

**Analysis of Existing San Juan County Regulations  
Marine FWHCAs**

May 31, 2011

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## Overview

This report is organized around the major components of the County's existing regulations that cover marine Fish and Wildlife Habitat Conservation Areas (FWHCAs). These components are:

1. Definition of FWHCAs
2. Classification of marine FWHCAs
3. Countywide marine FWHCA Maps
4. Protection Standards
  - Buffers
  - Overwater Structures
  - Shoreline Armoring
  - Mitigation Sequencing
5. Identifying Species of Local Concern
6. Buffer Alternatives
7. Shoreline Stabilization Alternatives
8. Reverse Osmosis Desalination System
9. General recommendations

Within each section, a table is provided that quote and/or describe the following:

- State regulations most-relevant to that component. This includes regulations per the Growth Management Act (generally covered under WAC 395-190) or the Shoreline Master Program guidelines (WAC 173-26).
- Existing county regulations (1992 SJCC as amended)
- Analysis of existing county regulations – relationship to BAS and State regulations, and description of deficiencies, aspects considered to be overly restrictive as compared with BAS, and aspects needing clarification/ simplification/ coordination.
- Options for addressing problems – not necessarily comprehensive

In the last column (Options), the Option which the author believes best complies with BAS, State regulations, and conditions in San Juan County is in bold font.

## 1. Definition of Marine FWHCAs

<u>Definition of Marine FWHCAs</u> State Regulations Most-relevant to Countywide Marine FWHCAs:	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p>WAC 365-190-130 (1) states:</p> <p><i>“Fish and wildlife habitat conservation” means land management for maintaining populations of species in suitable habitats within their natural geographic distribution so that the habitat available is sufficient to support viable populations over the long term and isolated subpopulations are not created. This does not mean maintaining all individuals of all species at all times, but it does mean not degrading or reducing populations or habitats so that they are no longer viable over the long term.</i></p> <p>This section goes on to clarify those areas under consideration for all FWHCAs. Section 2 states:</p> <p><i>Fish and wildlife habitat conservation areas that must be considered for classification and designation include:</i></p> <ul style="list-style-type: none"> <li><i>(a) Areas where endangered, threatened, and sensitive species have a primary association;</i></li> <li><i>(b) Habitats and species of local importance, as determined locally;</i></li> <li><i>(c) Commercial and recreational shellfish areas;</i></li> <li><i>(d) Kelp and eelgrass beds; herring, smelt, and other forage fish spawning areas;</i></li> <li><i>(e) Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or</i></li> </ul>	<p>Marine FWHCAs are not clearly defined in SJCC although they are classified as part of general FWHCAs under SJCC 18.30.160 (A).</p>	<p>The County should consider adding a specific definition for FWHCAs which includes the state suggested language contained in WAC 365-190-130. For consistency, the County should also consider adding a definition for Critical Saltwater Habitats.</p>	<p><u>Option A.</u> Do not include a specific definition.</p> <p><b><u>Option B.</u> Provide clear definition of FWHCAs that, for consistency, includes suggested state language.</b></p> <p><b><u>Option C:</u> Add definition to define Critical Saltwater Habitats.</b></p>

<u>Definition of Marine FWHCAs</u> State Regulations Most-relevant to Countywide Marine FWHCAs:	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p> <i>wildlife habitat;</i>  <i>(f) Waters of the state;</i>  <i>(g) Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; and</i>  <i>(h) State natural area preserves, natural resource conservation areas, and state wildlife areas.</i> </p> <p>           WAC 173-26-221 (General Master Programs Provisions) includes standards for the protection of Critical Saltwater Habitats. The applicability statement includes the following:         </p> <p> <i>Critical saltwater habitats include all kelp beds, eelgrass beds, spawning and holding areas for forage fish, such as herring, smelt and sandlance; subsistence, commercial and recreational shellfish beds; mudflats, intertidal habitats with vascular plants, and areas with which priority species have a primary association</i> </p>			

## 2. Classification of Marine FWHCAs

<u>Classification of Marine FWHCAs</u> State Regulations Most-relevant to Countywide Marine FWHCAs:	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p>As noted in (1) above, WAC 173-26-221 identifies Critical Saltwater Habitat.</p>	<p>SJCC 18.20.160 (A)(5) states:</p> <p><b>Marine Habitat Areas.</b> <i>These areas include the following:</i></p> <ul style="list-style-type: none"> <li>a. <i>All kelp and eelgrass beds;</i></li> <li>b. <i>Priority shellfish areas as follows:</i> <ul style="list-style-type: none"> <li>i. <i>All public and private tidelands or bedlands which are approved or conditionally approved by the Washington Department of Health for shellfish harvest;</i></li> <li>ii. <i>Any shellfish protection districts created under Chapter 90.72 RCW; and</i></li> <li>iii. <i>Areas with all of the following attributes: broad intertidal areas, bays with geographically restricted wave action and circulation, poor or limited flushing, warmer water temperatures, seasonally reduced salinities, and increased potential for algae bloom; and</i></li> </ul> </li> <li>c. <i>All identified smelt spawning areas.</i></li> </ul>	<p>The County's BAS supports the protection of the Marine Habitat Areas outlined in SJCC 18.20.160, but also emphasizes the inclusion of critical saltwater habitats listed under WAC 173-26-221. Inclusion of these provisions would expand the Marine Habitat Areas to also include: all spawning and holding areas for forage fish along with "mudflats, intertidal habitats with vascular plants and areas with which priority species have a primary association."</p>	<p><u>Option A.</u> Retain current wording in the SJCC.</p> <p><b><u>Option B.</u> Expand the classification of Marine Habitat Areas to be consistent with definition of critical saltwater habitats and consider renaming the Marine Habitat Areas to "Critical Saltwater Habitats."</b></p>

### 3. Countywide Marine FWHCA Maps

<u>Countywide marine FWHCA Maps</u> State Regulations Most-relevant to Countywide Marine FWHCAs:	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p>WAC 173-26-221(2)(c)(iii) states:</p> <p><i>Until an inventory of critical saltwater habitat has been done, shoreline master programs shall condition all over-water and near-shore developments in marine and estuarine waters with the requirement for an inventory of the site and adjacent beach sections to assess the presence of critical saltwater habitats and functions. The methods and extent of the inventory shall be consistent with accepted research methodology. At a minimum, local governments should consult with department technical assistance materials for guidance.</i></p>	<p>The SJCC currently does not specify the use of any particular countywide FWHCA map</p>	<p>Through the County's current update to the Shoreline Master Program, inventory maps are being prepared which identify approximate locations for many critical saltwater habitats (eelgrass, kelp, and forage fish spawning areas).</p>	<p><u>Option A.</u> Do not adopt the maps for marine FWHCAs.</p> <p><b><u>Option B.</u> When finalized, adopt the habitat maps for marine FWHCAs for use in general planning. Landowners should be cautioned that these maps are approximate and may not show all areas in need of protection. Conditions found on-site shall always prevail. For these reasons, a qualified professional may be needed to determine the presence or absence of critical saltwater habitat.</b></p>

## **4. Protection Standards**

The following topics are related to the protection of marine FWHCAs and will be discussed below:

- Buffers
- Shoreline armoring
- Overwater cover
- Mitigation sequencing

The existing County regulations for FWHCAs include Marine Habitat-Specific Standards (as listed in SJCC 18.30.160(B)(2)(b)). They are as follows:

- i. Septic drainfields and a 100 percent repair area must be at least 100 feet from the edge of the habitat area.*
- ii. Uses and developments in or over water must minimize changes to natural water circulation and must be designed and operated in a manner that minimizes the introduction of contaminants and debris.*
- iii. Uses and developments must minimize disruption of the substrate, and the location and design of structures and activities must minimize obstruction of light in the habitat area*

Exception to these standards may be given if a special report, prepared by a qualified wildlife biologist, habitat management consultant, botanist, or marine biologist demonstrates that such exception would not have a significant adverse impact on the habitat area.

The following tables provides for each specific protection standard listed in bullets above, the existing pertinent state and local regulations, an analysis of those regulations, and options for addressing problems.

### **4.1 Buffers**

The following scientific literature was most influential in the review of buffers:

Brennan, J., H. Culverwell, R. Gregg, P. Granger. 2009. Protection of Marine Riparian Functions in Puget Sound, Washington. Washington Sea Grant. Seattle, Washington. Prepared for Washington Department of Fish and Wildlife. June 15, 2009.

FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest ecosystem management: An ecological, economic, and social assessment. U.S. Departments of Agriculture, Commerce, and Interior. Portland, Oregon.

Kleinschmidt. 1999. Method to Determine Optimal Riparian Buffer Widths for Atlantic Salmon Habitat Protection. Kleinschmidt Associates. Pittsfield, Maine. Prepared for Maine State Planning Office, Augusta, Maine. January, 1999.

Knutson, K.L., and V.L. Naef. 1997. Management Recommendations for Washington's Priority Habitats. Riparian. Olympia, Washington: Washington State Department of Fish and Wildlife.

May, C.W. 2003. Stream-Riparian Ecosystems in the Puget Sound Lowland Eco-Region: A Review of Best Available Science. Watershed Ecology LLC.

Mayer, P.M., S.K. Reynolds, M.D. McCutchen, and T.J. Canfield. 2007. Meta-analysis of nitrogen removal in riparian buffers. *J. Environ. Qual.* 36:1172-80.

Mayer, P.M., S.K. Reynolds, T.J. Canfield, and M.D. McCutcheon. 2005. Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations. EPA/600/R-05/118, USEPA, Washington, DC.

Murphy, M.L. 1995. Forestry Impacts on Freshwater Habitat of Anadromous Salmonids in the Pacific Northwest and Alaska – Requirements for Protection and Restoration. NOAA Coastal Ocean Program Decision Analysis Series No. 7. NOAA Coastal Ocean Office, Silver Spring, MD. 156 pp.

Wenger, S. 1999. A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation. Office of Public Service and Outreach, Institute of Ecology, University of Georgia, Athens, Georgia. 1999.

<b>Buffers:</b> State Regulations Most-relevant to Marine FWHCAs	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
Per WAC 365-190-130 (3)  <i>(a) Counties and cities should consider the following:</i>  <i>(i) Creating a system of fish and</i>	Designated buffers related specifically to the protection of marine FWHCAs do not exist in the current chapter on critical areas. SJCC 18.30.160(D) Habitat Management Plans, requires a	1. <b>Absence of standard setback or buffer protocol.</b> The existing regulations contained within SJCC 18.30.160 do not contain specific reference to designated setbacks or buffers	1. <b>Absence of standard setback or buffer protocol.</b> <u>Option A:</u> Keep the existing language such that buffer determinations are made by qualified professionals as

<u>Buffers:</u> State Regulations Most-relevant to Marine FWHCAs	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p><i>wildlife habitat with connections between larger habitat blocks and open spaces, integrating with open space corridor planning where appropriate;</i></p> <p><i>(ii) Level of human activity in such areas including presence of roads and level of recreation type (passive or active recreation may be appropriate for certain areas and habitats);</i></p> <p><i>(iii) Protecting riparian ecosystems including salmonid habitat, which also includes marine nearshore areas;</i></p> <p><i>(iv) Evaluating land uses surrounding ponds and fish and wildlife habitat conservation areas that may negatively impact these areas, or conversely, that may contribute positively to their function;</i></p> <p><i>(v) Establishing buffer zones around these areas to separate incompatible uses from habitat areas;</i></p>	<p>report by a qualified professional which outlines mitigation for any adverse impacts. <b>Such mitigation may include:</b></p> <ul style="list-style-type: none"> <li>a. Establishment of buffer zones;</li> <li>b. Preservation of critically important vegetation;</li> <li>c. Limitation of access to the habitat area;</li> <li>d. Seasonal restriction of construction activities; and</li> <li>e. Establishment of a timetable for periodic review of the plan and performance or maintenance bonding.</li> </ul> <p>However, SJCC 18.50.330(D)(2) Residential development, includes the following for the setback of residential structures:</p> <p><b><i>Residential structures shall be located behind the treeline and set back a minimum of 50 feet from the OHWM, top of bank or berm, whichever is greater. Residential structures are also subject to the following:</i></b></p> <ul style="list-style-type: none"> <li><i>b. If there is no natural screening or if the shoreline</i></li> </ul>	<p>other than to emphasize that uses and developments shall minimize impacts and potentially mitigate through the establishment of buffers through a Habitat Management Plan.</p> <p>2. <b>Setback vs Buffer across all shorelines:</b> SJCC 18.50 utilizes a development setback rather than a buffer. The Best Available Science emphasizes the use of “buffers” as a regulatory tool to minimize impacts from uses and developments adjacent to critical areas. See examples at the end of this review for potential buffer options for San Juan County.</p> <p>3. <b>Buffer size:</b> BAS indicates that 50 feet is not a large enough buffer in many instances to protect marine shoreline functions. Table 3.3 in Chapter 3 of the BAS report identifies the varying range of buffers recommended by the FEMAT curves method. With the</p>	<p>appropriate.</p> <p><u>Option B:</u> Create a standard buffer for areas within or adjacent to critical salt water habitats. See the FEMAT method for determining appropriate buffer width based on targeted function. Based on this information, shoreline buffers within the County would likely start at a minimum of 85 feet. This option could be standardized depending upon site conditions and the various functions being addressed</p> <p><b><u>Option C: Create a variable buffer approach that is dependent upon intensity of proposed development, landscape characteristics and proximity to critical salt water habitats (see example in sub-section 6).</u></b></p> <p>2. <b>Setback vs Buffer across all shorelines</b></p> <p><u>Option A:</u> Continue to utilize the use of a standard shoreline setback rather than a buffer.</p> <p><u>Option B:</u> Create a standard</p>

<u>Buffers:</u> State Regulations Most-relevant to Marine FWHCAs	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p>Per WAC 173-26-221 (2)(c)(iii)</p> <p>(C) <b>Standards.</b> <i>Docks, piers, bulkheads, bridges, fill, floats, jetties, utility crossings, and other human-made structures shall not intrude into or over critical saltwater habitats except when all of the conditions below are met:</i></p> <ul style="list-style-type: none"> <li>• <i>The public’s need for such an action or structure is clearly demonstrated and the proposal is consistent with protection of the public trust, as embodied in RCW 90.58.020;</i></li> <li>• <i>Avoidance of impacts to critical saltwater habitats by an alternative alignment or location is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose;</i></li> <li>• <i>The project including any required mitigation, will result in no net loss of ecological functions associated with critical saltwater habitat.</i></li> <li>• <i>The project is consistent with the state’s interest in resource protection and species recovery.</i></li> </ul>	<p><i>area is cleared so as to preclude natural screening before a building permit application is approved, then a minimum setback of 100 feet from the OHWM or from the top of bank or berm, whichever is greater</i></p> <p>c. <i>A setback less than the minimums specified above may be authorized by the administrator only if it will result in a lesser environmental or visual impact.</i></p> <p>d. <i>If existing houses on adjoining waterfront lots are closer than the specified minimum setback, a lesser setback may be authorized by the administrator. This setback may be equal to the average setback of existing houses on adjacent lots, if the minimum setback would cause obstruction of views from the building site due to the location of existing houses</i></p>	<p>high degree of variability between function, FEMAT derived buffer recommendations range between 80 feet and 279 feet depending upon the addressed function.</p> <p>4. <b>Buffer reduction:</b> Reducing the setback (or buffer) due to visual impacts (see item c) or location of adjacent development (see item d) is not supported by BAS.</p>	<p>shoreline buffer across all shorelines.</p> <p><b>Option C: Create a variable buffer approach dependent upon intensity of proposed development, landscape characteristics and proximity to critical salt water habitats (see example below).</b></p> <p><b>Option D: As part of either option, require a vegetation management area along the shoreline which focuses on both water quality and habitat buffer functions. Allowances can be included which would provide direct shoreline access as well as limited vegetative clearing and trimming.</b></p> <p>3. <b>Buffer size:</b></p> <p><b>Option A:</b> Continue with a residential setback of 50 feet from all shorelines, up to 100 feet if natural screening is absent.</p> <p><b>Option B:</b> Consider a larger standard buffer. A 100-foot buffer is generally accepted as the minimum standard buffer supported by BAS. Based on the</p>

<u>Buffers:</u> State Regulations Most-relevant to Marine FWHCAs	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p><i>Private, noncommercial docks for individual residential or community use may be authorized provided that:</i></p> <ul style="list-style-type: none"> <li><i>Avoidance of impacts to critical saltwater habitats by an alternative alignment or location is not feasible;</i></li> <li><i>The project including any required mitigation, will result in no net loss of ecological functions associated with critical saltwater habitat.</i></li> </ul>	<p><i>and if consistent with other applicable regulations in this master program.</i></p>		<p>FEMAT method and the County's average shoreline mature tree height less than 100 feet, a <b>minimum</b> buffer of 85 feet could be considered. However, as a minimum standard, it should be noted that many shoreline areas should be afforded a greater level of protection. Thus, in order to capture the majority of shoreline areas and ensure protection of marine critical areas, a standard buffer of at least 150 feet would be most appropriate.</p> <p><b><u>Option C: Create a variable buffer approach as described in sub-section 6 below.</u></b></p> <p><b>4. Buffer reduction:</b></p> <p><u>Option A:</u> Continue allowing potential setback (or buffer) reductions based on visual impacts or the location of adjacent development. Note: this is not supported by BAS.</p> <p><u>Option B:</u> Allow for potential setback or buffer reductions <i>only</i> if the proposed actions will result in a net improvement to shoreline ecological functions.</p>

<u>Buffers:</u> State Regulations Most-relevant to Marine FWHCAs	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
			<p><b><u>Option C:</u> Same as Option B above, but in addition, establish clear standards to be met in order to reduce a shoreline setback or buffer. This could include a suite of alternatives or incentives intended to provide net improvement. For example:</b></p> <ul style="list-style-type: none"> <li>• <b>Significantly reduce exiting impervious surface</b></li> <li>• <b>Add shoreline vegetation where absent</b></li> <li>• <b>Remove existing shoreline armoring</b></li> <li>• <b>Remove existing overwater cover</b></li> <li>• <b>Provide improved infiltration</b></li> <li>• <b>Upgrade existing septic systems where appropriate</b></li> </ul>

## 4.2 Shoreline Armoring

The following scientific literature was most influential in the review of shoreline armoring:

Brennan, J., H. Culverwell, R. Gregg, P. Granger. 2009. Protection of Marine Riparian Functions in Puget Sound, Washington. Washington Sea Grant. Seattle, Washington. Prepared for Washington Department of Fish and Wildlife. June 15, 2009

EnviroVision, Herrera, and AHG. 2007. Protecting Nearshore Habitat and Functions in Puget Sound, an Interim Guide. Prepared by EnviroVision Corp., Herrera Environmental Consultants Inc., and Washington Departments of Fish and Wildlife, Ecology, Natural Resources, Transportation, Community Trade and Economic Development, the Recreation and Conservation Office, and the Puget Sound Partnership. Revised June, 2010.

Herrera. 2007a. Shoreline Modifications. Prepared for Washington Department of Fish and Wildlife, by Herrera Environmental Consultants, Inc. 2007.

Herrera. 2007c. Habitat Modifications White Paper. Washington Department of Fish & Wildlife, Olympia, Washington. Prepared by Herrera Environmental Consultants, Inc., Seattle, Washington.

Johannessen, J. and A. MacLennan. 2007. Beaches and Bluffs of Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-04. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington

MacLennan, A. and J. Johannessen. 2008. San Juan Initiative Protection Assessment Nearshore Case Study Area Characterization. Prepared for: The San Juan Initiative; The Puget Sound Partnership through The Surfrider Foundation.

SSPS. 2007. Puget Sound Salmon Recovery Plan. Shared Strategy for Puget Sound, Shared Strategy Development Committee. Plan adopted by the National Marine Fisheries Service January 19, 2007.

<p><u>Shoreline Armoring:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p>Per WAC 173-26-221 (2)(c)(iii)</p> <p><i>(C) Standards. Docks, piers, bulkheads, bridges, fill, floats, jetties, utility crossings, and other human-made structures shall not intrude into or over critical saltwater habitats except when all of the conditions below are met:</i></p> <ul style="list-style-type: none"> <li>• <i>The public’s need for such an action or structure is clearly demonstrated and the proposal is consistent with protection of the public trust, as embodied in RCW <u>90.58.020</u>;</i></li> <li>• <i>Avoidance of impacts to critical saltwater habitats by an alternative alignment or location is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose;</i></li> <li>• <i>The project including any required mitigation, will result in no net loss of ecological functions associated with critical saltwater habitat.</i></li> <li>• <i>The project is consistent with</i></li> </ul>	<p>Shoreline armoring regulations related specifically to the protection of marine FWHCAs do not exist in the current chapter on critical areas. Shoreline armoring is covered by SJCC 18.50.210 Bulkheads.</p> <p><i>A. Regulations.</i></p> <p><i>2. Nonexempt bulkheads shall 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 exists:</i></p> <ul style="list-style-type: none"> <li><i>a. <b>Serious erosion is threatening an established use on the adjacent uplands;</b></i></li> <li><i>b. A bulkhead is needed and is the <b>most reasonable method</b> of stabilizing an existing beach condition;</i></li> <li><i>c. There is a demonstrated need for a bulkhead in connection with water-dependent or water-related commerce or industry in an appropriate environment; or</i></li> <li><i>d. A bulkhead is the <b>most desirable method</b> for</i></li> </ul>	<p>1. <b>New stabilization</b> should not be allowed for the protection of “adjacent uplands.” The BAS emphasizes the detrimental effects from shoreline armoring. State shoreline management guidelines also states that armoring should only be constructed for the protection of principal uses or structures.</p> <p>2. <b>Hard vs Soft armoring:</b> WAC 173-26-231 also gives preference to those types of shoreline modifications that have a lesser impact on ecological functions (i.e. “soft” vs. “hard” shoreline modifications. This is also emphasized in the BAS. Soft measures should be preferred over hard measures.</p> <p>Both hard and soft shoreline stabilization should be defined.</p>	<p>1. <b>New Stabilization:</b></p> <p><u>Option A:</u> Continue to allow the construction of bulkheads to protect <i>established use on adjacent uplands</i>. Note: this is likely not a feasible option per the State shoreline management guidelines.</p> <p><b>Option B: Limit new stabilization only to those areas needed to protect an existing primary structure, water dependent development, or ecological restoration as noted in the shoreline management guidelines.</b></p> <p><b>Option C: See sub-section 7 which contains recommendations from the 2009 proposed update to the Shoreline Master Program.</b></p> <p>2. <b>Hard vs Soft armoring:</b></p> <p><u>Option A:</u> Continue to utilize current regulations which requires review of nonstructural techniques</p>

<p><u>Shoreline Armoring:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p><i>the state's interest in resource protection and species recovery.</i></p> <p>WAC 173-26-231 (3)(a), SMP guidelines for shoreline stabilization:</p> <ul style="list-style-type: none"> <li>• <i>New structural stabilization measures should only be allowed when necessity is demonstrated. Specific requirements for how to demonstrate need are established in WAC 173-26-231(3)(a)(iii)(B). This includes:</i> <ul style="list-style-type: none"> <li><i>i. existing primary structures;</i></li> <li><i>ii. new non-water-dependent development including Single Family Residences (with clarification);</i></li> <li><i>iii. water-dependent development; and</i></li> <li><i>iv. ecological restoration/toxic clean-up remediation projects.</i></li> </ul> </li> <li>• <i>An existing shoreline stabilization structure may be replaced with a similar structure if there is a demonstrated need to protect</i></li> </ul>	<p><i>stabilizing a landfill permitted under this master program.</i></p> <p>3. <i>Bulkheads shall not be permitted in conjunction with new projects or development when practical alternatives are available.</i></p> <p>4. <i>Bulkheads shall be permitted on marine feeder bluffs only where (a) a clear and significant danger to established development exists and (b) there is reasonable cause to believe that the bulkhead will in fact arrest the bluff recession and will not seriously disrupt the feeder action or the driftway.</i></p> <p>5. <i>Bulkheads constructed on Class I marine beaches shall be located behind the berm.</i></p> <p>6. <i>All bulkheads shall conform to the design requirements of the Washington Department of Fish and Wildlife, except where such design would be incompatible with protection of the shore process corridor and operating systems.</i></p> <p>7. <i>Applications for bulkhead permits shall include at least the following</i></p>		<p>prior to use of bulkheads.</p> <p><b>Option B: Include regulations which require implementation of soft shoreline armoring techniques prior to the use of hard armoring.</b></p> <p><b>Note: Consider adding definitions for both soft and hard armoring:</b></p> <p><i>a. Soft Structural Shoreline Stabilization Measures: Shore erosion control and restoration practices that contribute to restoration, protection or enhancement of shoreline ecological functions. Soft shoreline stabilization typically includes a mix of gravels, cobbles, boulders, logs, bioengineering, and native vegetation placed to provide shore stability in a non-linear, sloping arrangement.</i></p> <p><i>b. Hard Structural Shoreline Stabilization: Shore erosion</i></p>

<p><u>Shoreline Armoring:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p><i>principal uses or structures from erosion caused by currents, tidal action, or waves.</i></p> <ul style="list-style-type: none"> <li>• <i>When any structural shoreline stabilization measures are demonstrated to be necessary, pursuant to above provisions:</i> <ul style="list-style-type: none"> <li>i. <i>Limit the size of stabilization measures to the minimum necessary. Use measures designed to assure no net loss of shoreline ecological functions. Soft approaches shall be used unless demonstrated not to be sufficient to protect primary structures, dwellings, and businesses.</i></li> <li>ii. <i>Mitigate new erosion control measures, including replacement structures, on feeder bluffs or other actions that affect beach sediment-producing areas to avoid and, if that is not possible, to minimize adverse impacts to sediment conveyance systems.</i></li> </ul> </li> </ul>	<p><i>information:</i></p> <ul style="list-style-type: none"> <li>a. <i>Purpose of proposed bulkhead;</i></li> <li>b. <i>Low, normal, and high elevations, when appropriate;</i></li> <li>c. <i>Direction of net longshore drift, when appropriate;</i></li> <li>d. <i>Type of construction proposed; and</i></li> <li>e. <i>Elevation of the toe and crest of the proposed bulkhead with respect to water levels.</i></li> </ul> <p><i>8. Bulkheads shall be prohibited for any purpose if it will cause significant erosion or beach starvation.</i></p>		<p><i>control practices using hardened structures that armor and stabilize the shoreline from further erosion. Hard structural shoreline stabilization typically uses concrete, boulders, dimensional lumber or other materials to construct linear, vertical or near-vertical faces that are located at or waterward of ordinary high water, as well as those structures located on average within five (5) feet landward of OHWM. These include bulkheads, rip-rap, groins, retaining walls and similar structures.</i></p>

### 4.3 Overwater Structures

Scientific literature most influential in the review of overwater cover:

Brennan, J., H. Culverwell, R. Gregg, P. Granger. 2009. Protection of Marine Riparian Functions in Puget Sound, Washington. Washington Sea Grant. Seattle, Washington. Prepared for Washington Department of Fish and Wildlife. June 15, 2009.

Fresh, K., C. Simenstad, J. Brennan, M. Dethier, G. Gelfenbaum, F. Goetz, M. Logsdon, D. Myers, T. Mumford, J. Newton, H. Shipman, C. Tanner. 2004. Guidance for protection and restoration of the nearshore ecosystems of Puget Sound. Puget Sound Nearshore Partnership Report No. 2004-02. Published by Washington Sea Grant Program, University of Washington, Seattle, Washington.

Herrera. 2007b. Marinas and Shipping / Ferry Terminals. Prepared for Washington Department of Fish and Wildlife, by Herrera Environmental Consultants, Inc. 2007.

Overwater Structures: State Regulations Most-relevant to Marine FWPCA Protection Standards	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p>Per WAC 173-26-221 (2)(c)(iii)</p> <p><i>(C) <b>Standards.</b> Docks, piers, bulkheads, bridges, fill, floats, jetties, utility crossings, and other human-made structures shall not intrude into or over critical saltwater habitats except when all of the conditions below are met:</i></p> <ul style="list-style-type: none"> <li><i>The public's need for such an action or structure is clearly demonstrated and the proposal is consistent</i></li> </ul>	<p>Regulations for piers, docks and other overwater cover related specifically to the protection of marine FWHCAs do not exist in the current chapter on critical areas. Overwater cover is covered by SJCC 18.50.190 Boating Facilities: (including docks, piers, and recreational floats).</p> <p><i>B. General Regulations.</i></p> <ol style="list-style-type: none"> <li><i>Boating facilities shall be designed to minimize adverse impacts on marine life and the shore process corridor and its operating systems.</i></li> <li><i>Boating facilities shall be designed to make use of the natural site configuration to the greatest possible</i></li> </ol>	<ol style="list-style-type: none"> <li>Regulations for overwater cover do not specifically address direct impacts within designated critical saltwater habitats – primarily kelp and eelgrass beds and forage fish spawning areas. Based on the BAS, minimization of both size and quantity of over-water structures can be an effective management</li> </ol>	<ol style="list-style-type: none"> <li>Consider the limitation or restriction of piers and docks in areas designated as critical saltwater habitats – primarily kelp and eelgrass beds and forage fish spawning areas.</li> </ol> <p><b>Option A: For any proposal for a new or replacement overwater structure, require site evaluation to determine presence/absence of</b></p>

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWPCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p><i>with protection of the public trust, as embodied in RCW 90.58.020;</i></p> <ul style="list-style-type: none"> <li>• <i>Avoidance of impacts to critical saltwater habitats by an alternative alignment or location is not feasible or would result in unreasonable and disproportionate cost to accomplish the same general purpose;</i></li> <li>• <i>The project including any required mitigation, will result in no net loss of ecological functions associated with critical saltwater habitat.</i></li> <li>• <i>The project is consistent with the state’s interest in resource protection and species recovery.</i></li> </ul> <p>WAC 173-26-231 (3)(b), SMP guidelines for piers and docks (summarized):</p> <ul style="list-style-type: none"> <li>• New piers and docks allowed only for water-dependent uses or public access (note: docks for single-family</li> </ul>	<p><i>degree.</i></p> <p>3. <i>All boating facilities shall comply with the design criteria established by the State Department of Fish and Wildlife relative to disruption of currents, restrictions of tidal prisms, flushing characteristics, and fish passage to the extent that those criteria are consistent with protection of the shore process corridor and its operating systems.</i></p> <p>4. <i>Areas with poor flushing action shall not be considered for overnight or long term moorage facilities.</i></p> <p>5. <i>In general, only one form of moorage or other structure for boat access to the water shall be allowed on a single parcel: a dock or a marine railway or a boat launch ramp may be permitted subject to the applicable provisions of this code. (A mooring buoy may be allowed in conjunction with another form of moorage.) However, multiple forms of moorage or other structures for boat access to the water may be allowed on a single parcel if:</i></p> <p><i>a. Each form of boat access to water serves a public or commercial recreational use, provides public access, is a part of a marina facility, or serves an historic camp or historic resort; or</i></p> <p><i>b. The location proposed for multiple boat access structures is common area owned by or dedicated by easement to the joint use of the owners of at least 10 waterfront parcels.</i></p>	<p>tool to reduce potential impacts to the aquatic environment.</p> <p>2. Regulations for overwater cover do not specifically address options to reduce shading impacts.</p> <p>3. Measures to reduce substrate impacts do not include locating moorage far enough off-shore to prevent substrate disturbance from prop wash and potential grounding</p> <p>4. Regulations for overwater cover do not specifically address options to minimize pile size and quantity to the minimum necessary to support the structure.</p>	<p><b>critical salt water habitat and an evaluation of potential impacts.</b></p> <p><u>Option B:</u> Allow new or replacement overwater cover without site inspection, but with an evaluation of potential impacts.</p> <p>2. Consider additional regulation outlining potential measures to reduce shading:</p> <ul style="list-style-type: none"> <li>• <b>Minimization of pier width</b></li> <li>• <b>Orientation of structures in as much North-South direction as feasible</b></li> <li>• <b>Installation of light transmitting decking (such as grated decking)</b></li> <li>• <b>Use elevated walkways as high above the water surface as feasible</b></li> <li>• <b>Preference for joint-use or multi-use</b></li> </ul>

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p>residences are consider water dependent uses provided they are used for access to watercraft).</p> <ul style="list-style-type: none"> <li>• Construction shall be limited to the minimum necessary to support the intended use.</li> <li>• New developments of two or more dwelling units should plan for joint-use or community dock facilities.</li> <li>• Piers and docks shall be designed to avoid, minimize, and mitigate (in order of preference) impacts to ecological function as well as critical salt water habitats.</li> </ul>	<p>6. <i>Structures on piers and docks shall be prohibited, except as provided for marinas in subsection (H) of this section.</i></p> <p><i>C. General Regulations – Docks, Piers, and Recreational Floats.</i></p> <ol style="list-style-type: none"> <li>1. <i>Multiple use and expansion of existing facilities are preferred over construction of new docks and piers.</i></li> <li>2. <i>Mooring buoys shall be preferred over docks and piers on all marine shorelines except in the cases of port, commercial, or industrial development in the urban environment.</i></li> <li>3. <i>Moorage floats, unattached to a pier or floating dock, are preferred over docks and piers.</i></li> <li>4. <i>Every application for a substantial development permit for dock or pier construction shall be evaluated on the basis of multiple considerations, including but not necessarily limited to the potential impacts on littoral drift, sand movement, water circulation and quality, fish and wildlife, navigation, scenic views, and public access to the shoreline.</i></li> <li>5. <i>Docks or piers which can reasonably be expected to interfere with the normal erosion-accretion process associated with feeder bluffs shall not be permitted.</i></li> <li>6. <i>Abandoned or unsafe docks and piers shall be removed or repaired promptly by the owner. Where any such structure constitutes a hazard to the public,</i></li> </ol>		<p><b>structures over single-use over-water structures.</b></p> <ol style="list-style-type: none"> <li>3. Consider additional regulation outlining potential measures to reduce substrate impacts: <ul style="list-style-type: none"> <li>• <b>Locate moorage far enough off-shore to prevent substrate disturbance from prop wash and potential grounding</b></li> </ul> </li> <li>4. Consider additional regulation outlining potential measures to reduce other habitat impacts <ul style="list-style-type: none"> <li>• <b>Reduce pile size and quantity to the minimum necessary to support the structure.</b></li> </ul> </li> </ol>

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p><i>the County may, following notice to the owner, abate the structure if the owner fails to do so within a reasonable time and may impose a lien on the related shoreline property in an amount equal to the cost of the abatement.</i></p> <p><i>7. Unless otherwise approved by shoreline conditional use permit, boats moored at residential docks shall not be used for commercial overnight accommodations.</i></p> <p><i>8. Use of a dock for regular float plane access and moorage shall be allowed only by shoreline conditional use permit and shall be allowed only at commercial or public moorage facilities or at private community docks.</i></p> <p><i>D. Regulations – General Design and Construction Standards.</i></p> <p><i>1. Pilings must be structurally sound prior to placement in the water.</i></p> <p><i>2. Chemically treated or coated piles, floats, or other structural members in direct contact with the water shall be as approved by the Environmental Protection Agency.</i></p> <p><i>3. Pilings employed in piers or any other structure shall have a minimum vertical clearance of one foot above extreme high water.</i></p> <p><i>4. All floats shall include stops which serve to keep the bottom off tidelands at low tide.</i></p>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p>5. <i>When plastics or other nonbiodegradable materials are used in float, pier, or dock construction, full containment features in the design of the structures shall be required.</i></p> <p>6. <i>Overhead wiring or plumbing is not permitted on piers or docks.</i></p> <p>7. <i>New boathouses or covered moorages are prohibited on floats, piers, and docks. Other structures on floats, piers, and docks shall be limited to three feet in height.</i></p> <p>8. <i>A pier shall not extend offshore farther than 50 feet beyond the extreme low tide contour.</i></p> <p>9. <i>Dock lighting shall be designed to shine downward, be of a low wattage, and shall not exceed a height of three feet above the dock surface.</i></p> <p>10. <i>All construction-related debris shall be disposed of properly and legally. Any debris that enters the water shall be removed promptly. Where feasible, floats shall be secured with anchored cables in place of pilings.</i></p> <p>11. <i>Materials used in dock construction shall be of a color and finish that will blend visually with the background.</i></p> <p><i>E. Regulations – Joint-Use Community Piers, Docks, and Floats.</i></p> <p>1. <i>No more than one moorage facility shall be allowed as an accessory to any hotel, motel, multifamily residential development, or similar development.</i></p>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p>2. <i>Proposals for joint-use community piers and docks shall demonstrate and document that adequate maintenance of the structure and the associated upland area will be provided by identified responsible parties.</i></p> <p>3. <i>Recreational floats shall be placed offshore no farther than 200 feet beyond extreme low tide, the minus-3 fathom contour, or the line of navigation, whichever is closest to shore (WAC 332-30-148(2)).</i></p> <p>4. <i>All waterfront subdivisions approved after the adoption of this SMP shall include or provide for construction of a single joint-use moorage facility by the lot owners if moorage is desired by the owners, in a designated, reserved area of the waterfront. Identification of a moorage site shall not be construed to indicate that a shoreline permit will be granted for that site. Subdivisions located where it would be physically impossible to construct such a facility shall be exempt from this provision. Individual docks and piers shall be prohibited; however, the County may authorize more than one moorage facility if a single facility would be inappropriate or undesirable given the specific site and marine conditions. A legal easement must be dedicated to all lot owners for access to joint-use facilities.</i></p> <p>5. <i>The dimensional standards in subsection (G)(2) of this section shall apply.</i></p> <p><i>F. Regulations – Commercial/Industrial Docks.</i></p>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p><i>1. Substantial development permits for docks or piers serving single commercial or industrial enterprises shall not be granted until nearby commercial and industrial enterprises have been contacted regarding their water access needs and plans. Where more than one enterprise needs and could realistically make use of a single moorage facility, permits for individual facilities shall not be granted.</i></p> <p><i>2. Commercial and industrial moorage facilities and other docks and piers consisting of more than 20 moorage spaces shall be subject also to the applicable policies and regulations of this section.</i></p> <p><i>3. Bulk storage for gasoline, oil, and other petroleum products for any use or purpose is prohibited on piers and docks. Bulk storage means nonportable storage in fixed tanks.</i></p> <p><i>4. Spill clean-up facilities shall be available for prompt response and application at all piers and docks involved in oil and hazardous products transfer.</i></p> <p><i>G. Regulations – Residential Docks.</i></p> <p><i>1. New Shoreline Subdivisions. New subdivisions with shoreline frontage shall be required to provide community docks rather than individual, private docks, if any docks are proposed, as set forth in subsection (E) of this section.</i></p> <p><i>2. Size and Dimensions of Docks, Piers, and Floats.</i></p>		

<u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
	<p><i>a. The maximum dimensions for a dock (including the pier, ramp, and float) associated with a single-family residence shall not exceed 700 total square feet in area. In addition, the length of the dock (including the pier, ramp, and float) may not extend more than 115 feet in length seaward of the ordinary high water mark. Docks exceeding these dimensions may only be authorized by variance.</i></p> <p><i>b. The maximum dimensions for a joint-use dock (including the pier, ramp, and float) associated with two single-family residences shall not exceed 1,400 square feet in area. In addition, the length of the dock (including the pier, ramp, and float) may not extend more than 200 feet in length seaward of the ordinary high water mark. Docks exceeding these dimensions may only be authorized by variance.</i></p> <p><i>c. The maximum dimensions for a joint-use community dock (including the pier, ramp, and float) associated with more than two single-family residences shall not exceed 2,000 square feet in total area. In addition, the length of the dock (including the pier, ramp, and float) may not extend more than 300 feet in length seaward of the ordinary high water mark. If a variance is granted to allow a dock exceeding these dimensions, its construction may</i></p>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p><i>only be authorized subject to the regulations for a marina.</i></p> <p><i>d. Maximum length and width of a ramp, pier or dock shall be the minimum necessary to accomplish moorage for the intended boating use.</i></p> <p><i>3. Side Yard Setbacks. Docks shall be set back a minimum of 10 feet from side property lines. However, a joint use community dock may be located adjacent to or upon a side property line when mutually agreed to by contract or by covenant with the owners of the adjacent property. A copy of such covenant or contract must be recorded with the County auditor and filed with the approved permit to run with the title to both properties involved.</i></p> <p><i>4. Development of a dock on a lot intended for single-family residential purposes shall require a shoreline substantial development permit or a statement of exemption issued by the County.</i></p> <p><i>5. Applications for nonexempt docks and piers associated with single-family residences shall not be approved until:</i></p> <p><i>a. It can be shown by the applicant that existing facilities are not adequate or feasible for use;</i></p> <p><i>b. Alternative moorage is not adequate or feasible; and</i></p> <p><i>c. The applicant shall have the burden of providing the information requested for in subsections (A)</i></p>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p><i>and (B) of this section, and shall provide this information in a manner prescribed by the administrator.</i></p> <p><i>H. Regulations – Marinas.</i></p> <ol style="list-style-type: none"> <li><i>1. Dredging or filling of wetlands for the sole purpose of constructing a marina shall be prohibited.</i></li> <li><i>2. No marina shall be approved for construction within one-half mile of any outfall of primary treated domestic or industrial sewage except as a conditional use.</i></li> <li><i>3. All service facilities within or associated with a marina shall include provisions to prevent pollutants from entering the water.</i></li> <li><i>4. Commercial covered moorages may be permitted only where vessel construction or repair work is to be the primary activity and covered work areas are demonstrated to be necessary over water.</i></li> <li><i>5. Marina-related structures or uses which are not in and of themselves shoreline dependent shall not be located over water.</i></li> <li><i>6. Marinas shall be sited to prevent any restrictions in the use of commercial and recreational shellfish beds and in compliance with The Washington Department of Health’s “Environmental Health Guidelines for Marina Development and Operation.”</i></li> <li><i>7. The incorporation of reasonable public use facilities</i></li> </ol>		

<p><u>Overwater Structures:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
	<p><i>into public marina design shall be required. Marinas may include specific areas restricted for security reasons.</i></p> <p><i>8. Marinas shall be designed to minimize their adverse effects on the scenic qualities of the shorelines.</i></p> <p><i>9. Surface runoff from marina areas shall be controlled so that pollutants will not be carried into water bodies.</i></p> <p><i>10. Marinas shall not be permitted on Class I beaches or where their presence would interrupt driftways feeding Class I beaches.</i></p> <p><i>11. Where landfill is permitted, it shall be only for the necessary water dependent portions of the facility and shall conform to the policies and regulations of SJCC <a href="#">18.50.360</a> and <a href="#">18.50.370</a>. Landfill shall not be permitted for the creation of parking areas unless no feasible alternative exists and the creation of a parking area would be consistent with the policies of this SMP and with the public interest.</i></p> <p><i>12. Parking areas associated with marinas shall be subject to the policies and regulations of SJCC <a href="#">18.50.340</a>, Transportation facilities.</i></p> <p><i>13. Marinas shall be subject to the general design and construction standards for docks in subsection (D) of this section.</i></p>		

## 4.4 Mitigation Sequencing

<p><u>Mitigation Sequencing:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p>Per WAC 173-26-201(2)(e)</p> <p><i>“...mitigation measures shall be applied in the following sequence of steps listed in order of priority, with (e)(i)(A) of this subsection being top priority.</i></p> <p>(A) <i>Avoiding the impact altogether by not taking a certain action or parts of an action;</i></p> <p>(B) <i>Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts;</i></p> <p>(C) <i>Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;</i></p> <p>(D) <i>Reducing or eliminating the impact over time by preservation and maintenance operations;</i></p> <p>(E) <i>Compensating for the impact by</i></p>	<p>Mitigation sequencing related specifically to the protection of marine FWHCAs is located in SJCC 18.30.160(B)(1):</p> <p><i>a. The proposal must mitigate to the maximum extent feasible any significant adverse impacts to habitat functions and values and to habitat buffers. Mitigation actions by an applicant or property owner shall occur in the following preferred sequence, unless the applicant demonstrates that an overriding public benefit would warrant an exception:</i></p> <p><i>i. Avoiding the impact by not taking a certain action or parts of actions on that portion of the site which contains the habitat area or its buffer;</i></p> <p><i>ii. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;</i></p> <p><i>iii. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;</i></p> <p><i>iv. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or</i></p> <p><i>v. Compensating for the impact by replacing or providing substitute resources or environments. This may</i></p>	<p>Mitigation sequencing should include <i>monitoring</i> language as part of the requirement. The BAS indicates that success of mitigation is difficult to achieve. Monitoring of mitigation plan implementation is critical to ensuring success.</p>	<p><u>Option A:</u> Keep the existing language without requiring monitoring as part of the mitigation sequence.</p> <p><b><u>Option B: Require review of monitoring protocol as part of mitigation sequencing. Require mitigation plans to include monitoring language.</u></b></p>

<u>Mitigation Sequencing:</u> State Regulations Most-relevant to Marine FWHCA Protection Standards	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems
<p><i>replacing, enhancing, or providing substitute resources or environments; and</i></p> <p><i>(F) Monitoring the impact and the compensation projects and taking appropriate corrective measures.</i></p>	<p><i>require preparation of a habitat management plan in accordance with subsection (D) of this section.</i></p> <p><i>b. Where impacts cannot be avoided, the applicant must seek to implement other appropriate mitigation actions in compliance with the intent, standards, and criteria of this section. In an individual case, these actions may include consideration of alternative site plans and layouts and reductions in the density or scope of the proposal.</i></p>		

#### **4.5 Standards for Reverse Osmosis Desalination Systems (prepared by County staff based on code review and recommendations of the SJ Marine Resource and Water Resource Committees)**

The following scientific literature was most influential in the review of marine impacts associated reverse osmosis desalination systems:

Campbell, R. L., and A. T. Jones. 2005. Appropriate disposal of effluent from coastal desalination facilities. *Desalination* 182: 365-372.

Chia, F.-S., J. Buckland-Nicks, and C. M. Young. 1984. Locomotion of marine invertebrate larvae: a review. *Canadian Journal of Zoology* 62: 1205-1222.

Del Pilar Ruso, Y., J. A. De la Ossa Carretero, F. Giménez Casalduero, J. L. Sánchez Lizaso. 2007. Spatial and temporal changes in infaunal communities inhabiting soft-bottoms affected by brine discharge. *Mar. Environ. Research* 64: 492-503.

Del Pilar Ruso, Y., J. A. De la Ossa Carretero, F. Giménez Casalduero, J. L. Sánchez Lizaso. 2008. Effects of a brine discharge over soft bottom *Polychaeta* assemblage. *Environmental Pollution* 156: 240-250.

Einav, R., K. Harussi, and D. Perry. 2002. The footprint of the desalination processes on the environment. *Desalination* 152: 141-154.

Höpner, T. 1999. A procedure for environmental impact assessments (EIA) for seawater desalination plants. *Desalination* 124: 1-12.

Höpner, T., and J. Windelberg. 1996. Elements of environmental impact studies on coastal desalination plants. *Desalination* 108: 11-18.

Iso, S., S. Suizu, and A. Maejima. 1994. The lethal effect of hypertonic solutions and avoidance of marine organisms in relation to discharged brine from a desalination plant. *Desalination* 97: 389-399.

Lattemann, S., and T. Höpner. 2008. Environmental impact and impact assessment of seawater desalination. *Desalination* 220: 1-15.

Mayo, R. 2009. The current status of desalination systems in San Juan County, Washington and issues impacting their use. Unpublished report to the San Juan County Water Resources Committee.

Pérez Talavera, J. L., and J. J. Quesada Ruiz. 2001. Identification of the mixing processes and in brine discharges carried out in Barranco del Torro Beach, south of Gran Canaria (Canary Islands). *Desalination* 139: 277-286.

Raventos, N., E. Macpherson, and A. García-Rubiés. 2006. Effect of brine discharge from a desalination plant on macrobenthic communities in the NW Mediterranean. *Mar. Environ. Research* 62: 1-14.

Strathmann, R.R., 2009. Avoiding or Minimizing Potential Impacts of RO Desalination in San Juan County. An appendix to Mayo, 2009 (unpublished).

Tularum, G. A., and M. Ilahee. 2007. Environmental concerns of desalinating seawater using reverse osmosis. *J. Environ. Monitoring* 9:805-813.

<p><u>RO Desalination Systems:</u> Most Relevant Laws and Regulations</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems (items in bold are recommended)</p>
<p>RCW 36.70A.060, 170, and 172 (general requirements to consider the BAS, protect the functions &amp; values of Critical Areas, and give special consideration to conservation and protection of anadromous fisheries.</p> <p>WAC 365-190-130 Fish and wildlife habitat conservation areas.</p> <p>(1) "Fish and wildlife habitat conservation" means land management for maintaining populations of species in suitable habitats within their natural geographic distribution so that the habitat available is sufficient to support viable populations over the long term and isolated subpopulations are not created. This does not mean maintaining all individuals of all species at all times, but it does mean not degrading or reducing populations or habitats so that they are no longer viable over the long term. Counties and cities should engage in cooperative planning and coordination to help assure long term population viability.</p> <p>Fish and wildlife habitat conservation areas contribute to the</p>	<p><b>18.50.350 Utilities.</b></p> <p><b>A. Regulations – General.</b></p> <p>11. Applications for outfalls and underwater pipelines that transport substances harmful or potentially harmful to aquatic life or water quality shall not be approved unless the applicant has demonstrated that no significant adverse impacts will result.</p> <p><b>Desalination and reverse osmosis brine discharge is not considered to be potentially harmful to</b></p>	<p><b>1. Discharge from RO Systems.</b> The current regulations assume that compliance with State and Federal requirements will assure no negative impacts to marine habitats. There is however, concern that discharge into a basin or an area with limited mixing, particularly from a large facility, could negatively affect marine critical areas.</p>	<p><b>1. Discharge from RO Systems.</b></p> <p>Option A: Retain the existing standards.</p> <p><b>Option B: Require a detailed assessment of conditions at the proposed location and an analysis of the impacts of the project for larger facilities (those producing more than 33,000 gallons of potable water per day). Consider requiring</b></p>

<u>RO Desalination Systems:</u> Most Relevant Laws and Regulations	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems (items in bold are recommended)
<p>state's biodiversity and occur on both publicly and privately owned lands. Designating these areas is an important part of land use planning for appropriate development densities, urban growth area boundaries, open space corridors, and incentive-based land conservation and stewardship programs.</p> <p>(2) Fish and wildlife habitat conservation areas that must be considered for classification and designation include:</p> <ul style="list-style-type: none"> <li>(a) Areas where endangered, threatened, and sensitive species have a primary association;</li> <li>(b) Habitats and species of local importance, as determined locally;</li> <li>(c) Commercial and recreational shellfish areas;</li> <li>(d) Kelp and eelgrass beds; herring, smelt, and other forage fish spawning areas;</li> <li>(f) Waters of the state;</li> </ul> <p>(3) When classifying and designating these areas, counties and cities must include the best available science, as described in chapter <a href="#">365-195</a> WAC.</p> <ul style="list-style-type: none"> <li>(a) Counties and cities should consider the following: <ul style="list-style-type: none"> <li>(ii) Level of human activity in such areas including presence of roads and level of recreation type (passive or active recreation may be appropriate for certain areas and habitats);</li> <li>(iii) Protecting riparian ecosystems including salmonid habitat, which also includes marine nearshore areas;</li> <li>(iv) Evaluating land uses surrounding ponds and fish and wildlife habitat conservation areas that may negatively impact these areas, or</li> </ul> </li> </ul>	<p><b>aquatic life or water quality provided all required state and federal requirements are met.</b></p> <p><b>B. Regulations – Desalination.</b></p> <p>5. Desalination and reverse osmosis systems will not be allowed for the purposes of providing <b>the primary</b> water supply within new subdivisions and short subdivisions. Such facilities may be allowed for the purpose of supplying water for an established community water system.</p> <p>7. Desalination and reverse osmosis brine discharge <b>is not considered to be potentially harmful to aquatic life or water quality provided all required state and federal</b></p>	<p><b>2. Use of RO systems for new subdivisions and short subdivisions.</b> The current regulations allow RO systems to be used as a secondary source of water for new subdivisions and short subdivisions. There appears to be some public concern about this practice, which would potentially result in the construction of more RO systems. With appropriate standards however, it should be possible to allow these systems without negative effects on Critical Areas.</p>	<p><b>additional permit information as presented in BAS Chapter 3, Section 3.6.</b></p> <p>Option C: Same as option B plus require a detailed assessment for facilities discharging to bays with slow currents and basins.</p> <p><b>2. Use of RO systems for new subdivisions and short subdivisions.</b></p> <p>Option A: Retain the existing standards.</p> <p><b>Option B: Consider prohibiting the use of RO systems for new subdivisions and short subdivisions (but continue allowing</b></p>

<u>RO Desalination Systems:</u> Most Relevant Laws and Regulations	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems (items in bold are recommended)
<p>conversely, that may contribute positively to their function;</p> <p>(b) Counties and cities may also consider the following:</p> <p>(i) Potential for restoring lost and impaired salmonid habitat;</p> <p>(iii) Establishing or enhancing nonregulatory approaches in addition to regulatory methods to protect fish and wildlife habitat conservation areas.</p> <p>(4) Sources and methods.</p> <p>(c) Shellfish areas. All public and private tidelands or bedlands suitable for shellfish harvest shall be classified as critical areas. Counties and cities should consider both commercial and recreational shellfish areas. Counties and cities should consider the Washington state department of health classification of commercial and recreational shellfish growing areas to determine the existing condition of these areas. Further consideration should be given to the vulnerability of these areas to contamination. Shellfish protection districts established pursuant to chapter <a href="#">90.72</a> RCW shall be included in the classification of critical shellfish areas.</p> <p>(d) Kelp and eelgrass beds; herring, smelt and other forage fish spawning areas. Counties and cities must classify kelp and eelgrass beds, identified by the Washington state department of natural resources and the department of ecology. Though not an inclusive inventory, locations of kelp and eelgrass beds are compiled in the Washington coastal atlas published by the department of ecology. Herring, smelt and other forage fish spawning times and locations are outlined in WAC <a href="#">220-110-240</a> through <a href="#">220-110-271</a>.</p> <p>(f) Waters of the state.</p> <p>(i) Waters of the state are defined in RCW <a href="#">90.48.020</a> and include</p>	<p><b>requirements are met.</b></p>		<p><b>them for existing development).</b></p>

<u>RO Desalination Systems:</u> Most Relevant Laws and Regulations	Existing Local Regulations (items in <b>bold</b> are of concern)	Analysis of Existing Regulations	Options for Addressing Problems (items in bold are recommended)
<p>lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses in Washington. Stream types are classified in Title <a href="#">222 WAC</a>, the forest practices regulations. Counties and cities may use the classification system established in WAC <a href="#">222-16-030</a> to classify waters of the state. Counties and cities using the water types defined in WAC <a href="#">222-16-030</a> or <a href="#">222-16-031</a> (interim) should not rely solely on Washington state department of natural resources maps of these stream types for purposes of regulating land uses or establishing stream buffers.</p> <p>(iii) Counties and cities may consider the following factors when classifying waters of the state as fish and wildlife habitat conservation areas:</p> <p>(i) Salmonid habitat. Counties and cities should consider recommendations found in salmon recovery plans (see the governor's salmon recovery office). Counties and cities may use information prepared by the United States Department of the Interior Fish and Wildlife Service, National Marine Fisheries Service, the Washington state department of fish and wildlife, the state recreation and conservation office, and the Puget Sound partnership to designate, protect and restore salmonid habitat.</p>			

## 5. Identifying Species of Local Concern

<p><u>Identifying Species of Local Concern:</u> State Regulations Most-relevant to Marine FWHCAs</p>	<p>Existing Local Regulations (items in <b>bold</b> are of concern)</p>	<p>Analysis of Existing Regulations</p>	<p>Options for Addressing Problems</p>
<p>WAC 365-190-130</p> <p><i>Fish and wildlife habitat conservation areas contribute to the state's biodiversity and occur on both publicly and privately owned lands. Designating these areas is an important part of land use planning for appropriate development densities, urban growth area boundaries, open space corridors, and incentive-based land conservation and stewardship programs.</i></p> <p><i>(2) Fish and wildlife habitat conservation areas that must be considered for classification and designation include:</i></p> <p><i>(b) Habitats and species of local importance, as determined locally;</i></p>	<p><b>San Juan County has no designated Habitats and Species of Local Importance</b></p>	<p>As noted in the June 2009 comment letter from WDFW, consideration should be given to the designation of Species of Local Importance. This comment included not just their list of vulnerable species, but also their Candidate species. Specific to marine environments, this list included:</p> <ul style="list-style-type: none"> <li>• Black Oystercatcher</li> <li>• Great Blue Heron</li> <li>• Pigeon Guillemot</li> </ul>	<p><u>Option A:</u> Do not create a specific list identifying Habitats and Species of Local Importance. Continue to rely on State databases.</p> <p><b><u>Option B: Prepare and approve a formal listing of Habitats and Species of Local Importance.</u></b></p>

## 6. Buffer Alternatives

### 6.1 Example for a Site Specific Approach

This section describes a potential approach for determining the width of buffers to protect the ecological functions of San Juan County's marine shorelines and associated critical areas. This procedure is adapted from BAS (based primarily on the water quality work of Mayer et al 2007), with habitat and forest management parameters primarily from Kleinschmidt (1999) and Wenger et al., (1999) with minimum standards based on FEMAT curves (FEMAT 1993). Table 3 presents two sets of potential buffer widths, one based on minimal risk to Critical Area functions and one based on medium risk to those functions. If the County Council adopts regulations incorporating this potential site specific buffer approach, they will choose the desired level of risk and only those values will apply.

The following are definitions of terms used in this procedure:

<b>Definitions of terms as used in this buffer determination procedure</b>	
Development Area	The area that will be directly altered as a result of the proposed new development or activity. This includes the Cleared Area and the Impervious Area.
Development Parcel	The tax parcel or parcels in which the Development Area is located.
Cleared Area	Part of a Development Area in which a vegetation layer (tree, shrub, understory, or ground cover) is removed, at least temporarily, by humans. All or part of this area may also be Impervious Area.
Drainageway	A line showing the predicted path of storm runoff as it travels downhill, as shown in the 2010 County Drainageways map, or as determined in the field. In cases of conflict, conditions in the field take precedence.
Stream	A line on the San Juan County Stream Map or as determined in the field. Streams and stream types on San Juan, Lopez and Orcas Islands have been field-verified by the Wild Fish Conservancy.
Downslope Stream	A Stream or Stream segment located at the same or lower elevation as the Development Area, whether located on the Development Parcel(s) or not.

<b>Definitions of terms as used in this buffer determination procedure</b>	
Impervious Area	Grass lawn (grasses mowed at least monthly during summer) and areas that are naturally or artificially devoid of live vegetation, e.g., pavement, buildings, bark, bedrock visible at surface, bare soil, roads with dirt or gravel surface. Sod roofs and permeable pavement are excluded from this definition.
Invasive	Any plant listed as a noxious weed (any Class) in the most recent version of the San Juan County Noxious Weed List.
Non-invasive	Any plant not listed as a noxious weed (any Class) in the most recent version of the San Juan County Noxious Weed List.
Shrub	A woody plant of less than 20 ft height.
Herbaceous Plant	A non-woody vascular plant of any height.
Contributing Area	All lands at the same or higher elevation as the wetland and whose topography suggests they may contribute surface or ground water to the wetland during very wet periods.

### **Proposed Steps to Determine Marine Shoreline Buffer Width**

**Step 1.** The County will use Table 1 and information provided by the landowner, to make an initial determination of the **Development Intensity** rating (HIGH, MEDIUM, LOW) of the proposed development.

**Step 2.** Determine if there are or may be wetlands within the following distances from the development area, and if necessary determine the extent of required buffers:

<b>Land Use Intensity</b>	<b>Minimal Risk Option</b>	<b>Medium Risk Option</b>
High	450 feet	300 feet
Medium	300 feet	225 feet
Low	100 feet	80 feet

**Step 3.** Determine if there is a perennial stream within the following distances from the development area, and if necessary determine the extent of required buffers:

<b>Land Use Intensity</b>	<b>Minimal Risk Option</b>	<b>Medium Risk Option</b>
High	350 feet	225 feet
Medium	200 feet	1505 feet
Low	100 feet	80 feet

**Step 4.** Determine if there are or may be an intermittent stream within the following distances from the development area, and if necessary determine the extent of required buffers:

Land Use Intensity	Minimal Risk Option	Medium Risk Option
High	200 feet	150 feet
Medium	150 feet	125 feet
Low	80 feet	75 feet

**Step 5.** Review the County’s map of geologically hazardous areas, the section of County code describing geologically hazardous areas, and determine if the site is susceptible to wind and wave erosion. For these situations a licensed professional must determine erosion causes and rates, appropriate vegetation protection and runoff management measures, and appropriate buffers that will allow for natural erosive processes for the life of the structure (e.g. 75 years) and not require shoreline stabilization during this timeframe. If collection and direct discharge of stormwater is recommended, the stormwater, including runoff from the roof, must first be treated to remove contaminants. These mitigation measures and buffers are in addition to normal marine buffers which are necessary to protect ecological functions.

**Step 6.** Using available maps, the County will identify specific marine and upland Fish and Wildlife Habitat Conservation Areas (FWHCAs) (e.g. habitat for endangered, threatened or sensitive species; designated habitats of local importance; particular types of marine habitat defined as Critical Areas, specifically Critical Salt Water Habitat) that are on or in the vicinity of the site and may be affected by the proposed development.

**Step 7.** If upland FWHCAs are identified in the above review, determine required protection measures.

**Step 8.** Using Table 2, the landowner will determine the **Pollutant Transport** rating associated with the proposed development.

**Step 9:** Based on the above information provided by the landowner and/or its own determinations, the County will use Table 3 to make an initial estimate of the **required buffer width**. The specified buffer width shall be measured from the Ordinary High Water Mark (OHWM) or the edge of the area of special flood hazard as shown on the most recent FEMA maps and shall include all lands adjacent to the marine shoreline. Activities that should be allowed and prohibited in marine buffers are shown in Table 4.

**Step 10.** For shorelines in areas with currents and good mixing, the buffer widths shown in Table 3 may be **reduced** to 75% of the otherwise required width if one or more of the measures described below are undertaken and are maintained in a fully functioning condition in perpetuity:

- (a) Implementation of all or most applicable Low Impact Development (LID) measures described in the *Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Action Team/Washington State University, 2005), provided they are geotechnically and ecologically feasible and appropriate for the particular Development Parcel. These could include, for example, sod roofs, installation of rain gardens or planter boxes designed to slow, treat and infiltrate runoff, or use permeable, non-erodible surfacing on driveways and parking areas. Credit may be given for use of LID in the new development or for retrofitting of existing development located upslope or adjacent to the marine shoreline; or
- (b) Reduction in the extent of existing buildings, impervious areas, or developed areas located in more than 10% of a buffer area; or
- (c) A continuous row of native shrubs or trees is planted and maintained along at least 75% of the parcel's shoreline length where vegetation was previously legally removed; or
- (d) At least 75% tree canopy coverage is maintained on the development parcel; or
- (e) The property owner signs a recorded organic land management agreement with the County, stipulating that no chemical herbicides, insecticides, rodenticides, or fertilizers will be used on site, that roofing materials will be of a type that is not susceptible to growth of moss and will not contain zinc or copper, and that building construction materials will be of a type that is not susceptible to termites.

**Step 11.** Following completion of construction a final inspection is required to verify compliance with the approved plan and these requirements. If not completed at the time of final approval and/or issuance of a final certificate of occupancy, a financial guarantee and completion agreement may be required. If the approved plan includes ongoing action (e.g. restricted use of pesticides, maintenance of stormwater management systems) a recorded agreement between the property owner and County may be required.

**Table 1. Criteria for rating Development Intensity**

**Assign a rating of HIGH:**

If implementation of the proposed development involves any of the following:

(a) removal or alteration of vegetation such that total Developed Area (new and existing) comprises greater than the following percentages:

Development Parcel Size	0-3 acres	3-5 acres	5-10 acres	10-20 acres	>20 acres
Developed Area:	<b>50%</b>	<b>45%</b>	<b>40%</b>	<b>35%</b>	<b>30%</b>

(b) the site has less than 30 percent vegetation cover (excluding lawns and landscaped vegetation);

(c) the parcel will have more than 20% impervious area (including roads and areas which are denuded and compacted).

(d) the development area is located within or immediately adjacent to Critical Salt Water Habitat, or areas with species listed as endangered, threatened or sensitive

**Assign a rating of MEDIUM:** If neither HIGH nor LOW.

**Assign a rating of LOW:**

If implementation of the proposed development meets all of the following:

(a) the development area is not located in or immediately adjacent to Critical Salt Water Habitat, or areas with species listed as endangered, threatened or sensitive; and

(b) lighting complies with standards described in San Juan County Code Section 18.60.170 (Lighting); and

(c) the parcel will have less than 5 % impervious area (including roads and areas which are denuded and compacted); and

(d) if the parcel is wooded, the remaining trees provide at least 75% canopy coverage and corresponding understory vegetation remains unaltered; and

(e) the Developed Area (new and existing) comprises less than the following percentages:

Development Parcel Size:	0-3 acres	3-5 acres	5-10 acres	10-20 acres	>20 ac
New Developed Area:	<b>35%</b>	<b>30%</b>	<b>25%</b>	<b>20%</b>	<b>15%</b>

**Table 2. Criteria for rating Pollutant Transport**

**Assign a rating of HIGH:**

If any of the following are true:

(a) the same mapped Drainageway intersects both the Development Area and the marine shoreline, even if the marine shoreline is off-site, and no more than 400 horizontal feet separate the two, or

(b) the percent slope of land, measured between the Development Area and the marine shoreline, is greater than 30%, or

(c) more than 10% of the land between the landward edge of the Development Area and the marine shoreline is Impervious Area or will become so as part of the proposed development, or

(d) there is a spring or seep located within 400 feet of the marine shoreline.

**Assign a rating of LOW:**

If both of the following are true:

(a) no Drainageway intersects both the Development Area and the marine shoreline that is located within 400 horizontal feet, and

(b) The average percent slope of land, measured between the proposed development and the marine shoreline is <10%.

**Assign a rating of MEDIUM:** If neither HIGH nor LOW above.

**Table 3 Proposed option for buffer width specifications for SJC marine Critical Areas and areas influencing them (e.g. feeder bluffs)**

Intensity of Proposed Development	Transport Factors	Buffer Width (ft) Necessary for <b>Minimal</b> Risk to Functions Measured from Ordinary High Water Mark@		Buffer Width (ft) Necessary for <b>Medium</b> Risk to Functions Measured from Ordinary High Water Mark@	
		Bays, Estuaries and Areas with Limited Mixing	Areas with Currents and Good Mixing	Bays, Estuaries and Areas with Limited Mixing	Areas with Currents and Good Mixing
HIGH	High	350	200	225	150
	Medium	300	150	175	125
	Low	250	125	125	100
MEDIUM	High	200	150	150	125
	Medium	150	125	125	80*
	Low	125	100	80*	80*
LOW	High	125	80*	80*	65*
	Medium	100	80*	80*	65*
	Low	80*	80*	65*	65*

\*Additional setbacks and vegetative screening standards for aesthetic purposes are also found in the County Shoreline Master Program and may exceed these amounts (they generally require a 50 foot setback from the top of the bank where there is screening vegetation, and 100 feet where there is no vegetation).

The example buffer scenarios shown do not include setbacks and vegetation management measures that may be necessary to maintain bank stability. These are determined by a licensed geologist or engineer. Buffers are intended to provide for habitat functions associated with trees and vegetation, with the first 35 feet of the buffer providing the majority of the organic inputs and temperature regulation functions, and the remainder of the buffer intended to provide for water quality functions and to protect the trees immediately adjacent to the shoreline from accelerated rates of windthrow and blow down. Roads and driveways do not count toward buffer requirements (e.g. if there is a 15 foot road in a buffer, the exterior edge of the buffer is extended by 15 feet).

<b>Table 4. New activities allowed (Y) and prohibited (N) in marine riparian buffers</b>	<b>Zone 1 (first 35 ft.)</b>	<b>Zone 2 (remainder of buffer)</b>
1. Removal of trees that are a hazard to occupied structures, and limited tree removal and trimming of limbs and vegetation to allow for a filtered view from the primary structure is allowed in both zones providing a) disturbance of the soil and duff layer is kept to a minimum, b) the infiltration capacity of the soil is retained, c) there is little or no soil erosion, d) all trees over 12 inches diameter at breast height (dbh) as measured 4.5 feet above the ground on the up hill side of the tree are retained, e) all trees immediately adjacent to the water (e.g. within 15 feet) are retained, f) the remaining forest consists of trees that are multi-aged and well distributed across the buffer, g) and the canopy closure for the remaining forest is at least 75 % except directly in front of the primary structure, where the canopy closure may be reduced to not less than 50%. Trees may not be topped, and h) all vegetation overhanging forage fish spawning beaches is retained.	Y	Y
2. Limited logging may occur in zone 2 provided soils and the duff layer are relatively undisturbed, infiltration capacity of the soil is retained, there is little or no soil erosion, wind firm conditions are maintained, the remaining forest is multi-aged and well distributed, and all trees over 12 inches dbh are retained. Stocking levels for trees $\geq$ six inches should be at least 80 square feet per acre for primarily softwood stands, 70 square feet per acre for mixed wood stands, and 50 square feet per acre for primarily hardwood stands, and no more than 40% of the volume over 6" DBH should be removed in any 10 year period.		Y
3. Excavation, grading, creation of lawns and impervious surfaces including roads and driveways, construction of structures, removal or compaction of the organic soil horizon or ground cover, filling, discharging, dumping or storage of equipment or material, and use of chemical fertilizers and pesticides.	N	N
4. Residential scale septic system drain fields and stormwater infiltration facilities, provided they are installed without removing trees and otherwise meet State and local standards.	N	Y <sup>1</sup>
5. Trails, stairs or raised walkways for pedestrian use, not exceeding five feet in width, provided they are constructed of non-toxic materials, are designed to sheet flow runoff into adjacent vegetation, and are otherwise designed to prevent soil erosion and impacts to water quality.	Y	Y
6. Replacement of non-native vegetation with native vegetation, and restoration or enhancement meeting local, State and Federal requirements.	Y	Y
7. Fences.	N	Y
8. Critical Area exceptions and exemptions allowed by County Code.	Y	Y
9. Shoreline structures, such as boat ramps and stabilization structures in conformance with County Code.	Y	
10. Existing, legal structures and uses may continue, and if destroyed by fire or other act of God, may be rebuilt in conformance with SJCC 18.40.310.	Y	Y

<sup>1</sup> Residential scale septic system drain fields should be located no closer than 100 feet from the marine shoreline

<b>Table 4. New activities allowed (Y) and prohibited (N) in marine riparian buffers</b>	<b>Zone 1 (first 35 ft.)</b>	<b>Zone 2 (remainder of buffer)</b>
11. Placement or expansion of ditches, dams, or runoff diversions.	N	N
12. Creation or expansion of gardens or orchards, or landscaping with plant species not native to SJC, not to exceed 10% of the buffer, or more than 1000 square feet (whichever is larger).	Y	Y
13. Addition of prolonged (> 2 months/year) use by domestic, non-agricultural animals (e.g. horses), or addition of short-term use by a high density (>1/acre) of domestic animals.	N	N
14. Buffer averaging in accordance with adopted procedures.	N	Y

### Rationale for the Example Buffer Width Procedure

1. For habitat functions (temperature control, inputs of wood, leaves, insects and organic debris) a two-zone buffer is established, with zone one (closest to the water) consisting of 35 feet in accordance with the procedure established by Kleinschmidt (1999). For the minimal risk option and the lower end of the table, an additional 45 feet is retained in zone 2, for a total of 80 feet, which is the smallest buffer recommended by Kleinschmidt (1999) for a buffer with 75% canopy closure (which would allow for some tree removal to allow for a view and protect structures). For the medium risk option at the lower end of the table, a lower buffer is proposed of 65 feet which accounts for the minimum buffer based on the areas site potential tree height (approximately 85 feet). A value of 75% of the site potential tree height (approximately 65 feet for San Juan County shorelines) is believed to be a reasonable minimum width based on the Murphy (1995) curves method. This value is less than that recommended by Kleinschmidt for optimal buffers, but still protects some additional trees to help maintain wind firm conditions (one of the objectives of the zone 2 portion of the buffer). A 65-foot minimum buffer (plus 2 ft. for each 1% slope) is also consistent with the lower end of the buffer recommendations by Wenger (1999) for good protection of functions under most circumstances, provided there is effective management of contaminant sources. For water quality purposes, the proposed approach requires additional buffer in some circumstances.
2. In accordance with the Kleinschmidt approach, some logging is permitted in zone 2. This proposal does allow limited tree removal, limbing and trimming of vegetation to protect occupied structures and to allow for a filtered view.
3. Use of this range of widths for specifying buffers in San Juan County was influenced significantly but not exclusively by the statistical analysis of nitrate transport and assimilation published by Mayer et al. (2007). As a whole, newer studies have not refuted conclusions from that analysis. That analysis and many others were not used by FEMAT (1993), Knutson & Naef (1997), or the WDOE (Granger et al. 2005) in arriving at their buffer specifications because Mayer et al. published their analysis after those authors had published theirs. The other reviews did not use the rigorous,

statistical analysis (meta-analysis) of the literature that Mayer et al. used. The newer analysis focused on just one soluble substance (nitrate). BAS is insufficient to determine if buffers needed to adequately remove or retain some of the other potentially harmful substances and human pathogens, in the concentrations they do or could occur in SJC, should be narrower or wider.

4. The “Minimal Risk” shown in Table 3 assumes (a) most of the loads of soluble pollutants will travel below ground though some runoff may surface during prolonged or intense wet periods; (b) approximately 80 - 85 % of the pollutant load will be processed in a marine shoreline buffer of the specified width before it reaches marine waters; (c) the proposed marine buffers, in combination with existing protected natural lands, will be sufficient for maintaining *all* aquatic life within the natural range of variation expected for SJC shorelines; and (d) there is very low (“beyond a reasonable doubt”) probability that adverse impacts to marine functions will be worse than described in this report.
5. The “Medium Risk” shown in Table 3 assumes (a) *all* loads of nearly all soluble pollutants will travel entirely belowground during prolonged or intense wet periods; (b) approximately 75 – 80 % of the pollutant load is processed in a marine buffer of the specified width before it reaches marine waters, (c) the proposed marine buffers, in combination with existing protected natural lands, will be sufficient for maintaining *most* aquatic life within the natural range of variation expected for SJC shorelines, and (d) there is a moderate possibility that impacts to marine functions will be worse than described in this report.
6. For water quality purposes, it was felt that the Adamus tables developed for perennial streams were most appropriate for marine waters, where there is circulation and an opportunity for contaminants to be dispersed. Areas with limited mixing, where contaminants may become concentrated and organisms may experience long term exposure, have greater buffer requirements than areas with good mixing where contaminants would be diluted.

## 6.2 Additional Options to Consider

Excerpted from Chapter 3 BAS report:

Regardless of which approach or combination of approaches is adopted, to increase the effectiveness of the buffer, additional considerations should be applied. These include:

- Allowing driftwood accrual on beaches, and protecting, restoring and enhancing marine riparian forests for long-term future wood recruitment. These measures will help to prevent or slow shoreline retreat, and reduce landslide potential.

- Using natural stabilization designs to protect shores (if shoreline protection is needed) will further help to protect nearshore ecosystem processes. A need for shoreline protection may become more frequent with increased wave energy (predicted for some portions of the County), and sea level rise that are anticipated as a result of global climate change.

Activities that pose a higher risk of adverse effects on marine HCAs may require additional “setbacks” with limitations on uses. Other measures may allow for reduced buffers, such as effective on-site pollution control measures, low impervious surface, and minimizing breaks (or gaps) in buffers (Wenger 1999). Similarly, encouraging preservation and restoration of native vegetation may contribute to increased habitat complexity and improved functional benefits compared to non-native landscapes, which typically result in a homogenous habitat structure. This could lead to allowing a narrower buffer in such circumstances. As mentioned previously, shoreline stability and/or the presence of a feeder bluff may dictate a larger buffer or additional setback, based on the observed and anticipated erosion rates (determined by a qualified professional).

Finally, although minimally discussed in this report, the County may wish to consider measures to protect rocky intertidal communities from degradation due to human trampling. An example would be to adapt Oregon’s territorial sea management plan (OCMP 2010) to local circumstances (Irvine 2005). Irvine (2005) recommends the plan because it includes realistic considerations for several of the main issues related to human use of the shoreline. More specifically, the evaluation of human use and disturbance trends in order to minimize impacts from human trampling may provide long-term benefits for the conservation of important habitats

## **7. Shoreline Stabilization Alternatives**

The following example is excerpted from the June 15, 2009 draft CAO recommendations. These proposed regulations were prepared by the former CAO Citizen Review Committee and County staff, and the example is provided to give context to Council.

### *Bulkheads and Other Shoreline Structures.*

#### *A. Regulations.*

1. *These requirements apply within and waterward of the buffers required by this chapter:*
  - a. *After the effective date of this ordinance (\_\_\_\_\_) property owners shall be responsible for locating upland structures far enough from the shoreline to allow for natural erosive processes over the life structure which is considered to be 75 years.*
  - b. *With the exception of stabilization structures, other shoreline structures are*

*prohibited if they are likely to interfere with ecosystem functions and processes, or to harm wetlands, streams or fish and wildlife habitat conservation areas.*

- c. Maintenance and repair of shoreline structures shall not result in additional loss of ecosystem function and shall not encroach waterward of existing structures. To the extent possible repairs shall be designed to reduce impacts to the nearshore ecosystem.*
- d. New and enlarged boat ramps and rails are not allowed on forage fish spawning beaches.*
- e. The following apply to all new, expanded or replacement shoreline stabilization structures allowed under this section:*
  - i. Shoreline stabilization structures are only allowed when necessary to protect the following kinds of development existing on \_\_\_\_\_ (the effective date of this section):*
    - (A) a primary upland structure;*
    - (B) a septic system where there is no other reasonable means of replacement;*
    - (C) a road or driveway where there is no other reasonable means of access.*
  - ii. A shoreline stabilization structure may only be approved when there is conclusive evidence, documented by a geotechnical analysis prepared by a qualified professional, that:*
    - (A) The structure, septic system or road/ driveway is imminently threatened by shoreline erosion caused by tidal action, currents or waves. Normal sloughing, erosion of steep bluffs, or shoreline erosion itself is not an adequate demonstration of a need for a stabilization structure;*
    - (B) Surface or subsurface drainage is not causing or contributing to instability of the bank;*
    - (C) The removal of upland vegetation is not causing or contributing to instability of the bank;*
    - (D) Non-structural measures such as planting vegetation or improving drainage are not feasible or are not sufficient;*
    - (E) Bioengineering or soft armoring alternatives are used unless a qualified professional demonstrates they will not be adequate;*
    - (F) If hard armoring is proposed, the erosion rates are such that there is a significant possibility that the structure, septic system or road will be damaged within three years;*
    - (G) The size of the stabilization structure shall be limited to the minimum necessary and shall be located as far inland as possible.*
    - (H) Natural shoreline processes and functions are maintained to the greatest extent feasible.*



## **8. Example Amendments for Reverse Osmosis Desalination Systems**

(adapted from SMP recommendations from the SJ County Marine Resource and Water Resource Committees)

### **Marine Critical Area Regulations – Reverse Osmosis (RO) Desalination Systems.**

In addition to the requirements of SJCC 18.50.350 (Shoreline - Utilities) in areas where RO desalination systems will discharge to a Critical Area, including kelp and eelgrass beds, areas with shellfish, and habitat for salmon and forage fish, RO systems shall comply with the following:

1. A detailed assessment of conditions at the proposed location and an analysis of the impact of the project, are required for desalinization facilities producing more than 33,000 gallons of potable water per day. Projects that cannot mitigate their impacts, and that will negatively affect marine habitats and species, shall be denied. The applicant is responsible for all County costs incurred in the processing of these applications, including the cost associated with third party review of plans by a qualified professional. When third party review is necessary, the County may require pre-payment of estimated review fees.
2. Intake assemblies for desalinization facilities shall be designed using best available technology to avoid the impingement and entrainment of marine animals. Discharge lines shall be designed to facilitate rapid dispersion.
3. The use of shallow beach wells or infiltration galleries for intake filtration is allowed provided all state and federal requirements are met and the facility is installed landward of the line of mean lower low water.
4. For desalinization facilities constructed after \_\_\_\_\_(the effective date of these regulations), cleaning of membranes on-site is prohibited. For existing facilities, cleaning on-site is allowed, provided that cleaning chemicals can be disposed of at an approved waste disposal facility. Other maintenance, such as flushing and “pickling” with sodium metabisulfate is allowed.
5. As a condition of approval, new desalinization facilities shall sample salinity at the discharge site when the plant is put into operation using sampling protocols approved by the Department.
6. Land disposal of discharge from desalination or reverse-osmosis systems is prohibited.
7. Desalination and reverse osmosis systems will not be allowed as a source of water for new subdivisions and short subdivisions. Such facilities may be allowed for established community water systems and individual systems for existing lots.

## 9. General Recommendations

1. SJCC 18.30.110.B – Applicability
  - i. Consider increasing range of overlay district to account for all critical area buffers. This may include increases beyond 300 feet based on potential wetland buffers.
2. SJCC 18.30.110.D – General Exemptions
  - i. (4) Establishment of new lawns, landscaping, gardens, orchards, and fences should not be considered as an outright exemption from the application of critical area regulations as these areas may conflict with applicable buffers. Repair and maintenance could be considered as a general exemption.
  - ii. (5) Removal of dead trees and vegetation should not be considered exempt if they are not either a hazard or disease risk. Dead trees and other vegetation may provide valuable wildlife habitat.
  - iii. (6) Land divisions which in turn would result in one or more lots requiring implementation of a reasonable use exception should not be allowed.
3. SJCC 18.30.110.E – Reasonable Use Exception
  - i. Consider adjustment of this exception from the current 21,780 square feet or 80% of the parcel (whichever is less) to a threshold in-line with more typical standards. Consider values more in-line with 2009 proposal.