



## San Juan Initiative

### Policy Group Recommendations from July 24<sup>th</sup> Meeting

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US Fish and Wildlife

US Army Corps of Engineers

#### Marine Buffers, Vegetation Management and Protection of Threatened Structures

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#### Introduction

This paper provides background and a summary of San Juan Initiative Policy Group recommendations on three issues: marine buffer widths, vegetation management in buffers, and protection of threatened structures along the marine shoreline. All but one member of the Policy Group endorsed the following recommendations at the July 24, 2009 meeting in Friday Harbor. The recommendations include an approach for buffers along marine shorelines, limitations on shoreline armoring and a list of issues to be addressed through the County's deliberations and final decisions on the Critical Areas Ordinance (CAO) and Shoreline Master Program (SMP) updates. Additional information is available at [www.sanjuaninitiative.org](http://www.sanjuaninitiative.org). The federal and state agency partners abstained from taking a position on the Policy Group recommendations.

The San Juan Initiative is a public and private effort to assess the effectiveness of public and private efforts to protect the ecosystem of the San Juans with a particular focus on the marine shoreline. The Initiative has hosted 25 public workshops over the last three years to gather community input into what is working and what is not with current protection programs and to develop solutions. We have also conducted a shoreline characterization documenting presence of shoreline impacts and habitats. In addition to working with the public and a science team, we have also conducted a policy analysis and a review of permits to

determine the effectiveness of our current regulatory programs. From this research, we have developed the following recommendations that we believe balance the needs of managers, property owners and the ecosystem.

Policy Group members hope these recommendations are helpful in framing the community dialogue in the CAO and SMP update process. After several years of working with scientists, state agency staff, and the community, the Policy Group understands the complexity of these issues and the need to achieve ecological protection in a manner that respects and supports private property owners in the stewardship and enjoyment of their land. The Policy Group acknowledges that there is a lack of clear direction from science with regard to precise buffer and setback widths. In the face of this uncertainty, the Policy Group has attempted to find a middle ground, using current science, community concerns, and their own judgment in putting forward these recommendations. This paper contains a summary of the Policy Group consensus, concerns and detailed recommendations for buffer widths, vegetation management and the process and definition of threatened structures.

**Summary of San Juan Initiative Consensus, Provided that the Issues Listed Are Addressed:**

1. Endorsement of a tailored approach for setbacks based on the shoreline type, presence of vegetation and slope, provided the following issues are addressed:
  - a. The National Oceanographic and Atmospheric Agency (NOAA) has issued an opinion under their authority in the Endangered Species Act that 200 foot buffers are necessary to protect Chinook salmon. NOAA has provided unofficial comments that they would consider alternative approaches like the one recommended by the Policy Group if it achieves the same level of ecological protection. Additional work is needed with NOAA to confirm their support for alternative approaches.
  - b. Continued work with County staff is required to ensure the Policy Group recommendations will meet the state requirements for CAO and SMP, and that the recommendations are consistent with other parts of the proposed regulations.
  - c. The Policy Group is concerned that there is little public support for the recommended buffer widths. They believe a robust public process is necessary to ensure the community is effectively and respectfully engaged in the issues.
  - d. There should be additional research and analysis on how different slopes and soils affect shoreline water quality. Also analysis is needed to know if the stormwater model used here applies to the Pacific Northwest and San Juan County.
  - e. Buffer widths are measured from the “top of bank” which needs to be clearly defined so that arbitrary interpretations are avoided.
  - f. It should be clear how many properties will be affected by the recommendations, and the number of properties which may not conform to the new regulations. For properties that may become non-conforming with the new regulations, there must be clear rules for how property owners can maintain or expand their use without undue burdens.
2. Vegetation within the buffer area should be managed through a point system that provides property owners with views and access to the shoreline while maintaining

natural vegetation.

- a. The recommendation on maintaining vegetation recommends “Limited pruning” this term must be defined. And, limbing along the bottom 1/3 of trees may not achieve the shading necessary on forage fish beaches.
  - b. Revegetation and removal of non native vegetation should be allowed without submitting a plan.
  - c. Allow for natural tree falls and ensure that property owners aren’t “punished” for clearings that occur naturally
  - d. It should be clear if large trees can be removed and replace it with small trees to retain points?
  - e. It should be clear when a property has to submit a vegetation management plan to the County for approval.
3. Shoreline armoring like bulkheads and rock walls should only be allowed when a dwelling structure, an accessory dwelling structure, road, driveway or septic system is threatened by erosion as determined by a technical expert and there is no other feasible alternative.
- a. The proposal suggests homes need to be threatened within three years by bank erosion or instability. This three year timeframe for threatened may be too short because the process to get a permit may take too long and threatened structures could be damaged before approval is granted.
  - b. The suggested County process for hiring a third party expert will determine if the structure is threatened. This process needs to be timely for the property owner.
  - c. Other counties maintain a list of approved experts that the property owner can hire, San Juan County should further explore the creation of a County-approved list of experts.

## **Section 1: Buffer Width, Vegetation Management**

### **Overview Buffer Width and Vegetation Management**

There are many benefits to buffers of undisturbed native vegetation along marine shorelines. They include creating shade and temperature control for spawning forage fish, hosting terrestrial insects which are a key source of food for fish, providing habitat for birds and other animals, and maintaining slope stability and good water quality. The type of functions vary depending on shore type, vegetation, habitat features and species needs. For example, trees adjacent to a forage fish spawning beach provide shading which maintains the correct temperature for fish eggs. A tree on a plunging rocky shoreline provides a different function. The size of the buffer and how vegetation is managed in this buffer work together to provide ecosystem and community benefits.

The buffer and vegetation management approach recommended by the Policy Group would alter the past objective of the County's regulations from an aesthetic goal to one that maintains shoreline ecological function. The Policy Group, in endorsing this approach, also stated the importance of maintaining the property owner's ability to create and maintain views as well as access the shoreline. The Policy Group supported the development of both a prescriptive standard and a process for reviewing unique situations where prescriptive standards are not appropriate.

The issues of buffer size and vegetation management are described separately below. A buffer is the area set aside to protect ecological function and covers the area from top of bank to the development. Top of bank was selected as a reference point because it has been used historically in San Juan County, and generally it is more protective of shoreline ecosystem than other reference options, such as Ordinary High Water (OHW). Part of the reason for a setback along a beach or bluff is to reduce the chances that the property owner will need a hard shore stabilization structure over the life of the home. Measuring from the top of bank rather than OHW will more effectively identify the place where erosion is a concern. For instance, on a feeder bluff, OHW could be at the base of a long gently sloping sandy face. Measuring from OHW would put the home much closer to the edge than if the home were setback from the top of bank. Vegetation management describes how the trees and ground cover will be protected within the buffer area. The vegetation management proposal also includes the area between top of bank down to the Ordinary High Water mark. With this proposal property owners will be able to achieve a view, have access to the shoreline, prune and limb shoreline trees and shrubs.

### **1. Buffer Width: Recommendation**

The buffer distances are measured horizontally from top of bank to the developed area. The developed area includes "any man made change" (proposed CAO language). The size of the recommended buffer is based on three factors: slope, vegetation and type of shoreline<sup>1</sup>.

On rocky shores, the buffer area's predominate purpose is to protect water quality, wildlife corridors and food provided for aquatic species. Buffer width on rocky shores is adjusted as the slope increases due to the decreased capacity of thin or absent soils and limited vegetation to adequately clean water. Along beaches and bluffs, the buffer area provides the services mentioned above as well as protecting nearshore processes, including moderation of shoreline temperatures and protection of natural sediment and available nutrients<sup>2</sup>. Buffer widths on beaches and bluffs vary based on vegetation and the presence of feeder bluffs. Slope was not considered on beaches and bluffs because, after a cursory review of shorelines, there were no instances found where a beach or bluff had greater than 10% slope landward of top of bank. The buffer option for feeder bluffs presented by staff ensures an adequate setback to allow for erosion over time.

In determining the setback on rocky shorelines, staff assumed a few characteristics about run-off and existing water quality protection measures already in place. Runoff enters the buffer as overland and sheet flow. As water flows through the buffer, the type of vegetation affects the manner in which that water is absorbed or cleaned. A model from Rutgers University was reviewed to develop buffer widths options on rocky shorelines.

After reviewing 650 different studies, Rutgers University<sup>3</sup> developed an equation that can be used to size water quality buffers for streams and drinking water supplies based on the slope and type of vegetation. In their analysis, they found that a travel time of approximately 200 seconds through vegetative filter strips is necessary to allow sediment and associated pollutants to be removed from overland flow. This model was not designed for Puget Sound marine shorelines, but does show a correlation between the ability of different vegetation types to filter water at various slopes.

Stormwater quality is also addressed through Stormwater Best Management Practices (BMP's). BMP's are currently implemented in conjunction with upland development with the aim of preventing residential and business water pollutants from entering Puget Sound and other water bodies. Proposed CAO regulations prevent the use of pesticides, fertilizers, or building materials containing zinc or copper within 200 feet of the shoreline.

One of the challenges of determining appropriate buffers for the marine shoreline is that much of the science is based on freshwater systems. There are Puget Sound marine shoreline studies that document the importance of shade for forage fish, the importance of vegetation for bank stability, and the importance of food sources dropped from shoreline vegetation for salmon and other aquatic species. Although existing science does not provide precise information on what buffer size is adequate to protect these functions, we do know that a vegetated buffer is critical to the ecological health of marine shorelines. The size of the buffer is both a science and policy question.

The Policy Group recommends allowing the width of buffers to be reduced on parcels with less than 200 feet of shoreline frontage. On these parcels, if the existing homes on adjoining waterfront lots are closer than 50 feet on each side, then a buffer width equal to the average setback would be allowed.

The table below contains the buffer widths recommended by the Policy Group for the County's consideration based on the information presented above. The buffer size varies due to the presence or absence of a "well distributed forest of trees and undisturbed soil/duff layer." This term is defined in the next section of this paper under vegetation management. This option also proposes that feeder bluff buffers be adequate to ensure that the structure is not threatened by erosion after 75 years at current erosion rates. If erosion rates are not known, 150 feet of buffer is recommended<sup>4</sup>.

**Buffer Recommendations:  
Buffer Width for Areas with Rocky Shoreforms, Non-erodible Substrate<sup>5</sup>**

<b>Average Slope Across Buffer (from top of bank)</b>	<b>Well distributed forest with trees of all age classes and undisturbed soil/duff layer</b>	<b>Non Forested</b>
0-5%	75 feet	150 feet
6-10%	110 feet	
10% or greater	150 feet	

## Buffer Width for Beach Shoreforms and Pocket Beaches: Soft, Erodeable Shores<sup>5</sup>

Shoreline Type	Well distributed forest with trees of all age classes and undisturbed soil/duff layer	Non Forested
Beach <sup>1</sup>	100 feet	150 feet
Feeder Bluff	150 feet	

### 2. Issues that need to be addressed

- a. The National Oceanographic and Atmospheric Agency (NOAA) has issued an opinion under their authority in the Endangered Species Act that 200 foot buffers are necessary to protect Chinook salmon. NOAA has provided unofficial comments that they would consider alternative approaches like the one recommended by the Policy Group if it achieves the same level of ecological protection. Additional work is needed with NOAA to confirm their support for alternative approaches.
- b. Continued work with County staff is required to ensure the Policy Group recommendations will meet the state requirements for CAO and SMP and that the recommendations are consistent with other parts of the proposed regulations.
- c. The Policy Group is concerned that there is little public support for the recommended buffer widths. They believe a robust public process is necessary to ensure the community is effectively and respectfully engaged in the issues.
- d. There should be additional research and analysis on how different slopes and soils affect shoreline water quality. Also analysis is needed to know if the Rutgers model applies to the Pacific Northwest and San Juan County.
- e. Buffer widths are measured from the “top of bank” which needs to be clearly defined so that arbitrary interpretations are avoided.
- f. It should be clear how many properties will be affected by the recommendations and the number of properties which may not conform to the new regulations. For properties that may become non-conforming with the new regulations, there must be clear rules for how property owners can maintain or expand their use without undue burdens.

In conclusion, the Policy Group supports the recommendations for buffer widths, as long as the concerns listed above are addressed through a County process. The Policy Group acknowledges the shortage of applicable science in these matters and encourages the creation of local science that tests the above approach for ecological and community results.

### 3. Vegetation Management in Marine Buffers: Recommendations

The Policy Group previously discussed a number of options to find an approach to vegetation management that would meet the goals of protecting the environment while providing property owners flexibility and County planners administrative ease. The purpose of the vegetation management recommendations are to ensure the protection of ecological function and support property owners in creating views and shoreline access.

Policy Group recommendations are based on comments from property owners at three public meetings, discussions with members of the construction trades industry, staff research and on-the-ground testing and consultation with scientists. The recommendations are based on an approach used in the State of Maine over the last 19 years to protect marine and lake shorelines. The Maine vegetation management approach was created initially to protect water quality and maintain rural aesthetic around ponds and lakes while still allowing views. After the development and application of the approach for almost ten years, the approach was then expanded to apply to shorelines in 2000. The approach in Maine is well liked by local governments because as one Maine planner said, “It provides them clarity, especially for the code officers.” The approach has never been challenged in court. The Maine approach was chosen for several reasons by staff. First, the purpose they are trying to achieve is very similar to the purpose we are trying to achieve in San Juan County. Although there are substantive differences in ecology between Maine and Washington, they both have rocky shorelines interspersed with beaches lined by a conifer forest. The approach provides certainty and flexibility and results in both a well distributed stand of trees and views for property owners. Based on interviews with Maine shoreline planners, it is implementable for local governments.

The recommendations were field tested by staff and a few Policy Group members and a local arborist on four properties: three rocky shorelines and one feeder bluff. Based on our cursory assessment, it is not an onerous process for property owners and would result in both views and maintenance of a diverse stand of vegetation.

#### **a. Vegetation Standards**

This approach is designed to maintain a well-distributed stand of native vegetation and provide guidance for how to maintain views and access while protecting ecological function. A well-distributed stand of trees ensures a diversity of species, age, and other vegetation and is defined by a “point system.” This system, which assigns values to trees down to two (2) inches in diameter, requires that a certain total value of trees be maintained in the 25-foot by 25-foot squares (625 square feet).

The tree values are based on tree diameters and are as follows:

##### Diameter of Tree at 4-1/2 feet above Ground Level (inches)

2-4 inches = 1 point

4-12 inches = 2 points

More than 12 inches = 4 points

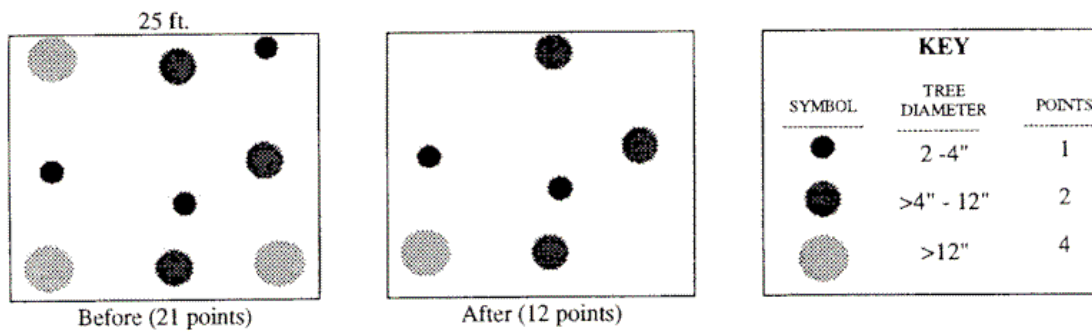
Adjacent to rocky, beach and bluff shorelines, it is recommended that a rating score of 12

or more points be maintained for each 25-foot by 25-foot square and that no cleared opening is created in the canopy greater than 250 square feet.

As an example of the above rating system, if a 25-foot by 25-foot plot adjacent to a shoreline contains three (3) trees between 2 and 4 inches in diameter, three (3) trees between 4 and 12 inches in diameter, and three (3) trees over 12 inches in diameter, the rating score is:

$$(3 \times 1) + (3 \times 2) + (3 \times 4) = 21 \text{ points}$$

Thus, the 25-foot by 25-foot plot contains trees totaling 21 points. Given that a total score of 12 must be maintained, trees totaling 9 points ( $21 - 12 = 9$ ) may be removed from the plot provided that no cleared opening is created in the canopy greater than 250 square feet. The figure below is just one example of allowable cutting under the point system.



Limited pruning of tree branches on the bottom third of the tree is permitted. Dead branches are permitted to be pruned without restriction. Understory and shrubs less than two inches in diameter may be hand pruned, shaped or thinned but shall not be removed. Shrubs may be trimmed to a height not less than five feet. Removal of trees shall be accomplished with minimal disturbance of soil, and stumps should remain in the ground. Removal of hazardous trees is allowed.

**b. Administration of the Standard:**

The Policy Group recommends that for new developments, property owners prepare a site plan with the assistance of the San Juan Islands Conservation District ( a non-regulatory agency), a private professional, or on their own. The plan would be recorded with the County and would be inspected and enforced by the County. For existing development, the Policy Group recommends that no plan is required, but that property owners are expected to meet the standards of the vegetation requirements.

**c. Standard for Access to Shoreline:**

It is important to prevent runoff from funneling directly along a pathway to the water. For this reason, a footpath, not to exceed (5) feet in width as measured

between tree trunks, is allowed provided that a cleared line of sight to the water through the buffer strip is not created. It is important that the footpath meander so that the runoff is trapped by vegetation and natural depressions within the buffer strip.

#### **d. Exception Process to Prescriptive Standard:**

Due to site conditions, the property owner may feel that an alternative solution would be more protective of native forest and undergrowth than that allowed under the prescriptive standard. In these cases, the property owner may elect to submit a Critical Area Site Plan (CASP) for approval. CASP is described in the new CAO regulations. The CASP is a site-specific process that allows greater flexibility as long as the ecological functions are achieved.

#### **4. Issues that need to be addressed**

- a. “Limited pruning” must be defined. And, limbing along the bottom 1/3 of trees may not achieve the shading necessary on forage fish beaches.
- b. Allow revegetation and removal of non native vegetation without submitting a plan.
- c. Allow for natural tree falls and ensure that property owners aren’t “punished” for clearings that occur naturally.
- d. Can you remove a large tree and replace it with small trees to retain points?
- e. The trigger for requiring a plan must be explicit and clearly written.

## **Section 2: Process and Definition of Threatened Structures**

### **Threatened Structures Background:**

The San Juan Initiative is recommending a new standard for placement of hard shore armoring along beaches and bluffs. The new standard would only allow the placement or replacement of hard shore protection if the main structure, accessory dwelling structures, roads, septic systems and driveways are shown to be threatened by erosion in a three year time frame and no other alternative to protect the structure exists. This new standard has been vetted by the public and is supported by the community. The Policy Group directed staff to provide a robust definition of “threatened” based on science and develop a process for determination that could be implemented by County staff.

The San Juan Initiative received a grant from the Puget Sound Partnership to help develop an issue paper with a technical addendum outlining the important issues to consider in defining a structure as threatened. A workshop of regional planners, engineers and policy makers was convened to inform that process. The Initiative hired Jim Johannessen of Coastal Geologic Services to develop the technical addendum. The issue paper and the technical addendum can be viewed on the Initiative website at [www.sanjuaninitiative.org](http://www.sanjuaninitiative.org).

### **1. Threatened Structures: Recommendations**

The Policy Group recommends the following approach for the County to determine if a

property is threatened.

**a. Structures to be Protected:**

“Structures considered for shoreline protection include: primary parcel structure (includes commercial, industrial or residential), accessory dwelling units, septic system, public road, public infrastructure like pipes or utilities, and private driveways/roads where relocation is not feasible. Structures not protected are: stairs, tram, trail to the beach, bathhouse, detached deck/patio, fence, sheds, trees, and landscaping.”

**b. Determination of “Threatened”**

The Policy Group accepts the recommendation of Coastal Geological Services that the most appropriate technical approach is to use “documented erosion rates over a long enough timeframe to dampen the effect of short-term changes.” The recommended time frame is 30--40 years. Coastal Geologic Services also recommends using an additional hazard assessment process to ensure that the structure is not exposed to landslide hazards potentially not captured in the erosion rate methodology. If the erosion rate and additional hazard assessment suggest that harm will likely occur to the structure within a three-year timeframe then the property is deemed “threatened”.

**c. Process for Conducting Report**

Specific and rigorous reporting standards are needed to guide the quality and consistency of site evaluations for determining erosion rates and threats to structures. The type and level of expertise is also critical. As noted in the technical addendum, “A geology or geotechnical study for a coastal property needs to account for a variety of factors that affect coastal erosion and slope stability. The study/report should include:

- Quantification of causes of erosion
- Past erosion rates over a minimum of 30 years
- Projection of future rates over the next several decades
- Detailed topography from the structure to the lower beach
- Analysis of slope stability and mechanism for slope failure in the vicinity
- Estimate of when the structure would be undermined (including an allowance for bank recession equal to the largest documented landslide in the vicinity)
- Summary of exact factors causing threat to structure.
- Detailed analysis of relocating the structure and soft shore protection alternatives if property is found to be threatened within the three-year timeframe.

**d. Process Once a Property is Determined to be Threatened**

Alternatives to protect the threatened structure should be evaluated by a technical expert to determine which option is least invasive to the function of the near--shore

environment while still preventing damage or loss of property. The alternatives should include:

1. Structure relocation should be considered a viable option, especially as rising sea levels and on-going maintenance and repair are issues.
2. All anthropogenic factors should be addressed, such as drainage, landscaping, and so forth.
3. Soft solutions that could reduce risk, such as dewatering, re-vegetating the slope, and placement of beach nourishment and/or large woody debris, should be evaluated and integrated into a solution.
4. If the above solutions are not adequate or feasible, then the minimal bulkheading could be considered to protect only the threatened structure, not the entire property.
5. Mitigate impacts from alterations to functions and processes as they relate to the site and to the landscape (drift cell).

#### **e. Administration of the approach**

To reduce the problem of “dueling experts,” it is recommended that the County amend the Critical Areas Ordinance/Shoreline Master Program to provide two options for property owners in the review process:

1. Allow shoreline property owners to pay the County to hire a third party expert to determine if a structure is threatened. The report work would be conducted in a manner removed from both the County and the applicant. The qualifications of the pool of consultants would be transparent and consistent.
2. Shoreline property owners are assessed an additional review fee when submitting their site report to the County. This fee is then used to pay for an outside expert to review the report for the County.

## **2. Issues that need to be addressed**

1. The three year timeframe for threatened may be too short because the process to get a permit may take too long and threatened structures could be damaged before approval is granted.
2. The process for hiring a third party expert needs to be timely.
3. Further explore the creation of a County-approved list of experts.

### **References:**

<sup>1</sup> Haberstock, A.E., Nichols, H.G., DesMeules, M.P., Wright, J., Christensen, J.M., Hudnut, D.H. 2000. Method to Identify Effective Riparian Buffer Widths for Atlantic Salmon Habitat Protection. *Journal of the American Water Resources Association*. 36( 6) 1271-1286.

<sup>2</sup> Protecting Nearshore Habitat and Functions in Puget Sound, An Interim Guide, Oct. 2007. Envirovision, Herrera and AHG.

<sup>3</sup> Nieswand, G.H., Hordon, R.M., Shelton, T. B., Chavooshian, B.B., Blarr, S. 1990. Buffer Strips to Protect Water Supply Reservoirs and Surface Water Intakes: A Model and Recommendations. *Water Resources Bulletin* 26 (6) 959-965

<sup>4</sup> 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.

<sup>5</sup> Shipman, H. 2008 A Geomorphic Classification of Puget Sound Nearshore Landforms. Puget Sound Nearshore Partnership Report NO 2008-01. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, WA.