional consultants' reports prepared for the applicants, addressing new slope stability modeling, and an updated report from Coast and Harbor Engineering, along with additional information.

Coastal Geologic Services Inc. (CGS) was requested to review these reports, relevant aerial photos, ground photos we were provided with, and other published and unpublished information on coastal and bluff processes and mapping. CGS was asked to characterize conditions at the coastal portion of the site, estimate risk at the site, evaluate possible causes of erosion mentioned by the applicants and their consultants, and provide opinions on whether the constructed bulkhead was needed. This author and other staff at CGS have not had the opportunity to visit the site. This technical memo summarizes findings.

The subject property, parcel 151024002000, is located on southeast Blakely Island, in eastern San Juan County, and has approximately 491 ft of shoreline facing to the east-southeast. The property is within a small bay, partially sheltered by Armitage Island.

Available Information

The following primary materials were reviewed in preparation of this document (additional references are listed in the *References* section at the end of the report):

Technical Memorandum: Runstad Property - Supplemental coastal geologic analysis, by Coast and Harbor Engineering, Dec. 17, 2015, 14 pp. (Exhibit N).

Technical Memorandum: Runstad property – Shoreline Erosion Protection, by Coast and Harbor Engineering, Nov. 26, 2012, 7 pp.

Technical Memorandum: Runstad Property Beach Nourishment, by Coast and Harbor Engineering, Apr. 23, 2015, 8 pp.

Geotechnical engineering conclusions and recommendations, Runstad property, Blakely Island, Washington, by Hart Crowser, dated Dec. 17, 2015, 4 pp. plus 4 figures (Exhibit L).

Ordinary High Water at Runstad Property on Blakely Island 17921-00, by Hart Crowser, Nov. 8, 2013, 5 pp. plus photographs.

- Fish and wildlife habitat conservation area report, Runstad property on Blakely Island, San Juan County, Washington, dated Dec. 17, 2015, 7 pp. plus 6 photo pages (Exhibit M).
- Riparian Enhancement Plan: Runstad Shoreline, Blakely Island prepared by Hart Crowser, Aug. 8, 2014, prepared for Foster Pepper, 15 pp.
- S Blakely photos, a PDF supplement to the above, with four full-page ground photos (one photo dated Feb. 9, 2011) and a poor scan of a survey map, 5 pp. total.
- Preliminary Topographic survey for Jon Runstad, San Juan Surveying, Nov. 23, 2015 (Exhibit K).
- Preliminary Topographic survey for Jon Runstad, San Juan Surveying, Jun. 3, 2015.
- Shoreline oblique aerial photos by the WA Dept. of Ecology: 2006, 2002, and 1977 (Figure 1).
- Vertical aerial photo from 1998–2015, provided through Google Earth (Figures 2, 4, and 5).
- Washington Coastal Zone Atlas for San Juan County (WA Dept. of Ecology 1978).
- Feeder bluff mapping of Puget Sound (MacLennan et al. 2013).
- Net shore-drift mapping of San Juan, County (Johannessen 1992).

Site Conditions Overview

Overview and Developed Features

The subject property is a low bank property. The site is shown in a series of oblique aerial photos in Figure 1. With the exception of a small clearing, the site upland and marine bank were almost fully tree-covered up through 2006, including what appears to be evergreen and deciduous trees and shrubs (Figure 1).

A rock bulkhead section was constructed along approximately 300 ft of the site, as shown on the recent San Juan Surveying map. The length of the bulkhead wall was not included in any of applicant's many reports, with the exception of one reference to it being a 150-ft-long bulkhead. The bulkhead is not located waterward of the house; it is waterward of the gravel access road and utility lines leading to the house from the northeast. It is not clear from the aerial photos when this access road was installed. The drainfield is shown on the survey map upslope of this section of access road.

The approximately 300-ft-long newer rockery wall abuts what appears to be a rockery bulkhead on its northeast end. This different rock wall runs for approximately an additional 300 ft to the east. Most of this wall is waterward of only a mowed grass field and not waterward of any buildings or road, with the exception of the far east end where a tennis court is on the order of 30–40 ft landward of the marine bank crest. Aerial photos show that this eastern rock wall was constructed between 2006 and 2008, which concurs with direct observation of construction by this author. The wall in this area does not appear in the 2006 aerial photos by the Washington Department of Ecology and clearly appears in the 2008 aerial photos, along with what appears to be unusually light colored beach sand on the upper beach—including waterward of the mean higher high water line. To our knowledge this bulkhead was not permitted.

According to the photos provided from the San Juan County file and those believed to be taken by WDFW on February 9, 2011, the bulkhead appears to be a steep-faced rockery wall constructed over the upper beach. We understand the rockery was constructed in prior to February 9, 2011,

apparently prior to construction of the house. A separate shorter reach of rock revetment appears to be present waterward of the house on the parcel, south of the new bulkhead, as seen in Photo 1 in the Fish and Wildlife Conservation Report (Hart Crowser 2015) and in Figure 2, which is a vertical air photo from 2011. This southern revetment section was constructed of rounded boulders. This reach of rounded rock revetment is not shown on the survey map.

It is not at all clear from any of the applicant's reports what the bulkhead was intended to protect, other than some amount of bank erosion/recession. Nor are the setback distances of site features stated in any of the applicant's reports.

A vertical air photo shows the site in a plan view perspective, taken during the construction of the house at the subject property in August 2011 (Figure 2) and again in 2015 (Figure 4). The marine bank near the house was mostly well vegetated in all of these photos, which suggests that any erosion of the bank which may have been occurring was very minor. Trees persisted on the majority of the bank face, with low growing vegetation elsewhere.

The house at the property was measured, using several of the best available vertical aerial photos, as approximately 50 ft landward of the nearest portion of the low bank crest at the marine shore (Figures 2 and 4). This is the closest point of the house in relation to the bank crest. No other buildings are located closer to the bank on the parcel. The most recent survey map of the property by San Juan Surveying does not show a top of bank. It may be that there is no discernible bank crest, as the bank has a relatively shallow slope. If the 25-foot contour on this survey map is used as possibly the top of bank, the house setback appears to be on the order of 48–52 ft at the closest location. The access road appears a bit closer to the bank than the house, but because this area cannot be discerned in air photos and the applicant's reports do not provide any details, this setback is not known and cannot be assessed.

Geology and Elevations

The bank was mapped as composed of glacial till (WA Dept. of Ecology 1978). Till is the strongest glacial deposit in San Juan County, having been compressed under the full weight of the most recent ice sheet, which was on the order of 4,000–5,000 ft thick. The bank at the site was mapped as *stable* in WA Dept. of Ecology (1978).

The survey map shows what appears to be the approximate top of bank waterward of the east end of the house at between 20 and 25 ft in elevation in the NAVD88 (National American Vertical Datum of 1988) datum. The survey map by San Juan Surveying states that local mean lower low water (MLLW) was within 0.5 ft of NAVD88, such that these datums are almost interchangeable. The survey map shows that the toe of the rockery was between 8 and 10 ft NAVD88, which would make the bank height approximately 10 to 15 ft high directly waterward of the east end of the house.

The general bank slope is about 2:1 (horizontal:vertical), with a 2.4:1 slope at the south end and 1.7:1 where the bank is highest. Waterward of the southeast corner of the house, the slope is 2.2:1. These slopes are less steep than typical erosional banks in San Juan County.

Net Shore-drift and Waves

The property is within an area mapped as not having appreciable net shore-drift (Johannessen 1992). Most of the sediment from the beach or any bank erosion does not leave the bay. In the *Change Analysis* report by the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP; Simenstad et

al. 2011), the parcel was mapped as a pocket beach. A pocket beach is defined as a beach that is contained between two bedrock headlands that essentially functions as a closed system in terms of littoral sediment transport (Simenstad et al. 2011, CGS 2011). Pocket beaches do not typically occur within a drift cell and there is little or no littoral (alongshore) exchange of sediment between the pocket beach and adjacent shores. Pocket beaches are typically swash-aligned (i.e., oriented perpendicular to the direction of predominant wave approach; Shipman 2008). They are relatively short in length, as compared to the length of a barrier beach. In plan view their shape is crescentic and they often have well-sorted sediment (CGS 2011).

This site is partially sheltered from waves by Armitage Island. Wave size is limited by fetch, which is the distance of open water over which wind can build waves. The site is not exposed to swells from any direction. This site is only exposed to a narrow (window) fetch from the southeast (north of Armitage Island) with a maximum fetch of 6 miles, and 0.9–1.1 miles from the south-southwest (west of the island). Armitage Island and the headlands on either side of the subject site pocket beach do not completely block wind-generated waves, but these features will greatly diminish wave energy reaching the beach at the site through wave refraction and diffraction. Therefore, the wave energy reaching the site would be generally similar to a site exposed to up to several miles of southeast fetch, making this site on the lower energy end of the spectrum for San Juan County shores.

The erosion of the bank toe appears as if it may have coincided with work to develop this site. Specifically, this erosion appears to have been associated with clearing and constructing/enlarging the access road and utilities leading southwestward to the house. A significant amount of clearing and a temporary roadway is evident waterward of the full length of the house in 2011 (Figure 2), which may have extended to very near the top of bank. It appears that this amount of clearing relatively close to a marine bank without drainage control could have caused what appears to have been several very small and shallow surficial slides. As shown in the 2006 aerial photo (Figure 1), the uplands were almost completely forested.

Cumulative Risk Relative to Need for Armor

The Marine Shoreline Design Guidelines (MSDG; Johannessen et al. 2014) was created for assessing marine shore properties and determining appropriate erosion control alternatives for a given site—including sites where no erosion control measures are justified. The MSDG was contracted by the Washington Department of Fish and Wildlife in cooperation with Washington Department of Natural Resources, Washington Department of Transportation, and the Aquatic Habitat Guidelines Group. The document was peer-reviewed by 27 regional experts, scientists, and practitioners and revised based on reviews prior to publication.

If the rockery was intended to protect only the access road, this was never clearly stated in applicant's reports. No setback distances were provided, such that a risk analysis could not be completed for this feature.

Using the MSDG Table 3-4, we calculated the cumulative risk for this parcel as follows:

- ◆ For the erosion potential score component, the shoretype of "no appreciable drift" earns a score of zero.
- ◆ The fetch of 5.6 miles earns 3 points.

- ◆ The setback from the house to the nearest bluff crest of approximately 50 ft earns 2 points in the infrastructure threat category.
- ◆ Because there is a residential building, that earns 3 additional points in the infrastructure threat category.
- ◆ The cumulative risk score is given as the sum of the erosion potential scores times the sum of the infrastructure threat scores, or $(0+3) \times (2+3) = 15$.

Cumulative risk scores up to 15 points fall into the Low Risk category. The MSDG decision tree recommended course of action for low risk sites with hard armor such as this is bulkhead removal (MSDG Figure 5-11). Erosion control structures are deemed as not needed for situations where the setback is relatively large relative to the risk. Long-term erosion rates are outlined as most instructive in the MSDG. However, note that the fetch for this site, due to wave dampening by Armitage Island and the headlands (as discussed above) is an exaggeration of the wave energy at this site. In addition, the waves approach generally directly onshore, further limiting the effects of waves.

The MSDG strongly recommends that an erosion rate be determined for a site prior to deciding if an erosion control structure is needed. The erosion rate for this site, as discussed in the following section, was estimated by Coast and Harbor Engineering at 1 inch/year (0.08 ft/yr), a very low erosion rate.

The MSDG alternatives analysis (MSDG Table 5-8) suggests that appropriate techniques for this site include: no action, bulkhead removal, and possibly beach nourishment, large wood, and bank reslope and revegetation. Revetments or vertical walls (or any type of hard armor) is not recommended for a Low Risk site such as this.

Analysis of Coast and Harbor 2012 Memo

The technical memorandum by Coast and Harbor Engineering titled *Runstad Property – Shoreline Erosion Protection* (2012) considered the San Juan County Shoreline Master Program (SMP) regulations for where a bulkhead may be allowed, section 18.50.210. No author is included for this memo, and the memo was not stamped by a licensed geologist, engineering geologist, or professional engineer. The most relevant points within this technical memorandum regarding these regulations will be discussed below.

A.2.a) Serious erosion is threatening an established use of the adjacent uplands

The memo discusses a low-elevation bank toe erosional feature, complete with a photo (Coast and Harbor 2012 Figure 1). The presence of this minor toe erosion, which appears to be limited to less than 5 ft vertically (no dimensions were provided in the memo), appears to be the only bit of evidence provided in this section demonstrating “serious erosion”. No measurements or specific mention of the house or any other improvements are included in this analysis. Therefore, there are no improvements discussed which may or may not require protection from erosion.

The Coast and Harbor 2012 memo states that “during high tide, when water depth at the shoreline is 2–4 ft or deeper, a significant amount of wave energy that enters the bay is delivered to the bank.” The bank toe appears to be located at least 1.5 ft above mean higher high water (MHHW). Stating that 2–4 ft of water is above the toe of the bank demonstrates that this site is not well understood by the authors. In San Juan County and surrounding counties, a low-to-moderate wave energy site along

a glacial drift bluff typically has its bank toe several feet or more above local MHHW. This was verified by the ground photos provided, which show drift logs waterward of the wall in some locations. Overall, it appears the authors may not have visited the site due to the lack of specific mention of a site visit and specific information relative to the property. Only a completely bedrock shore without a beach would have the bank at such a low elevation such as it would have this much water depth against it at high tide. In other words, bluff backed beaches with glacial sediments and beaches do not occur with 2–4 ft of water against them in San Juan County. Additionally, this conclusion is not at all consistent with another consultant report prepared for the applicants that stated that the ordinary high water mark (OHWM) was located completely waterward of the bulkhead (see *Ordinary High Water Mark* section towards the end of this report).

The memo relies heavily on wave modeling. It is not appropriate that the authors used incomplete bathymetry data (as the authors stated) and wind data from a considerable distance away (Ault Field on Whidbey Island)—apparently without verifying that this wind data is similar to local conditions or adjusting the wind data. The full information on the calibration (or lack thereof) of the “preliminary” model was not provided. In fact, this shore is generally among the less exposed areas of the San Juan County marine shore. A hypothetical “design wind storm” was used by Coast and Harbor to estimate waves near the shore. The parameters are not explained; however, the wave approach angle used would create a worst-case scenario. A 47 mph wind speed was used from 140 degrees, producing significant wave heights of 2.2 ft. Even with the apparent shortcomings of the preliminary wave model, storm waves of this size are not high-energy waves and are often exceeded in San Juan County. It is important to note that just refining the wave model would not change the fact that erosion appears very slow and that risk was not otherwise demonstrated.

A bluff erosion rate was not determined by the 2012 Coast and Harbor memo. Using these modeled waves alone, the technical memo states that wave impacts were “threatening an established use of the Runstad property and the bulkhead is required along the full length of the damaged area to control bluff erosion.” Again, no demonstrated use or improvements, erosion rates, extent of erosion, or other relevant information was provided in the memo so is therefore not possible to show a threat as is inferred in the memo. Therefore, it does not appear this SMP requirement was met.

The 2015 nourishment memo, also by Coast and Harbor, showed one excerpt from an historical aerial photo (1941) and other recent photos that appear to be from Google Earth from 2005 on. The memo stated that the images were of insufficient scale to measure erosion rates. The 1941 image shown was from a photo compilation and not an original aerial. The original photos are readily available for order and would have allowed for erosion rate work to have been completed. The 1941 photo compilation shown would never be sufficient for shore change work. Photos from approximately 1960 and later from San Juan County or private, local vendors are of sufficient scale to carefully measure erosion rates at sites experiencing erosion. If this site was not truly erosional, indicated for example by a well-vegetated bank (such as most of this site), then it would also be difficult to measure change because of a lack of ground visibility in the photos.

Coast and Harbor (2012) estimated bluff erosion at 1 inch per year, which is probably a reasonable number. If this erosion rate is correct, the bluff crest would recede 50 ft to the nearest corner of the house in approximately 600 years. If a buffer for safety of 20 ft was removed from the setback of at least 50 ft, then it would take approximately 360 years for erosion to reach the waterward edge of

this buffer. The access driveway for the house is closer to the bank, but as the applicant's reports do not include any details on this area, it is not possible to assess it. Sea level rise will likely accelerate erosion, but the distances are still large relative to a very slowly eroding site.

A.2.b) The bulkhead is needed and is the most reasonable method of stabilizing the beach.

This section of the 2012 Coast and Harbor technical memo, which fully relies on the wave model and a picture of bank toe erosion (as discussed immediately above), quickly jumps to the conclusion that "only a structural solution can protect against shoreline erosion."

The memo then discusses the potential use of anchored logs, termed large woody debris (LWD). The memo gives two example large wood projects. Large wood is a design technique covered in detail in the MSDG. As this author was the lead author on the peer-reviewed MSDG, including the chapter on large wood, we have considerable expertise in this area.

Both of the large wood examples listed in the 2012 memo were generally described as failures for one reason or another, and were used to try to demonstrate that large wood would not be appropriate for the Runstad site. What the memo does not reveal is that both of the project sites discussed were areas of substantial shoreline fill (placement of soil and other materials to extend dry land into the tidelands), which moved the shore considerably waterward. This situation is explicitly listed as inappropriate for the use of large wood in the MSDG and this situation is not present at the subject property and has been used as an example by professionals such as Hugh Shipman, coastal geologist for the Washington State Department of Ecology. Therefore, the use of these examples is not appropriate.

Additionally, the Tacoma Narrows site used a method of anchoring which has also been described as inappropriate in the MSDG—the use of rigid and fixed vertical posts. This is literally a textbook example of how not to anchor large wood, so it is inappropriate to use this example to dismiss the use of anchored large wood at this site. Also, see several brief posts on this site:

<http://gravelbeach.blogspot.com/search?q=tacoma+narrows>.

Beach nourishment is also discussed by the 2012 Coast and Harbor memo and dismissed as impractical, as it was concluded to require renourishment at too frequent a time interval (5–10 years). The basis for this conclusion was not explained other than referring to the wave modelling. In fact, if erosion control was needed to protect the house—which we do not agree with—beach nourishment would appear to be a feasible approach. This site meets the following criteria to make it favorable for beach nourishment, as outlined in the MSDG:

- ♦ Site is swash-aligned, meaning waves approach close to straight on to the shoreline (as demonstrated by the wave model and by the definition of a pocket beach).
- ♦ Site is not a very high wave energy site.
- ♦ Site is not in a drift cell, such that littoral sediment transport is very limited.
- ♦ Shoreline length for nourishment could be 150 to 300 ft or more.

A blanket opinion that these soft shore protection techniques are not appropriate and that a rockery wall is appropriate due to a preliminary wave model and professional experience should not be considered adequate reasoning by itself in a technical memorandum by professional consultants.

A.3) Bulkheads shall not be permitted in conjunction with new projects or development when practical alternatives are available

As stated in the Coast and Harbor 2012 memo, the house was constructed in 2011 (also see Figure 2). This would appear to be very recent and new construction, as it appears the bulkhead was also constructed earlier in 2011 prior to the house, as evidenced from the various photos. The bulkhead was constructed without permits. This would appear to qualify as constructed with new construction, in our opinion.

In addition, the practical alternative was no action at the shore as outlined above. Conclusions in this section also rely on the discussion of what is appropriate for the site, which does not appear to be supported, as stated above.

A.7.b) ...includes at least the following information: Direction of longshore transport

The wave model was used to prepare Figure 6 in the 2012 memo, which shows the Coast and Harbor's interpretation of longshore transport at the site. This figure shows transport coming from both ends of the pocket beach moving towards the new house. Therefore, this shows sediment moving into the area of concern, located waterward of the recent house. Showing this information may satisfy the requirement; however, it is important to note that the interpolated sediment transport would indicate either accretion or relative stability near the house, as sediment would appear to be delivered from both directions to this location.

The fact that the 2012 memo does not refer to published longshore drift (net shore-drift) mapping shows either an incomplete understanding of available information for local shores or a selective omission. Net shore-drift (the long-term effect of longshore drift) was mapped as *not* occurring at this site in 1992 (Johannessen 1992), and this was verified in MacLennan et al. (2013). These data have been online for years at the WA Department of Ecology Coastal Atlas website.

A.8) ...Prohibited for any purpose if it will cause significant erosion or beach starvation

The Coast and Harbor 2012 memo states, "The bulkhead is constructed high in the profile, not in response to retreat of the intertidal beach, but to protect the slope at the back of the beach from episodic erosion due to high storm waves combined with high water level." This statement acknowledges that the marine bank is what is intended to be protected from erosion. If this function were to be provided by a permitted bulkhead, by definition, it would reduce the sediment input to the beach. This would directly reduce sediment input and therefore the conclusion ("nature does not need to erode the upland to provide sediment to the beach so that it is not in a starved state") does not appear accurate, and is not consistent with the stated need for a bulkhead. Bank or bluff erosion is understood to supply approximately 90% of the beach sediment in the region (Keuler 1988, Johannessen and MacLennan 2007), with even higher proportions from an island where there are no rivers and only small streams in very distant locations. No stream or river sediment appears to be delivered to this beach, such that bank erosion is the only source.

With the subject bulkhead and the adjacent recent bulkhead on the east side, the large majority of this pocket beach shore is now armored. This has caused significant cumulative impacts to this beach system, which have not been addressed to date.

Additionally, the near-vertical face of the rockery wall causes some amount of wave reflection, which would cause additional beach scour. A number of technical reports in the literature discuss increased wave reflection from these and other types of shore protection structures causes waves at high water, which are taken as best available science in the region (MacDonald et al. 1994, Shipman et al.

2010). This is not addressed in the Coast and Harbor memos. Therefore, the analysis of this SMP regulation is not complete.

Analysis of Coast and Harbor 2015 Memo

The memo titled "Runstad Property – Supplemental coastal geologic analysis" by Coast and Harbor Engineering, dated December 17, 2015, was received after initial analysis and writing was completed addressing the 2012 memo by Coast and Harbor Engineering. The 2015 memo addresses issues requested by San Juan County to comply with the supplemental coastal geologic analysis relative to **portions of** (and not all relevant portion of) SJCC 18.35.130.G. This work appears to be an update of the 2012 memo. Points made in the 2015 Coast and Harbor memo will be discussed by subheading herein, with reference to information provided in the previous section of this report.

Description of the causes for the erosion, SJCC 18.35.130(G)(3)(f)(vii)(A)

Similar to the 2012 analysis by Coast and Harbor, the preliminary (and admittedly not accurate) wave model and a single photo of bank erosion was used to justify the need for the unpermitted bulkhead. See above section (A.2.a) *Serious erosion is threatening an established use of the adjacent uplands* for a series of weaknesses with these lines of reasoning, including the fact that the area experiences relatively low wave energy which causes littoral (alongshore) transport along the beach towards the southwest end of the bulkhead, and not away.

Past erosion rates over a period of at least 30 years, SJCC 18.35.130(G)(3)(f)(vii)(B)

This section is also much the same as in the 2012 memo. The aerial photos presented were a very poor choice for attempting to do shore change work. See the above section (A.2.a) *Serious erosion is threatening an established use of the adjacent uplands* for a series of problems with points in this section of the Coast and Harbor memo.

The Coast and Harbor memo states that, "the historical rate of shoreline erosion at the Runstad property shoreline is estimated at approximately 1" per year." This is a very slow erosion rate (0.08 ft/yr) and along with other discussion in this section of the 2015 memo, does not in any way justify the installation of a bulkhead at this site (as described above).

Projection of future rates of erosion over the next 30 years, SJCC 18.35.130(G)(3)(f)(vii)(C)

The Coast and Harbor 2015 memo addresses one portion of this section of the code—as referenced in the heading for this subsection (18.35.130(G)(3)(f)(vii)(C)). This sub-section addresses a projection of erosion rates over the next 20 years. It is likely the erosion rate will increase due to sea level rise, and this may result in a 2 in/yr erosion rate as stated in the 2015 memo. No exact mechanism or rate of anticipated slope recession other than this rate was offered, other than stating that it "does not represent actual dynamics of the shoreline retreat occurred on-site." This broad apparent discrediting of the erosion rate forwarded is not further explained or substantiated.

It is important to note that this projected erosion rate is not applied to one of the most relevant portions of this section of code, 18.35.130(G)(3)(f)(vii)(F), which states that:

(F) In the case of an application for hard structural stabilization measures, the report shall contain a determination that in the absence of such measures, there is a significant possibility that the structure to be protected will be damaged by shoreline erosion within three years.

An erosion rate of 2 in/yr will not threaten the house, access road (if that is what is intended to be protected), or other improvements. No mechanism for larger or deep-seated slides has been defensibly put forward, as the memo by Mr. Hammer addresses (attached). The omission of addressing this key part of the code negates the analysis of this larger portion of the code.

Section 18.35.130(G)(1) of this portion of the code addresses Standards and Requirements for Shoreline Modifications, including mitigation sequencing. This was not mentioned or discussed in any of the applicant's reports. The first step and most important step (G)(1)(b)(i) in mitigation sequencing in this code is to avoid the impact altogether. This was obviously not carried out for the site, as the applicant is seeking an after-the-fact permit instead of a permit for bulkhead removal. The conclusions reached by this author using the information presented in this memo lead to avoidance as being the best management choice for the property.

Section G(3) of this portion of the code addresses additional standards for shoreline stabilization measures, including (a) that "new development on all shorelines other than bedrock shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure (minimum 75 years) as demonstrated by geotechnical analysis." This analysis of setback was not presented to our knowledge for the house built soon after the bulkhead was installed. Beyond this in (b), the code specifies that only the minimum size of stabilization measures can be constructed. This has not been addressed by the applicant relative to the very lengthy bulkhead, and this long structure has not been justified.

Section G(3)(e) of this portion of the code states that all five conditions listed in section SJCC 18.35.130(G)(3)(e) (ii) had to be met to allow a structural stabilization at a single-family residential site. Neither the 2015 Coast and Harbor Engineering nor the geotechnical engineering report (discussed immediately below) satisfy all of these conditions. This specifically includes the first condition, that erosion is not caused by upland conditions and the clearing of natural vegetation, which may very well be the case, and the second condition, that vegetation planting and drainage improvements would not be sufficient to address issues on site. The other conditions are addressed elsewhere in this report.

Detailed Topography from the Project to the Lower Beach, SJCC 18.35.130(G)(3)(f)(vii)(D)

Selected results of two different surveys, with very different apparent levels of accuracy, are presented in this subsection of the 2015 Coast and Harbor report. Two cross-sections from these surveys are used to try to show that the beach has not eroded in an approximately one year long period. The difference in beach elevation is extremely small at one of the two cross-sections, with coverage over what appears to be only a 10-foot-wide area of the uppermost beach. The memo states that this minor accumulation of sediment may be "an indication of long-term positive effect of the project on the Runstad shoreline." The use of such an incomplete data set over such a short period of time to suggest that a new near vertical face bulkhead has had a positive impact on the beach is highly questionable, and goes against Best Available Science for the region, such as Shipman et al. (2010), Clancy et al. (2009), Simenstad et al. (2011), and MacDonald et al. (1994).

Analysis of Geotechnical Engineering 2015 Report

A report submitted by Hart Crowser titled *Geotechnical engineering conclusions and recommendations, Runstad property, Blakely Island, Washington*, dated December 17, 2015, concluded that the bulkhead was necessary. This memo appears to have been intended to address SJCC 18.35.130(G)(3)(e).

This memo did rely very heavily on slope stability modeling. It appears that the analysis by Hart Crowser assumed incorrect values for most parameters input into the slope stability model, and appears to have reached conclusions such as the site is at real risk of experiencing deep-seated bank failures that do not appear consistent with other information and do not appear to be correct. This topic is being addressed by another professional and will be reported on separately.

Ordinary High Water Mark Memo

The 2013 memo from Hart Crowser discussing the location of the ordinary high water mark (OHWM) was reviewed, along with ground photos attached to the memo and oblique aerial photos. The Hart Crowser memo relies heavily on the presence of ephemeral vegetation on the upper beach. The site visit occurred in late summer, at the time of maximum extent of seasonal vegetation following the previous spring and summer, and in fair weather conditions when seasonal and ephemeral vegetation is present.

It appears most professionals would have mapped the OHWM as running along the toe of the marine bank. The OHWM is typically mapped within the zone of dense drift logs and not at the waterward edge of sparse logs. Additionally, a change in the bed or the presence of relatively dense vegetation (not scattered ephemeral vegetation) is typically required to locate OHWM. The determination that the rockery wall was constructed entirely landward of OHWM is questionable in my professional opinion. Photographs in the memo show a fairly consistently sloping beach right up to the rockery toe, with no apparent backshore present. Many photos show no or very sparse drift logs present waterward of the rockery wall, and most of the photos show no or sparse low-growing vegetation.

Furthermore, if the bank and beach were seriously eroding as concluded in the Coast and Harbor memos, there would not be any measurable amounts of vegetation or drift logs present on any of the upper beach. The rockery undoubtedly was constructed in an approximately 4–6-foot-wide area waterward of the toe of the bank, and therefore was very likely constructed waterward of the OHWM.

Photographs in the Fish and Wildlife Habitat Conservation Area report by Hart Crowser such as photographs 4 and 8 show the active beach with very recent wrack deposits and an absence of drift logs present along what appears to be a long reach of the center of the rockery wall. These are clear indications that the OHWM was further landward than the wall, contrary to the conclusions in the OHWM report.

Other project photos, such as Figure 7 in the Coast and Harbor 2015 report, show tidal waters in the absence of storm waves reaching up to the face of the 2011 rock bulkhead, indicating that the normal reach of the tides is beyond the face of the bulkhead. Figure 9 in the same report shows what appears to be very recent wrack deposits within several feet of the toe of the southern portion of the bulkhead in May, a time not known for storms or unusually high tides. Both of these photos are indicative of an OHWM located higher than the toe of the majority of the length of the rockery wall.

Similar conditions existed at other properties in San Juan County and elsewhere in the region where an expert in OHWM mapping clearly stated that the OHWM was located at the toe of the marine bank. This location would be landward of the toe of the existing rockery and therefore, along with other information presented in this subsection of this report, it is quite likely that the OHWM was located landward of the toe of the rockery wall when constructed in 2011.

Conclusions and Recommendations

As described in more detail above, the 2012 and 2015 site and regulatory analysis reports by Coast and Harbor Engineering appear incomplete and misleading. Site conditions were not adequately described or documented, other than showing and discussing several photographs and a preliminary and incomplete wave model. Their analysis relies very heavily on the preliminary wave model and had little other measurements or information. The wave model relies on a relatively distant wind dataset without any analysis or calibration to conditions at the site. The bathymetry data used was admittedly incomplete as well. The memos do not include specific analysis of geology or upland conditions and features, and some of the conclusions are not consistent with best available science.

The Coast and Harbor memos, along with the Geotechnical Engineering memo by Hart Crowser, stated that the erosion is serious and severe, but the erosion rate forwarded was 1 in/yr (0.08 ft/yr). History of any documented bank recession events other than intermittent and regionally common bank toe scarp was not provided. It is this author's professional opinion that the extensive clearing and lack of drainage management was likely the cause of the small "sloughing" events mentioned in the reports, and not coastal erosion, as the site is in a relatively low wave energy location.

Additionally, the Geotechnical Engineering by Hart Crowser memo indicates that there is a real risk of deep-seated slides at the site, while neither the basic geology nor any field evidence from the site or from near the site supports this. The glacial till of the bank is fairly resistant to erosion and is not typically subjected to larger slope failures. It appears that this modelling is misleading and should not be relied on. This topic will be addressed further separately.

The Coast and Harbor Engineering reports do not cover critical portions of San Juan County code 18.35.130(G)(3)(f)(vii)(F), including but not limited to whether the substantial improvements are directly threatened by coastal erosion within 3 years.

Section 18.35.130(G)(1) of the code addresses Standards and Requirements for Shoreline Modifications, including mitigation sequencing. This was not mentioned or discussed in any of the applicant's reports. The first step and most important step (G)(1)(b)(i) in mitigation sequencing in this code is to avoid the impact altogether, and this was obviously not carried out for the site, as the applicant is seeking an after-the-fact permit instead of a permit for bulkhead removal.

No risk was demonstrated to the house or any other significant improvement on the property, including the access drive, and no alternatives other than a 300-foot-long rockery wall were provided. Therefore the need for structural shoreline stabilization was not demonstrated. This can be compared to the MSDG cumulative risk rating, which categorizes the house site as a Low Risk site. The MSDG would suggest no need for erosion control, and in fact that the site is a good candidate for bulkhead removal. If the rockery was intended to protect only the access road, this was never clearly stated and no distances were provided, such that a risk analysis would not be complete for this feature.

The fact that there is a large amount of detailed geologic, geomorphic, and other mapping for this site that was not mentioned, and that none of Best Available Science documents were used (only one reference was provided by Coast and Harbor, which was a bathymetry file). This also suggests that the analysis by Coast and Harbor was incomplete.

Limitations of This Report

This report was prepared for the specific conditions present at the subject property to meet the needs of specific individuals. No one other than the client (Friends of the San Juans) and their agents should apply this report for any purposes other than that originally contemplated without first conferring with the geologist that prepared this report. The findings and recommendations presented in this report were reached based on available information presented in the text. The report does not reflect detailed examination of sub-surface conditions present at the site, or drainage system designs, which are not known to exist. The report is based on examination of information as stated in this report and not on field reconnaissance. In addition, conditions may change at the site due to human influences, floods, groundwater regime changes, or other factors.

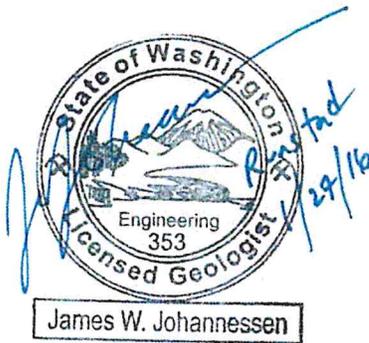
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Coastal Geologic Services Inc.



Jim Johannessen,

Licensed Engineering Geologist, MS

ATTACHMENTS:

Figure 1. Shoreline oblique aerial photos by the WA Dept. of Ecology: 2006, 2002, and 1977.

Figure 2. Vertical aerial photo from August 2011, provided through Google Earth.

Figure 3. Topography at the subject property derived from LiDAR data.

Figure 4. Vertical aerial photo from May 2015, provided through Google Earth.

Figure 5. Vertical aerial photo from June 2008, provided through Google Earth.

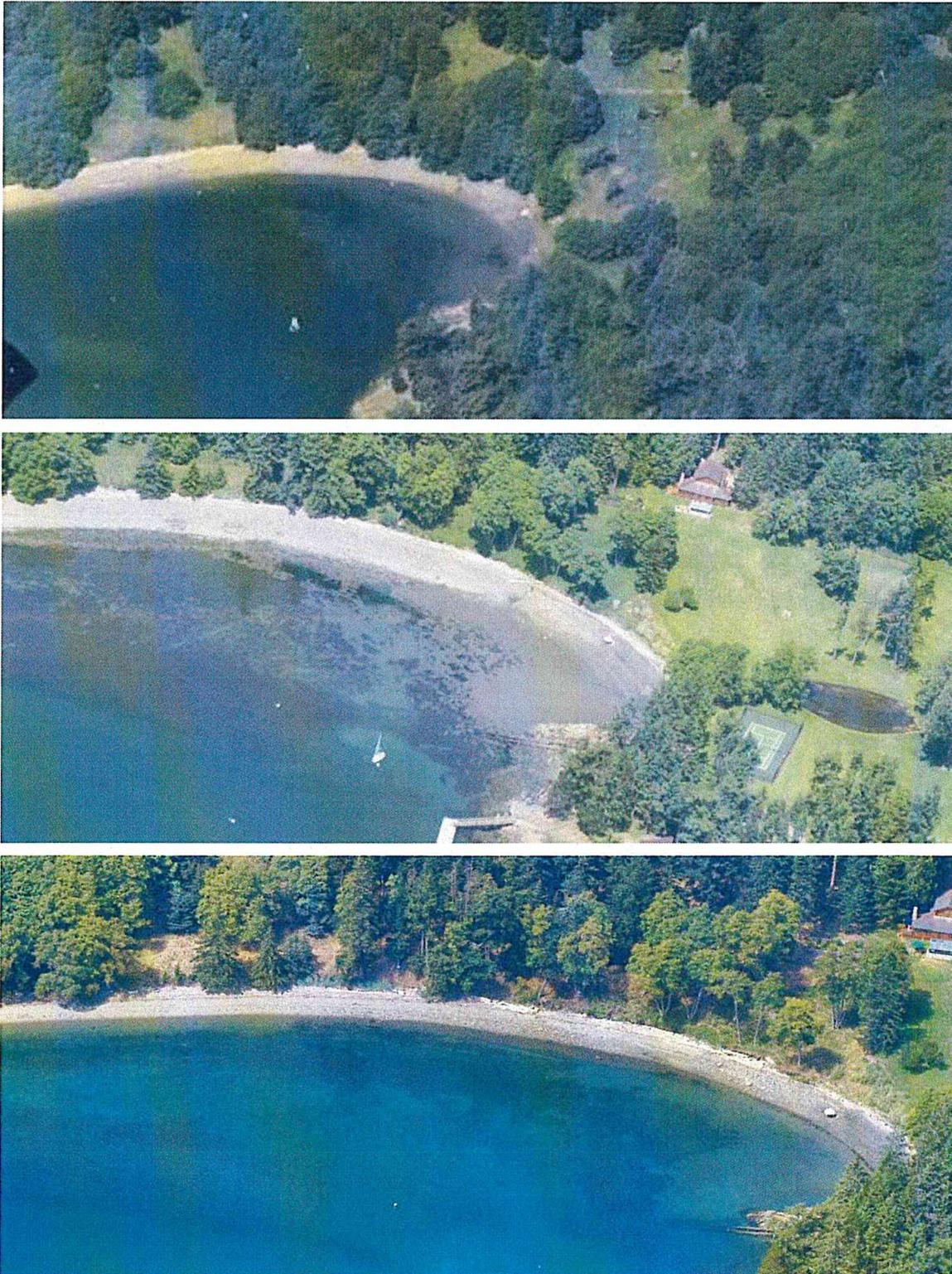


Figure 1. Shoreline oblique aerial photos by the WA Dept. of Ecology: June 1977 (top), June 2002 (middle), and August 2006 (bottom)



Figure 2. Vertical aerial photo from August 2011.

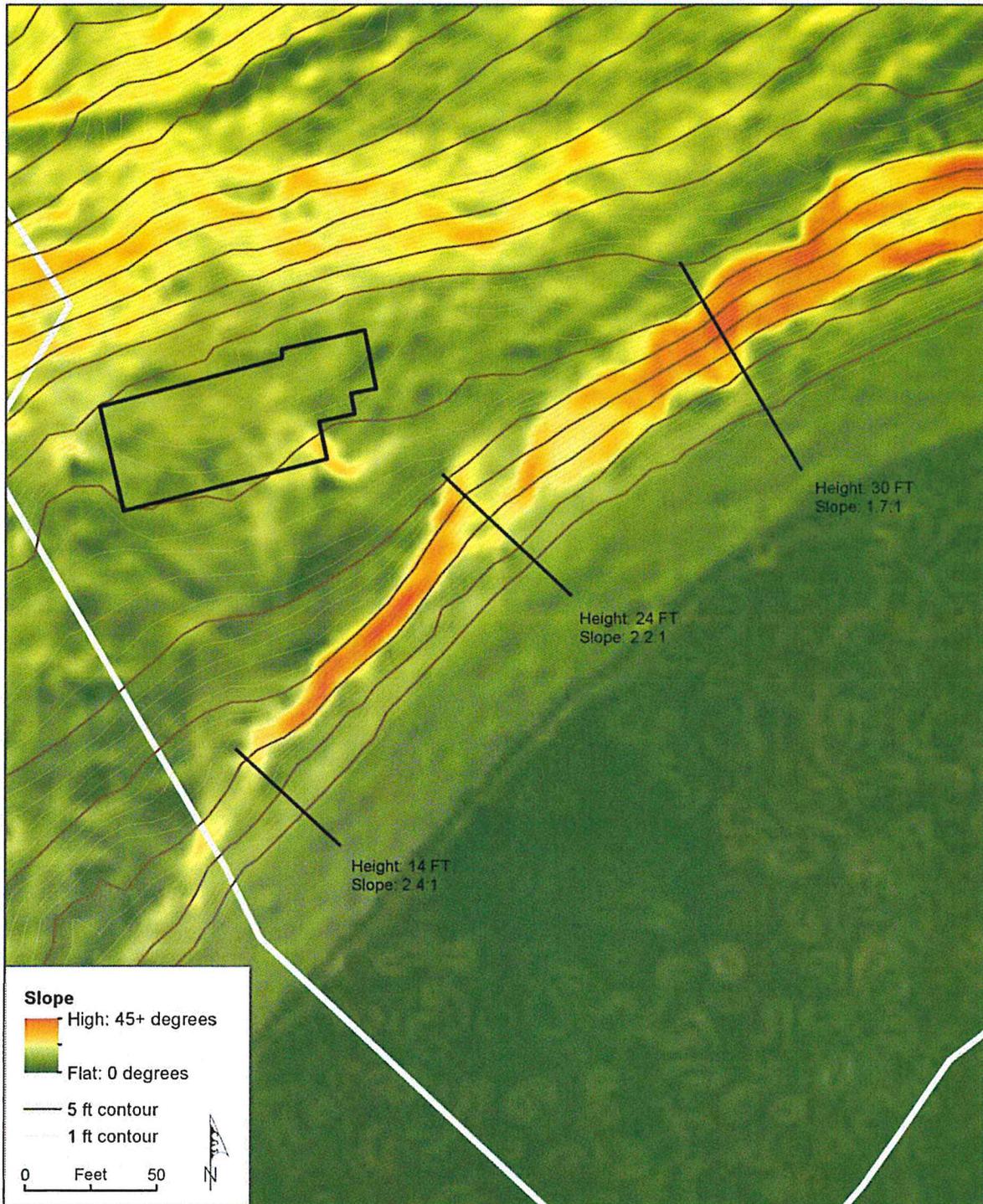


Figure 3. Topography at the subject property derived from LiDAR data (San Juan County 2013).



Figure 4. Vertical aerial photo from May 2015.



Figure 5. Vertical aerial photo from June 2008.

ATTACHMENT B

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January 21, 2016

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Review of Hart Crowser Report Runstad Property, Blakely Island, Washington

Introduction

This report provides an assessment of a Hart Crowser report titled "Geotechnical Engineering Conclusions and Recommendations, Runstad Property, Blakely Island, Washington" dated December 17, 2015 regarding a stability assessment of the above referenced property. We have not been on the property so our assessment is based on the following:

- A review of the USDA Soil Conservation Service (SCS) "Soil Survey of San Juan County, Washington".
- A review of the Washington DNR "Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington, by Lapen, 2000".
- A review of the State of Washington "Water Supply Bulletin No. 46".
- A review of the NAVFAC Manual DM 7.2.
- A review of grain size tests provided in the Hart Crowser report (unknown locations and depths). Stability analyses were also reviewed.
- Two topographic survey maps prepared by San Juan Surveying for the Runstad property.
- Shoreline aerial oblique photos of the site available from the Washington Department of Ecology (DOE) from 1977, 2002, and 2006.
- Geologic mapping in Coastal Zone Atlas of Washington, San Juan County, by DOE.

Soil Characteristics

The SCS logged site soils at the property as Roche gravelly loam, which is consistent with the grain size test results provided by Hart Crowser (HC), and the SCS maps the Roche soils as being underlain by glacial till at relatively shallow depth. Till, which has high strength and density, was mapped over the site in both of the geologic mapping sources listed above. The site above the near beach level is forested with evergreen trees

that appear to be up right and stable. The unpermitted wall appears to be located shoreward of several escarpment areas and vegetated bank areas. This information suggests that soil at the property is of higher strength than the soil properties used in the HC report. The HC report did not provide a map showing where the soil samples were taken or the depth below grade at which they were obtained.

Engineering Assumptions

The HC report used relatively weak engineering properties in their slope stability analyses.

Property	Hart Crowser Engineering Assumption	Comments
Failure plane	11 feet below grade	Local stability analysis in HC report shows 3 feet, consistent with expected depth of glacial till (if glacial till is that deep)
Static safety factor (SF)	0.99	Local stability analysis in HC report shows SF of 0.54, consistent with expected depth of glacial till
Unit weight	120 pcf	Grain size tests show sandy GRAVEL to gravelly SAND so a unit weight in the 125 to 130 pcf range would be more appropriate, however using unit weight for till would be most appropriate
Cohesion	0 psf	This would be appropriate for clean granular soils like beach deposits, not gravelly loam and glacial till found below grade
Internal friction	32 degrees	Appropriate for near the surface soils but we anticipate a much higher value at depth where glacial till appears to be present

A review of the Hart Crowser stability analyses revealed an assumed failure plane extending down up to 11 feet below grade (Figure 3). Since our literature review of the area describes glacial till at relatively shallow depth (3 feet or less) we would expect stronger soils along the failure plane. In addition, a review of aerial photos of the area where the global stability was performed show a forested slope, so we question the soil conditions used in the HC report, since well vegetated slopes have natural protection from erosion. On Figure 4 in the HC report, the local stability analyses showed a failure plane extending down around 3 feet. In our opinion, a subsurface soil investigation would be prudent to verify the HC findings.

The Hart Crowser stability analyses global results showed a static safety factor (SF) = 0.99. Note that safety factor is an engineering method of showing the relative stability of

(Page 3 of 4)

a slope by comparing the forces and moments restraining soil movement relative to the forces and moments causing failure. The safety factor = all forces (and moments) resisting movement divided by all forces (and moments) causing movement. On Figure 4 in the HC report, the local analyses results showed a static SF of 0.54 and the failure plain extended to a depth of 3 feet.

The analyses for both the global analyses and local analyses utilized the following engineering properties, which in our opinion would be appropriate for the loose beach deposits.

Unit Weight -----120 pcf
Cohesion ----- 0 psf
Internal Friction--- 32 degrees

Unit Weight = 120 pcf. The grain size tests results in the HC report show the material to be sandy GRAVEL to gravelly SAND, so a unit weight in the 125 to 130 pcf range would be more appropriate than the 120 pcf used in the analyses. Driving and resisting forces are a function of the unit weight of soils being analyzed.

Cohesion = 0 psf. This would be appropriate for clean granular (loose) soils, but the literature show the surficial soils as sandy GRAVEL to gravelly SAND (Roche gravelly loam) soils, which is mapped as being underlain by glacial till. The Hart Crowser report showed failure planes extended as deep as 11 feet below grade, at a depth we would anticipate glacial till would be present, and which would have a relatively high cohesive strength. Note the 4 grain size tests appear to have been run on surficial granular soils such as beach deposits. Cohesion is one of the soil strength parameters that would provide much of the resisting forces in the analyses.

Internal friction = 32 degrees. This may be appropriate for near the surface soils but we would anticipate a much higher value at depth where glacial till may be present. Again, friction is a strength value that would add to the resisting forces in the analyses.

Conclusions and Recommendations

In our opinion, the engineering properties used in the stability analyses are unusually conservative.

In conclusion, we are of the opinion that the stability analyses are likely not accurate relative to site soil conditions, and that the bank at the property is not as unstable as indicated in the HC report. If slope stability modeling is to be used, we recommend that a test pit or a boring investigation be performed so the engineering properties assigned to the subsurface profile in the Hart Crowser report can be verified. It appears that the near shoreline sloughing is surficial in nature and not deep seated as indicated in the Hart Crowser report.

(Page 4 of 4)

It would not be unexpected if movement occurred in the upper soils and the surficial beach soils, but a failure plane would be limited to that area above the glacial till and the presence of a stable forest is indicative of relative site stability.

In our opinion, a backhoe or boring investigation should be done to verify the soil strength and density parameters used in the Hart Crowser report.

If you have any questions regarding the contents of this report, or if we can be of further assistance, please contact our office.

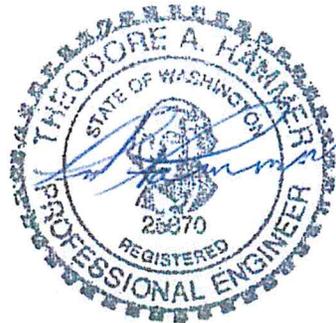
Sincerely,

Western Geotechnical Consultants, Inc.



Theodore A. Hammer, P.E.
Geotechnical Engineer

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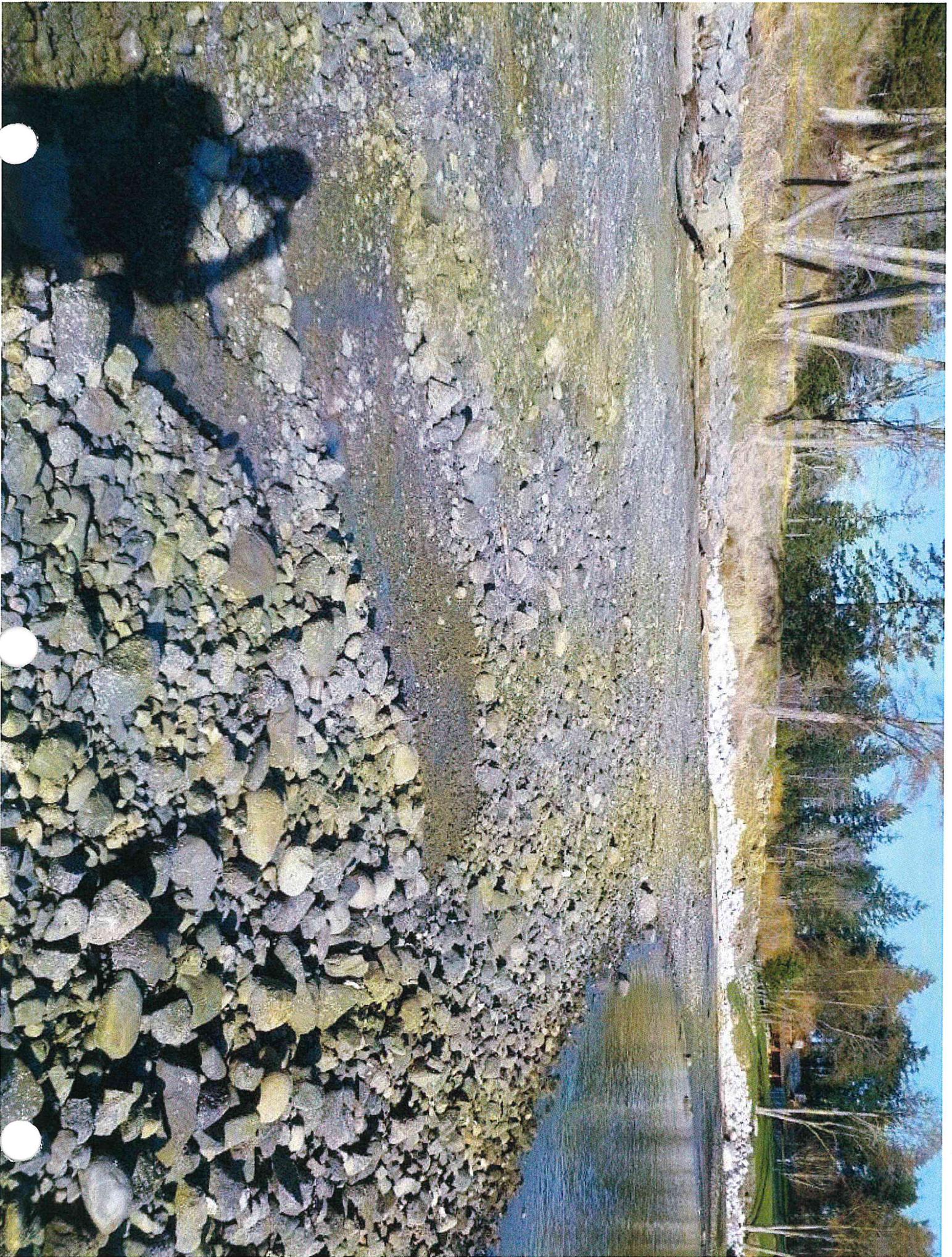
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ATTACHMENT E

Summary of Fish Catch Results for Runstad Cove, 2008 and 2009

Skagit River System Cooperative Research Program

May 2012

Beach seine sampling for fish was conducted at Runstad Cove as part of Washington State's Salmon Recovery Funding Board Project # 07-1863 N: *WRIA2 Habitat Based Assessment of Juvenile Salmon*, also locally known as the *Big Picture Project*.

Runstad Cove is located on the southeast side of Blakely Island (Figure 1). Large beach seines were used at Runstad Cove after methods described in Skagit System Cooperative Research Department (2003). We made 14 beach seine sets over the two-year study period. Beach seining occurred monthly from March through August in 2008 and March through October in 2009.

The beach seine site within Runstad Cove consisted of gravel to mixed coarse substrate. On 64% of the days the site was sampled eelgrass or macro algae was present. Average maximum water depth was 2.2 meters deep and average salinity was 30.4 parts per thousand within the area seined. Water temperature varied by month, but ranged from approx 8 degrees C in March to peaks of over 13 degrees C in July each year.

We caught a total of 2,512 fish from 39 different species or species groupings over the two-year study period, including three species of juvenile salmon and three species of forage fish (Table 1). We also kept count of Dungeness crab (23) caught by seines, as this species is of commercial and recreational interest.

Please refer to Beamer and Fresh (2012) for more information regarding timing, abundance, and habitat selection of focal fish species for the Big Picture Project. The focal species are: Chinook salmon, chum salmon, pink salmon, Pacific herring, surf smelt, Pacific sand lance, and hexagrammids (greenlings and lingcod).

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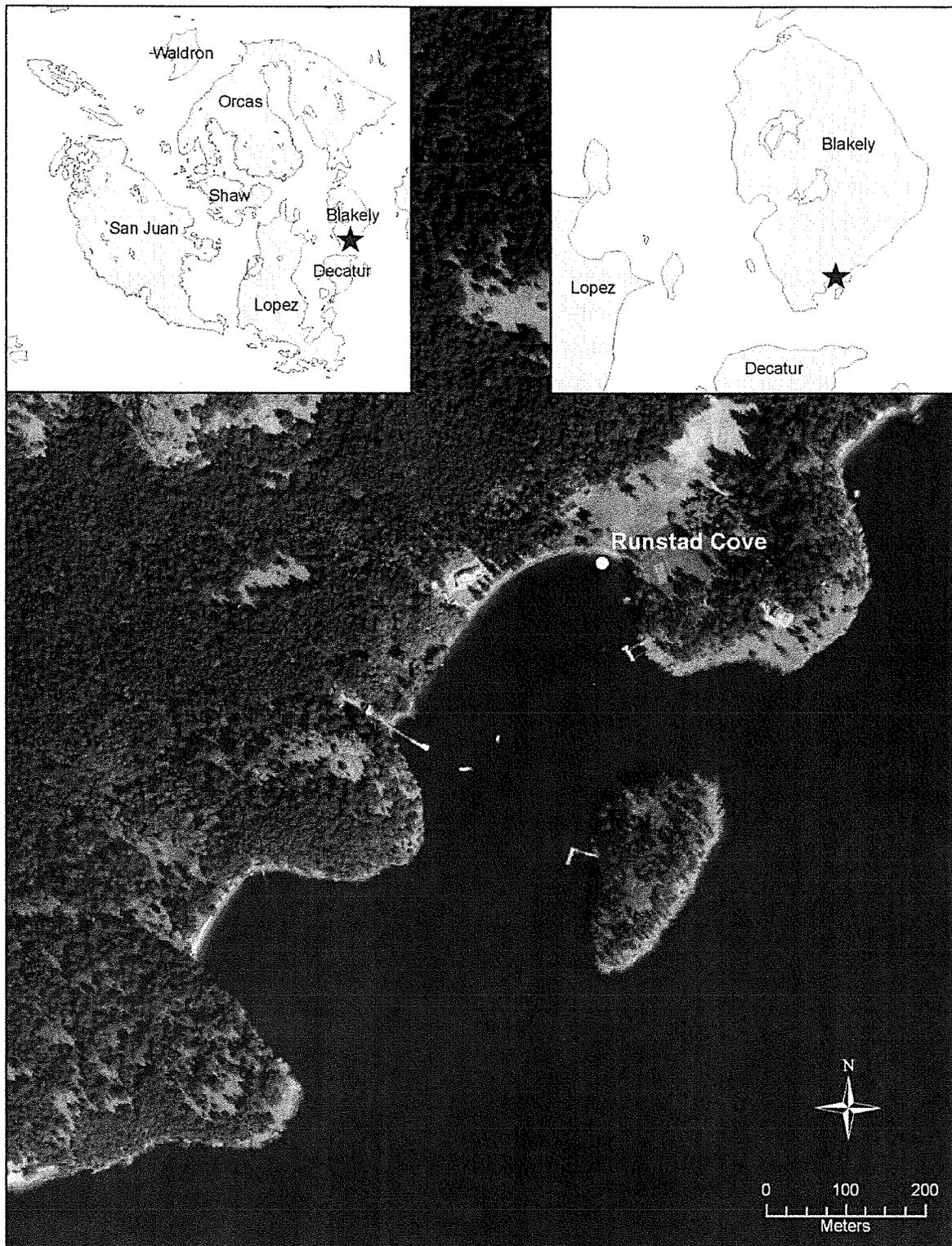


Figure 1. Location of Runstad Cove beach seine site.

Table 1. Fish catch summary for Runstad Cove beach seining, 2008 and 2009.

Assemblage Groupings	Taxonomic group	Genus species, age & mark	Common name	Total catch	Catch per set	Frequency in catch
Crabs	Canceridae	Cancer magister <6.5"	Dungeness crab, sublegal size	23	1.64	42.9%
Flatfish	Pleuronectiformes	Parophrys vetulus	English sole	3	0.21	7.1%
		Isopsetta isolepis	Butter sole	2	0.14	7.1%
		Other or unknown flatfish	Unidentified flatfish species	1	0.07	7.1%
		Other or unknown flatfish post larval	Unidentified post larval flatfish species	1	0.07	7.1%
Forage fishes	Clupeidae	Clupea harengus adult body form	Pacific herring, adult body form	1117	79.79	21.4%
	Osmeridae	Hypomesus pretiosus post larval	Surf smelt, post larval juvenile	41	2.93	7.1%
		Hypomesus pretiosus adult body form	Surf smelt, adult body form	14	1.00	7.1%
	Ammodytidae	Ammodytes hexapterus adult body form	Pacific sand lance, adult body form	2	0.14	7.1%
Greenlings/lingcod	Hexagrammidae	Hexagrammos stelleri	Whitespot greenling	28	2.00	28.6%
		Hexagrammos spp	Unidentified greenling species	21	1.50	50.0%
Gunnels and Pricklebacks	Pholidae	Unidentified Gunnel Species	Unidentified gunnel species	71	5.07	35.7%
	Stichaeidae	Lumpenus sagitta	Snake prickleback	42	3.00	42.9%
	Pholidae	Pholis ornata	Saddleback gunnel	28	2.00	21.4%
		Apodichthys flavidus	Penpoint gunnel	18	1.29	21.4%
Other - marine	Syngnathidae	Pholis laeta	Crescent gunnel	13	0.93	28.6%
		Aulorhynchus flavidus	Tubesnout	2	0.14	14.3%
Other - unknown	Unclassified Larval Fish	Syngnathus griseolineatus	Bay pipefish	1	0.07	7.1%
		Larval Fish	Unidentified larval fish	1	0.07	7.1%
Pacific salmon	Salmonidae	Oncorhynchus keta age 0+	Chum salmon, subyearling	169	12.07	28.6%
		Oncorhynchus gorbuscha 0+	Pink salmon, subyearling	57	4.07	35.7%
		Oncorhynchus tshawytscha age 0+ no external mark	Chinook salmon, wild subyearling	3	0.21	21.4%
Sculpins	Cottidae	Other or unknown Cottid	Unidentified sculpin species	449	32.07	57.1%
		Myoxocephalus polyacanthocephalus	Great sculpin	131	9.36	71.4%
		Gilbertidia sigalutes	Soft sculpin	50	3.57	35.7%
		Leptocottus armatus	Pacific staghorn sculpin	34	2.43	64.3%
		Artemis fenestralis	Padded sculpin	16	1.14	35.7%
		Blepsias cirrhosus	Silverspotted sculpin	16	1.14	28.6%
		Enophrys bison	Buffalo sculpin	12	0.86	35.7%
		Clinocottus acuticeps	Sharpnose sculpin	12	0.86	28.6%
		Hemilepidotus hemilepidotus	Red Irish lord	8	0.57	21.4%
	Liparidae	Snailfish spp	Unidentified snailfish species	4	0.29	14.3%
	Hemitripterae	Nautichthys oculoasciatus	Sailfin sculpin	3	0.21	7.1%
	Cottidae	Oligocottus maculosus	Tidepool sculpin	1	0.07	7.1%
Sea perches	Embiotocidae	Cymatogaster aggregata	Shiner perch	17	1.21	35.7%
		Embiotoca lateralis	Striped seaperch	1	0.07	7.1%
Sticklebacks	Gasterosteidae	Gasterosteus aculeatus	Three spined stickleback	23	1.64	50.0%
True cods	Gadidae	Microgadus proximus	Pacific tomcod	55	3.93	28.6%
		Other or unknown Cod	Unidentified true cod species	37	2.64	14.3%
		Theragra chalcogramma	Alaska pollock	8	0.57	7.1%

ATTACHMENT F



An Assessment of Ecosystem Protection
What's Working, What's Not

A Preliminary Report
June 16, 2008

San Juan Initiative Policy Group

Lynn Bahyrch, Lincoln Bormann, Jeri Ahrenius, Sam Buck, Lisa Byers, Tom Cowan, Nick Jones, Peter Kilpatrick, Patty Miller, Kit Rawson, Steve Simpson, Ron Zee, and Co-Chairs Jonathan White and The Honorable Kevin Ranker.

Partners

San Juan County, Puget Sound Partnership, The National Fish and Wildlife Foundation, Tulalip Tribes, Department of Ecology, Department of Natural Resources, Department of Fish and Wildlife, National Park Service, NOAA Fisheries, US Fish and Wildlife, US Army Corps of Engineers, The Surfrider Foundation, The Nature Conservancy, and the Trust for Public Lands.

"It's the responsibility of government and our representatives to agree on "WHAT" we need for a healthy society, for the good of all. But "HOW" we get there can best be determined by the people most affected, working through an inclusive, consensus-based process. This is real democracy in the Jeffersonian sense. It's our version of a barn building exercise in the 21st century."

Bill Ruckelshaus, Chair of the Puget Sound Partnership

The San Juan Initiative: People & Place

Over the past year and a half the San Juan Initiative, governed by a Policy Group of local citizens and governmental officials, has been investigating the health of the marine shoreline in the San Juan Islands. We have studied past efforts, conducted research in four case study areas and talked with scientists, land owners as well as governmental officials, building trade professionals and environmental advocates.

Our goal is to determine "what's working and what's not" in terms of our many efforts to protect the marine ecosystem. This report shares what we've discovered.

Now we're moving into the final phase of our project. During the next six months we'll work with the community to come up with specific proposals to strengthen the things that are working well and fix the things that aren't. We're looking for solid, long-term solutions that work for both the environment and for landowners and citizens in the islands.

This report includes the following:

1. A summary of findings, a detailed assessment of what is working and what's not to protect the marine shoreline, and a discussion of opportunities to improve environmental protection and support property owners
2. Appendices:
 - Nearshore Study Area Characterization
 - Education Assessment
 - Voluntary Protection Programs
 - Shoreline Owner, Community and Trade Group Research
 - Permit Review
 - Review of Regulatory Protection Programs

The report is intended to serve three primary functions:

1. Provide a basis for the San Juan Initiative Policy Group's decision on where to focus its efforts in the next phase of the Initiative
2. Encourage landowners and citizens in the San Juans to engage with us in the next stage
3. Serve as a guide for others working on similar issues across Puget Sound

The Importance of the San Juan Island's Ecosystem

"What drew me to the San Juan Initiative is the chance to look at the health of the ecosystem as a whole, rather than independent parts. That means we're paying close attention to how the whole system is interconnected, including private and community rights and values. We're interested in the underlying systems that create and support vitality." Jonathan White, Orcas Island Builder

The San Juan Islands have the most intact marine ecosystem in all of Puget Sound.

Protecting the San Juans is important not only to the residents of the islands, but also to the entire Puget Sound region. For example, all twenty-two populations of Puget Sound Chinook Salmon (now listed as Endangered Species) use the San Juans to grow bigger and stronger before their journey to the open ocean and again on their return. And the

marine environment in the San Juans is a center of biodiversity, home to creatures ranging from orcas to sea cucumbers.

At the same time, we're not immune to the larger problems in the area. As we know from the Puget Sound Salmon Recovery Plan and other environmental studies, a combination of factors affects the capacity of the region to support wildlife. Our salmon runs, migrating marine birds, and orcas are all vulnerable to circumstances outside of our local control: commercial harvest of sea life, pollution from urban development in central Puget Sound, untreated sewage from Victoria BC, global climate change, damaged rivers and lost estuaries.

These factors need attention if we are to bring the entire Puget Sound ecosystem back to health. It would be a mistake to underestimate the importance of protecting what's left of our intact habitat. Study after study has identified that protecting this resource is one of the most important factors for ensuring the recovery of the larger Puget Sound ecosystem.

The San Juan Ethic, Legacy, and a Look Forward

"There is an incredible ethic of stewardship among us living in the San Juans. Whether you are builder, real estate agent, farmer, boat builder, conservative or liberal, we all want the islands to be healthy and act to make them so" The Honorable Kevin Ranker, San Juan County Councilmember

The people of the San Juans have a rich history of caring for the environment and enjoying its bounty. Activities like lime mining and commercial shipping are faded memories while salmon fishing and crabbing continue, but at much reduced levels. Largely acting on their own sense of what is right, landowners, farmers, builders, resort managers and marina operators have dramatically changed their practices over the years, resulting in improvements to the health of the local ecosystem. Except for rare cases, we no longer discharge raw sewage from homes and vacation resorts, the bays next to marinas no longer "turn red or blue when boat owners paint their hulls" (Ian

Wareham, West Sound Marina), and we don't have to deal with mining sites eroding the land into the sea.

Because the natural beauty of the islands is so important to those of us who live and play here, we have acted to protect this place we call home. Our efforts – along with our small population and lack of heavy industry -- have kept our marine environment the most pristine in Puget Sound.

Disturbing Trends, Pollution, and Growth Pressure

"I've seen a lot of changes in my thirty years of living here. The research of the Initiative has given us real data about what has happened and the pressures we are likely to face as a community. It has confirmed some of what I thought and it has surprised me". Tom Cowan, Longtime Lopez Resident and Former Director of the Northwest Straits Commission

Despite the good work of the people of the San Juans, the future of our area is in question. Another million and a half people are expected to live in the Puget Sound region by 2025, adding to our current population of 3.8 million. Some of these people will live in the San Juans and many more will come to visit and recreate. Globally, pollution is increasing and affecting species like our orcas. Locally, new home development and the creation of necessary infrastructure are changing the landscape and the community.

Although everything appears intact on the surface, scientists are uncovering troubling trends affecting the basic building blocks of the ecosystem. Marine birds are vanishing; rockfish populations have crashed; eelgrass and forage fish spawning beaches are disappearing; and salmon runs are from 1 to 10 percent of their historic abundance.

Our ecosystem is vulnerable, and we need to find effective ways to protect it before it declines to the level of other areas in the Sound.

Good Intentions Facing Challenging Complexity

"The erosion on my beach increased when my neighbor built a bulkhead and now I have to build one." Mitchell Bay Shoreline Owner

Over the past decades we've learned a great deal about the complex interrelationships between species we all love and ones most people don't even know about. For example, healthy salmon populations require not only their natal rivers for spawning, but after leaving the rivers they need an abundant food supply of "forage fish." In turn, forage fish such as sand lance and surf smelt require healthy beaches with the right amount of overhanging vegetation, gravel, sand and clean water to produce their young.

Preserving a vibrant ecosystem is a complicated task --probably more complicated than we understand right now --and although many of us are working hard, not all of our efforts are effective. People have good intentions but are sometimes misguided in their efforts to protect the environment and enjoy their property. Regulatory and incentive-based programs are often successful in assisting property owners on stewardship issues, but some of these programs result in undue hardship and lack commensurate benefit to the environment. Complex, redundant and conflicting regulations have frustrated many people who are trying to do the right thing. In some cases increased regulation over the past several decades may have been counterproductive. We heard this criticism frequently from landowners and building trade professionals.

We Can Find Solutions

"The needs of people must be given serious consideration and balanced when writing rules to control environmental impacts" John Evans, San Juans Builders Association

Our research and communication with landowners, scientists and others in the first phases of the San Juan Initiative have identified a number of opportunities for improvement. Bolstering the health of our local ecosystem doesn't mean we must

sacrifice everything we love about living here in order to preserve it; it means we must design and implement our conservation programs wisely to ensure their efficiency and efficacy while supporting human rights and values. From builders to government officials to landowners, one of the San Juan's greatest assets is how much people care for their place and their community.

"I went to the Initiative meeting in Eastsound. Knowing that people care about what we will be giving our children was so encouraging", Anna Roseberry, 27, mother

A More Detailed View of the San Juan Island Ecosystem: *What is Working, What's not?*

"Yes, we are aware that there are things that are adversely impacting our marine environment, but we believe that the significant problem areas will not be found in West Sound because they have to do with bigger things - fisheries regulation, protected species, shipping regulation and, as you mentioned, international agreements on salmon catch with Canada." John Gorton, West Sound Resident

Understanding the current health of an ecosystem like the San Juans is a complex task, especially since we don't have enough information to get a complete picture. We don't know what was here historically, nor do we fully know what is here now. Without this information, we cannot accurately analyze the trends of important ecosystem functions or the organisms that rely on them. Key features like feeder bluffs, shoreline vegetation and water quality have not been measured, and we lack long-term studies for most of our shoreline resources. However, a number of residents have lived along the shore and observed it for decades. Many of the property owners who attended our meetings have lived on their property for 30 years and several for as long as 60 years. Their knowledge, based on years of observation, adds greatly to our understanding of the ecosystem.

In addition, work of the UW Marine Labs, Friends of the San Juans, the SeaDoc Society, the San Juan Marine Resource Committee and many others have provided a good foundation to assess current protection efforts. The Marine Resources Committee's Marine Stewardship Area Plan, which was adopted by the San Juan County Council, identifies key indicators of health and current trends. It also identifies the greatest threats to the ecosystem.

In terms of local threats, the Marine Stewardship Area Plan highlights the importance of changes to the physical shoreline caused by the placement of docks in eelgrass beds and salmon migration zones, armoring/bulkheading of banks and the removal of trees adjacent to the seashore. Building on the findings of the Marine Stewardship Area Plan, the San Juan Initiative conducted an assessment of current regulatory, education and property-owner incentive programs to determine whether these programs encouraged or discouraged beneficial actions for the environment.

The Initiative's assessment is grounded in science and based on new findings from research. As part of the research design, we looked in depth at four representative case study areas of the San Juans: a 9 mile stretch of shoreline on San Juan, Orcas, Stuart and Lopez Islands. In each of these case study areas, we documented shoreline changes and identified correlations between human actions and ecosystem response. By combining this research with a countywide assessment of programs, we identified what is working and what is not in terms of protecting key ecosystem features and processes.

In the next few sections we'll discuss these results in detail. Things that are working are italicized and printed in *green*. Things that aren't working are not italicized and printed in brown.

Protection of Key Ecosystem Features and Functions

What is Working, What's not

"Even though most of the shoreline is in good shape, we found from the research that some of the most sensitive areas like feeder bluffs have been altered. But, half the shorelines are yet to be developed which presents us with an opportunity to do a better job." Joe Gaydos, SeaDoc Society Regional Director and Orcas Resident

1. Overall, there is a high retention of **shoreline vegetation** that benefits the marine ecosystem by providing shade to spawning forage fish, dispersal of rainfall, a supply of terrestrial insects that feed organisms in the sea, and resting places for birds. The overall retention of trees is high (88% of the forest cover has been retained over the 30 years of Shoreline Management), with the average loss on properties developed since 1977 at 20 percent. We found a high degree of variability parcel to parcel -- from 95% to almost zero -- in how much forest cover has been retained on lots developed since 1977.
2. **Eelgrass** in the San Juans makes up approximately 7 percent of the total for Puget Sound. This percentage is significant because it serves as a feeding and rearing place for many of the populations of migrating salmon in Puget Sound and other species like crab, rock fish and herring. Eelgrass is believed to be declining in the San Juans, and there are five places of dramatic decline: Nelson, Westcott, Mitchell, Blind and Fossil Bays. This dramatic decline is being studied to assess what combination of factors -- including disease, changes to water quality and temperature, and physical disruption from docks, armoring, and boat anchoring -- are causing it. In our four case study areas we found 26% of the docks and 30% of mooring buoys were placed in areas of eelgrass. Shoreline residents also believe commercial crab harvesting and derelict crabbing gear may contribute to eelgrass declines.
3. **Forage fish** spawning beaches are critical because, like eelgrass beds, they provide important habitat for a key part of the life cycle of sand lance and surf smelt, which are a basic food source for the whole ecosystem. In the case study area we found almost 4 miles of documented forage fish spawning beach and 10 miles of potential spawning beach. Armoring has a direct impact on the forage fish spawning beaches through burial of habitat or by changing the type of beach sediment present. Of the 71 parcels within our case study areas with documented forage fish habitat, half had

armoring. In addition, half of all parcels with armoring were on beaches with potential forage fish spawning habitat.

4. ***Shoreline armoring*** includes the placement of bulkheads, rocks or other structures to prevent land erosion. Thirty percent of the shoreline in Puget Sound is armored. Only twelve percent of the shoreline in the four San Juan case study areas is armored. However, the most sensitive areas are being armored. Feeder bluffs supply sediment to the beach to create forage fish spawning habitat and supply the substrate for eelgrass. Our case study shows that feeder bluffs and pocket beaches are disproportionately being armored. Of the 4.5 miles of feeder bluffs in our study area, 30 percent have been armored. This eliminates the source of sand and gravel for beaches, which then leads to private property erosion and loss of forage fish spawning areas. We also found 80 percent of the 4 miles of armoring in the case study areas was low enough on the beach to cover places where forage fish could spawn.
5. ***Shoreline vegetation*** on most developed parcels is being maintained. But we found that armored shores had a greater loss of shoreline forest and overhanging vegetation. Parcels that had been armored lost twice as much forest as unarmored shores. We also found that armored shores had about 20% less overhanging vegetation.
6. *In Puget Sound harvest of **crabs** has doubled in the last ten years.* We did not collect scientific information on crab and salmon populations but long time residents reported a significant decline in their ability to catch crabs and salmon.
7. *The Department of Ecology requires San Juan County to implement new **stormwater regulations**.* Property owners raised numerous concerns about increased stormwater runoff from uphill properties and localized impacts to water quality and sedimentation of lagoons. Building trade professionals question the current regulations and believe they are creating worse impacts than previous practices.
8. *There is a good start on developing a **comprehensive database** for the marine ecosystem of the San Juans. The Marine Resources Committee is in the process of developing a monitoring program for the County which will be completed by the end of the year.* But there are no funds committed to implement it. The lack of an accessible, comprehensive, science-based understanding of the ecosystem undermines the motivation of landowners and others who want to do the right thing. It also limits our ability to determine the success of management changes.

Property Owner Interests:

What's working, What's not

"I believe in regulations but they've gotten out of the realm of common sense. You start getting people going around the regulations, or spending thousands of dollars to employ consultants." Walt Corbin, Orcas Resident

1. Many shoreline property owners would like to have a private dock and/or mooring buoy for convenient access to boats. *Community docks and docks located away from eelgrass are preferred under County regulations. There are also new techniques for anchoring mooring buoys that have minimal if any impact on eelgrass and other organisms living on the bottom. County and state regulations are very complex and the process for getting approval of new docks is time consuming, expensive and uncertain. New techniques for anchoring mooring buoys are much more expensive (\$2,000-3,000) than the older high-impact concrete block designs. There is limited space availability in marinas in close proximity to property owners who desire mooring facilities.*
2. Healthy shorelines and abundant sea life: *Crab harvest in Puget Sound has increased from 4 million pounds per year in 1995 to 8 million pounds in 2007. Managers believe that the crab harvest is sustainable. But, property owners see that they are getting less crab than they did ten years ago because the harvest of crabs and salmon is significantly limited by current distribution and timing of commercial (tribal and non tribal) harvest. Voluntary rockfish closures have not resulted in rebounding rockfish numbers, and fishing for rockfish is quite limited. Salmon harvest by recreational fishermen has also declined in recent years.*
3. Protection of land from erosion – *If a home or other upland use is threatened by shoreline erosion the county grants approval for armoring. Where previous armor has been placed, the County supports repair and replacement. Some bulkheads and armoring increase erosion adversely affecting nearby property owners.*
4. Views from the water and from homes – *The County requires visual screening of homes from the water but allows for clearing to create and maintain a view.*

Homeowners have experienced changing interpretations, reflected in the wide variance of trees retained on newly developed lots and affecting views.

5. Rules that are fair, equitable and enforced – Shoreline property owners and professionals in the building trades feel that rules are often not applied equitably, and that decisions by managers seem arbitrary. Property owners provided anecdotal information about the lack of enforcement within their communities and the impact of that on their property and to the shoreline. This anecdotal information was supported through conversations with contractors, builders and others who work on shoreline properties.

Management Programs: Overarching Findings

What's working, What's not

"Though regulatory protection of nearshore marine environments has improved as our understanding of these environments has improved, there are still critical areas that need to be addressed. As our understanding of the nearshore marine environments evolves, new tools and strategies can be identified that will help to address both the needs of property owners and the environment." Brian Williams, Department of Fish and Wildlife Biologist.

Regulatory Programs:

1. *The rules and laws governing modifications of the marine shoreline for bulkheads and docks have become more stringent over the last ten to twenty years as the science has improved our understanding of how the marine environment functions. It is now more difficult to get a dock or bulkhead approved if it has the potential to significantly impact the marine environment. The multiple permit requirements at the County, State and often Federal level of government serve as checks and balances to ensure that new activities mitigate their impacts to the shoreline. This duplication of effort also leads to confusion, conflict and frustration on the part of landowners and professionals in the real estate and building trades. In general, administrative practices require more specific conditions than the adopted codes. The lack of consistency between the more general codes and the specific science-based site-by-site review creates confusion among applicants. In addition, most of the governmental resources are deployed in the review and approval of permits, leaving few resources to provide*

technical assistance to property owners, inspections or enforcement after the permits have been issued. The confusion and uncertainty have an unintended consequence of encouraging people to act without getting a permit. Another unintended consequence is that property owners spend lots of money on proposals with a high uncertainty of approval. Many shoreline property owners and building trade professionals feel overburdened and discouraged by regulatory processes, and not confident that compliance will lead to meaningful results, either for them or for the environment.

2. *Regulatory programs at the state and local level have improved in their application of science to how permits are conditioned, resulting in less impact from current structures.* There are many older bulkheads, docks, and mooring buoys that appear to have greater (adverse) impacts than recent structures, and there are limited tools being used to reduce the impact from these older structures.
3. *Accountability and access to information – There have been improvements to the specificity in permits on the part of the County and Department of Fish and Wildlife. This makes it easier to assess compliance and reduce the impact to the ecosystem. There is also a great deal more information available on the location of habitats and ecosystem processes and functions.*

However, there are essentially four problems with current accountability:

- a. The information available is not easily searchable and there is no system that integrates the various permit processes between local and state governments. For example, DFW keeps track of their permits by landowner name and the County by tax parcel number. It is nearly impossible to correlate the two systems and assess what has been allowed by permit.
- b. The permit record does not accurately capture changes to the physical shoreline or the location of shoreline structures in the County. We found over 200 parcels in the case study areas with shoreline armoring but found only 9 permits in the County files and 11 permits in DFW files. The permits we found were not all the same between the two agencies. Although many of these shoreline changes may have appeared more than 20 years ago before permits were required, this does not explain why there are so few permits.
- c. The lack of specificity within County permits limits our ability to check on compliance or to condition a permit to have less impact. For instance,

there is limited detail on exemption permits which cover both new and repaired bulkheads and repair of docks. We heard from many builders, contractors and property owners that in the process of repairing docks and bulkheads past impacts have actually expanded. There is no system to inform shoreline property owners of the environmental conditions or management activities adjacent to their property. This leads to widely different views and perceptions about the health of their immediate environment as well as what is allowed and prohibited.

- d. There is little inspection of structures after they have been built. We found less than 50 percent compliance with the requirements in county dock permits.

"Most contractors and builders want to do the right thing, but with no enforcement, the few that don't comply create problems for the rest of us." Peter Kilpatrick, builder.

4. *The most recent dock permits approved by the county required placing the docks to reduce impact to eelgrass. WDFW has only approved two docks over eelgrass since 2000 and both had requirements for mitigation.* Although there is a focus on protecting eelgrass from docks, there is not a parallel emphasis on the other impacts to eelgrass: anchoring, crabbing and sediment inputs which together may create more damage than the current number of docks.
5. *County and state requirements reduce the impact of new bulkheads and prohibit the armoring of feeder bluffs. There has been significant advancement in the science of how to reduce property erosion and improve protection of the environment.* However, the current approach of parcel-by-parcel erosion control may not always be the best solution. The cause and effect of the erosion often stretches across more than one parcel. Solutions like soft shore beach armoring can address erosion on multiple parcels and at the same time improve the quality of the beach for forage fish. Armoring of feeder bluffs is prohibited in the county, feeder bluffs aren't mapped. Additionally, armoring requirements do not take into account the unique characteristics of the shoreline, allowing impacts to adjacent and down-current landowners as well as loss of ecosystem function. The

installation of single family bulkheads or the repair of existing bulkheads is currently exempted from the County permit process. This limits protection of the shoreline and in some cases increases impacts.

6. *The County requires retention of trees to screen new construction from the water and allows clearing to provide a view from a home. Most of the landowners we interviewed, especially the long-term residents, prefer to keep trees for buffer and privacy.* There are no requirements to maintain vegetation for ecological purposes. This results in incidents where a lot is cleared before applying for a building permit, and there have been varying interpretations of what screening and clearing for a view mean. This is borne out by the results measured in the case study areas where retention of trees varied from 95 percent to zero.

“One of my clients was required by an agency to maintain a 50 foot buffer between his house and the shoreline, and then another agency required him to cut down half the trees in that buffer to install stormwater protection”. Terri Williams, Owner of Permit Resources, Orcas Resident

7. *New science is being used by local and regional planners to require permit applicants to design their structures to have less impact.* Although individual requirements are becoming more specific and rigorous, there continues to be little assessment or accounting for cumulative impacts. The county and the state both lack tools or programs to assess cumulative impacts.
8. *Regulations covering shoreline setbacks, tree buffers, armoring of banks, stormwater control and docks are increasingly more stringent and assumed to individually increase protection of the environment.* However, there are numerous examples of how the regulations conflict and in combination don't make sense for the landowner or the environment. House setback requirements are one of the most common management tools for reducing impacts and it is not clear from our research whether this tool is working.
9. *Our understanding of climate change is increasing and there are predictions of the impacts in Puget Sound that could be used in the design of shoreline*

changes. There are no regulatory programs that are currently considering the likely impacts of climate change. There has been increased information about the impact of climate change and there is discussion at the policy level but it has not yet filtered down to the everyday decision making of permit planners, nor is there guidance provided to planners.

10. *Mitigation is required by the county and the state to ensure no net loss of critical fish habitat.* There are no regional mitigation strategies or sites to address bulkhead impacts. There is also little guidance for local planners for how to mitigate impacts from docks.

Incentives

1. *There are at least three incentive programs that reward property owners for good stewardship.* But current programs are used mostly on large lots. In our case study area, conservation easements were on lots with an average of 1300 feet of shoreline while most parcels within our case study area had less than 200 feet of shoreline. The County's Open Space Taxation program rewards property owners for good stewardship but few land owners know about it and it is not currently designed to reward owners of small lots. Nor does it target some important shoreline ecological features. In addition, there is no monitoring that ensures the retention of features for which the property owner is receiving the tax break.
2. *Conservation easements have improved in explicitly protecting shoreline resources in recent years. The San Juan Preservation Trust and the Land Bank have increased their attention and focus on protection of shoreline resources. This is evident in the number of conservation easements with explicit protection for eelgrass, kelp and forage fish habitat increasing from 45% over the last 25 years to 60% in the last eight years.*

Education

1. *We found landowners are highly knowledgeable and interested in understanding how to best manage their land. There has been a significant effort by governmental and non-profit organizations to provide basic information to*

property owners. The best and most consistent program is provided by Friends of the San Juans. The information provided by other groups is generally so basic that it does not address the issues faced by the landowners.

2. *Landowners want to steward their property and care deeply about their shoreline. Landowners lack specific technical information that would allow them to make better decisions prior to modifying their parcels. In addition, there is little technical support for builders, contractors or realtors on the importance of shoreline resources and how to advise their clients. For instance, most property owners are not aware of whether or not they are on a feeder bluff or adjacent to forage fish areas.*
3. *There is a system for coordination of existing resources among education providers. There is also a concerted effort by the Marine Resources Committee to continue improving the coordination of education and outreach within the county. However, property owners need more specific information to assist in there stewardship.*
4. *In the Puget Sound region the boating industry is making a concerted effort to inform boat owners of their impact. Although boating has impacts on enclosed embayments, there has not been a local effort to educate the boating community outside of the Whale Museum's work to reduce impacts from boats on whales.*

Opportunities for Improvement

The results of the assessment of “what’s working and what’s not” helps to identify opportunities to increase the certainty that protection efforts will result in a healthy functioning ecosystem now and into the future. With the conclusion of the assessment, the San Juan Initiative now shifts its focus to the development of solutions. These solutions, if implemented by the various involved governments and organizations, will address the core issues raised in the assessment.

The Policy Group will hold two meetings, June 20 and 27, to determine where to focus the next phase of the Initiative. Their decision will be based on several factors:

- ~What can be successfully accomplished in the remaining months from July to December of this year?

- ~What resources are available from both the Initiative and participating organizations?
- ~What is most important for the future of the ecosystem and the interests of property owners?

Below is a list and brief description of the potential areas for focus. These opportunities were developed by the staff and discussed with property owners, real estate and construction trade professionals, and officials from several government agencies.

The list and descriptions are intended as a decision-making tool for the Policy Group members, who after discussion may choose to modify the list. The staff will continue to analyze feasibility – costs, tradeoffs, likelihood of success, and so forth, for each of the areas of focus for the Policy Group deliberations. Regardless of which areas of focus are selected, the following process for design of solutions and recommendations for change needs to involve landowners, trade professionals, and governmental officials, and be based on sound science.

There are more opportunities for improvement than can be advanced by the current staffing and resources of the San Juan Initiative. We hope that the list and additional ideas for improvement will inspire others to get involved and advance ecosystem protection in the San Juans.

“As we design solutions, we need to focus on the good that is happening not just the bad. So often when we try to fix things, the unintended consequences cause more harm than the original problem.” Patty Miller, Orcas Resident

1. Improve Support to Property Owners

- a. **Provide convenient technical assistance:** This would involve more research on what issues are most pressing to land owners, what technical resources are needed and the magnitude of resources necessary to meet the interest. The staff, working with agencies, could design a system for providing this service, addressing issues such as where the resource would be housed,

who would be responsible for the different components, what it would cost, and how it could be funded. The final result could be an agreement by the responsible organizations to implement the system when funding is secured.

- b. Develop a system that provides relevant science information on the current status of the ecosystem.** It is not easy for shoreline property owners to get access to information about their local environment, status of its health, what is changing, and whether activities that they see (like harvesting) are consistent with the regulations. Similar to the results possible in item “a” above, the staff could more specifically determine from property owners and trade professionals what information would be most useful, how it could be provided, who could best provide it, and what it would cost. The ability to provide information through a web-based tool could be explored.
 - c. Provide incentives that work for smaller properties:** This would involve working within our case study areas to determine what incentives are most attractive to property owners and working with the conservation groups (Land Bank, SJ Preservation Trust, Trust for Public Lands, The Nature Conservancy and the County Assessor) to identify how their programs could be adapted to work with smaller properties. In addition, a landscape approach would be explored that would target multiple smaller properties in areas with high habitat values.
 - d. Provide incentives to reduce impacts of current docks, mooring buoys and bulkheads:** Examine the existing tools and potential new ones to voluntarily reduce the impact of current structures. Work with property owners within case study areas to find incentives that would be attractive and workable. Look for models from other communities.
 - e. Modify past conservation easements to better protect shoreline resources:** Improve the explicit protection of habitats from modification through revision of past conservation easements or with properties already enrolled in the tax incentive programs by working with the SJ Preservation Trust, the Auditor’s office and the SJ County Land Bank.
- 2. Address landowners’ interest in boat access while protecting key ecosystem processes and functions.** Work with local marina operators, landowners and government agencies to assess the demand for boat access and

current availability. Develop options for increasing boat access through marinas, single use and shared docks in areas that would have minimal impact on marine resources.

3. **Encourage the retention of shoreline vegetation:** This may involve a two-tier approach. First: review current codes and encourage the County staff and Critical Areas Ordinance (CAO) Committee to more clearly address the desire of property owners to maintain a view, provide visual screening and protect shoreline functions and processes. Second: identify education and incentive partners to create a more effective set of tools for shoreline landowners.
4. **Address the impacts of transient boat anchoring and boating on embayments:** Multiple government agencies and citizens would be involved in creating a solution. Focus on Garrison Bay and create a partnership with the National Park Service, the County, Departments of Natural Resources and Fish and Wildlife to identify a transient mooring system that results in eelgrass protection and view shed protection, and is easy to enforce. Look for other models – like Jefferson County’s voluntary no anchor zones.
5. **Explore ways to clearly identify if there are environmental impacts from crab harvest and the potential to reward landowners with better access to crab harvest for good stewardship of habitat on private property.** Work with the tribes, Department of Fish and Wildlife and NOAA Fisheries to determine if there are impacts to eelgrass in the San Juans from crab harvest. Identify opportunities and constraints for increasing crab harvest by shoreline property owners.
6. **Reduce multi-agency duplication in permit process and free up resources for advance technical assistance to property owners.** Form a task force of the regulatory agencies to identify ways to streamline the process while improving overall protection. Research programs in other areas and work directly with the Governor’s Office for Regulatory Assistance to identify potential pilot program opportunities. Develop a proposal for review and refinement by the agency directors. Ensure that there is technical expertise in the local regulatory and incentive programs.
7. **Address the lack of specificity within county codes and update WDFW’s administrative code with the science already in use:** Work through the Critical

Areas Ordinance update to increase specificity for protection of shoreline resources. Work with WDFW staff to document where specificity would be most useful and identify barriers to updating the State codes.

8. **Develop shoreline reach approaches to protection of resources and control of erosion that bring together incentives and regulatory tools:** Identify already existing models that could inform this work. Identify already existing reaches within case study areas that may benefit from a landscape approach to erosion. Work with coastal engineers, property owners and County staff to design a model that identifies areas where soft shore protection could work in the county and work to implement a model project that could be applied in other areas. Create a standardized methodology for evaluating suitability of shoreline reaches for soft shore protection alternatives.
9. **Improve regulatory programs for stormwater to make more sense to landowners, trade professionals and improve environmental protection.** Work with local building trade professionals and the County to identify conflicts in the current requirements. Present the findings to the Department of Ecology and seek administrative support to develop alternative approaches that fit the conditions in the San Juans.
10. **Provide education for trade professionals and create incentives for increased expertise:** Identify models from other communities that have found ways to provide ongoing education and incentives to improve local capacity for lower impact shoreline structures. Explore a community-based trade association that provides technical expertise to property owners and county on a case-by-case basis. Identify stable funding sources for education.
11. **Design compliance system with penalties:** Work with the County and with contractors, home-owners, and other interested parties to design a system that works for the community and provides greater certainty of protection. Identify stable funding for inspections of shoreline projects.
12. **Address the need to consider cumulative impacts at the local and regional scale:** Work with WDFW and coastal ecologists to develop a model or tool that quantitatively assesses cumulative impacts at a landscape level and that can be applied to individual project decisions. The tool would be specific for the various types of impacts: docks, armoring, etc.

- 13. Work with local and regional agencies to incorporate predictions of climate change:** Identify the barriers to incorporating predictions of climate change. Research the response from other island communities world-wide to understand barriers to management. Identify which management programs will most need to adapt and suggest strategies for addressing change.

Making a Contribution: From the Home Shore to Regional Ecosystem

Through the process of field work, analysis, comparing notes, and conversations of all kinds, we found many opportunities to make a difference if we work together. The effectiveness of our science is increased by first-hand observations of long-time island residents. Our well-intended layers of governance and policy have evolved and can improve from the pragmatism of “what’s working, what’s not.” We’ve found, again and again, that the landowner’s best interest is often also good for the environment. “Doing the right thing” is mutually beneficial.

Just as the beauty of the San Juans can be expressed in something small, like a tide pool, and also in something large, like the breathtaking expanse of a ridge-top vista, meaningful contribution begins with simple measures practiced at home and scales up to more complex, ecosystem-wide issues. By collaborating and partnering with state and federal entities, we can develop a critical mass to get things done. Thoughtful engagement is synergistic. In the same way that our appreciation and love of place deepens over time, so does our instinct to care and protect our land and waters.

San Juan Initiative, June 16, 2008

ATTACHMENT G

