San Juan County Marine Stewardship Area Plan

Prepared by the San Juan County Marine Resources Committee

Kirsten Evans & Jody Kennedy

July 2, 2007

This plan was funded in part through a cooperative agreement with the National Oceanic and Atmospheric Administration with grant no.G0600034. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its sub-agencies.

(This Page Intentionally Left Blank)

TABLE OF CONTENTS

THANK YOU

The San Juan County Marine Resources Committee extends enormous gratitude to the numerous individuals, agencies and organizations throughout Puget Sound who played a significant role in creating the stewardship area plan. We could not have completed this project without you.

PRIMARY PARTNERS AND FINANCIAL CONTRIBUTORS

Charlotte Martin Foundation
Friends of the San Juans
NOAA MPA Center
Northwest Straits Commission
Puget Sound Action Team
San Juan County
SeaDoc Society
Shared Strategy for Puget Sound
The Nature Conservancy
The Port of Friday Harbor
The Surfrider Foundation
The Tulalip Tribes
The University of Washington Friday Harbor Laboratories
The Whale Museum
WSU Beach Watchers

KEY CONTRIBUTORS

San Juan County Marine Resources Committee

Alan (Skeet) Lowe, commercial fisherman
Barbara Marrett, Port of Friday Harbor (from 2006)
David Loyd, Owner/operator, Waldron Freight
Howard Rosenfeld, Council Member, Town of Friday Harbor (to 2006)
Jim Slocomb, MRC Vice-Chair, GIS and information system consultant
Jonathan White, custom home builder, Trustee, San Juan Preservation Trust
Joy Sevier, San Juan Island Chamber of Commerce
Kelley Balcomb-Bartok, Council Member, Town of Friday Harbor (from 2006)
Ken Sebens, Director, UW Friday Harbor Laboratories
Kit Rawson, MRC Chair, Senior Fishery Management Biologist, Tulalip Tribes
Laura Arnold, planning consultant
Mary Masters, environmental consultant
Michael Durland, Owner/manager, Deer Harbor Boat Yard
Mike Ahrenius, Port of Friday Harbor (to 2006)
Richard Strathmann, Friday Harbor Laboratories (from 2006)
Ron Henrickson, Director, San Juan County Community Development & Planning
Terrie Klinger, UW School of Marine Affairs, Friday Harbor Laboratories (to 2006)
Tina Whitman, Science Director, Friends of the San Juans

Jody Kennedy, MRC Coordinator (to 2006)
Mary Knackstedt, MRC Coordinator (from 2006)

MSA Core Planning Team Members
Ginny Broadhurst, Interim Director, Northwest Straits Commission
Jacques White, Marine Conservation Program Manager, The Nature Conservancy
Jim Slocomb, MRC
Jody Kennedy, Washington Policy Coordinator, Surfrider Foundation
Joe Gaydos, Regional Director, Staff Scientist, SeaDoc Society
Kirsten Evans, Consultant
Kit Rawson, MRC
Mary Masters, MRC
Phil Green, Yellow Island Steward, The Nature Conservancy
Terrie Klinger, University of Washington School of Marine Affairs
Tina Whitman, MRC

Technical Advisors
Alan Chapman, Lummi Nation
Bob Pacunski, Washington Department of Fish and Wildlife
Brad Hanson, National Oceanic and Atmospheric Administration
Claudia Mills, Friday Harbor Laboratories
Dave Nysewander, Washington Department of Fish & Wildlife
Don Gunderson, University of Washington
Don Rothaus, Washington Department of Fish & Wildlife
Doug Myers, Puget Sound Action Team
Eric Beamer, Skagit River System Cooperative
Eric Eisenhardt, Washington Department of Fish & Wildlife
Grant Kirby, Northwest Indian Fisheries Commission
Greg Bargmann, Washington Department of Fish and Wildlife
Jan Newton, University of Washington
Jim West, Washington Department of Fish and Wildlife
Kevin Britton Simmons, University of Washington
Lora Leschner, Washington Department of Fish and Wildlife
Phil Bloch, Washington Department of Natural Resources
Rich Osborne, The Whale Museum
Russel Barsh, KWIAHT (Center for the Historical Ecology of the Salish Sea)
Sandy Wyllie-Echeverria, University of Washington
Steve Hinton, Skagit River System Cooperative
Steve Norton, Evergreen State College
Wayne Palsson, WA Department of Fish and Wildlife

Technical Reviewers
Art Kendall, NOAA Fisheries (retired)
Brad Hanson, NOAA Fisheries
Glenn VanBlaricom, University of Washington
Jennifer Ruesink, University of Washington
Kolleen Irvine, US Fish & Wildlife Service
Kurt Fresh, NOAA Fisheries
Megan Dethier, Friday Harbor Laboratories
Robin Baird, Cascadia Research
Si Simenstad, University of Washington
Todd Anderson, San Diego State University

Stakeholder representatives & Community Members
Anna Hall, Whale Watch Operators Association NW
Dave Caster, Washington State Parks
David Nash, Commercial fisherman
David Roberts, Washington Department of Natural Resources
Deborah Hopkins, San Juan Visitors Bureau
Jack Giard, Commercial fisherman
Karen Thompson, Puget Sound Crab Assoc.
Kevin Ryan, US Fish and Wildlife Service
Liz Illg, Nonprofits Unlimited, Visitors Bureau, SJ Chamber of Commerce
Nick Jones, Barlow Bay Fish
Polly Fischer, Puget Sound Anglers Association
Ralph Hahn, San Juan Economic Development Council
Richard Civille
Rowann Tallmon, WSU Beach Watchers
Sam Barr, Samish Nation
Sarah Jones , Barlow Bay Fish
Shane Aggergaard, Island Adventure Cruises
Stephanie Buffum Field, Friends of the San Juans

2007 Community Outreach Workshop Hosts
Joe Gaydos, Orcas Island
Karen Vedder, San Juan Island
Tina Wyllie-Echeverria, Shaw Island
Tom Cowan, Lopez Island

Other Key Contributors
Barbara Rosenkotter, San Juan Lead Entity
Hilary Culverwell, Puget Sound Action Team
Kara Shaber, The Nature Conservancy
Kari Koski, The Whale Museum/ Soundwatch Boater Education Program
Kevin Ranker, San Juan County CounciL
Lacey Halstead, The Nature Conservancy
Sarah Fischer, NOAA MPA Center
Terry Williams, Commissioner of Fisheries and Natural Resources, Tulalip Tribes
Todd Peterson, The Norton Arnold Company
Victoria Parker, Past MRC Member
Zach Ferdana, The Nature Conservancy

SUMMARY

The San Juan County local government is acting on a vision for the San Juan Islands. This vision is one of a healthy marine ecosystem with thriving populations of marine species, including salmon, seabirds, and killer whales and one with strong recreational and resource based industries, such as recreational fishing, wildlife watching and marine research. Located at the convergence of Puget Sound and Georgia Basin, the San Juan archipelago is characterized by a rich diversity of marine life that draws hundreds of thousands of visitors each year. Yet, the ecological systems that support these species and industries are threatened. Human activities resulting in habitat loss, toxins in the water and marine life, climate change, chronic small oil spills, and numerous other stresses to the marine system are becoming increasingly prevalent as the human population in Puget Sound grows and expands to rural areas. In order to achieve their vision for the San Juans and protect the archipelagos' rich marine diversity, the San Juan Board of County Commissioners designated the county a Marine Stewardship Area.

Established in January 2004, the Marine Stewardship Area set a course for the Marine Resources Committee (MRC) to identify the key action steps toward a healthier and more sustainable island marine ecosystem for the natural resources and the benefit of the people who live, work and recreate there. To accomplish this, the MRC brought in partners from the Northwest Straits Initiative, The Nature Conservancy and SeaDoc Society to develop a planning process that would identify key strategic actions incorporating scientific knowledge and human-based priorities, such as our desires to fish and to paddle.

The partnership selected a conservation action planning process developed by the Nature Conservancy; otherwise known as the "5-S Framework". It is named 5-S for the five-step process it entails. For the first step or "S" for "system", the Committee convened a panel of scientists to identify a set of stewardship "targets": species, major groupings of species, ecological communities and/or systems that, taken together collectively represent the range of marine biodiversity of the San Juan ecosystem. In the following two "S" steps (stresses and sources), MRC members met with marine managers and local stakeholders for two days to identify and rank the stresses affecting the targets and the upstream sources of those stresses in order to yield a threat assessment for the marine ecosystem. Next, the MRC developed broad action paths, named "strategies", for the 4th "S", to mitigate the threats causing harm to the system. During a key intermediate step, the MRC established measurable benchmarks, identifying what the Committee and planning partners hope to achieve with the implementation of the plan. These Benchmarks form the foundation of the final "S" step, which is "success" in achieving the desired conservation goals for the Marine Stewardship Area. Measuring success is also incorporated into the process through the identification of key indicators that will be measured over time, forming the bases of a long term monitoring plan.

As an example, through the planning process, the MRC selected seabirds as a stewardship target. One of the indicators for the health of this target is number of nesting pairs of black oystercatchers, a seabird that resides on shorelines of the San Islands year-round. Based on this indicator, the MRC developed the benchmark for maintaining stable or increasing numbers of nesting pairs of black oystercatchers based on 2006 levels. As the plan is implemented, this MRC will track numbers for this benchmark to help evaluate success. All the information collected throughout this process on the targets, the background information for assessing the viability of these targets, the threat assessment and strategy development is captured in an electronic workbook. The workbook is a spreadsheet-based decision support tool created by TNC. It will be used to incorporate new information as it becomes available and to monitor success in achieving the benchmarks.

Through the Nature Conservancy planning process and with the help of many partner organizations, stakeholders, managers, and local citizens, the MRC identified over 35 priority strategies under the Marine Stewardship Area plan. These strategies were presented to citizens throughout the county and other key stakeholder groups through a series of presentations and public meetings on all the ferry serviced islands.

MSA Strategies
November 15, 2006

Education:

- Communicate a clear, inspiring stewardship message to the public and develop a comprehensive communication strategy.
- Education & outreach on the benefits of "softshore" alternatives for shoreline armoring.
- Education & outreach on the importance of eelgrass and the benefits of best marine use/shoreline development practices.
- Promote public awareness of the status of and threats to rockfish, lingcod, and greenling so that the public is involved, understands, and takes ownership over the problem and action toward a solution.
- Promote water quality protection through best management practices to help ensure that locally-harvested marine species pose insignificant risks to human health.

Community Stewardship:

- Foster projects that engage the public (seasonal and year-round residents) in marine stewardship.
- Work with stakeholders to develop and implement a strategy for identifying and engaging key partners as active marine stewards.
- Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally).
- Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping).
- Reduce nitrogen inputs from human sources to improve water quality for eelgrass.
- Minimize new armored shoreline.
- Remove shoreline armoring where appropriate (refer to FRIENDS soft shore blueprint).
- Increase prey base in order to restore herring spawning to all historic areas.
- Protect and restore herring spawning habitat.
- Reduce bycatch of depleted species of bottomfish.
- Reduce disturbance of seabirds.
- Support efforts to reduce risk and improve response to oil spills.
- Reduce impacts of derelict fishing gear to seabirds.
- Support efforts to reduce bioaccumulative toxins in order to help restore local populations of killer whales.

Management & Planning:

- Draw attention to and work to include marine issues (stormwater, wastewater, etc) within watershed management plans and programs.
- Work to ensure that fisheries management supports a local fishing economy.
- Work to ensure that species restoration/recovery is to a level that allows sustainable fishing.
- Suspend direct harvest of select species of bottomfish until recovery goals are met.

- Implement the local salmon recovery plan.
- Increase salmon (considering their size and the season) to support restored marine mammal populations.
- Recommend that the County plan for sea level rise and other climate change implications.
- Recommend that County policies & regulations are directed toward achieving a scenic, functional and natural marine environment that is available for human enjoyment.
- Determine the scope and nature of the water quality problem and develop an implementation plan.

Coordination:

- Connect with regional efforts working to protect and restore salmon populations.
- Continue and build upon MRC, county and others' outreach efforts with the tribes.
- Help marine managers address the pressures on marine resources associated with increased population and demand.
- Recommend improved and coordinated policies for building, anchoring, docks, enforcement, and mitigation.
- Support others' efforts to highlight traditional marine practices.
- Work with county and port districts to develop criteria for facility (such as barge landings) sighting, operation and maintenance.

Research:

- Support research to inform the MRC, managers, and decision makers on the trends and conditions of marine communities in the San Juans.
- Monitor the effectiveness of marine management and stewardship measures to better inform the MRC, managers, and decision makers.

The Marine Stewardship Area Plan aims to protect and restore the entire marine system in the San Juans. Recognizing that much of this plan is beyond the scope and capacity of the MRC, the Committee is counting on our friends, partners and community members to implement this plan along with us.


10
San Juan County
Town of Friday Harbor
United States
Canada
British Columbia
Washington

I. BACKGROUND

Faced with the declining health of marine life in the San Juan Islands along with increasing human pressures, the San Juan Board of County Commissioners designated the County a Marine Stewardship Area with the stated objective: "to facilitate the protection and preservation of our natural marine environment for the tribes and other historic users, current and future residents, and visitors."[1] With this resolution, the board tasked the Marine Resources Committee (MRC)[2] with delivering the results of a formal study with detailed recommendations for achieving this goal. As a result, the Committee began collecting available marine resources data and placing this data on maps in order to get a better picture of the county's marine life and the potential measures that would help to protect it and the human activities that depend on it.

During the first year following the designation of the stewardship area, the MRC compiled marine resources data, mapped them and developed the concept for a county-wide zone scheme (Slocomb 2004). The zone scheme proposed special use areas along county shorelines where resources were found to be especially abundant. The proposal included multiple use and restricted use areas, proposing voluntary protection measures such as no anchoring in eelgrass beds. Simultaneously, Committee members and staff conducted extensive community outreach, giving presentations to communities and stakeholder groups on San Juan, Shaw, Waldron, and Orcas islands to gather input in the development of new marine protection measures (see appendix B.1). The Committee also presented their work on the MSA to the first Marine Managers' Work Session for San Juan County. Organized by the Northwest Straits Commission, this two-day meeting brought marine site managers together from federal and state agencies, tribes, land conservancies, and MRC members to identify opportunities to improve management strategies to protect marine species and habitats in the San Juans.

The outcome of the managers work session, the spatial analysis and the public outreach meetings was identifying the need to 1) involve local planners, the science community and marine managers, including tribes, in order to better understand what actions were needed to address threats to the marine environment; and 2) return to community members with a more concrete proposal for them to respond to. Recognizing this, the MRC developed a partnership with the Washington Chapter of the Nature Conservancy and the Northwest Straits Commission and SeaDoc Society to develop the best planning process for engaging scientists, managers, citizens and stakeholders in the development of strategic actions. The planning process selected was The Nature Conservancy's site-based conservation action planning approach. The bases for the plan were the MRC's vision and goals developed originally in 2001 and then revised in 2003. This statement (see Appendix A) clearly defined the Committee's vision to protect both the natural marine resources as well as the human activities connected to them.

II. PLANNING PROCESS

To further develop the Marine Stewardship Area, the MRC applied a conservation planning methodology developed by The Nature Conservancy called the Five-S Framework for Site Conservation, also known as "Conservation Action Planning" (TNC 2003a, Low 2004). This approach involves the selection of a limited set of ecosystem elements (called 'focal conservation targets') to serve as the focus of the conservation effort. The focal conservation targets are selected so

[1] San Juan County Resolution No. 8-2004. January 2004.
[2] The MRC, created in 1996, is a citizens' advisory committee to the local county government on issues pertaining to the marine environment.

that they collectively encompass the range of biodiversity at the site through their dependence upon important ecological and physical processes that benefit other species not represented among the focal targets. The information generated during the planning process was managed using the Conservation Action Planning Workbook (TNC 2005), a spreadsheet-based decision support tool created by TNC.

The Five-S Framework five main steps:

1. Systems (Targets): Systems are the elements of conservation concern: the natural resources and the natural processes that maintain them. These natural resources become the focus of management action. This step has 3 parts: a) identifying a set of five to eight focal ecological systems, species groupings or specific species to serve as the focal targets, b) ranking the 'viability' of each target based on the health of the key ecological factors and processes upon which it depends, and c) using these ranks to assess the overall "biodiversity health" of the site.
2. Stresses: Stresses cause destruction or impairment of a system (e.g., water pollution). This step involves identifying the stresses affecting each of the focal targets identified in Step 1 and then ranking the stressors, based on the best available info and judgment.
3. Sources: Sources are the activity(ies) that produce a stress. Together, the sources and the stresses comprise the Threats to our systems. This step has several parts. First, the team identifies the sources of the stresses identified in Step 2 and then ranks them by their degree of contribution to the stress and the irreversibility of the stress caused by that source. "Irreversibility" refers to the ability of the system/attribute to recover if the source of stress was removed. Next, that information is combined with the stress rankings to generate a list of critical threats using the Conservation Action Planning Workbook. The critical threats are then ranked to generate a prioritized list of the 16 greatest threats.
4. Strategies: These are the actions taken to conserve priority systems. These actions are most often focused on abating threats and maintaining the health of our systems (within the context of the assessed situation).This step involves brainstorming a variety of specific strategies (management actions) that could be used to abate each threat identified in Step 3. A "situation assessment" compiling information on the human communities and the socio-economic drivers behind the various sources identified in step 4 is done and used to develop and assess strategies. The strategies are then ranked based on a cost: benefit assessment, feasibility and probability of success and an action plan is made.
5. Measures of success: In this step, performance measures are set against which the effectiveness of stewardship actions will be assessed. Measures may be related to the status of the targets and/or the threats to be abated and involve science-based indicators.

The MRC made two major modifications to the Five-S Site Conservation Planning methodology, one related to project governance and the other related to the integration of socio-cultural values. In a typical Five-S Site Conservation Planning project, TNC would be the lead organization, or might lead jointly with partner organizations. In this case, a stakeholder group – the MRC – served as the lead decision-maker. A Core Planning Team made day to day decisions about the project and essentially staffed the MRC on this project. The Core Planning Team membership included several MRC members, a marine ecologist from TNC, a wildlife veterinarian, and the manager of a TNC refuge island. MRC and TNC staff and a part-time project coordinator jointly staffed the project on a daily basis. The MRC reviewed and signed off on all major steps of the process.

The second major modification related to the integration of socio-cultural values into the planning process. A typical Five-S Site Conservation Planning project incorporates information on the human context of the planning area principally through the situation assessments. In accordance with current practices in marine resource planning and conservation (e.g. the use of socio-economic operating principles alongside biophysical operating principles in the Great Barrier Reef management plan

development), the MRC decided to expand the scope of the project to include a set of socio-cultural focal targets in addition to traditional biodiversity targets. This decision reflected several factors. The goals adopted by the MRC for the Marine Stewardship Area (see Appendix A) explicitly include the protection of direct use benefits for marine resources. Second, the participants at a technical workshop held by the MRC to obtain scientific input into the selection of focal targets recommended that human uses of the marine environment be included as a focal target for the planning process.

While the Five-S Framework has been adapted for use in protection of physical cultural heritage resources (TNC 2003b), few TNC site conservation planning efforts have incorporated socio-cultural values as targets. Thus, the MRC adapted the Five-S planning methodology for socio-cultural values as they went along. The target selection, viability analysis and preliminary threat assessment phases were done separately for each set of targets. The results of the threat assessments were then combined to develop joint planning objectives. Since the most proximate sources of stress affecting the socio-cultural targets differed from those affecting the marine biodiversity targets, the socio-cultural targets were housed in a separate copy of the Conservation Action Planning workbook.

III. OUTCOMES

The MRC implemented the planning process using a combination of formal workshops to involve larger numbers of scientific experts and stakeholders and smaller planning work sessions of the Core Planning Team and/or MRC. The MRC served as the lead organization developing and implementing the project. A Core Project Team composed of representatives from the MRC, TNC, Northwest Straits Commission and SeaDoc Society was formed to manage the project. Additional stakeholders were included in some of these smaller work sessions. Technical experts participated in additional meetings to assist the MRC with the viability and stress-source analyses. Appendix B.2 includes a list of all meetings, workshops and work sessions held. A more detailed discussion of the process used to complete each phase of the planning process is included in the discussion of each step.

Finally, given the limited information available and significant interpretation required to make assessments of indicator status and stress/source magnitudes, the MRC elected to commission an outside technical review of the results of the viability and threat assessments for the marine biodiversity targets. Two reviewers were identified for each target and asked to review the viability and threat assessments. Ten out of 14 reviewers submitted comments; these comments were compiled and submitted to the Core Team for consideration (See Appendix D).

A. SAN JUAN MARINE SYSTEMS

Focal Target Selection

The Five-S Framework calls for the identification of a set of 5-8 focal conservation targets that collectively encompass the range of biodiversity of the site, represent a range of biological organization from species to ecological communities to ecological systems and other important natural resources, and occur a range of scales from local (<10 km^2) to regional (>10,000 km^2). The restriction of the number of focal conservation targets to no more than eight targets is predicated on the idea that for each focal target, there are numerous species and other features of the system that are dependent upon the same ecological and physical processes as the focal target and will benefit from the strategies adopted to protect the broader focal targets. Species that fall into this category are considered particularly important biologically and culturally may be called out as “nested targets” for the focal target with which they are associated.

Through an iterative process involving formal and informal consultation with scientific and technical experts and review by a broader group of stakeholders, the MRC selected the following marine biodiversity-related targets:

- Rocky intertidal communities
- Rocky subtidal communities
- Nearshore sand, mud and gravel communities
- Rockfish, lingcod and greenling
- Seabirds
- Marine mammals
- Pacific salmon

Short descriptions of the focal targets, the rationale for their selection, and the nested targets identified for each follow. These targets were selected to encompass the range of marine biodiversity within San Juan County and also to include species using different realms of the marine environment.

In consultation with stakeholders, the MRC also developed three socio-cultural targets related to human uses of the marine environment:

- Enjoyment of the marine environment
- Thriving marine-based livelihoods
- Cultural traditions: ceremonial, subsistence, sustenance and spiritual uses and aspects

Description of Focal Targets

Rocky intertidal communities – This focal target includes a highly diverse assemblage of marine algae and animals that inhabit the rocky shores of the San Juans, along with dynamic physical and biological processes that are a feature of this environment. It extends from the interface between terrestrial vegetation and the upper splash zone to the depth of the lowest tides. In addition to its ecological importance as a producer of organic material and as a foraging area for both terrestrial and marine animals, the rocky intertidal is the dominant shoreline type in the MSA and is an important recreational area for humans. This target was recommended by participants at the scientific workshop and the stakeholder workshop. The nested targets include characteristic species include barnacles, limpets, rockweed (*Fucus spp.*) and other seaweeds, seagrass (*Phyllospadix*), chitons, crabs and many other invertebrates, as well as black oystercatchers. (Black oystercatchers were later moved to the seabird target when it was decided that seabirds included shorebirds).

Rocky subtidal communities – This focal target represents the benthic communities found on rocky substrate from just below the lowest tides to a depth of 30 m. The nested targets include characteristic species such as canopy-forming kelps and numerous species of red and brown seaweeds, invertebrates such as sea urchins, sponges and crab, and fish species such as juvenile rockfish and perhaps juvenile salmon. This target plays an important ecological role in the San Juans marine ecosystem by serving as a nursery area for many fish species, a foraging area for fish, birds and mammals, and an area of primary production that feeds deeper water habitats.

Nearshore sand, mud and gravel communities – This focal target describes the ecological communities found in soft-bottom habitats, which typically occur along beaches with lower wave and current energy and embayments, from the intertidal to a depth of 30 m. Characteristic species include eelgrass (*Zostera marina*) and other submerged aquatic vegetation, clams, and forage fish (herring, sand lance, and surfsmelt), along with the shoreline processes that maintain the sediments.

Rockfish, lingcod and greenlings – This focal target represents an assemblage of relatively sedentary bottom-dwelling fish species common to rocky habitats in the MSA that are also targeted by recreational fisheries. Recovery of rockfish populations has long been a goal of the MRC and the Northwest Straits Commission. The characteristic species include quillback, copper and Puget Sound rockfishes, lingcod, kelp greenlings. This target also includes several "nested targets", which are other species that co-occur with rockfish and are thought to benefit from actions taken to protect rockfish, such as species in deep water rocky reef communities, adult spot prawns, and adult Dungeness crab. This target was recommended by participants at the scientific workshop and the stakeholder workshop.

Seabirds – This focal target represents marine birds with significant feeding aggregations or nesting sites within the MSA, including seaducks and shorebirds. Principal species include: rhinocerous auklets, hooded mergansers, pelagic cormorants, harlequin ducks, bufflehead ducks, goldeneyes, pigeon guillemots, and glaucous-winged gulls. This target was recommended by participants at the scientific workshop and the stakeholder workshop.

Marine mammals – This focal target includes the whale, dolphin, porpoise and seal species commonly found in the MSA, such as killer whales (*Orcinus orca*), minke whales, grey whales, harbor porpoises, harbor seals, sea lions and river otters. In addition to playing potentially important roles in structuring the marine ecosystem as predators, these species have great cultural importance for residents and visitors to the MSA. This target was recommended by participants at the scientific workshop and the stakeholder workshop.

Pacific salmon – This focal target includes juvenile salmon species that use marine habitats of the MSA as they migrate through the MSA towards the open ocean, the resident population of adult Chinook (a.k.a. "blackmouth"), and adult salmon species that pass through the MSA en route to their natal streams. This target was not one of the original targets recommended by the Scientific Workshop participants but was added by the MRC because of its cultural importance as well as the desirability of integrating the MRC's role in salmon recovery efforts with this broader ecosystem-focused effort. As salmon are a migratory species, this focal target has the added benefit of tying in freshwater systems.

Enjoyment of the marine environment – This focal target includes the numerous ways in which residents and visitors enjoy the marine environment and the different values we obtain from it. This includes having a diversity of marine recreation opportunities as well as spiritual resources and is a fundamental component of our sense of place. Some of the important characteristics of this target are the existence of abundant populations of marine wildlife for people to enjoy viewing, locally-caught and raised high quality seafood available for consumption, opportunities to engage in diverse recreational activities and particularly boating, public access to beaches and shorelines, unspoiled views, and the enjoyment and respect of historical and present-day marine cultural sites and traditions.

Thriving marine-based livelihoods – This focal target describes the residents' desire to support livelihoods and make a living in ways that use the marine environment of the San Juans, recognizing that the ability to do so is dependent upon having healthy and abundant marine wildlife populations and our ability to understand the ecosystem that supports them. This includes having local food security, whether via sustenance harvests or the ability to purchase local seafood, having various marine transportation options available to serve the many islands (some of which do not have ferry service), and being able to make a living in diverse ways related to the marine environment.

Cultural traditions: ceremonial, subsistence, sustenance and spiritual uses and aspects – This focal target encompasses a range of values related to the marine environment other than purely recreational or commercial values, that include intangible benefits such as spiritual values and fulfillment and

tangible benefits such as personal harvest for sustenance purposes and stewardship. This target encompasses physical marine cultural sites, historical and modern marine-related cultural practices, opportunities to harvest for tribal ceremonial, subsistence and sustenance purposes, and recognition and appreciation of tribal treaty rights to marine resources. Sustenance uses differ from subsistence uses in that subsistence uses fill a critical need for physical and/or cultural survival, while sustenance uses refer to personal harvest for dietary purposes. Sustenance harvests may have a spiritual or ethical component when an individual chooses not to harvest a particular species as an act of stewardship of their environment.

Viability Analysis

The viability assessment methodology used in the Five-S Framework relies upon the identification of a set of "key ecological attributes" for each target and then identification of indicators to assess the status of these key ecological attributes. Key ecological attributes are "pivotal aspects of the focal target that distinguish it from others, shape its natural variation over time and space, and strongly influence other characteristics of the target and its long-term persistence and function" (TNC 2004). They can include biological characteristics, ecological processes, and biotic interactions with the physical environment, along with the critical causal links among them. Once the set of key ecological attributes is identified, one or more indicators must be developed to evaluate the status of the key ecological attribute. Finally, for each indicator, criteria must be developed to state whether it is in poor, fair, good or very good status. The indicator ratings are combined to yield a status assessment for each attribute, which in turn can be used to develop an overall assessment of the status of each target. The Five-S Framework defines viability as the likelihood that a target will persist long-term (usually 100 years). The rating categories are:

- Very Good = optimal: the factor is functioning at an ecologically sustainable level, and requires little or no human intervention to ensure long-term (100 years) viability.
- Good = acceptable: the factor is functioning within its range of natural variation; it may require some human intervention to ensure long-term (100 years) viability.
- Fair = unacceptable: the factor is outside the range of natural variation and requires human intervention. If unchecked, the attribute will be vulnerable to serious degradation.
- Poor = extreme danger: the factor is well outside the natural range of variation, and allowing this condition to persist for an extended period will make restoration practically impossible. (Adapted from Low 2004).

As is apparent from the category descriptions, improving the status of the attributes that are rated as being in poor or fair condition becomes a top priority in the strategy phase.

Preliminary work on the viability assessment phase began at the June 14th, 2005 Scientific Workshop and continued over several months. Following the Scientific Workshop, the Project Core Team held numerous individual and small group meetings with technical experts to identify key ecological attributes and indicators for the marine biological diversity-related targets and solicit information, in the form of data or best professional judgment, on the current status of those indicators. Once the viability analysis was largely complete, the MRC commissioned an outside technical review of the viability analysis for the marine biodiversity targets. Technical contributors are recognized on page 4 and summarized comments are Appendix D.

The viability analysis for the socio-cultural targets followed a similar approach. Key attributes – rather than key ecological attributes – were identified for each socio-cultural target, and indicators were identified to assess the status of key attributes. An ad-hoc subcommittee of MRC members was formed to assist the Core Team in developing and implementing a viability analysis for the socio-cultural targets. This group consulted with additional stakeholders, including representatives from the

San Juan Visitors Bureau, Port of Friday Harbor and others, in an all-day work session to review a set of indicators and define what the desired future condition (i.e., "good" or "very good" condition) would be for each indicator. Participants also identified, evaluated and ranked a list of 31 possible stresses affecting these targets, and identified the top sources contributing to the highest ranked stresses.

Findings[3]

The overall viability rating for five of the seven biodiversity targets was "fair", which means that these targets lie outside the range of natural variation and require human intervention or the target may be vulnerable to serious degradation, as shown in Table 1 below. The MRC was unable to identify overall viability rankings for the remaining two targets, rocky intertidal habitats and rocky subtidal habitats, due to insufficient data. All three of the socio-cultural targets were rated as "fair".

The overall viability rankings were calculated from the viability ratings for each key ecological attribute (key attribute in the case of the socio-cultural targets), which were in turn derived from the indicator ratings for each attribute. All calculations were performed using algorithms contained within the Conservation Action Planning workbook decision-support tool (TNC 2005).

Table 1. Focal Targets and Overall Target Status for the San Juan Islands Marine Stewardship Area.

Target	*Overall Viability*
Marine biodiversity targets:	
1. Rockfish, lingcod and greenling	Fair
2. Pacific salmon	Fair
3. Marine mammals	Fair
4. Seabirds	Fair
5. Rocky intertidal communities	Unknown
6. Rocky subtidal communities	Unknown
7. Nearshore sand, mud and gravel communities	Fair
Socio-cultural targets:	
1. Enjoyment of the marine environment	Fair
2. Thriving marine-based livelihoods	Fair
3. Cultural traditions	Fair

Of the more than 40 attributes identified for the marine biological diversity-related targets, one key ecological attribute, *Population abundance of rockfish, lingcod, and greenling* was rated as being in "poor" condition. Sixteen key ecological attributes were found to be in "fair" condition:

- Areal coverage of wetlands associated with the shoreline in embayments
- Substrate structure and characteristics in embayments
- Water column characteristics in embayments
- Native aquatic vegetative canopy in nearshore sand, mud and gravel communities
- Age structure of the rockfish population
- Rockfish species richness
- Abundance of prey items for juvenile salmon (of up to 100 mm)

[3] Note: This section reports the results of the viability analysis *prior to* the external technical review commissioned by the MRC.

- Juvenile salmon habitat abundance along beaches
- Juvenile salmon habitat abundance in embayments
- Prey abundance for resident Chinook
- Resident Chinook salmon ("blackmouth") population abundance
- Seabird nesting success
- Seabird food resource availability
- Population size of selected seabird species
- Seabird food resource availability and quality
- Population size and structure of resident killer whales

Finally, the Core Project Team was unable to determine viability ratings for any of the attributes for the Rocky Intertidal Communities target and for most of the Rocky Subtidal Communities target, as well as assorted indicators for other targets. Collecting data to determine the viability ratings for these targets should be included among the priority action items in the final MSA Plan.

B. THREAT ASSESSMENT: STRESSES AND SOURCES

The threat assessment phase of the Five-S Framework has two main steps:

1. Stresses: This step involves identifying the stresses affecting each of the focal targets identified in Step 1 and then ranking the stressors, based on the best available information and judgment.
2. Sources: This step has several parts. First, the team must identify the most proximate sources of the stresses developed in Step 2 and then rank them by their degree of contribution to the stress and the irreversibility of the stress caused by that source. Then, that information is combined with the stress rankings to generate a list of critical threats via TNC's Conservation Action Planning workbook. The critical threats are then ranked to generate a list of the 16 most critical threats.

An additional "Situation Assessment" step may also be performed at this stage, using a participatory methodology developed by the Wildlife Conservation Society (WCS) to build causal chain diagrams of the human activities and underlying social, economic and cultural factors that create the sources of stress (WCS 2004). See Appendix F for an example.

The Project Core Team adopted a multi-pronged approach to the threat assessment phase. First, in addition to reviewing the focal target list and developing the socio-cultural focal targets, participants at the 50+ person stakeholders Threat Assessment Workshop in October 2005 were asked to identify and rank the top stresses and sources affecting each focal target and construct a situation diagram using the WCS Situation Assessment methodology. Given the variable results from the workshop and the MRC's desire to fully document the scientific basis and assumptions underlying the identification of top threats, the Project Core Team then conducted a more detailed threat analysis following the Five-S Framework and using the Conservation Action Planning workbook.

The ad-hoc subcommittee of MRC members that was formed to assist the Core Team with the socio-cultural targets also developed a threat assessment for the socio-cultural targets. In an all-day work session held in May 2006, this group plus additional stakeholders, including representatives from the San Juan Visitors Bureau, Port of Friday Harbor and others, identified, evaluated and ranked a list of 31 possible stresses affecting these targets, identified the top sources contributing to the highest ranked stresses, and generated situation assessment diagrams for some key stresses. The MRC has not yet combined this information into an overall threat assessment using the Conservation Action Planning workbook as was done for the biodiversity targets. This is because the sources of stress for the socio-cultural targets do not overlap across targets and can have different impacts to the system depending

on the target. For example, a stress to human enjoyment, such as "marine views impaired by buildings" has a difference impact on the target, marine-based livelihoods, making it difficult to identify and rank common sources of this stress for both targets.

Findings: Top threats to marine biodiversity targets

The top threats to the marine biodiversity targets, and hence the marine environment of the San Juans, are listed in order of priority in Table 2.

Table 2. Top threats affecting all marine biodiversity targets in the San Juan County Marine Stewardship Area as of 8/31/06. *designates tied ranking.

Rank	Threat	Overall Threat Rank
1	Large oil spills	**High**
2	Climate change	**High**
3	Shoreline modification due to docks, shoreline armoring, boat ramps, jetties, etc.	**High**
4	Non-local sources of salmon decline	**High**
5	Invasive species	**Medium**
6	Persistent organic pollutants from current industrial and historical sources	**Medium**
7	Polluted stormwater runoff	**Medium**
8	Septic systems and wastewater discharge	**Medium**
9	Predation by marine mammals	**Medium**
10	Historical harvest of rockfish, lingcod & greenling until 1999.	**Medium**
11*	Disturbance by other wildlife	**Medium**
12*	Fishing/harvesting activities	**Medium**
13	Derelict fishing gear	**Medium**
14	Small chronic fuel and oil spills	**Medium**
15	Human disturbance on shore	**Low**
16	Sediment loading resulting from upland construction activities, logging, clearing and livestock	**Low**
	Overall Threat Status for MSA	**High**

The overall threat ranks were calculated from the rating of how significant an impact each threat has on each target, following the decision rules specified by the Five-S Framework and using the Conservation Action Planning workbook: The threat-to-system rank is at least the highest rank given to any threat associated with a particular source of stress and is adjusted upwards as follows: three High rankings equal a Very High; five Medium rankings equal a High; seven Low rankings equal a Medium (TNC 2005). A table showing the threat ranks for each target is included in Appendix E along with a note about assumptions made concerning contaminants.

Threat definitions

These are the operating definitions used by the Core Planning Team in conducting the stress-source analyses for the biodiversity targets.

- *Large oil spills* – Catastrophic and/or significant oil spills occurring within the San Juan MSA or close enough to the MSA that wind and/or currents distribute the oil over a significant portion of the MSA. A specific size of vessel or volume of oil spilled was not designated.

- *Climate change* – Refers to the impacts of global climate change due to global warming on the marine environment of the MSA. Key impacts are thought to include a rise in sea level due to thermal expansion, increases in water temperature and changes in water circulation patterns and related consequences for marine food chains.
- *Shoreline modification due to docks, shoreline armoring, boat ramps, jetties, etc*. –Alteration of shorelines and shoreline habitats due to a variety of physical structures plus shoreline and habitat impacts due to barge landings. Threat ratings generally reflect shoreline modification within the MSA, though shoreline modification in other areas has the potential to affect marine resources of the MSA
- *Non-local sources of salmon decline* - Refers to multiple sources of salmon decline originating outside the MSA. Includes impacts of hatcheries located outside the MSA, degradation of salmon spawning habitat, and salmon harvest activities outside the MSA (including ocean harvests). Impacts of persistent organic pollutants were considered separately.
- *Invasive species* – Refers to the impacts of non-indigenous species on marine habitats of the MSA. Does not include potential effects of invasions of non-indigenous species occurring outside the MSA that may influence marine resources within the MSA. Also does not include blooms of harmful microalgae.
- *Persistent organic pollutants from current industrial and historical sources* – Refers to a variety of persistent organic pollutants (POPs) that bioaccumulate in marine organisms and have adverse effects on the organisms' health, such as PCBs. Includes impacts of POPs originating outside the MSA that are found in marine organisms in the MSA as well as POPs that may be present in sediments within the MSA. Does not consider human health impacts. See discussion of assumptions made regarding contaminants in Appendix E.
- *Polluted stormwater runoff* – Non-POP contaminants originating from terrestrial sources and having adverse effects on marine organisms, such as metals, pesticides and polyaromatic hydrocarbons, which typically enter the marine system via stormwater. Includes those contaminants originating from terrestrial sources located within the MSA plus those originating from terrestrial sources outside the MSA that reach the MSA due to currents. Does not include sediments or turbidity, nor human health impacts. See discussion of assumptions made regarding contaminants in Appendix E.
- *Septic systems and wastewater discharge* – Refers to the impacts of wastewater and greywater entering the marine environment from wastewater treatment facilities, septic systems, and vessels, including impacts from nutrients (e.g., nitrogen and phosphate), pathogens and viruses (e.g. fecal coliform bacteria), and endocrine-disrupting compounds. Includes sources located within the MSA as well as those originating outside the MSA that may impact the resources of the MSA via currents (e.g. Victoria wastewater outfall). Does not consider human health impacts. See discussion of assumptions made regarding contaminants in Appendix E.
- *Predation by marine mammals* – Refers to the impacts of marine mammal predation on marine resources of the MSA. The scope of this threat generally refers to predation occurring within or near the MSA, depending on the spatial extent of the prey species population (e.g., North Sound rockfish population). Reflects a sentiment that marine mammal predation has increased due to changes in the relative abundance of predators and prey.
- *Historical harvest of rockfish, lingcod & greenling until 1999* – Refers to the impacts of harvesting activities directed at rockfish, lingcod and greenling species prior to 1999 within the MSA. Reflects a sentiment that the magnitude of harvest was formerly much greater than

today, and the population characteristics of the species targeted continue to show the effects of greater harvest rates in the past.

- *Disturbance by other wildlife* – Refers to the effects of other species on MSA targets, particularly eagles and other predators of seabirds, occurring within the MSA.
- *Fishing/harvesting activities* - Refers to the impacts of fishing and harvesting activities occurring within the MSA over the last 5-6 years on target and non-target species (e.g., bycatch, habitat impacts). Does not include the effects of lost or derelict gear. Was formerly divided into several threats depending on species targeted.
- *Derelict fishing gear* – Refers to the impacts of lost or derelict fishing gear within the MSA on MSA resources.
- *Small chronic fuel and oil spills* –Small and/or chronic sources of polyaromatic hydrocarbons originating within the MSA from vessels and marinas, but not those entering the marine environment via stormwater. A specific size or volume of oil spilled was not designated. Does not consider human health impacts. See discussion of assumptions made regarding contaminants in Appendix E.
- *Human disturbance on shore* – Disturbance and/or damage to marine organisms due to human recreational activities along the shorelines of the MSA, such as walking, landing small boats and kayaks etc. Does not include barge landings or disturbance of animals due to vessels. Includes direct damage (e.g. trampling) as well as disruption of animal behavior (e.g. flushing birds).
- *Sediment loading resulting from upland construction activities, logging, clearing and livestock* – Reflects all sources of sediments entering marine waters due to human activities within watersheds, both activities occurring within the MSA as well as those occurring outside the MSA but may influence the MSA via currents (e.g. Fraser River). Does not include the effects of removal of shoreline vegetation (marine riparian vegetation) or other contaminants.
- *Human disturbance on water* –Disturbance of marine animals due to human activities, such as boating and boater behavior, occurring within the MSA. Does not include the impacts of boat wakes, anchoring and/or mooring buoys.
- *Removal of riparian terrestrial vegetation along shore* – Refers to the impacts of the removal of shoreline vegetation within the MSA, such as loss of shading, increased sheet flow runoff. Does not include contaminants or effects of removal of shoreline vegetation outside the MSA that may impact fish species within the MSA.
- *Boat wakes* – Refers to the impacts of boat wakes occurring within the MSA on shoreline characteristics and marine communities
- *Local freshwater diversions and withdrawals* – Refers to the impacts of diversion and withdrawal from surface and subsurface freshwater resources within the MSA on marine resources of the MSA.
- *Harmful algal blooms* – Refers to the impacts of blooms of microalgal species with adverse impacts on marine organisms. Does not consider human health impacts.
- *Boating activities* (anchoring, mooring buoys) – Refers to the impacts of anchoring and mooring of vessels within the MSA on marine resources. Does not include impacts of boat wakes, boater behavior (e.g. disturbance of seabirds) or vessel discharges while anchored.
- *Loss of eelgrass* – Refers to the impacts of the loss of eelgrass beds within the MSA on other species, specifically Pacific salmon. In accordance with the Five-S Framework, this should

not be considered a "source" in the stress-source analysis and should be replaced by the various human activities causing the loss of eelgrass. Since this could be a long list of sources, much of which is conjecture, it was left as is.

Findings: Top threats affecting socio-cultural targets

As discussed above, despite many attempts, we were unable to generate a threat assessment summary that evaluated the impacts of threats across all of the socio-cultural targets, due to the fact that there was little overlap between the most proximate source(s) causing each stress across stresses and across targets, and because it was more difficult to distinguish between sources and stresses for these targets – one target's stress may be another target's source and vice-versa. In lieu of a threat summary, we developed a ranked list of the top stresses affecting the socio-cultural targets (shown in Table 3), and listings of the top sources contributing to the highest ranked stresses. The key sources contributing to these stresses were identified using situation assessments prepared in the social targets work session and will be further identified in the strategy development component.

Table 3. Top stresses affecting the MSA socio-cultural targets.

Rank	Stress	Rating
1	Not enough fish to catch.	very high
2	Not enough opportunity for commercial fishing	very high
3	Fish contaminated with pollution	very high
4	Shellfish contaminated with pollutants	high
5	Low availability of local seafood	high
6	Not enough public access to beaches and shorelines	high
7	Marine views and/or viewsheds impaired by buildings	high
8*	Not enough access to marine views and viewsheds	high
9*	Little knowledge of historical/current marine cultural sites & traditions	high
10*	Too few cultural activities and traditions are practiced	high
11*	Not enough fish landed for local markets	high
12*	Too few local vessels involved in commercial fisheries	high
13*	Not enough local fishermen involved in the commercial fisheries	high
14*	Wages too low in marine-based livelihoods	high
15	Not enough opportunity for sustenance fishing	high
16	Reduced quality of marine recreational experiences	high
17*	Not enough big fish caught	high
18	Marine cultural sites and practices aren't respected	high
19	Not enough opportunity for recreational fishing	high
20	Not enough shellfish available to catch	high
21	Not enough access to shellfishing areas	med
22	Inadequate marine transportation infrastructure	med
23	Not enough boating facilities for residents' use	med
24	Not enough wildlife to view	med
25	Locally caught/raised seafood is too expensive	med
26	Not enough opportunities to learn about the marine environment	med
27	Little diversity in marine-based livelihoods	med
28	Not enough opportunities for marine research	low
29	Not enough boating facilities for visitors' use	low
30	Shellfish are too small	low
31	Not enough diversity of marine recreational experiences	low

* - equal value/tied with the stress above.

C. MSA BENCHMARKS

Benchmarks are a key precursor to the development of stewardship strategies and also provide the measuring stick by which the MRC and its partners will be able to evaluate their progress in protecting and restoring the marine environment of the MSA. The Five-S Framework uses two types of benchmarks: those that are related to improving the status of the target, and those that are related to abating critical threats. All benchmarks should be feasible to implement and, if achieved, leave the MRC reasonably certain that all of the targets will survive and the MSA will retain adequate ecological function. The benchmarks should also be:

- Quantitative, or at least measurable
- Effective
- Achievable
- Time limited – have a deadline for completion

The MSA Core Team identified a set of "Benchmarks" that describe the changes the MRC wants to see in the viability of the targets and which the MRC will use to report on improvements in the status of marine resources as a result of actions taken by the MRC and its partners. The priority objectives represent a short list of all the potential objectives considered by the MRC; the remaining objectives are included in the plan as "Longer-term Objectives" to be implemented down the road, or as "Findings" that fall outside of the MRC's scope of work. For a list of the long term benchmarks and findings, see Appendix C.1. As presented in the next section, the priority benchmarks are the focus of conservation strategies.

<u>Research Benchmarks</u>

A key outcome of the plan is the identification of key research priorities for the Marine Stewardship Area. Early in the planning process, it became clear that the MRC needed better data on the trends and conditions of marine communities in the San Juans. Technical advisors could not identify reliable data sources to support viability analysis for many of the marine species identified as either targets or key indicators. Such information is critical in order to develop effective management measures and measure their success. Some of the Priority Research Objectives identified at the writing of this plan (for the complete list, see Appendix C.2)

- Determine the cumulative impacts of docks and other overwater structures on habitats of interest.
- Determine the current levels of PCBs, mercury, tributyl tin, flame retardants and other bioaccumulating contaminants in fish and shellfish in the San Juans that may have biological impacts, including to human health; identify which are priority causes for concern and establish appropriate threshold amounts. Determine local levels of consumption so that the threshold for human health risks is adjusted for local consumption rates.
- Identify significant local sources of priority contaminants listed above and establish specific timelines to reduce these inputs.
- Determine a maximum allowable concentration of PAHs in sediments, water column, clams, etc.
- Determine the current abundance of sand lance and smelt in the MSA
- Determine current viability/status of rocky intertidal target within the MSA.
- Determine current viability/status of rocky subtidal within the MSA.
- Identify the current level of greenhouse gas emissions in San Juan County and a target and timeline for reduction.
- Determine number and condition of physical marine cultural sites within the MSA.
- Determine what level and frequency of fishing opportunities are needed to be considered viable.

D. STRATEGIES

Following the development of benchmarks, the Marine Resources Committee identified a comprehensive list of strategies. Strategies are management actions that will directly address the top priority threats in order to achieve the benchmarks. The MRC developed the strategies list working from proposals put forward by stakeholders and managers at the Threat Assessment Workshop and second Managers Work Session. In addition, the Core Team developed a situation analysis for each target. These are diagrams that draw out the connections between the target, the stresses to that target and the human activities that are causing the stress, providing a useful tool for identifying the most effective strategies. For an example of a situation analysis diagram, please see Appendix F. For the complete set, please see the accompanying MSA CD.

Strategies are presented by Target under the benchmark they are aiming to achieve. "B" is for biodiversity benchmarks; "T" is for threat-based benchmarks; "SC" is for Socio Cultural benchmarks. Many of the benchmarks are listed multiple times because they apply to more than one target. The relationships between the targets, benchmarks, strategies and threats are presented in a matrix format on the accompanying MSA CD.

Criteria for the strategies:

1. MRC's job: within our mission, authority, and ability; and are not being done by another group.
2. Smart: most effective/ greatest impact
3. Start-up: can occur within five years

Benchmarks and strategies presented by target

Conservation Target: Nearshore sand, mud and gravel communities

Benchmark

B-4. The regional coverage of eelgrass (Zostera marina) remains stable on beaches and increases by 10 percent in embayments over a 5-year period by 2013.

Strategies

1. Recommend improved and coordinated policies for building, anchoring, docks, enforcement, and mitigation.
2. Improve water quality relative to eelgrass needs (see T-7, strategy 1)
3. Education & outreach on the importance of eelgrass and best marine use/shoreline development practices

Benchmark

T-3. Ensure that there are enough salmon of the right sizes and species available within the MSA at the right times of year to support restored marine mammal populations.

Strategies

1. Implement local salmon recovery plan
2. Connect with regional efforts

Benchmark

T-4. Reduce the number of miles of armored shoreline by 2016.

Strategies

1. Minimize new armored shoreline
2. Remove shoreline armoring where appropriate (soft shore blueprint)

3. Education & outreach on the benefits of "softshore"

Benchmark
T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark
T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Benchmark
T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

Conservation Target: Rocky intertidal and rocky subtidal communities

Benchmark
T-2 Abundance of healthy kelp habitat and community dynamics remains at current levels or increases by 2016.

Strategy
Still need to develop strategies. Research is a priority.

Benchmark
T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark
T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Conservation Target: Rockfish, lingcod and greenling

Benchmarks

B-1. Increase lingcod populations to greater than 25% of unfished spawning biomass by 2027 and increase rockfish populations to greater than 25% of unfished spawning biomass by 2037. Maintain kelp greenling populations at 2006 levels.

T-1. Impacts of harvest activities within the MSA on the rate of rockfish species recovery are within 10% of the time it will take to recover rockfish populations under zero harvest-related mortality by 2037.

Strategies

1. Reduce bycatch of select species.
2. Suspend direct harvest of select species until recovery goals are met.
3. Promote public awareness of the status of and threats to rockfish, lingcod, and greenling [objective: Public is involved, understands, and takes ownership over the problem and action toward a solution.]

Benchmark

T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark

T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Benchmark

T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

Conservation Target: Marine Mammals

Benchmark

B-2 Increase the resident killer whale population size to greater than 103 animals by 2020.

Strategies

1. Increase salmon (see T-3)
2. Reduce vessel disturbance
3. Support efforts to reduce bioaccumulative toxins

Benchmark

B-3. Restore herring spawning to all historic areas.

Strategies

1. Protect and restore spawning habitat
2. Support regional herring recovery efforts

Benchmark

T-3. Ensure that there are enough salmon of the right sizes and species available within the MSA at the right times of year to support restored marine mammal populations.

Strategies

1. Implement local salmon recovery plan
2. Connect with regional efforts

Benchmark

T-4. Reduce the number of miles of armored shoreline by 2016.

Strategies

1. Minimize new armored shoreline
2. Remove shoreline armoring where appropriate (soft shore blueprint)
3. Education & outreach on the benefits of "softshore"

Benchmark

T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark

T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Conservation Target: Pacific Salmon

Benchmark

B-3. Restore herring spawning to all historic areas.

Strategies

1. Protect and restore spawning habitat
2. Support regional herring recovery efforts

Benchmark

B-4. The regional coverage of eelgrass (Zostera marina) remains stable on beaches and increases by 10 percent in embayments over a 5-year period by 2013.

Strategies

1. Recommend improved and coordinated policies for building, anchoring, docks, enforcement, and mitigation.
2. Improve water quality relative to eelgrass needs (see T-7, strategy 1)
3. Education & outreach on the importance of eelgrass and best marine use/shoreline development practices

Benchmark
T-3. Ensure that there are enough salmon of the right sizes and species available within the MSA at the right times of year to support restored marine mammal populations.

Strategies

1. Implement local salmon recovery plan
2. Connect with regional efforts

Benchmark
T-4. Reduce the number of miles of armored shoreline by 2016.

Strategies

1. Minimize new armored shoreline
2. Remove shoreline armoring where appropriate (soft shore blueprint)
3. Education & outreach on the benefits of "softshore"

Benchmark
T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark
T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Benchmark
T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

Conservation Target: Seabirds

Benchmark
B-3. Restore herring spawning to all historic areas.

Strategies

1. Protect and restore spawning habitat
2. Support regional herring recovery efforts

Benchmark
B-5.
a) The number of nesting pairs of black oystercatchers remains stable at the 2006 level or increases over a four year timeframe by 2017.
b) The number of nesting pairs of pelagic cormorants is stable at the 2006 level or

increasing over a four year time frame by 2022. Eagles are a threat with no strategy. Not within our goals to address this threat. Solution is to increase population levels to withstand increased predation.

Strategies

1. Reduce disturbance
2. Reduce impacts of derelict fishing gear
3. Reduce oil spill risk (see T-5)
4. Increase prey base (see B-3)

Benchmark

T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark

T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Socio-cultural target: Enjoyment of the marine environment

Benchmark

SC-1. There are viable recreational, commercial, ceremonial and sustenance fishing opportunities year-round for county residents, tribes with usual and accustomed fishing rights and visitors by 2037.

Strategies

1. Ensure that species restoration/recovery is to a level that allows sustainable fishing. (need to clarify or quantify “sustainable”)
2. Ensure fisheries management supports a local fishing economy.

Benchmark

SC-4. Locally-harvested marine species pose insignificant risks to human health, given local rates of consumption, by 2017.

Strategies

1. Promote water quality protection through best management practices.
2. Determine scope and nature of the water quality problem and develop implementation plan.

Benchmark

SC-5. In San Juan County, the majority (greater than 50% percent) of people are aware, involved, and feel ownership of the MSA.

Strategies

1. Communicate a clear, inspiring stewardship message to the public.
2. Foster projects that engage the public (seasonal and year-round residents) in marine stewardship
3. Identify and engage key partners as active marine stewards. (need to refine with help from stakeholder groups)

Benchmark

SC-6 Placeholder for a non consumptive enjoyment benchmark, such as: a scenic, functional and natural marine environment is available for human enjoyment.

Strategies

1. Recommend that county plan for sea level rise and other climate change implications.
2. Recommend that county policies & regulations are directed at achieving this benchmark.
3. Help marine managers address the pressures on marine resources associated with increased population and demand.

Benchmarks

B-1. Increase lingcod populations to greater than 25% of unfished spawning biomass by 2027 and increase rockfish populations to greater than 25% of unfished spawning biomass by 2037. Maintain kelp greenling populations at 2006 levels.

T-1. Impacts of harvest activities within the MSA on the rate of rockfish species recovery are within 10% of the time it will take to recover rockfish populations under zero harvest-related mortality by 2037.

Strategies

1. Reduce bycatch of select species.
2. Suspend direct harvest of select species until recovery goals are met.
3. Promote public awareness of the status of and threats to rockfish, lingcod, and greenling [objective: Public is involved, understands, and takes ownership over the problem and action toward a solution.]

Benchmark

B-3. Restore herring spawning to all historic areas.

Strategies

1. Protect and restore spawning habitat
2. Support regional herring recovery efforts

Benchmark

T-3. Ensure that there are enough salmon of the right sizes and species available within the MSA at the right times of year to support restored marine mammal populations.

Strategies

1. Implement local salmon recovery plan
2. Connect with regional efforts

Benchmark

T-4. Reduce the number of miles of armored shoreline by 2016.

Strategies

1. Minimize new armored shoreline
2. Remove shoreline armoring where appropriate (soft shore blueprint)
3. Education & outreach on the benefits of “softshore”

Benchmark

T-5 The probability of a catastrophic oil affecting the San Juan Islands is less than .0005 per year. Amount of chronic oil pollution is reduced by 2016.

Strategies

1. Minimize chronic pollution from land and marine sources (includes medium spills and chronic events like bilge pumping.)
2. Support efforts to reduce risk and improve response to oil spills.

Benchmark
T-6. Reduce greenhouse gas emissions from San Juan County according to the same standards adopted by Seattle.

Strategy

1. Promote concept of the county doing its part to reduce greenhouse gas emissions (think globally, act locally)

Benchmark
T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

Socio-cultural Target: Thriving marine based livelihoods

Benchmark
SC-2. By 2017, there is a reliable marine transportation infrastructure with limited and properly sited facilities for vessels with freight movement capacity at all ferry-served islands and access available to transfer passengers from small boats (from other islands) to ferries at all WSF ferry landings.

Strategy

1. Work with county and port districts on criteria for facility sighting, operation and maintenance. (Facility includes barge landings)

Benchmark
SC-4. Locally-harvested marine species pose insignificant risks to human health, given local rates of consumption, by 2017.

Strategies

1. Promote water quality protection through best management practices.
2. Determine scope and nature of the water quality problem and develop implementation plan.

Benchmark
SC-5. In San Juan County, the majority (greater than 50% percent) of people are aware, involved, and feel ownership of the MSA.

Strategies

1. Communicate a clear, inspiring stewardship message to the public.
2. Foster projects that engage the public (seasonal and year-round residents) in marine stewardship
3. Identify and engage key partners as active marine stewards. (need to refine with help from stakeholder groups)

Benchmark
SC-7 Healthy marine environment that sustains thriving marine-based livelihoods.

Strategy

1. Incorporate this vision into a communication strategy (A-1).

Benchmark
T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

Socio-cultural target: cultural traditions, ceremonial, subsistence, sustenance and spiritual uses and aspects

Benchmark

SC-3. There is a general acceptance and awareness of marine related cultural practices and traditions, including treaty fishing rights by 2017.

Strategies

1. Continue and build upon MRC, county and others' outreach efforts with the tribes.
2. Support others' efforts to highlight traditional marine practices.

Benchmark

SC-4. Locally-harvested marine species pose insignificant risks to human health, given local rates of consumption, by 2017.

Strategies

1. Promote water quality protection through best management practices.
2. Determine scope and nature of the water quality problem and develop implementation plan.

Benchmark

SC-5. In San Juan County, the majority (greater than 50% percent) of people are aware, involved, and feel ownership of the MSA.

Strategies

1. Communicate a clear, inspiring stewardship message to the public.
2. Foster projects that engage the public (seasonal and year-round residents) in marine stewardship
3. Identify and engage key partners as active marine stewards. (need to refine with help from stakeholder groups)

Benchmark

T-7. Nitrogen inputs from human sources do not exceed more than 10 percent of natural levels by 2017 – considering changing to capture all pollutants that we care about.

Strategy

1. Draw attention to/include marine issues (stormwater, wastewater, etc) within watershed management plans and programs

All Conservation targets, Socio-cultural targets and all Benchmarks

Strategy

1. A-1. Develop a comprehensive communication strategy to deliver our messages to the public

IV. CONCLUSION & NEXT STEPS

Following the development of draft strategies, the MRC led a review process to give marine managers and community members throughout the county another opportunity to learn about the process, the threats facing marine resources, and the strategies developed to address them. With help from The Norton Arnold Company, the MRC interviewed key stakeholders, held a meeting with tribal managers, organized the third Marine Managers Work Session and facilitated four public workshops on four different islands. These meetings gave community members and key parties an opportunity to understand the process, comment on the draft plan and identify the strategies that are most important to them. Appendix B.3 contains a full report on the spring 2007 outreach effort.

Public comments were considered by the MRC along with the outcomes of the Marine Managers Work Session and the entire planning process to determine the strategies that the committee will promote first. However, the Committee feels strongly that all the strategies laid out in this plan are important if the marine ecosystem is going to thrive under current pressures. In addition, this planning process identified many gaps in information that members of the core planning team, technical advisors and marine managers agree are important for understanding the condition of local marine resources and the necessary actions to protect them. Filling these "data gaps" is a priority and need to be incorporated into the future work of research organizations including schools, agencies, and nongovernmental organizations.

Over the next few years, the MRC will incorporate the outcomes from this plan into their workplan. In addition, the Committee will advocate for moving these outcomes forward through other means, such as the San Juan Initiative[4], policy recommendations to San Juan County government and marine managers, collaborative efforts with governmental and non-governmental partners, to give just some examples. This plan will be most effective if it becomes a core around which numerous marine ecosystem protection and restoration efforts can coalesce. The MRC will continue to emphasize coordination of marine managers' authorities and responsibilities towards implementing this plan's strategies as well as coordination of marine managers' policies and actions with the work of the MRC and other citizens' and non-governmental organizations.

At the time of adoption, the monitoring plan for the Marine Stewardship Area is not final. In the upcoming year, the Core Team will work with technical advisors to develop a detailed monitoring plan based on the benchmarks identified through this planning process. Over time, the MRC will track available information to assess whether or not the targets are achieving the benchmarks. If benchmarks are not being met or approached, strategies will be reviewed and modified as necessary using the same approach used here to develop them. These important changes will be reflected in the workbook. Thus, this is an adaptive plan.

While the MRC took the lead on this planning process, the outcomes are the result of the combined efforts of many organizations, interest groups, managers, community leaders, and citizens who care deeply for the long-term health of San Juan County's marine resources. If the same energy and commitment goes into implementing the draft strategies and monitoring their effectiveness, then this

[4] The San Juan Initiative began in January 2007 and is a two-year public-private partnership between San Juan County and Shared Strategy for Puget Sound. Led by local and regional leaders, the initiative aims to prioritize protection measures based on existing planning efforts, including the Marine Stewardship Area plan, assess how effective programs are in protecting the ecosystem and then generate recommendations for improvements. These recommendations will be presented to local leaders as well as regional, state and federal managers. This process will help to inform the regional efforts of the Puget Sound Partnership.

plan will be a success and the benefits will be realized through a healthier ecosystem and more vibrant economy.

The MRC encourages others working to protect and restore the marine resources in the San Juan Islands to carefully review this plan and incorporate the outcomes into your efforts. If you would like a presentation on the plan and/or accompanying workbook, please contact the Marine Resources Committee: 360-370-7592.

REFERENCES CITED

Low, Greg 2003. Landscape-scale conservation: a practitioner's guide, 4th edition. The Nature Conservancy.

Slocomb, Jim. March 2005. Revised DRAFT Marine Stewardship Area Phase II Report. The Marine Resources Committee.

The Nature Conservancy (TNC) 2003a. The Five-S Framework for Site Conservation, Volume I, 3rd edition, July 2003.

The Nature Conservancy (TNC) 2003b. Conservation Area Planning for Tangible Cultural Resources. Guatemala. August, 2003.

The Nature Conservancy (TNC) 2004. Assessment of Target Viability Worksheet for Conservation Project Management Workbook Versions 3 (CAP) and 4.

The Nature Conservancy (TNC) 2005. Conservation Action Planning Workbook, version 4(b).

Wildlife Conservation Society (WCS) 2004. Participatory spatial assessment of human activities – a tool for conservation planning. Living Landscapes Technical Manual 1, June 2004.

APPENDICES

APPENDIX A. MRC Vision and goals

Goals of the San Juan County Marine Resources Committee
Adopted 11/7/01, revised 4/4/03

Ecological/biological

a. To protect and restore the marine biological diversity, ecosystem processes, representative ecosystems and special natural features.
b. To conserve fish populations and the upland, nearshore, and deepwater habitats that support them. The initial goal will be to increase the abundance and productivity of selected populations.
c. Prevent further reductions in marine populations including marine birds and habitats within the San Juans and increase populations of marine species to levels exceeding present levels, within the range of natural variability.

Cultural, social & economic

d. To recognize and appreciate the existence values, especially cultural and spiritual values, provided by a fully functioning marine ecosystem. To protect and restore the marine ecosystem so that these benefits will be available for future generations.
e. To recognize and protect direct use benefits for marine resources, including ceremonial, subsistence, recreational and commercial fishing. To protect and restore the marine ecosystem so that these benefits will be available for future generations.
f. To acknowledge cultural heritage resources and encourage understanding and appreciation of them.
g. To recognize the need for scientific research opportunities and the benefits that accrue from this research.
h. To promote increased education and awareness of the marine environment. To encourage all participants to be open to others' perspectives concerning the marine environment so that all relevant players will be encouraged to participate in developing protection/recovery plans.
i. Protect marine-based recreational resources, including fishing, recognizing that on (and in) the water recreation and enjoyment is an important part of not only our local economy but also our community, culture and the coastal legacy we leave for our children.

Approach/Guiding Principles for How

j. To use both indigenous knowledge and the results of scientific research to inform adaptive management.
k. To better protect beaches, coasts and the marine environment from pollution, relying upon existing Clean Water Act, Hydraulic Code and Shoreline Management Act Authorities, water quality overlay areas shall be designated to ensure appropriate levels of protection for the marine environment. Such regulations may include the identification of areas that warrant additional pollution protections and the enhancement of marine water quality standards.
l. To promote increased education and awareness of the marine environment. To encourage all participants to be open to others' perspectives concerning the marine environment so that all relevant players will be encouraged to participate in developing protection/recovery plans.

(This Page Intentionally Left Blank)

APPENDICES B 1-3 Community Involvement

B.1 MRC Marine Stewardship Outreach Campaign in 2004: meetings, presentations and displays

- Small personal presentations for communities on Stuart, Johns and Waldron Islands and in Deer Harbor on Orcas. Summer-fall 2004
- Several public presentations at MRC meetings on San Juan Island. Summer-winter 2004
- Full page ad published in the San Juan Journal, smaller ads in the Sounder and Weekly. June, July and August 2004
- Whale Museum's Environmental Forum. July 2004
- San Juan Lions Club. July 2004
- Orcas Island Lions Club. July 2005
- San Juan County Fair. August 2004
- San Juan BOCC. August 2004
- Waldron Island Community Outreach Meeting. November 2004
- NWSC MPA Mangers Work Session. November 2004
- Deer Harbor, Orcas Island Community Outreach Meeting. November 2004
- Power Squadron. December 2004
- Marine Science Lecture Series hosted by the SeaDoc society and the San Juan Nature Institute. February 2005
- Roche Harbor Salmon Fishing Derby. February 2005.
- Board of County Commissioners (BOCC). February 2005
- Puget Sound Georgia Basin Research Conference. March 2005
- Eastsound, Orcas Community Outreach Meeting. April 2005
- Shaw Island Community Outreach Meeting. May 2005
- Anacortes Swap Meet/Opening day at the Flounder Bay/Sky Line Yacht Club. May 2005
- Roche Harbor Bayliner Rendezvous. June 2005
- Rotary Club. June 2005
- Environmental fair on Orcas Island. June 2005

(This Page Intentionally Left Blank)

APPENDIX B.2 MSA planning workshops, worksessions, and meetings spring 2005 – 2007

Table a. List of MSA planning meetings, workshops and worksessions

Date	Type of meeting	Topic(s)
April 20, 2005	MRC	Discussion of draft targets
April 20, 2005	Science Subcommittee	Discussion of Five-S process design
May 4, 2005	MRC	Five-S briefing
May 18, 2005	MRC	Five-S briefing & feedback
June 1, 2005	MRC	Five-S process design briefing
June 6, 2005	Core Team	Five-S training w/Betsy
June 7, 2005	Core Team	Five-S training w/Betsy
June 14, 2005	Core Team + interested MRC	Technical Panel Workshop
June 15, 2005	MRC	Tech Panel workshop results; planning process discussion
July 6, 2005	MRC	Brief discussion of MOU
July 20, 2005	MRC	Worksession: Target selection
August 2, 2005	Core Team	Mtg with Terry Williams
August 3, 2005	MRC	Briefing/update
August 27, 2005	NW Straits	Briefing on Five-S
September 22, 2005	Core Team	Review Technical Panel member comments on target selection; October workshop planning.
September 27, 2005	Core & experts on rocky habitats	Rocky habitats viability analysis
October 5, 2005	MRC	Worksession/update
October 5, 2005	Core Team	Review viability analysis; finalize October workshop agenda
October 19, 2005	MRC	Worksession - review viability analysis for workshop
October 20-21, 2005	Core Team + interested MRC	Stakeholder Workshop
November 2, 2005	MRC	Worksession: discuss results of stakeholder workshop
November 16, 2005	MRC	Worksession - complete rockfish situation analysis
December 7, 2005	MRC	Short worksession - review workshop targets
December 7, 2005	Core Team	Workbook demonstration; discussion of workshop threat analysis
January 4, 2006	MRC	Status update
January 4, 2006	Core Team	Planning session for marine managers meeting; Five-S next steps
January 30-31, 2006	Blitz - Core Team	Biodiversity target viability and stress-source analyses
February 1, 2006	MRC	Status update
February 15, 2006	MRC	Worksession: update on & review of biodiversity targets viability assessment
February 15, 2006	Core Team	Blitz results; continue biodiversity targets viability & threat assessments
February 27, 2006	Core Team - conference call	Finalize biodiversity viability analysis and review stress-source for nearshore targets
March 1, 2006	MRC	Worksession: human benefits (socio-cultural) targets

Date	Type of meeting	Topic(s)
March 1, 2006	Core Team	Review threat assessment; prep. for marine managers workshop
March 7, 2006	Ad-hoc Socio-cultural targets team	Viability analysis for socio-cultural targets
March 13-14, 2006	MRC + marine managers worksession	Strategies development and opportunities for implementation
April 25, 2006	Core Team - conference call	Review marine mammal and seabird threat assessments
May 3, 2006	Science Subcommittee	Discuss technical review
May 10, 2006	Blitz - Ad-hoc Socio-cultural targets team	Socio-cultural targets "blitz" worksession: viability & threat assessments
June 12, 2006	Core Team	GIS component
June 21, 2006	MRC	Update on Blitz results
June 21, 2006	Core Team	Review socio-cultural target viability & threat assessments
July 5, 2006	MRC	Worksession: situation assessments
July 5, 2006	Core Team	Work on objectives, socio-cultural viability & threat assessments; replacing Kirsten
July 13, 2006	Core Team conference call	Work on objectives
July 19, 2006	MRC	Worksession: situation assessments
July 19, 2006	Core Team	Work on objectives
August 3, 2006	Core Team worksession	Work on objectives
August 16, 2006	MRC	Brief worksession: objectives
August 16, 2006	Core Team	Work on objectives; MSA planner transition
October 24, 2006	Strategies worksession	Develop draft strategies
November 15, 2006	MRC	Adopt draft strategies
March 24, 2007	Public Workshop on Shaw Island	Public review of draft strategies
April 7, 2007	Public Workshop on San Juan Island	Public review of draft strategies
April 14, 2007	Public Workshop on Lopez Island	Public review of draft strategies
April 21, 2007	Public Workshop on Orcas Island	Public review of draft strategies
May 14 -15, 2007	MRC + marine managers worksession	Review strategies and identify opportunities for implementation
June 20, 2007	MRC	Vote on the Final MSA Plan
July 17, 2007	MRC presentation to the San Juan County Council	Presentation of the final plan for adoption.

B.3 Report: Public and Marine Managers' Review of the San Juan County Marine Stewardship Area Plan

This report, prepared by the Norton-Arnold Company, covers the four community meetings and the marine managers' workshop held March – May 2007.

(This Page Intentionally Left Blank)

Report: Public and Marine Managers' Review of the San Juan County Marine Stewardship Area Plan

Introduction

This report provides the results of four community meetings held in March and April 2007 to review the Marine Stewardship Area (MSA) Plan for the San Juan Islands. The report identifies and discusses the protection and restoration strategies receiving the highest degree of support from the approximately 220 San Juan County residents who participated in meetings on Shaw, San Juan, Lopez and Orcas Islands. This report also summarizes the perspectives and findings of federal, tribal, state, county agencies and non-governmental organizations who met in May 2007 at the Marine Managers' Workshop to review the MSA plan.

The high level of attendance at the community workshops indicates a high degree of concern about the health of the County's marine environment. Some participants attended more than one workshop and a number provided their own transportation from islands not served by ferry. Participants, particularly at the Shaw and Orcas workshops, treated the workshop as a gathering of the community to the point of providing music by Island musicians. Almost the entire adult population of Waldron participated in the Shaw Island meeting. Even with the workshop with the smallest attendance, which was Lopez Island with approximately 33, had a Marine Resources Committee (MRC) member noting, "This is the largest attendance we have ever had for an MRC event."

Clearly, participants, as demonstrated by the large turn out and the number, variety and intensity of their comments, regard the County's marine resources as valuable in and of themselves and as contributing to the quality of their lives. To them, these resources are much more than abstractions in management plans.

Facilitator's Recommendations

Given the high level of citizens' concern and involvement demonstrated in the community workshops, San Juan County, and federal, tribal and state agencies and non-governmental organizations have the opportunity and responsibility to initiate significant positive change in the County's marine environment. We recommend implementation of the six strategies the MRC describes in its report to the San Juan County Council (to which this report is Appendix B). In addition, based on the information and perspectives offered in our interviews

Contents

Appendices

with 20 stakeholders and our facilitation of the community and marine managers meeting we recommend the following:

Take advantage of the widespread, vital public concern and local knowledge about the health of San Juan County's marine environment. County residents across the political spectrum are united in their concern about the future of the Islands' marine resources and in their dismay at the declines they have witnessed in the last 30 years specifically in herring, salmon and seabirds. As one of those interviewed said, "If you asked everyone in the County to stand on their head and spin for 24 hours if it would restore the health of the Islands' marine environment, everyone would do it."

The Marine Resources Committee and the County should respond vigorously and specifically to citizens' interest in participating in the stewardship of San Juan County's marine resources. The MRC should provide technical and other support for citizen-science initiatives such as the plankton sampling being conducted by Waldron Island residents. Water quality monitoring would benefit from citizen involvement as would other field monitoring.

Begin and continue ecosystem monitoring that will establish a baseline understanding of water quality, habitat conditions (specifically in relation to seagrasses and forage fish spawning) and wildlife status and trends (specifically Western Grebes and Common Murres). Calibrate precisely the characteristics of healthful marine water in the archipelago. (One of those interviewed said that the first order of business is to quantify what constitutes healthy marine water to establish a baseline with which to compare conditions in the MSA.) Involve citizens in and continue to work with the Friday Harbor Labs on ecosystem monitoring.

Continue to find innovative ways to inform and educate residents and visitors about the County's marine resources and their stewardship. Support the education of an expanded corps of Beach Watchers, and make use of Beach Watchers in outreach to the public.

Do more to quantify the economic value of the County's marine resources. Quantify the link between the County's economic vitality and a healthy marine environment. Engage the business, real estate and development communities in a realistic, frank, practical, scientifically sound discussion of opportunities for mutual benefit.

Through MRC and County communication and involvement, make managers of agencies, particularly Washington Department of Fish and Wildlife, directly aware of the consequences of agency decisions on the ability of County residents to enjoy and to sustain themselves with the County's marine resources. These resources play a vital role in many Islanders' lives. Involve agency managers in MRC meetings.

Make the MRC more inclusive. Secure the participation of a representative from Lopez Island. Meet on islands other than San Juan.

Offer incentives to encourage "green" landscape management and development practices particularly in relation to shoreline management. Economic and professional opportunities await enterprising individuals willing to pioneer a green approach to landscape management in the Islands.

Anecdotal reports indicate that no-harvest zones are effective in increasing the size and abundance of ling cod. Consider instituting additional no-harvest zones for

We Can't Continue Business As Usual

"In coming across President Channel from Waldron to attend this meeting (on Orcas) we observed 35 to 40 seabirds. This is a catastrophic decline in numbers at this time of year from 20 years ago. This great loss is correlated with growth in the County. The County Council needs to know that we can't continue business as usual."

Shaw and Waldron Island participants registering their votes on the polling boards.

other ground fish. Use the results of analyses of the new no-harvest zone around Yellow Island in making decisions concerning salmon and groundfish harvest.

Take seriously the signals that seabirds and herring are sending about the health of the marine environment in northern Puget Sound. Direct MRC, County and agency resources to protect and restore species and environments (e.g. benthic invertebrates, herring and seagrass beds) at the base of the food web.

Conduct a scientifically sound, public review of seal and sea lion management.

Community Workshop Overview

The purpose of the community workshops was a thorough public review of the MSA Plan developed by the San Juan County Marine Resources Committee.

The meetings were preceded by interviews with 20 San Juan County residents and tribal representatives. These interviews identified issues, concerns and questions that helped structure the community meetings. Observations from these interviews appear throughout this report. The interviews, particularly with San Juan County residents of long standing, also helped describe an environmental baseline and context for the protection strategies, which were the meetings' focus.

We organized the community workshops to enable thorough consideration of strategies identified in the Plan to protect and restore key species, critical habitats and human values indicative of a healthy marine ecosystem. We sought comment on the following topics:

- *Enjoyment of the marine environment and thriving marine-based livelihoods*
- *Cultural traditions: ceremonial, subsistence, sustenance and spiritual uses and aspects*
- *Seabirds*
- *Pacific salmon*
- *Rockfish, lingcod and greenling*
- *Habitat*
- *Water quality*
- *Marine mammals*

Participants registered their perspectives on each of these groups of strategies to protect and restore the County's marine resources by:

- *Discussing their views with MRC members and other knowledgeable discussion leaders who served as "topic leads" at each of eight "listening posts" at the community workshops*
- *Using the discussion guides to write additional strategies and to rank strategies in order of priority within specific topics*
- *Registering their views about which strategies would be most likely to be supported by the community*
- *Ranking strategies in order of priority across all topics*

Demonstrate the links between Economic Prosperity and a Healthy Marine Environment

"Unless we enlist the support of realtors, developers and investors, we cannot hope to succeed using voluntary (stewardship) measures." Hire an economist to show developers, builders, merchants, tour boat operators why it makes economic sense to restore the marine environment. Demonstrate the links between economic prosperity and a healthy marine environment.

Stewardship Makes Sense

"Good stewardship enhances our property values and economy." "Ownership is linked to a willingness to act."

The Past Should be our Guide

One participant remembers bays in the San Juans in the 70's being "black" with juvenile herring. This participant recalls flocks of Western Grebes covering 40 to 50 acres, and being joined on the water in the fall by thousands and thousands of Common Murres. Another participant remembered Friday Harbor being "plugged" with "firecracker" herring.

Marine Resources Committee member David Loyd operating the Waldron Island freight boat.

- *Offering their observations about themes and findings after reviewing all the information at the conclusion of a meeting.*

This report's appendices offer a complete transcript of participants' comments as well as the results of polling concerning the plan's strategies to protect and restore the County's marine resources. Please review the sample discussion guide in the appendix to see the range of ways participants could register their views.

Promote Sustainability

"The best way to protect the quality of a natural resource is to build an economic activity around it."

Results of Polling Concerning Strategies

Distinct levels of support for strategies emerged as a result of the discussions at the community workshops. Participants registered their support for particular strategies through green dot/red dot polling, or voting, near the conclusion of each meeting. (Each participant was given 10 green dots and three red dots. Green dots indicated support for a strategy; red, opposition to or reservations about a strategy. Participants could vote with as many of their green dots as they wished, in any number from 1 to 10, and their red from 1 to 3. In other words, participants could choose to put all of their dots, green or red, on any one strategy if they felt very strongly about it, or they could vote on 10 strategies with one green dot each to spread their support.) Reflecting the level of support each strategy received, the following sections organize groups of strategies into tiers. Each tier represents a distinct break point in the vote tally. For example, the first and second ranked strategies received 101 and 93 votes respectively while the third ranked strategy received 56 votes, showing a clear break point in the vote total. A total of 1,203 votes were cast. Not all participants used all of their votes, saying, for example, that there were no strategies they opposed.

Tier 1

The following two strategies received the highest degree of participants' endorsement at all of the community meetings. The table ***Strategy Polling Results*** in this report's appendix gives the total votes for all strategies for all four community workshops.

Strategies are listed in ***bold italics***.

Top ranked strategy***: Foster projects that educate and engage the public (seasonal and year-round residents) in stewardship of the County's marine environment.***

Polling results show that education and public involvement are high priorities for San Juan Islanders. Participants recommended, among other initiatives:

The development of clear stewardship messages for use on ferries, in news and feature articles, in agency communications and elsewhere

A "Marine Steward" program in schools

More Beach Watcher – type education and use of Beach Watchers as educators

More education about "green" landscaping options and professional opportunities

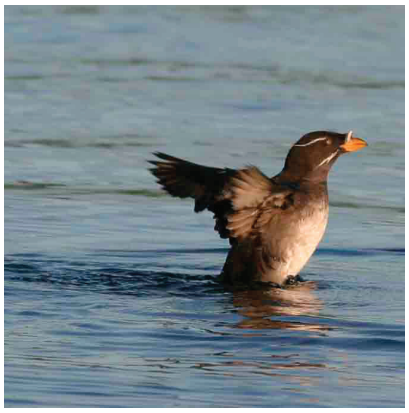
More information exchange with realtors, boat owners, land owners and developers

Participants enjoy some music after the Shaw Island meeting.

Education for shoreline landowners to encourage sustainable practices such as "soft shore" management and eelgrass protection

Working with businesses and quantifying the link between the Islands' economic and ecological health.

Participants requested support for community-based stewardship and data-gathering projects such as the plankton surveys being conducted by Waldron Island residents. Participants endorsed citizen science, both for the benefit it brings of more current data gathered more widely and also for the connection it enables citizens to make with the marine environment.



Participants in interviews and community meetings expressed concern about significant declines in sea bird populations in the San Juan Islands since the 1970s.

Second ranked strategy***: Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat and water quality.***

Some participants emphasized the value of greater care with the upland application of herbicides and pesticides. Some advocated the provision of public financial support to repair failing septic systems. Others noted the long-term value of the designation, and in some cases, the public acquisition of critical habitats. Some participants recommended that the community protect habitat by offering incentives for innovative development practices that reduce impacts to nearshore habitat. Low-impact development to reduce stormwater run-off and "soft-shore" alternatives to replace hard armoring of shorelines were offered as examples.

The strategies in this table received the highest level of support from participants at the four community workshops. The table shows the strategies listed by category, strategy number, and also which marine resources are protected by the strategy.

Polling Results All Islands Tier 1 Strategies	Category	Strategy #	Protection strategies	Marine resource(s) protected by strategy	# of Votes	% of total votes (1203)
	Stewardship & Education	23	Foster projects that educate and engage the public (seasonal and year round residents) in marine stewardship	Enjoyment/Livelihoods, Cultural Traditions, Habitat, Water Quality, Seabirds, Salmon, Rockfish, Lingcod and Greenling	101	8%
	Protect Habitat	8	Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat & water quality.	Habitat, Water Quality, Salmon, Rockfish, Lingcod and Greenling	93	8%

Tier 2

Meeting participants supported the following strategies, listed here in order of priority, consistently but to a lesser degree than those in Tier 1. Tier 2 encompassed strategies that received from 56 to 41 votes.

Preserve and increase public access to natural shorelines and marine views, coupled with a strong stewardship message and compatible behavior expectations.

Managers' discussion also centered on the challenge of connecting people with the natural environment while at the same time protecting resources from overuse and degradation.

Where consistent with sustainability, promote harvest opportunities in the San Juan Islands and the preservation and development of infrastructure so that as much as possible of the associated economic benefit is local.

This strategy was the subject of considerable discussion both at the community workshops and the Marine Managers' meeting. Some citizens and managers pointed out that people will more actively advocate for resources, particularly fish and wildlife, that they are able to harvest or to which they otherwise have access. One participant observed: "The best way to protect the quality of a natural resource is to build an economic activity around it." Other participants countered with the concern that declining populations of fish species required their protection from harvest. This divergence of perspective is demonstrated by the fact that the strategy receiving the next highest vote total calls for suspending direct harvest of selected species.

Suspend direct harvest of select species until recovery goals are met.

Participants endorsed this measure particularly in relation to rockfish. Although some participants opposed harvest bans, others across the political spectrum supported this approach. One of the stakeholders interviewed said, in essence: *Between about 1920 and 1960 we "clearcut" the San Juans' marine environment. And now, through continuing harvest, we are not allowing Mother Nature to replenish herself.*

Implement the local salmon recovery plan.

Participants noted the importance of coordinating local salmon recovery with regional efforts because many salmon stocks found in the Marine Stewardship Area are in transit through the San Juans.

Protect and restore spawning habitats for forage fish.

Participants recommended education on the value of forage fish as fundamental to the food web coupled with promotion of best management practices (BMPs) for identifying and protecting forage fish spawning habitat on privately owned beaches.

Support regional herring recovery.

Common and abundant up until the 1970s, herring balls were frequently recalled in interviews and in the discussion at community meetings. One of those interviewed remembers bays in the San Juans in the 70's being "black" with juvenile herring. This County resident recalls flocks of Western Grebes covering 40 to 50 acres, and being joined on the water in the fall by thousands and thousands of Common Murres. Another interview respondent remembers Friday Harbor being "plugged" with "firecracker" herring.

Share Information

Centralize and provide access to data, maps and other information about San Juan County's marine environment.

Promote and adopt innovative development practices such as low impact development, green building and smart growth to reduce harm to the environment.

In supporting this strategy, participants saw economic and professional as well as environmental benefits. Providing innovative products and services will benefit enterprising individuals and the nearshore and marine environments.

Reduce risk and improve response to oil spills.

Participants were concerned not only with the harmful effects of chronic small oil spills but with the catastrophic results of a large spill. One participant described the worst case scenario of a tanker losing its rudder and running aground in Haro Strait. Participants recommended that the County prepare to respond to a major oil spill, and the stationing of a rescue tug in the Strait of Juan de Fuca.

Elephant seals rely on the MSA's marine and terrestrial habitats.

Work with federal, state and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow reliable commercial, recreational and sustenance harvest in the San Juan Islands.

County residents participating in interviews and community meetings feel strongly that resource management agencies must be aware of the consequences of decisions, particularly those governing harvest. Many participants believe that over-harvesting of marine life, from herring to sea urchins has dramatically, and some fear irreversibly, depleted populations of species that County residents prize for sustenance and recreation. (One participant summed up the motivation for his participation in the Orcas community workshop by saying, "I'm here on behalf of my stomach.") During their meeting on May 14 and 15 marine managers discussed collaborative management of marine resources in the San Juans.

Minimize chronic pollution from land and marine sources.

This strategy reflects participants' strong support for better managing upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat and water quality. It also registers participants' concern about persistent bioaccumulative toxins in the marine, and human, food chain.

The following table provides the order of priority and vote totals for Tier 2 strategies.

	Category	#	Protection strategies	Marine resource(s) protected by strategy	# of Votes	% of total votes
	Improve Public Access To Beaches	36	Preserve and increase public access to natural shorelines and marine views, coupled with a strong stewardship message and compatible behavior expectations.	Enjoyment/Livelihoods	56	5%
	Protect Fish	17	Where consistent with sustainability, promote harvest opportunities in the San Juan Islands and the preservation and development of infrastructure so that as much as possible of the associated economic benefit is local.	Enjoyment/Livelihoods	52	4%
	Protect Fish	13	Suspend direct harvest of select species until recovery goals are met.	Rockfish, Lingcod and Greenling	50	4%

	Category	#	Protection strategies	Marine resource(s) protected by strategy	# of Votes	% of total votes
Polling Results – All Islands Tier 2 Strategies	Protect the Food Web	21	Protect and restore spawning habitat for forage fish.	Seabirds, Salmon, Marine Mammals	49	4%
	Stewardship & Education	27	Promote and adopt innovative development practices such as low impact development, green building, and smart growth to reduce harm to the environment.	Habitat	48	4%
	Prevent Pollution	1	Reduce risk and improve response to oil spills.	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling	48	4%
	Protect the Food Web	22	Support regional herring recovery efforts.	Seabirds, Salmon, Marine Mammals	44	4%
	Protect Fish	16	Work with federal, state, and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow reliable commercial, recreational, and sustenance harvest in the San Juan Islands.	Enjoyment/Livelihoods	42	3%
	Prevent Pollution	2	Minimize chronic pollution from land and marine sources (medium spills and chronic events such as bilge pumping and fuel spills).	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling,	41	3%

Tier 3

MRC members believed it important to identify those strategies with relatively less support from the public. While not the least supported strategies, (votes for which are tallied in the Strategy Polling table) Tier 3 strategies received between 36 and 30 votes. Strategies not grouped in Tiers 1, 2 and 3 received fewer than 30 votes.

The County and its citizens do their part to reduce greenhouse gas emissions.

Participants noted that this directive includes the need for the County to plan and prepare for the impacts of sea-level rise on marine habitat and species. Some participants, however, believe that this strategy is outside of the purview of the MRC.

Improve Understanding of Seagrasses

Participants emphasized the importance of taking care of the lower levels of the food chain in order to sustain marine life (seabirds, ground fish, salmon, Orca) at the upper levels. This concern was expressed in the admonition to protect and restore benthic, nearshore and spawning habitats.

Provide education and outreach on the importance of nearshore habitat and best marine uses/ shoreline practices to protect it.

Participants endorsed involving and informing the public through events such as "clam-ins" to highlight maintaining the health of County shorelines and locally-grown seafood. Participants supported education on the value of eelgrass linked with BMPs that stress minimizing docks and anchorages. Also supported was

outreach to convey BMPs to reduce nutrient and sediment laden run-off from upland activities.

Remove derelict fishing gear.

Participants expressed concern about fishing nets and crab pots made with non-biodegradable synthetic materials that continue to catch and kill fish and crabs long after the nets and pots are no longer retrievable. One participant also noted the importance of eliminating the sale and use of illegal fishing gear in the San Juan County MSA.

Reduce disturbance (of marine mammals) from vessels.

Participants recommended land-based whale watching. Some participants advocated initiating zones free of motorized vessels and delineating travel lanes for them. Others advocated returning to a wind-powered fishing fleet.

The following table provides the order of priority and vote totals for Tier 3 strategies.

	Category	Strategy #	Protection strategies	Marine resource(s) protected by strategy	# of Votes	% of votes
Polling Results – All Islands Tier 3 Strategies	Address Climate Change	34	The County and its citizens do their part to reduce greenhouse gas emissions. The County plans for sea level rise and other climate change affects.	Habitat, Seabirds, Rockfish, Lingcod and Greenling, Salmon, Marine Mammals	36	3%
	Protect Habitat	9	Improve understanding of sea grasses (such as eelgrass) & environmental conditions causing its loss to protect and restore it.	Habitat	33	3%
	Stewardship & Education	26	Provide education and outreach on the importance of nearshore habitat and best marine uses/shoreline practices to protect it.	Habitat, Salmon	32	3%
	Protect Fish	15	Implement local salmon recovery plan (i.e., research to find how much salmon use the San Juan marine environment, conduct habitat protection and restoration projects, and improve hatchery and harvest management).	Salmon, Habitat, Marine Mammals	31	3%
	Remove Derelict Fishing Gear	38	Remove derelict fishing gear.	Seabirds, Salmon, Rockfish, Lingcod and Greenling, Marine Mammals	30	2%
	Protect Marine Mammals	20	Reduce disturbance from vessels.	Marine Mammals	30	2%

Representative Recommendations and Conclusions

After engaging in discussions and considering the perspectives presented at the community meetings, participants were asked, in summarizing the "sense of the group", what messages they would like to convey to the Marine Resources Committee and the San Juan County Council. Participants offered the following:

"Unless we enlist the support of realtors, developers and investors, we cannot hope to succeed using voluntary (stewardship) measures." Hire an economist to show developers, builders, merchants, and tour boat operators why it makes economic sense to restore the marine environment. Demonstrate the links between economic prosperity and a healthy marine environment. "Good stewardship enhances our property values and economy."

"Align protection with livelihood."

"Ownership is linked to a willingness to act."

Address the lack of baseline data on water quality, habitat, and wildlife population status and trends. Initiate, fund and support long-term ecosystem monitoring. Provide meaningful opportunities for citizen participation in data gathering. Centralize and provide access to data, maps and other information about San Juan County's marine environment.

Provide opportunities at various levels for community and individual involvement in active stewardship of the environment.

Harmonize the county's tax structure with the MSA vision. Integrate MSA strategies into the County's tax structure. For example, make it easier to establish a shellfish bed than a large retail market. Align the County's policies and procedures with the goals and objectives of the MSA.

"Education should always precede voluntary efforts or regulation." Provide more Beach Watcher-type education. Make greater use of Beach Watchers in engaging and informing the public.

Support the development of the Friday Harbor Labs into a national center for marine research and employment like the Monterey Aquarium and research center.

"Freshwater supports all the other resources of the islands. It is critical that it be managed effectively."

"In coming across President Channel from Waldron to attend this meeting (on Orcas) we observed 35 to 40 seabirds. This is a catastrophic decline in numbers at this time of year from 20 years ago. This great loss is correlated with growth in the County. The County Council needs to know that we can't continue business as usual."

Orcas in the San Juan marine stewardship area with Mt. Baker in the background.

Marine Managers Workshop

The community meetings were followed, on May 14 and 15, 2007, by a workshop with managers of federal, tribal, state and county agencies and non-governmental organizations (NGOs) with responsibility for land or water conservation and management in the San Juan archipelago.

Tables in the appendix to this report summarize:

the managers' ranking, in order of priority, strategies for the MSA draft plan

agency/NGO mandates, plans and opportunities for partnership.

Of note was the managers' concurrence with community participants in designating, as highest priority, the following two strategies:

Foster projects that educate and engage the public (seasonal and year-round residents) in stewardship of the County's marine environment.

In addition to their responsibilities for scientific assessment and compliance with regulations, many of the agencies and organizations represented at the workshop are responsible for informing and serving the public.

Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat and water quality.

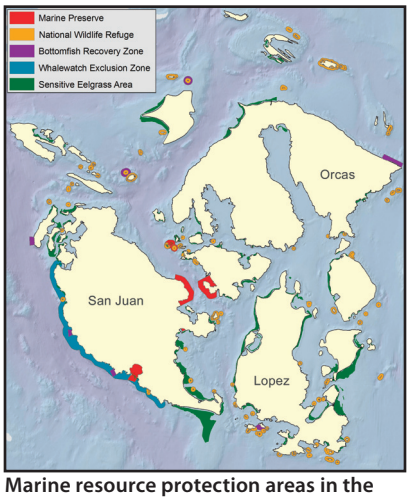
Marine managers concurred with the public's view, expressed in the community workshops, that the health of the upland environment contributes directly to the health of the marine environment.

The managers discussed at length the following strategy ranked third in priority by both managers and community participants:

Preserve and increase public access to natural shorelines and marine views, coupled with a strong stewardship message and compatible behavior expectations.

While acknowledging the importance of public access to natural shorelines, managers were concerned about protecting biodiversity and other natural values potentially damaged by too much or careless use. The managers recommended coordination among agencies to provide access in ways that protected shorelines' physical features and biodiversity.

The appendix of the report includes a summary of the Marine Managers' discussion and recommendations.



Marine resource protection areas in the San Juans.

Marine Managers' Conclusions

To direct the meeting's concluding discussion, the facilitator posted the 17 strategies ranked highest at the community meetings. Each manager responded in writing to each strategy in terms of these points:

We are doing….
We are planning to do…
We need partners to do…

The appendix of this report summarizes the outcome of this work. An immediate result was the agreement of federal, tribal, state, county and non-governmental marine managers to jointly consider the nomination of a site in the San Juan Archipelago for the State Department of Natural Resources Aquatic Reserve Program. This program protects state-owned aquatic lands through management plans for the conservation of habitat and species.

The managers agreed to meet more than once a year to identify, evaluate and undertake cooperative projects and programs in the San Juan County Marine Stewardship Area.

Appendices

Community Workshops Introduction

The following appendices document the comments and perspectives of participants in four community workshops held in March and April 2007 on Shaw, San Juan, Lopez and Orcas Islands. The purpose of the workshops was to review and discuss the San Juan County Marine Stewardship Area plan. Strategies to protect and restore the County's marine resources were organized, for discussion, according to the following "listening post" topics:

1. Enjoyment of the marine environment and thriving marine-based livelihoods
2. Cultural traditions: ceremonial, subsistence, sustenance and spiritual uses and aspects
3. Seabirds
4. Pacific salmon
5. Rockfish, lingcod and greenling
6. Habitat
7. Water quality
8. Marine mammals

Strategy Polling

The purpose of strategy polling was to determine which strategies, among all topics, were most important to participants. Participants voted on their top-ranked strategies using green and red dots. Each participant had 10 green and three red dots, which they could allocate to a strategy in any number they chose. Green dots indicated support for a strategy. Red indicated a participant's sense that the strategy was low priority, not supported by the community, an impediment to the stewardship of San Juan County's marine resources, or outside of the purview of the MRC. (The MRC instituted red dot voting after the Shaw meeting, so Shaw results reflect supporting votes only.)

Strategy Polling Results

			Shaw/Waldron	San Juan Island		Lopez Island		Orcas Island			
Category	**Protection Strategies**	**Marine Resource(s) Protected By Strategy**	Votes	Green Votes	Red Votes	Green Votes	Red Votes	Green Votes	Red Votes	Total Votes	% of votes
Stewardship & Education	Foster projects that educate and engage the public (seasonal and year round residents) in marine stewardship	Enjoyment/Livelihoods, Cultural Traditions, Habitat, Water Quality, Seabirds, Salmon, Rockfish, Lingcod and Greenling	46	12	0	9	0	34	0	101	8%
Protect Habitat	Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat & water quality.	Habitat, Water Quality, Salmon, Rockfish, Lingcod and Greenling	18	26	0	12	0	37	1	93	8%
Improve Public Access To Beaches	Preserve and increase public access to natural shorelines and marine views, coupled with a strong stewardship message and compatible behavior expectations.	Enjoyment/Livelihoods	1	13	0	4	0	38	0	56	5%
Protect Fish	Where consistent with sustainability, promote harvest opportunities in the San Juan Islands and the preservation and development of infrastructure so that as much as possible of the associated economic benefit is local.	Enjoyment/Livelihoods	9	8	0	2	8	33	6	52	4%
Protect Fish	Suspend direct harvest of select species until recovery goals are met.	Rockfish, Lingcod and Greenling	12	19	7	8	0	11	0	50	4%
Protect the Food Web	Protect and restore spawning habitat for forage fish.	Seabirds, Salmon, Marine Mammals	18	12	0	6	0	13	0	49	4%
Stewardship & Education	Promote and adopt innovative development practices such as low impact development, green building, and smart growth to reduce harm to the environment.	Habitat	4	10	1	4	0	30	0	48	4%
Prevent Pollution	Reduce risk and improve response to oil spills.	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling	22	2	0	8	0	16	0	48	4%
Protect the Food Web	Support regional herring recovery efforts.	Seabirds, Salmon, Marine Mammals	22	4	0	5	0	13	0	44	4%

Strategy Polling Results

Category	Protection Strategies	Marine Resource(s) Protected By Strategy	Shaw/Waldron			San Juan Island		Lopez Island		Orcas Island			
			Votes	Green Votes	Red Votes	Green Votes	Red Votes	Green Votes	Red Votes	Green Votes	Red Votes	Total Votes	% of votes
Protect Fish	Work with federal, state, and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow reliable commercial, recreational, and sustenance harvest in the San Juan Islands.	Enjoyment/Livelihoods	2	7	1	1	4	32	1	42	3%
Prevent Pollution	Minimize chronic pollution from land and marine sources (medium spills and chronic events such as bilge pumping and fuel spills).	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling,	17	1	0	4	0	19	0	41	3%
Address Climate Change	The County and its citizens do their part to reduce greenhouse gas emissions. The County plans for sea level rise and other climate change affects.	Habitat, Seabirds, Rockfish, Lingcod and Greenling, Salmon, Marine Mammals	8	12	9	5	3	11	4	36	3%
Protect Habitat	Improve understanding of sea grasses (such as eelgrass) & environmental conditions causing its loss to protect and restore it.	Habitat	6	11	0	6	1	10	0	33	3%
Stewardship & Education	Provide education and outreach on the importance of nearshore habitat and best marine uses/shoreline practices to protect it.	Habitat, Salmon	1	17	0		0	14	0	32	3%
Protect Fish	Implement local salmon recovery plan (i.e., research to find how much salmon use the San Juan marine environment, conduct habitat protection and restoration projects, and improve hatchery and harvest management).	Salmon, Habitat, Marine Mammals	7	6	0	5	0	13	0	31	3%
Remove Derelict Fishing Gear	Remove derelict fishing gear.	Seabirds, Salmon, Rockfish, Lingcod and Greenling, Marine Mammals	1	5	0	14	1	10	0	30	2%
Protect Marine Mammals	Reduce disturbance from vessels.	Marine Mammals	9	4	0	13	0	4	0	30	2%
Prevent Pollution	Support efforts to reduce toxins that accumulate in the food chain.	Enjoyment/Livelihoods, Cultural Traditions, Marine Mammals	3	6	0	5	0	13	0	27	2%
Protect Fish	Reduce bycatch of select species.	Rockfish, Lingcod and Greenling	1	1	0	6	0	18	0	26	2%
Coordination & Partnerships	Continue and build upon joint tribal-community events, such as hosting the tribal canoe groups when they pass through the San Juan Islands.	Cultural Traditions	3	6	2	1	1	16	0	26	2%
Prevent Pollution	Determine scope and nature of the water quality problem and develop implementation plan.	Water Quality	0	10	0	7	0	8	0	25	2%

Strategy Polling Results

Category	Protection Strategies	Marine Resource(s) Protected By Strategy	Shaw/Waldron			San Juan Island		Lopez Island		Orcas Island			
			Votes	Green Votes	Red Votes	Green Votes	Red Votes	Green Votes	Red Votes	Green Votes	Red Votes	Total Votes	% of votes
Transportation	Work with users, the County and port districts to develop criteria for facility siting (barge landings, marinas, docks, moorings) that balance the need for marine resource infrastructure with protection of ecosystem function.	Enjoyment/Livelihoods	0	10	0	2	0	13	0	25	2%
Stewardship & Education	Feature the work of local artists and poets, inspired by the islands' marine ecosystem, in stewardship messages	Enjoyment/Livelihoods	3	10	3	6	0	5	1	24	2%
Stewardship & Education	Develop a vision of a San Juan County economy based on sustainable marine-based livelihodds and a communication strategy to promote this.	Enjoyment/Livelihoods	2	7	1	5	0	9	1	23	2%
Prevent Pollution	Promote water quality protection through best management practices to keep toxins and pathogens out of seafood.	Enjoyment/Livelihoods, Water Quality	4	5	0	3	0	11	0	23	2%
Protect Habitat	Improve and coordinate incentives, regulations, enforcement and mitigation to better manage shoreline construction, bulkheads, docks and anchoring.	Habitat, Marine Mammals	5	4	2	8	0	6	4	23	2%
Protect Habitat	Improve understanding of kelp & the environmental conditions causing its loss to protect/restore it.	Habitat	3	7	0	2	0	10	0	22	2%
Prevent Pollution	Prevent pollution by product bans, incentives for substitutes, and better handling and disposal practices.	Water Quality	8	2	0	2	0	10	0	22	2%
Protect Fish	Educate public to understand the status and threats to rockfish, lingcod, and greenling and take ownership for recovery.	Rockfish, Lingcod and Greenling	7	5	0	1	0	8	0	21	2%
Protect Habitat	Minimize new bulkheads. Remove shoreline armoring—such as bulkheads, boat ramps, and docks (where appropriate). Educate and encourage shoreline landowners to choose soft shore treatments that do not harm the nearshore habitat.	Habitat, Salmon	1	4	0	7	0	8	6	20	2%
Coordination & Partnerships	Work with groups developing watershed management plans to include effects on the marine environment in those plans.	Enjoyment/Livelihoods	0	4	0	1	0	11	0	16	1%
Protect Seabirds	Reduce disturbance from humans.	Seabirds	3	3	2	3	0	5	0	14	1%
Coordination & Partnerships	Identify and engage key partners as active marine stewards.	Cultural Traditions	4	3	0	2	0	4	0	13	1%

Strategy Polling Results

Category	Protection Strategies	Marine Resource(s) Protected By Strategy	Shaw/Waldron			San Juan Island			Lopez Island			Orcas Island				
			Votes	Green Votes	Red Votes	Green Votes	Red Votes		Green Votes	Red Votes		Green Votes	Red Votes		Total Votes	% of votes
Protect Seabirds	Increase prey base for seabirds.	Seabirds	5	2	0		0		4	1		11	1%			
Coordination & Partnerships	Coordinate with regional habitat protection efforts.	Habitat	0	3	0	1	0		4	0		8	1%			
Coordination & Partnerships	Connect with regional salmon protection efforts.	Salmon, Habitat	0	2	0	2	0		3	0		7	1%			
Stewardship & Education	Identify and collaborate with existing marine stewardship voluntary programs to coordinate marine stewardship in the County.	Enjoyment/Livelihoods	1	2	1	1	0		3	0		7	1%			
Preserve Traditional/ Cultural	Support efforts to highlight traditional marine practices.	Cultural Traditions	0	1	0	1	0		2	0		4	0%			

Themes and Findings

After discussing the draft plan's strategies and registering their priorities through polling, participants offered the following observations and conclusions:

Shaw/Waldron Islands

- Everything is important
- Many strategies are inter-related
- Those that are vague/idealistic won't get done
- Too much reliance on bureaucracy
- Focus on education
  - Need to have say in how implemented
- Common theme: education
  - Active learning
  - Lean on local school boards to integrate into curriculum
- Lessen risk of oil spills (what is being done now?)
- Threat: no contingency plan for when a cargo ship loses power in storm
- Education effort focused to adults (residents/visitors) – "30 stewardship ideas"
  - Brochure on ferries & shops
  - Displays in shops
- Speed limits on boats
- Bicycle & walking paths reduce oil
- Education: combine w/arts, learn thru exposure to actual events
  - Instill some of "thrill" at environment

What can be done now?

- Education has to come before others, and will increase likelihood of other measures getting done
  - Videos on ferries – emphasize environment & how it is being degraded, & how it can be protected
  - Workshops on ferries
  - Focus on key things
  - Get behavior to change
- Economics – links "choir" to the rest of the population
  - Everyone subject to economics
  - Show that MSA plan will "pay off"
- Ought to do everything
- Cut off activities like labs dumping chemicals down the drain
- Alternative to bottom paint
  - Store boats on dry land
- If enforcement – should be a local presence
- Celebrate successes
  - Focus on positive
- Tourist bureau: needs to communicate expected behavior
- Use music to grab people to get them involved
- Concept of shared sacrifices can be a selling point
- A lot that we don't know about & that needs to be acknowledged in plan

San Juan Island

- High level of concern
- Answers aren't easy (e.g. pollution).
- Solutions may conflict.
- Education is important.
- Look for opportunities.

- Think outside the box.
- Promote green building and sustainable industries.
- MSA plan is a work in process, which will continue to incorporate input from citizens.
- Climate change
  - (red) hard for us (MRC) to do anything about it
  - (green) obligation to future generations to act
  - If we don't act as individuals, no one else will either.
- Learn from long-term residents and cultural traditional knowledge.
- Target newcomers and children with education.
- Use Beach Watchers.
- Engage development community – hire economist to demonstrate the links between economic prosperity and a healthy marine environment.

Lopez Island

- Engage citizens in data collection – citizen science connects people directly to marine resources.
- Timing of tourism coincides with important natural resource processes.
- Engage funders/marine managers in supporting grassroots efforts in the County.
- Define the impact of visitors and communicate their impact to them.
- Things are changing very quickly.
- Note differences among the islands – perhaps Lopez has already incorporated some cultural stewardship ideas.
- Ownership is linked to a willingness to act. Develop economic structure that emphasizes incentives for protection.
- We care and take protection seriously.
- Action: share information to broaden perspectives.
- We are willing to consider extreme/serious action.
- Address the lack of baseline data – water quality, habitat, etc.
- Educate broadly about individual responsibility followed by ownership and stewardship.
- Marine stewardship – work across islands – pan-county – How can we educate our community?
- Align protection with livelihood.
- Focus of green dots may be biased towards practical/timely.
- Focus on speaking from the heart.

Orcas Island

- With education and outreach, folks' opinions about strategies could change, so mark the priority of strategies as before and after education and outreach.
- The more education and outreach, the more willingness there will be to participate in stewardship.
- It's difficult to prioritize strategies because they are interconnected.
- It's important to create venues for "cross-pollination."
- Find ways to integrate MSA strategies into the County's tax structure, for example make it easier to establish a shellfish bed than a large retail market. Harmonize the County's tax structure with the MSA vision.
- Focus on messages that stewardship is for the improved economic, mental and physical health and benefit of the County.
- In coming across President Channel from Waldron to attend this meeting we observed 35 to 40 seabirds. This is a catastrophic decline in numbers at this time of year from 20 years ago. This great loss is correlated with growth in County. The County Council needs to know that we can't continue business as usual.
- Continue the conversation and collaboration begun at this meeting concerning MSA issues. Incorporate MSA strategies into San Juan County procedures and governance.
- This workshop inspires hope for the future.
- Shellfish aquaculture has great potential in the waters of San Juan County.
- Fresh water supports all the other resources of the islands. It is critical that it be managed effectively.
- Tap islands' vitality – kids. Choose "Stewards of the Month" at schools.
- Consider a stewardship tax.
- Develop a stewardship logo.
- Educate realtors.
- Encourage product "eco-branding." A big outreach effort is needed!

Listening Post Comments

Attendees discussed their views on these topics with Marine Resources Committee (MRC) members and other knowledgeable discussion leaders who served as Topic Leads at each of the eight listening posts. Each listening post brought together strategies from the Marine Stewardship Area (MSA) plan related to a particular topic such as water quality or seabirds. Meeting participants wrote the following comments either as responses to strategies already in the plan or as additional strategies. Participants wrote comments about existing strategies on "post-it" notes for display in the meeting rooms. Additional strategies were recorded in discussion guides on each of the eight topics. In addition, some attendees voted for some of these comments and strategies as high priorities during the meetings' polling. The following transcript notes these votes.

Enjoyment and Thriving Livelihoods

Shaw/Waldron Islands

Post-It Comments

- MRC takes on promotional role for local sea foods.
- Create market demand for SJC marine products through marketing "spin" e.g. the "copper river" salmon phenomenon.
- How do we know when we have a variety of sustainable marine-based livelihoods?
- Put survival and increase of sea life above our desire to harvest; allow harvesting, but at lower levels.
- Fishing is not a sport. All recreational fishing done from human powered or electric boats.
- Actions for communication strategies: (examples)
  - Use local media effectively
  - Work in the schools
  - Support local artists and poets
- Public access to shoreline is subject to stewardship.
- Access and prepare for rising sea levels and impacts on ecosystem as a whole including human economies/harvest.
- More value-added seafood products.
- Consider including SJC/Salish Sea Economy/Ecology as a high school course taught in public schools.
- Encourage local youth to develop strong sense of place through stories/folklore and use.
- Encourage local youth to pursue sustainable marine based livelihoods.
- Provide interactive learning opportunities for school children to participate and learn about the marine environment. Ideally do it K-12.
- Enforce San Juan County Nuclear Weapon Free Zone. Radiation kills marine life too.
- With a positive integrated foreseeable economic outcome, all of the potential outcomes should rate 4 or 5.

Discussion Guide Comments

- New good rules, regulations, and enforcement.
- Create institutional mechanisms to give MRC and its base of local info a key role in setting sustainable fish levels.
- Have Nature Conservancy, Land Trusts play vanguard role in habitat management and coming up with good rules.
- Encourage residential and commercial sites to collect rainwater on site in storage to manage for storm events, rationing for salmonid habitat inland, natural disaster prep, on site gardening use.
- Incorporate a habitat rating for each property tax assessment, and excellent habitat. Receive a lower tax assessment than properties that have adverse impacts.
- Many of these strategies are rather fuzzy -- too much motherhood and apple pie.
- I like #6 for finfish and wild harvest, but I'm leery of more shell-fish farming. Privatizing the commons for someone's profit is very different from harvest that doesn't take over an area.
- Sustenance fishing and crabbing is very important to the citizens. The resources must be shared more equitably with commercial fishing. Citizens need to be out harvesting - it's a huge part of stewardship of the environment.
- Regarding #1: if "marine based" includes tourism, then it's a poor idea. "Sustainable" is not possible with fisheries and current population. Regarding #4: marine transportation needs to be controlled. How many boats are too many? Regarding #5: Not all these things can be done. Recreational should be very restricted, commercial next, sustenance should be favored. Regarding #7: We have much shoreline. Have a moratorium on all waterfront building. Regarding #8: of course. Regarding #9: begin a buy-back program for waterfront. Regarding #10, nice idea, but low priority.

Enjoyment and Thriving Livelihoods (cont.)

- Close all bottom fisheries for 10 years.
- Set goal to remove all waterfront homes through attrition.
- Put survival and increase of sea life above our desire to harvest; allow harvesting, but at lower levels.
- Too many to evaluate.
- Promote idea that part of human experience is to be an activist steward wherever one lives, express love of place for all who live on this good earth!
- Ban all boats except sailboats and human powered craft. No noise for the marine creatures. Quieter even for people.
- Does the public want things to work and not just be?
- Regarding #4: hard sell to people wanting docks! Regarding #7: another hard sell to laypersons. Regarding #8: a lot more.
- Education is necessary in order to gain support.
- Support is generally broad based. There are a lot of cultural groups who have a stake.
- Regarding #6: this may have dubious legality.
- Write lots of feature articles raising environmental I.Q. so all will be a 5.
- Regarding #1-5: with education.

San Juan Island

Post-It Comments

- Support Friday Harbor Labs in becoming a center, like Monterey Bay Aquarium, for research and research jobs.
- Expand the purview of F.H. Lab research to focus on red tide analysis and other practical issues – not only "arcane" subjects
- Support the growth of the Friday Harbor Labs in high-tech research.
- Open private tidelands to everyone and have owners enhance them. (1 green dot)
- Restore clam gardens, (e.g. Reid Harbor; West Sound).
- Make seaweed culture legal.
- Used to be a thriving fishing fleet 23 years ago; now it's not here.
- Allow for sufficient access for freight e.g. barge landings. (1 green dot)
- Should support land-based whale watching (access, etc., presentations)
- Property rights need to be compromised to control invasive species.
- Eliminate motorized recreational vessels (2 red dots) (2 green dots)
- Identify and educate concerning the effects of global warming on local fishing interests. (2 green dots)

Discussion Guide Comments

- Ban WDFW from San Juan County.
- Mandate restoration of clam gardens.
- Stop all commercial invertebrate harvest.
- Promote extractive aquaculture (seaweed farms).
- Inform and employ WSU Beach Watchers more.
- Discontinue fishing derbies.
- Get rid of fishing derbies!
- Education is key.
- Regarding #1-5: if you include realtors and developers, 1 if you don't. Regarding #2: marine stewardship is a project! Regarding #3: neutral - it depends on the programs. Regarding #4: use same rules applicable to a fresh water reservoir. Regarding #5: 3, but with incentives, 4 or 5. Regarding #6: this must be very carefully done, due to federal constitutional constraints. Regarding #7: neutral. Regarding #8: these rules need to be applied inland too. Regarding #9: But may require enforcement to balance increased vulnerability. Regarding #10: Have an annual song contest.
- Regarding #4-6: public support must include tribes and businesses.

Lopez Island

Post-It Comments

- Ban fishing derbies; support subsistence harvest.
- Establish a biodiesel plant using seal and dogfish oil.

Enjoyment and Thriving Livelihoods (cont.)

- Encourage the local marketing and consumption of local commercially caught seafood.
- Encourage local youth to engage in and pursue marine based livelihoods.
- Use San Juan County (SJC) fisheries to benefit local communities.
- Educate islanders about local seafood options.
- Conduct a comprehensive value-based assessment with residents of and visitors to SJC that identifies benefits, values and life outcomes which can be prioritized. Identify common values and recognize/acknowledge areas of autonomy. Incorporate the results of this assessment into SJC Comprehensive Plan and manage for these values.
- Educate locals (part-timers and full-timers) about the possible impacts of pesticides/herbicides they use on their gardens on the fisheries industry (the fish they eat).
- Systematically monitor pesticide/herbicide residue run-off from uplands.

Discussion Guide Comments

- Eliminate all fishing derbies and support subsistence fishing.

Orcas Island

Post-It Comments

- Have MRC meetings on islands other than San Juan. Meet on the ferries.
- The power and effectiveness of neighborhood education
- The runoff of petroleum into Eastsound is causing the flesh of clams to become gray. Ban outboards in bays.
- The Washington Department of Health provides regular updates of shellfish health on line at www.wa.doh.gov.
- Shellfish testing is conducted by
  - State
  - Shellfish farms
  - Individual owners
- Have the newspaper publicize the weekly results of shellfish testing.
- We are not conserving or preserving for a living museum. We are reestablishing and confirming an ecologically rich and economically vital community.
- "The best way to protect a resource is to create a viable economic activity around it."
- Limited public and private access to shellfish areas
- Support environmentally conscious business owners.
- DNR maps of public beaches?
- How to deal with the "tragedy of the commons" and the harvesting of protected species
- We need formalized education from providers. Networks need to be linked.
- Local landowners put land, specifically waterfront, in County "management area" for information and access
- Capitalize on the energy people have: "I want to care."
- Encourage "wild farming" - beach enhancement for clam propagation.
- Have local control of local resources, for example urchins.
- Provide public education on clamming including sponsoring "clam-out days."
- Support ecosystem businesses.
- Create a-before-and-after survey concerning marine stewardship: ask "Did your experience/knowledge increase?"
- Educate newcomers about stewardship. Education starts at the realtor's office. Educate landowners prior to onshore development.
- Have a shellfish gardening seminar in Waterfront Park – Bay of Eastsound. Write a proposal to the Community Foundation for a grant to conduct the seminar every year. (There are good models around Puget Sound).
- Encourage natural cultivation of shellfish through the San Juan Initiative. Increase local food production for own use.
- Become active stewards of shellfish.

Discussion Guide Comments

- Teach cultural/livelihoods class at high schools.
- Need apprenticeships.
- Regarding #10: always a good idea.
- Work with Leave No Trace and Washington Water Trails groups.

- Make lessons about future affect on health, survival, and value of property.
- Local fishers sell their catch to local buyers.
- Fishers self-impose moratoriums on select species.
- Benefits/incentives for fishers who do least harm and who keep the seafood here.
- How about a Coho salmon net pen hatchery? The fish will stay in the islands and provide a selective fishery for sport fishermen and local commercial fishermen. In addition these fish will provide a valuable reliable food source for marine mammals. For example, the Squaxin tribe has done this with great success.
- Encourage local consumption of local fish.
- Reduce salmon derbies and other competitions impacting fish populations.
- Educate the public.
- Formalize an education plan and use existing environmental education groups. Train them to carry the MRC message of stewardship.
- Restore local residents' access to shellfish and seaweed beaches.
- Promote seaweed and shellfish aquaculture.
- Get WDFW out of San Juan County.
- Too hard to quickly prioritize all of these items, most of which I know little or nothing about. (They are written in columns instead of numbers).
- Contamination education
- Regarding #4: clarity and simplification is critical.
- Reduce salmon derby and other competitions impacting fish populations.
- Regarding #5: this is controversial because it threatens "control."
- Restore local residents' access to shellfish and seaweed beaches.
- Promote seaweed and shellfish aquaculture.
- Get WDFW out of San Juan County.

Cultural Traditions

Shaw/Waldron Islands

Post-It Comments

- Support citizen science by ensuring the quality of the social experience.
- Complete the County-wide archaeological survey to enhance shoreline protection.
- Increase awareness about where our food comes from, stress importance of locally grown/caught/dug/etc. *Benefits to health of environment/human health, cultural survival. . .
- We need to make sure our CHILDREN get opportunities to develop THEIR OWN personal relationship with the ecosystem (e.g. time alone digging in the sand) not us telling them "how it is" (red dot)
- Embrace the diversity of tradition
- Mentor intergenerational relationships
- Invite tribal participation when opportunities occur involving economic or private activity which involves change to the environment.
- Create a book-list and database of cultural traditions and stories.
- Make stewardship into a route to the thrill of life on earth (wherever you live)
- Music and the arts keep a culture (such as the culture of stewardship) alive.
- It's not how many of us there are – it's what we do.
- Beating ourselves over the head won't move us forward.
- To identify and engage organizations folks voted for: Get clear information to them about the huge $ and health problems for adults and children when their choices go to treating land and Puget Sound like a dump. All adults hate garbage cans, simply hide them and feel happy. A lecture tends to do nothing, so have them watch a DVD showing damage areas and the horrible results on people's health, our nature and the enjoyment and value of property going down. This could possibly get them making more positive decisions and let them know as more damage happens the public should know they've had these lessons and chose ongoing damage.
- Identify what cultural traditions we want to encourage, share, and make our own. This is part of the educational process to adopt shared values to support voluntary actions or, if necessary, regulation.

Cultural Traditions (cont.)

- Examples of islander/tribal interaction
  - Knitting yarn
  - Storytelling
  - Dance
  - Host in the right way (how to introduce yourself/topic)
- Work in the schools, at all levels.
- Celebrate successes, to educate and draw people towards stewardship.
- Link the MRC to the ARC (agricultural)
- Population size control
- Use local and indigenous knowledge to create data about marine resources.
- Youth education
- Mythology/folk-lore/story
- Local tribes' memories/understanding of each island and its waters
- Legislation based on best available science
- Start young – teach detailed knowledge of and love for local flora and fauna (so everyone stays engaged)
- CELEBRATE! Have celebrations and festivals focused on marine food and on marine environment.
- Publicize success stories (oyster catchers, bald eagles, etc.)
- Examine integration and balancing strategies among the listening post topics.

Discussion Guide Comments

- Education: hire marine experts to act as guest lecturers in school system.
- Education: initiate school/4H hands-on activities, direct restoration, like raising and releasing salmon fry, restoring shellfish beds, seeding herring eggs throughout the San Juans.
- Integrate locally grown agriculture interests with marine resources.
- Decentralized food production and consumption greatly diminishes habitat destruction, global warming, and pollution impacts.
- Support programs for wine varieties and our own wine district, for our own fruit, veggies, and winter greenhouses.
- Please work aggressively for more protection from big oil spills.
- The pressures of growth and development impact cultural traditions. Realtors and CoC interests must not dominate the discussion of these issues.
- Prioritize local people doing local things over out-of-area people coming in and doing stuff - not exclusion but prioritizing some.
- "Culture" includes the non-human community. What would plankton and grebes et al say if they could fill out these sheets?
- Education (especially our young community members) is a primary concern of culture. I think it extremely important to make possible (and frequent) authentic experiences with the ecosystem. That is to say, we need to make sure the next generation gets a lot of time in the sand/water/dirt in order for them to develop their own real relationship with the ecosystem.
- Compare and contrast contemporary culture with traditional culture.
- Raise environmental I.Q. - invite people to know the miracle of everyday more so they sense the thrill of being engaged in their environment wherever they live.
- Identify what cultural traditions we want to encourage, share, and make all of our own. This is part of the educational process, and should precede others.
- County-wide and local resource celebrations - a western grebe party!
- Change personal life style.
- Give more land back to the Indians - soon.
- We should encourage sailing.
- Have signs on all the roads from the ferry landings that highlight conservation of marine resources and their threatened nature.
- The problem is one of perception. "Traditional" means "a threat to progress" or "out of date and inefficient" to many people, and "native" means "out to get more for me for no good reason". People don't value their own traditional and past - it's even harder to get them to value other peoples.

- I support all these.
- Regarding #5: with education this is a 4 or 5, otherwise 2 or maybe 3.
- Regarding #5: depends on how well it's done.

San Juan Island

Post-It Comments

- Each island has its own longhouse.
- Build and support a Coast Salish Cultural Center for dialogue, connections, honoring, celebrations.
- Build a co-management long house.
- Incorporate newcomers.
- Marinas are dissemination points to reach the boater community.
- Use different strategies for different components of the communities.
- Mainstream culture is driven by economics, which includes everyone. Management of an economic resurgence requires all to participate, including the MRC, realtors, developers and investors.
- Celebrate reef nets, canoe journeys. (1 red dot)
- Community theater
- Have a rendezvous: Aug 13 – the fishermen came to Jensen's Beach and we had a party!
- Go to old-timers and record their knowledge (Indians especially). (1 green dot)
- We should interact more with the tribes that are co-managing here.
- See what other islands around the world have done. (1 green dot)
- Connect people to their personal place (history, science, etc.) (1 green dot)
- Activate the Beach Watchers (WSU extension).
- Empower neighborhoods to make management plans for their environment.
- Alternative energy – low-impact lifestyle
- Create website highlighting knowledge, history, and activities for kids especially.
- Partner, acknowledge and include education efforts in MRC mission. (1 green dot)

Discussion Guide Comments

- Work with tribes that have a county history.
- Use Beach Watchers more and better connect them to MRC.
- Encourage community gathering for story telling.
- Develop a Coast Salish Cultural Center.
- Establish an economic vision that allows all cultures to be expressed, including, the culture of stewardship.
- Re-activate the "rendezvous" salmon beach BBQ at the peak of salmon season.
- Look to native traditions to develop local responsibility for all stocks to eliminate the "rush for fish," i.e. rules that promote the Tragedy of the Commons.
- Education is key.
- Establish an economic vision that allows all cultures to be expressed, including, the culture of stewardship.
- Regarding #1: who could object? Regarding #2: this is a plus for everyone. Regarding #3: depends on kind and degree of support. Regarding #4: particularly if tied to safety of upland water for humans. Regarding #5: this is an essential cultural change.
- Work with tribes that have a county history.
- Use Beach Watchers more and better connect them to the MRC.
- Regarding #3: lack of understanding.
- Regarding #2: must bring in tribal leaders, de-fuse regulation "rights" politics.
- Encourage community gathering for story telling.
- Develop a Coast Salish Cultural Center.

Lopez Island

Post-It Comments

- Educate people to know about and use "green" products.

Cultural Traditions (cont.)

- Teach a lot more biology in grade school.
- Conduct a comprehensive value-based assessment in San Juan County (SJC) and neighboring cultural areas which identifies benefits and values, life outcomes, and priorities. Incorporate the results of this assessment into the SJC Comprehensive Plan as values to be recognized and planned for.
- Encourage stewardship through music and celebrations.
- There should be more natural history information in our local papers. That's how you build culture - through education and knowledge.
- This is the center of the universe! Protect the culture here.
- San Juan County government should be "green."
- Research ways to make local biofuels (from sugar beets?) Ethanol doesn't emit as much carbon (rather than renewable but non sustainable biodiesel.)
- Study what's been done in other marine stewardship areas such as those in New Zealand.
- Actively encourage vibrant communities and individual empowerment.
- Open an office of public archaeology to protect cultural sites with landowner support.
- More barbecues!
- Create a program to educate a countywide team of stewards who have knowledge/pamphlets/reference system to actively educate neighbors/ landowners/summer folk/ etc. along their beaches/roads/mountain sides.

Discussion Guide Comments

- Recognize local cultural practices.
- Do not conflate Native American cultural practices with tribal government policy.
- Open an office of public archaeology.
- More education regarding what those cultural practices are/were. Regarding threat: marine cultural sites and practices aren't respected.

Orcas Island

Post-It Comments

- Sponsor traditional events involving food, storytelling, cultural songs and dances to share Orcas's tribal and immigrant culture and insights.
- Consider what resources we have and their sustainability before developing. Locally control resource management.
- Find an outlet for the spirituality that is already here, for example in songs and ritual, to support stewardship.
- Use the two public beach sites (Crescent Beach – Camp Norwester and Obstruction Pass on Orcas) to re-establish long houses for celebrations and tourist education. (They'd have to be closed in winter for "spiritual sweeping.")
- Invest in scientific research and background knowledge before developing and before making management plans.
- The MRC should educate local environmental educators in stewardship talking points:
  - San Juan Nature Institute
  - Land Bank
  - Friends of the San Juans
  - Science teachers
  - Sea Doc Society
  - County Extension
  - Parks Department
- Use biofiltration for water and stormwater. Look globally for solutions to local issues (L.I.D.)
- Talk to the tribes to help establish baselines for local habitat and wildlife.
- Use scientific and tribal knowledge to observe and track climate changes and to mitigate their effects on our ecosystem.
- Coast Salish Chiefs' Council (80 from B.C., 20 from Puget Sound) should co-manage S.J.C. parties based on stewardship.
- Think about strategic beaver deployment to recharge aquifers and sequester carbon.
- Create ritual and educational events around what we already know.
- Foster a relationship between the tribes and the immigrants (and the wildlife and their habitat).
- First step: tribal and immigrant cultures should develop a relationship (Maybe through the Grange?)
- Map the islands for cultural and spiritual sites that could be re-sanctified and held in trust. Make this generally known.

Cultural Traditions (cont.)

- Shift the focus away from development and growth areas to stewardship (especially W.R.T. water)
- Encourage large woody debris to be left to retain moisture on the forest floor (30 year trees could be bundled).
- Create a forum for listening to and recognizing Native history and experience here. Apologize.
- Get churches and realtors on board.

Discussion Guide Comments

- Renew tribal cultural events to draw and educate locals and visitors.
- Promote archeological records as traditional harvest/stewardship strategies.
- Evaluate tribal crab harvest blitzes.
- Restore and increase intertidal clam gardens/clam terraces at all suitable beaches. (see: John Harper - 2004-5)
- We could become walkers, or bicyclists, rowers, or one who travels by bus or train. Don't fly anywhere, except as a butterfly. The choir must change, too.
- Identify cultural sites for future set asides along shores.
- More interpretative/educational efforts to promote stewardship
- Formalize an education plan to carry message and make sure existing environmental educators receive and promote MRC stewardship information.
- Ban geoduck "mining."
- Promote aquaculture.
- Regarding #1: Re-establish a presence of Native American local tribes on Orcas Island.
- Build friendships and relationships with tribal people by hosting Native American cultural activities like classes on arts and handicrafts, sales of Native handwork at venues like Saturday Farmer's Market, ferry landing open-air, and etcetera.
- Build (with new Native American friends developed through the fun activities like this one and #1) a longhouse on Land Bank land at Crescent Beach, State Park land at Obstruction Pass campground, at old midden sites. Need sites for intercultural activities, including arts classes, demonstrations, sales to tourists and locals at Crescent Beach; longhouse camping; Obstruction Pass Park.
- Need to educate the public more regarding toxic contamination.
- Educate associations on small islands.
- Do not promote special tribal ecotourism on our islands. Keep that on the mainland.
- Conduct extensive analysis of toxins in seafood. Follow analysis by applying pressure on municipalities throughout the region to eliminate source of these toxins.
- Teach the history of European strategy in Puget Sound schools.
- Promote archeological record as traditional harvest/stewardship strategies.
- More interpretative/educational efforts to promote stewardship
- Regarding #2 and #3: include the Tribes!
- Restore and increase intertidal clam gardens/clam terraces at all suitable beaches. (see: John Harper - 2004-5)
- Renew tribal cultural events to draw and educate locals and visitors.

Seabirds

Shaw/Waldron Islands

Post-It Comments

- Education and regulation are both needed – need a list of recommended behaviors to protect seabirds and other marine resources.
- Regulate harvesting technology that has high bird mortality attached.
- Create citizen database site for people to enter, view data on a website.
- Interpretation of annual marine survey of ecosystem
- Consolidate all existing marine science studies and evaluate for how they all fit together.
- Ban all motor boats in San Juan County.
- Work in the school; connect kids with birds.

Seabirds (cont.)

Discussion Guide Comments

- The giant catches of herring that were allowed in the past took the food from the birds. White Rock used to be white, covered with gulls' nests, their guano, a huge populace of screaming birds. "Herring balls" were everyday.
- All others are equal import. #5 is top - gill netting deaths!
- Winter bird watching contest!
- Educate people to not themselves or their dogs harass seabirds on land.
- Decrease toxins in food chain.
- Reduce rats in nesting areas.
- Aren't #1 and #2 the same thing?
- Reduce tourism.
- Regarding #1, 2, 3, 4: these three (2-4) feed into #1.
- Regarding #9: I think education regarding birds is likely to be effective because birds are pretty while sea cucumbers and plankton aren't so cute.
- Regarding #9: I'd like to see some sort of bird-watching education/bird count coordination network and I would help with that.
- Hard to have priorities.
- Regarding #2: 2 without education - 4-5 with education; Regarding #4: 4 with education - 3 without; Regarding #8: with education and the county cleaning up its own act-4.
- Generally high. Birds are cute and visible, sort of like whales.
- Everyone talks about salmon but herring are the basis of salmon feeding as well as seabirds and marine mammals.
- I strongly support all these measures. The greater public, however, would probably resist a number of them. (1 green dot)

San Juan Island

Post-It Comments

- Involve public in tracking birds.
- Bring back food sources.
- Have bird reports in local paper. People like birds. Help educate people.
- Dropping populations of Harlequin Ducks, Cormorants. Is food resource depleted all the way down to phytoplankton?
- Education and engagement of the public. People need to know how they can help. They want to help.
- Birds indicate presence of food. Need data throughout the year.
- Education – big priority. Stewardship
- Use Beach Watchers to assist.
- Effects of global warming – act locally. (1 green dot)
- MRC – create a database that is on a website.
- Rick Bonney, Cornell could come and help set up databases.
- Derelict fishing gear
  - Cause of death for birds/mammals
  - Fishermen want the nets back.
- Human disturbance of nesting areas.
  - Fishing boats
  - Kayakers create more disturbance than motor boats.

Discussion Guide Comments

- Work with Beach Watchers more.
- Enforce existing law around sea bird colonies more.
- Carefully work out economics.
- Regarding #9: report bird counts monthly.
- Better communication and coordination with other agencies that deal with migratory bird needs when various birds are not here i.e.: summer, Harlequins in Idaho.
- Tell people what they can do to help.

- Regarding #2: 4-5 with education, Salmon is an icon, and efforts to save it are more popular. Regarding #4: depends on how "reduction" is to be effected. Regarding #5: 5, but 3 if County taxpayer pays, probably. Regarding #8: 2-4 County must act on itself first. Best example is City of Seattle.
- Enforcement existing law around sea bird colonies more.
- Regarding #1: public may not understand what this means. Regarding #7: 3 or 2 resistance (bilge pumping) but all else 5. Regarding #8: lack of understanding; anticipate increase in near future.

Lopez Island

Post-It Comments

- The colors of the MRC map fade in two weeks. Print a color-fast map.
- Put the MRC map on rental kayaks.
- Partner with commercial / recreational operators to improve on-the-water behavior.
- Educate divers, kayakers and sport fishers about marine stewardship and the Marine Stewardship Area.
- Put signs on refuges.
- Engage BLM and other local, regional, state and federal agencies to coordinate consistency of management with similar ecosystems and landscapes based on proximity and shared management goals.
- Protect freshwater and wetland habitat for seabirds.
- Protect the abundance of benthic and intertidal invertebrates as food for seabirds.
- Be prepared for a big oil spill response to protect seabirds.
- Are overnight and gillnet closures necessary to protect seabirds? If so, why are these closures applied only to non-tribal commercial fishermen (not tribal or Canadian)?
- Evaluate the impact of fishing gear on birds. Is this the right thing to regulate? Are we missing the real impacts? And if modified fishing gear, like bird panels on gill nets, is super important for birds, then why isn't it applied to tribal and Canadian fishermen? The bird-net panel forces fishing in difficult areas. Birdnet panel requirements are applied unequally and unfairly.
- "Instead of getting rid of the fishermen, get rid of the monofilament."
- Do more to protect seabirds from small spills.
- Coordinate with the U.S. Fish and Wildlife National Wildlife Refuge System.
- Hold talks on seabird conservation for summer visitors in islands, on ferries.
- Sponsor topical works by artists to focus public attention on seabirds.
- The Islands have become a commodity. People get more value if informed. Use economics to advance stewardship.

Discussion Guide Comments

- Coordinate with USFWS NWR's.
- Regarding #4: greater protection of habitat.

Orcas Island

Post-It Comments

- Write a plan for disseminating the marine stewardship message and identify providers to carry that message. The MRC could contract with providers with management by MRC.
- How can we control boaters' disturbance of seabirds?
- How can we get Shell Oil to protect eelgrass beds for forage fish for birds?
- Bring back forage fish to increase prey for seabirds: big declines in seabird numbers are obvious.
- Educate realtors about the need to protect habitat. Inform potential buyers concerning the habitat being bought. Develop "preservation guidelines."
- How can bycatch of seabirds be avoided?
- Escort tugs are needed for oil tankers. A big oil spill would be a disaster for seabirds and for all marine resources.
- Consider a tax to fund marine management.
- Chart out which time of year would be most important to reduce bird disturbance. A full-time 200 yard buffer may not be needed.
- Assess and control runoff contributions to anoxic conditions and impacts on seabird populations.

Seabirds (cont.)

- Restore predator/prey imbalance (seals and sea lions) which will help the food supply for seabirds.
- Initiate a buy-back program for seabird habitat.
- Institute a tax similar to that supporting the Land Bank to support the MSA.
- Provide education on ferries.
- Have Beach Watchers aboard Deer Harbor Charters, and have naturalist to do bird counts.
- Local people can help collect and disseminate information.
- Protect seabirds' nesting and foraging habitat.

Discussion Guide Comments

- Remove all dams to facilitate spawning.
- Modify current fishing practice (site and method limits).
- Provide lessons on nature and how it supports economic vitality, value, health.
- Teach and emphasize biology, K-12.
- Eliminate salmon derbies.
- Regarding #7: Identify current environmental educators and train them in the MRC/stewardship message - specifics of situations.
- Only a very small percent give a damn.
- Stronger political positions.
- Regarding #1-4 and 11-12: education and outreach will help increase these efforts.
- Regarding #12: more monitoring stations.
- Regarding #1: depends on how it affects upland owners. Regarding #3: if clear and consistently applied, otherwise 1.
- Regarding #5: too broad. Regarding #6: need to interface with upland owners. Regarding #11: too broad. Regarding #12: 5 if simplify regulations, make them clear/concise, understandable, otherwise 1.
- All above depends on education.
- Eliminate salmon derbies.
- Remove all dams to facilitate spawning.
- Modify current fishing practice (site and method limits).

Pacific salmon

Shaw/Waldron Islands

Post-It Comments

- Stop fishing for 5 years.
- Remove dams.
- Add a submerged float to mooring buoys where absent – reduce drag of chain over eelgrass.
- Expand stewardship coloring book to "Best Practice Guide" for all of Puget Sound – Distribute on ferries etc. (trifold format)
- Human power only fishing areas (with picture of person fishing from row boat)
- Stop commercial fish-farms.
- Prevent bottom-trawling.

Discussion Guide Comments

- Good research has been done. Point here is to set up good regulations and enforce them.
- Severely restrict fishing - MRC and local communities determine sustainable levels not fishing industry.
- Implement citizen involvement in study and long-term monitoring of nearshore habitat.
- Ban all marine motors - only sailboats.
- Regarding #4: not just research!
- Regarding #3: subsidize solar power.
- More extensive study of seal populations as they affect both juvenile and adult salmon.
- Collect scale samples of fish, salmon, herring, etc. to trace their origins and map their migratory paths.
- #3 and #6 are the same. Move all homes 600 feet from shoreline by zoning and regulation - allow building only with approved potable water and appropriate septic systems.

- No salmon sport fishing from petroleum power vessels.
- Regarding #12: what about all the toxins from "bottom paint" on boats?
- Prevent bottom trawling.
- #1 and 2; #7 and 8; #11 and #12 should be paired.
- County should study control of its own greenhouse gas generation.
- Unable to prioritize - let it all rip.
- Educate, feature articles w/lots of info frequently in local papers.
- Stop all fishing until recovery.
- Regarding #1: people don't realize this is such a big deal.
- Regarding #7: involve people in data collection. Validate local knowledge by bringing locals into daily/weekly/monthly observations.
- Coordinate with fishing industry to gather better data and figure out solutions.
- Generally salmon are an interest of multiple factions of people from pretty broad-based backgrounds.
- Regarding #1 - 5: if voluntary zones protection could be established.
- Regarding #6: 2 to 4, depending on education and incentives used.
- Regarding #12: control of water use is related to control of energy use.
- Regarding #1: restores and improves food chain. Regarding #2: same. Regarding #3: guidelines and regulations need to be better communicated. Regarding #4: needs sufficient funding. Regarding #5: involve State and B.C. Regarding #6: see 3. Regarding #7: find ways to involve visiting public as well. Regarding #8: see 7. Regarding #9: i.e. ban all new 2-stroke engines etc. Regarding #10: need to enforce double hulled tankers. Regarding #11: how can this be planned? Regarding #12: enforce county regulations-make incentives available.
- Regarding #8: ride the wave Al Gore created!! Regarding #10: citizens must push the state on a tugboat escort.
- Education will provide public support in all areas.
- Note that first column what citizen supports - second column what they think general public will support.

San Juan Island

Post-It Comments

- Manage as an ecosystem, not species by species (4 green dots)
- Focus on herring recovery; engage regional and state authorities. Needs a real program. Important for birds and fish
- Balance management and consciousness raising.
- Permit future ponds so they will have capacity to release during low-water times (1 green dot)
- Maintain quality of San Juan Islands' freshwater streams. (1 green dot)
- Make San Juan County a "no take" zone for marine organisms for 10 years.
- County-wide program regarding education about pesticides and herbicides and their effects: signage at local retailers. Possible local ban
- Eliminate the "race for fish" management scheme; encourage local responsibility for sustainability.
- Encourage chipping rather than burning of land-clearing vegetation.
- Educate regarding beach erosion as a natural (inevitable) process. Enhancement alternatives
- "Education" could have a somewhat negative connotation so focus on providing information.
- Imperative to enlist support of business communities, landowners, boat owners as targeted audience for stewardship.
- Educate islanders about juvenile salmon (from regional streams) using local nearshore and estuaries and river/stream mouths for foraging (on local terrestrial insects, etc.)
- Restore salmon to benefit the whole environment, forests, other species, people.
- Discontinue salmon derbies. (3 green dots)
- Bring back our clear water. Used to be able to see down to the bottom outside of kelp beds. Let's bring back the clear water.
- Rendezvous event at peak of salmon season, such as Salmon BBQ community event. Demonstrations of reef netting. Show shell middens. Showcase how life was.
- Education! How can I be a good steward? Small actions count.

Discussion Guide Comments

- Inform and employ Beach Watchers.
- Protect pocket estuaries.

Pacific salmon (cont.)

- Make San Juan County a no-take of any marine species for about 10 years.
- Develop Best Management Practices for land/home owners.
- Contribute to reduction of air-borne flux of accumulating contaminants in the NE Pacific (and wherever else salmon forage).
- Discontinue salmon derbies.
- Protect and restore salmon spawning and rearing habitat.
- Nationalize oil companies.
- Regarding #1: 2 without education or incentives, otherwise 4. Regarding #2: 4-5 depending on nature of efforts. Regarding #3: may depend on incentives. Regarding #4: 4-5 with sufficient publicity, otherwise 3. Regarding #6: 2 if done by enforcement only, 3 to 4 if sufficient education of seasonal visitors/inhabitants. Regarding #9: 2 if not enforced, 4 if enforced. Regarding #10: 2 if not enforced, 4 if enforced. Regarding #11: 2 to 4; County must act on itself first. Regarding #12: 2 to 4, depends on incentives and education.
- Inform and employ Beach Watchers.
- Protect pocket estuaries.
- Discontinue salmon derbies.
- Develop best management practices for land/home owners.
- Nationalize oil companies.

Lopez Island

Post-It Comments

- "If you/we restore it, they will come!" (Create bumper stickers to engage public interest in salmon restoration.)
- The San Juans should be seen as a unique laboratory for
  - Science
  - Economic development
  - Human behavioral changes.
- Create and post signage at ferry landings highlighting important aspects of marine stewardship and the Marine Stewardship Area
  - Bottom fish recovery areas
  - Protecting eelgrass
  - Etc.
- Provide education especially with our children concerning
  - Food web(s)
  - Life cycle
  - Stewardship actions
- Question the culture that determines that it is ok to kill/consume one species over another. Why kill any?
- Protect our locally spawning salmonids and their streams.
- Sell only legal fishing gear in San Juan County.
- Scientifically assess ecosystem changes including location and timing of dogfish and salmon numbers.
- Cull sea lions. Address the super abundance of dog fish.
- Don't build anything over eelgrass. Protect every piece/acre.
- Educate the public about the importance of creating shaded shorelines and riparian areas for juvenile salmon.
- Create and display visual presentations, for example for use on ferries: Educate about how special and fragile the area is.

Discussion Guide Comments

- Protect our local spawning streams.
- Connecting with regional efforts is critical: salmon recovery is a regional problem.
- Make it illegal to sell illegal fishing gear!
- Protect our local spawning streams.

Pacific salmon (cont.)

Orcas Island

Post-It Comments

- Support the recovery of forage fish. Protect nearshore habitats where forage fish spawn.
- Restrict fishing methods in certain areas to reduce by-catch. If fishing for salmon, use appropriate gear and methods.
- Cities for climate protection (LLP) to highlight specific strategies for lowering greenhouse gases.
- The decline of recreational salmon fishing in the Islands has had a significant economic impact.
- No-fishing areas for salmon are not effective because salmon in the San Juan Islands are transitory.
- People's decisions of what they want will be modified by what they know.
- A side benefit of recovering salmon is the economic benefit of local recreational fishing, salmon guides, etc.
- Increase herring hatcheries.
- Provide education and outreach concerning the benefits of "soft shore" enhancements.
- Institute no-fishing areas.
- Provide tax incentives for protection of spawning streams.
- Marine protected areas help salmon and other species. Target areas of biodiversity.
- Initiate an enhancement program for forage fish. Develop and operate hatcheries for forage fish. Release forage fish in areas with the best habitat.
- Create a statement/common theme of what we want people to take away about salmon conservation/stewardship.
- MRC should serve as a link and trainer of stewardship for all education programs.
- Provide technical and financial assistance for homeowners to maintain healthy septic systems.
- Require that information about septic systems be immediately forthcoming from realtors when people buy property.
- Support designated car wash facilities with interceptors for heavy metals.
- Provide to the public more information about the Long Live the Kings program.

Discussion Guide Comments

- Remove all dams to facilitate spawning.
- Modify current fishing practice (site and method limits).
- Provide lessons on nature and how it supports economic vitality, value, health.
- Teach and emphasize biology K-12.
- Eliminate salmon derbies.
- Regarding #7: identify current environmental educators and train them in the MRC/stewardship message – the specifics of situations.
- Only a very small percent give a damn.
- Stronger political positions.
- Regarding #1-4 and 11-12: education and outreach will help increase these efforts.
- Regarding #12: more monitoring stations.
- Regarding #1: depends on how it affects upland owners. Regarding #3: if clear and consistently applied, otherwise 1. Regarding #5: too broad. Regarding #6: need to interface with upland owners. Regarding #11: too broad. Regarding #12: 5 if it will simplify regulations, make them clear/concise, understandable, otherwise 1.
- All above depends on education.
- Eliminate salmon derbies.
- Remove all dams to facilitate spawning.
- Modify current fishing practice (site and method limits).

Rockfish, lingcod and greenling

Shaw/Waldron Islands

Post-It Comments

- If this many people showed up at a fish and wildlife commission meeting we could change things for the better.
- There is no shortage of greenling – in every kelp bed.
- Ling cod regs are working – season opening and size limits <26" and >40" closed. Could this work for rockfish?

Rockfish, lingcod and greenling (cont.)

- Laws need to change the way WDFW sets fishing rules!
- W.R.T. suspending direct harvest – who does MRC need to influence to make change? WDFW
- Dungeness crab
  1 – Concern about local citizen access to resource.
  2 - Concern about exhausting resource, commercial over harvest
- Important to look at competition between higher level predators – seals and whale balance changed and affecting lower food resources. Should inform harvest management.
- Not enough emphasis on the bottom of the food web – to support fish and whales – at least not articulated in draft report.
- New Strategy – work with Surfrider Foundation and R.E.E.F. to help educate public – look at their programs, don't reinvent the wheel.
- Signs at all ferry landings about the endangered water ecosystem.
- Tell WDFW to publish smaller rules pamphlets by region – save paper – make them easier to use and follow – (Region 7).
- Prevent harvest of fish by divers.
- Allow the older, mature, reproductive-age fish to exist to increase the species.
- Strategies for rock fish, ling cod and greenling look more like objectives – what are the specific action items that will protect/recover marine fish?
- Not sure what priorities are for threats and strategies – need research to show what is most important: Harvest? Bycatch? Pollution? Other?
- Establish chum salmon run on Waldron Island.
- Publish more widely info about age and vulnerability of rock fish.
- Publicize* when WDFW will be taking comments on fishing rules (*locally).
- How can we get citizen input, such as MRC, into fishery policy-making at State and Federal level?

Discussion Guide Comments

- Real regulations and new enforcements. Are there new mechanisms?
- Focus on school kids - develop teaching strategies that can be used all over the Puget Sound region.
- Give MRC a real voice in setting sustainable levels.
- Regarding 8 - citizens not the problem, corporate interests are.
- Need more research to determine which threats/stresses are actually the top priorities to address.
- Strategies look like objectives (such as #1). What are the actions to achieve?
- Examine protecting and enhancing the bottom of the food web with respect to restoring the fish populations
- Examine the imbalances of predator numbers with respect to restoring fish numbers especially large seal population. 2% loss of predation by migrating orcas.
- If you have an educated public, any of the strategies will have wider acceptance. In general, greater public support for what will be perceived as "directly" helping, e.g. catch limits, etc. The more abstract, the less tolerated, e.g. proper disposal of wastewater when washing the car at home.
- Make all sport fisheries be human-powered, sail, or electric boats. Eliminate all takings by sport divers.
- So many of these are duplicates of other sheets.
- Allow the older, mature, reproductive fish to exist, so that they can increase.
- Prevent divers from harvesting.
- Regarding #5 and 6: if we don't want oil spills we can't have tankers coming through. We can't ask that to stop as long as we drive our big boats and cars.
- I think changing the ethic of car-dependence and oil dependence is important but I don't know exactly how to go about that. All these "island cars" that people seem to take pride in ("my-car-is-a-battered-wreck-so-I'm-more-island-style") are a problem.
- Everything. These fish are magnificent.
- Regarding #2: there is a knee-jerk reaction about fishing. It should not be a sport.
- Regarding #6: scored 2. If the County cleans up its act first, then it would be a 4.
- Regarding #3: long-term community-based studies w/sustained support from scientific community.
- I think I support all of these but who knows about the public.

Rockfish, lingcod and greenling (cont.)

San Juan Island

Post-It Comments

- Use Monterey Reserve as a model – also Florida model
- Add voluntary no-take zones for San Juan Marine Preserves and then managed by WDFW (1 green dot)
- Resource allocation dedicated to non-consumptive use
- Redefine voluntary no-take zones to match scientific research – for proven protective areas used by rockfish.
- Use bathymetry data to identify new reserve sites. (1 green dot)
- Expand False Bay Marine Reserve to include Kanaka Bay and surrounding waters. (1 green dot)
- Match no-take zones with public highly used areas on land with the goal of having concerned citizens assist with monitoring.
- Recommend limiting rockfish fishing season to lingcod season only. Currently: May 1 – June 15 per WDFW regulations for sports fishing. (2 green dots)
- Increase size of BFRZ's. (2 green dots)
- Protect rockfish prey base.
- Get WDFW out of S.J. County. Prohibit fish spear fishing. Prevent Geoduck mining of seabed. (2 red dots)
- MRC procure grant to develop "catch and release" device that is less likely to damage rockfish and establish distribution channel (1 green dot)
- Beach Watchers help educate beach users re: bottom fish recovery issues. Discover no-take zones. (Beach Watchers and MRC team in education)
- Develop internet site for general public that educates at high level (concise) – picture of island species and their threats. Also habitats. (Target new-comers.)
- Change signage to look like U of W signs (purpose to increase visibility). Also add "No Bottom Fishing" to existing sign (changes possibly made last year) (1 green dot)

Discussion Guide Comments

- Add bottom fish no-take fish zones to WDFW San Juan Islands Marine Reserve.
- Initiate graduated boat decal fees link with engine horsepower.
- Establish large no-fishing sanctuaries to protect breeding fish stock.
- Ban all spear-fishing.
- Employ and inform Beach Watchers.
- Raise awareness of global warming effects on bottom fish.
- Protect and support rockfish prey base such as forage fish and perhaps others.
- Fish Board understands "allocation", or allocate a portion of catch to a preserve.
- Get WDFW enforcement agents along West Side to police fish preserve, too.
- Close bottom fishing along the West Side in orca critical habitat as mandatory experiment in conserving large females.
- Get high resolution bathymetry from Gary Greene and use it and side-scan-sonar habitat classifications to define new experimental marine preserve and get that reserve on the Marine Area and map (annual fishing regulations).
- Limit rockfish fishing to the lingcod season only.
- County divestment from major greenhouse gas producers
- Increase recycling; reduce input into landfills thereby reducing methane production.
- Education is key.
- Regarding #1-2: unless practical, then 4. Risk of no practical way to reduce by catch. Regarding #2: 2-3 without education. 4-5 with education. Regarding #4: 3 if regulation, 5 if sufficient education. Regarding #6: 4-5 if county moves first, otherwise 2.
- Add bottom fish "no take" zones to WDFW San Juan Islands Marine Reserve.
- Employ and inform Beach Watchers.
- Regarding #2: 2 but could be a 5 with convincing (Florida) model of sport fish environment.
- Establish large no-fishing sanctuaries to protect breeding fish stock.

Rockfish, lingcod and greenling (cont.)

Lopez Island

Post-It Comments

- Make it easy to buy legal fishing gear
  - Barbless hooks
  - Crab traps with rot cord.
- Sell only legal fishing gear in Washington state, or at least, in San Juan County.
- Education
  - Write articles for local media
  - Get information to the community.
- Enforce regulations in no-take zones! Assess the scope and size of zones.
- Create big no-take zones.
- Make existing bottom fish recovery zones bigger with mandatory compliance.
- Use buoys to mark sensitive habitats.
- Use open space program to protect tidelands and shorelines.
- Engage the community in stewardship of bottom fish. Provide education and outreach to build marine ethic/ownership of marine resources.
- The large population of dogfish may be reducing herring populations.
- Change fishing policy to NO rockfish catch permitted.

Discussion Guide Comments

- Reduce non-local harvests.
- Start dogfish harvest industry.
- Maintain large no-take zones.
- Increase size of bottom fish recovery areas.
- Prevent over-fishing of all species.
- Juvenile habitat restoration.
- Implement milk carton idea for releasing rockfish.
- Make sale of illegal fishing gear illegal itself! No barbed hooks! No treble hooks!

Orcas Island

Post-It Comments

- Kill seals so that you have more herring so ling cod don't eat rockfish. (4 red dots)
- Use the ferry system for education about protection of bottom fish – provide mini seminars.
- Is there a database which organizes the information necessary to support bottom fish recovery and other recovery efforts?
- Dovetail education with the Salish Sea Community Atlas on Salt Spring Island.
- Link marine protected area to lighthouse restoration on Stuart Island. Education contact: Margaret Jonas.
- Why isn't the Bell Island bottom fishing restricted zone identified on the color map (in purple)?
- Identify the areas most important to protect rockfish.
- Isn't it time to really close fishing for rockfish in some or all of the San Juans?
- Take global warming into account in management of fisheries.
- Are sewage discharges changing the acidity of sea water?
- When you go out and can't catch a rockfish when you are trying, it's time to close the fishery.
- Produce the marine stewardship area map as a place mat and supply crayons to color in the key. Kids and parents will learn about the MSA and can take the information home.
- Provide education for boaters so they can respect habitat and can re-educate their colleagues.

Discussion Guide Comments

- Ban all spear fishing.
- Education: Marine Stewardship Area Map Outreach (contact Marta Branch 376-8588 for more on this idea).
- Long-term suspension of fishing for rockfish.
- Teach and emphasize biology K-12.

- Regarding #1: ban derbies.
- Cull seal population.
- Believe only a very small percent give a damn.
- More septic taken and sewer regulations.
- Regarding #4: unaware! Regarding #5: education and economics (wood burning).
- Regarding #7 and #8: hope for 5.
- Regarding #7: urban mainland/Canada.
- Regarding #4: how to enforce? Regarding #6: too broad. Regarding #7: if regulations are clear and easy to apply, otherwise no support (1).
- Cull seal population.
- Regarding #1: too hard to enforce. Regarding #7: 5, if it can be shown that pollution threatens human health, otherwise 4.
- Ban all spear fishing.

Habitat

Shaw/Waldron Islands

Post-It Comments

- Permitting process is confusing. County should make it easy for people to do it right.
- Using already engaged teacher-scientists to train and organize their students to gather data and do public outreach to engage more citizens.
- Abalone decline of concern
- Regulations to protect habitat are important; maybe even more effective is to engage residents' interests and ownership – love, even – of our home.
- Maintain eroding beaches.
- As population increases – just to keep status quo – each person has to pollute less.
- Sustained, long-term community involvement in long-term studies. (1 dot)
- Involve people/students in activities which foster awareness and stewardship. Back up with enforcement.
- All these actions won't add up to much if there's a big oil spill. (1 dot)
- Research needs to be done on less beautiful marine animals and their place in the marine environment – sea cucumbers, urchins – what affect does heavy fishing have on marine environment – regulation needed?
- Add threat: fast moving powerboats
- Oil spills/fuel in water
- Trim equipment leaks.
- Big wakes in small passages
- Wakes from boats are not consistent w/storm wave action. Limits needed in
  - Wasp passage
  - Approaches to Deer Harbor and West Sound.
- Avoid overharvesting by divers and derbies.
- Close Park's Bay to vessel for minimum 5 years, see if bottom fish recover.

Discussion Guide Comments

- Ban all marine motors.
- Boat wakes, speed, hull and vessel, design as determinant of wake damage.
- Phase out two cycle outboard motors, which are much more polluting than four cycle engines.
- Do a study on how the absence of floating woody debris effects prey base populations. Consider that historically spring floods (with out migrating salmonids) provided shelter for these in the marine environment.
- Do a dock survey (with independent baselines) to evaluate if small fish (and to what extent) prefer dock areas as shelter. If so consider toxic management plan to change.
- Examine the impacts of loss of natural balancing forces, e.g. predation of seals by orcas and how that effects fish populations.
- Primary #1 - citizens must push for carbon emission reduction. Local legislative efforts set example and help generate momentum nationally.
- Education should always come before regulation, so it's an automatic #1.

Habitat (cont.)

- Regulations are important to protection of habitat; maybe more effective is to engage residents' interests and ownership - love - of our house.
- Regarding #1: make it easy and cost effective to do things properly! Clear specs; smooth processing of paperwork, etc.
- Regarding #12: reduce population on the shoreline, encourage forest land for carbon dioxide reuptake. Regarding #13: education is great, but we'll never reach our goals without regulation.
- Restrict and reduce the two main industries in SJC, namely tourism and real estate.
- Regarding #10: anti-fouling paint.
- The eco-system is totally connected.
- Community involvement needs to be long term, sustainable. Scientists come and go with money and big ideas; locals stick around but when the scientists run off, the support structure for community science and involvement disappears.
- Educated in direction of everyone being a 5!
- Regarding #6: as this is regulatory, #3 and #5 should precede this. Regarding #12: but County has to clean up its own set first, then it would be a 4.
- Depends - people will most likely suffer personal inconvenience if they understand the reason they have to put their moorings down in a certain way (or whatever).
- Regarding #1: no one wants to be regulated, but we must regulate ourselves. Regarding #8: very dull subject.
- Although I strongly support all these, I realize prioritizing will happen. It's frustrating to perform triage on these strategies, so I end up choosing the most general items on the list.

San Juan Island

Post-It Comments

- Educate/change property owners' understanding about shoreline erosion. It is a natural process. Also about enhancement/protection options.
- Analyze/assess cumulative impacts of shoreline activities/development before it is permitted.
- Imperative to have business community/landowners/boat owners' support. These groups should be targets for info/education.
- Connect data to personal action while being honest about data gaps. (1 green dot)
- Prevent seabed disruption by commercial crabbing: stop all commercial crabbing.
- Get WDFW out of S.J. County.
- Prohibit all motorized recreational boats.
- Graduated boat decal fees according to horsepower
- Focus on degradation aspect of plastic – you can't see the particle but it may be inhaled or ingested. (1 green dot)
- Focus on toxic releases from such places as Bellingham, airports nearby, etc. What is effect of styrene, jet fuel, etc.?(1 green dot)
- Suggest that the Town of Friday Harbor monitors water quality from the town's sewer outfall and Spring Street landing storm drain.
- Enforce shoreline/dock permits in a more fair and even manner.
- Educate newcomers to create a culture of environmental stewardship. Bring realtors on board to help educate newcomers. (1 green dot)
- Native vegetation is better than lawn; don't have an urban mindset; provide landscaping education (workshops); follow Arthur Kruckeberg's (naturalist) recommendations. (1 green dot)
- Tug/barge defined separately from pleasure craft in terms of landing/craft launching.
- Survey how much land-applied pesticides are sold in the Islands to quantify problems.
- Protect shoreline access for barge/landing craft for outer islands.
- Protect haz mat access to ferry-served islands. Identify propane/gasoline/hazmat removal.
- Educate homeowners to reduce pesticides, herbicides and other upland pollutants on a county level.
- Monitor amount of herbicides and pesticides in county as a way to gain perspective and educate users to their environmental harm.
- Allow ramps on outer islands for barge landings as essential public facilities.
- Commend MRC for letter/public stand on eelgrass protection – continue aggressive stance on shoreline protection.
- Promote engineered natural habitats in response to shoreline armoring issues.

Habitat (cont.)

- Strong concerns regarding local and state permitting continuing to allow inappropriate armoring of local shoreline.
- Require an analysis of coastal processes affected by armoring or structures, before allowing development.
- Do not allow any shoreline development below 30' and above mean sea level to address sea level rise due to climate change.
- One week a year – S.J. visitor and tourist and lodging businesses donate services to children's programs for environment for Puget Sound urban kids.
- Reduce methane emissions from landfills by recycling.
- How can we affect climate change?
- Bring pressure on local politicians to reduce greenhouse gasses.
- Divest from companies who are not environmentally responsible on a County level?
- Bring pressure on Victoria to treat their raw sewage.

Discussion Guide Comments

- Stop plastic use and littering.
- Moratorium on new docks.
- Support research into low impact docks.
- Inform and employ Beach Watchers.
- Good habitat equals higher real estate values and visitor attractions. Engage and inform business community, especially realtors, builders, bankers.
- Education is key.
- Use "popcorn" concrete for necessary ramps (expensive).
- There are so many more very large yachts (over 70') which go over 25-40 km through relatively small passages. They throw a large wake resulting in bottom and shore erosion.
- Regarding #1: 2-4 depending on incentives and education. Regarding #4, #5 and #6: Education is always = 5. Regarding #7: depends on plan! Regarding #8: same as education. Regarding #9: 2 if done by enforcement only; 3 - 4 if sufficient education of seasonal inhabitants. Regarding #10: 2 if no enforcement; 4 if enforced. Regarding #12: 2-4 depending on how! County must get on itself first.
- Stop plastic use and littering.
- Moratorium on new docks.
- Regarding #2: #6 is a positive way to achieve #2 which the public may be more open to. Regarding #6: will to go 5 from 4 as more info is made available. Regarding #12: lack of understanding: anticipate increase in near future.
- Regarding #1, #2, #4, #8, and #9: need more engagement of public to get results. Regarding #3: provide sufficient funding. Regarding #5: provide funding and engage visiting public. Regarding #6: more frequent information needed re: state of the art. Regarding #7: funding needed - engage public. Regarding #10: engage local and all visiting boating public. Regarding #11: need to enforce double hulled tankers only. Regarding #12: how can the County plan for this? Regarding #13: absolutely at any age.

Lopez Island

Post-It Comments

- Target kayak companies, marinas (sport fishing), dive shops to partner for protection of stewardship areas, national wildlife refuges, etc.
- Algae blooms – cause and effect noticeable in past 20 years, some years, highly noticeable
- Human population growth and our ruination of primary productive components of the environment must be severely curbed.
- Establish a San Juan County (SJC) value-based assessment which identifies benefits, life outcomes and values to be prioritized, protected and managed for.
- Marine stewardship area map
  - Better to have black and white pattern coding for preserves and eelgrass areas
  - Colors fade when the map is posted in sunny areas.

Habitat (cont.)

- Incorporate SJC ordinances tied to the County comprehensive plan to limit growth and home size and encourage "green" building. Establish no-development zones in view sheds and shoreline and sensitive "identified" areas. Establish "In Common" lands linked with habitat and SJC residents' values.
- Let our children witness us habitually walking and cycling. Don't fly anywhere.
- Water quality and habitat are critical/most important for everything else (other stewardship targets). These are the foundation.
- Conduct more research to determine how habitats are used and how humans affect them.
- Seek national Congressional designation of habitat areas to be "held in common" representing shared values with shared management. Obtain and hold levels of autonomy including NGO, County, State and Federal.

Discussion Guide Comments

- Research to determine how habitats are used and what human activities impact them.
- Control activities to prevent over-fishing of all species.
- Restore depleted species.

Orcas Island

Post-It Comments

- Protect Eastsound's wetlands.
- Support efforts like IOSA.
- Require vents that seal off when full on boats (Boat design/elbows on fuel lines).
- Design oil separators for bilge pumps.
- Outlaw 2-cycle engines.
- Work with realtors. Go to realtor meetings.
- Provide habitat information and recommendations to new landowners.
- Provide the MSA Plan to commercial and recreational fishermen.
- A one-size-fits-all plan is challenging given the diversity of the islands.
- Work with shoreline property owners.
- Simplify and clarify regulations to make clear:
  - What are the rules
  - What counts where
  - Map based so rules are clear.
- Use volunteers like key club (Orcas school)
- Assess and control chemicals from upland/boat sources in terms of eelgrass.
- Eastsound's old septic systems leak into the bay.
- Provide incentives/grants to upgrade septic systems.
- Provide education and enforcement of boaters to prevent sewage from recreational boaters going into marine waters.
- Visit and provide education on other islands such as Crane and Blakely.
- Establish an inspection system for septic systems and marinas: Deer Harbor, Bell Port.
- Make sure boating facilities (buoys etc.) are available and have the correct design/location.
- Develop education plans that specifically identify providers/audiences.
- Eastsound sewage: Rosario needs a Class A system and an association to manage it.
- Maintain the connection and interface between uplands and the shoreline.

Discussion Guide Comments

- Assemble regional database of available science.
- Regarding #5: over arching priority to help all public support!
- Look at programs like Leave No Trace for ideas about how to educate individuals.
- Advertisements like the one in the back of your book (pg. 19) are great because they relate people's behavior directly to habitat. Make it personal!
- All are important!
- Believe only a very small percentage give a damn.
- Teach and emphasize biology K-12.

- Regarding #9: 3-5 depending on if it's their land.
- Regarding #1: provided there is clarity in regulations and consistent application. Regarding #2: if there is good interface between upland/shoreline owners and regulation agencies. Regarding #7: depending on how it affects upland use. Regarding #9: little support from shoreline owners. Need clear regulations which are applied consistently. Regarding #12: strong support for concept, but what is the strategy?
- Clear, concise regulations that are easy to interpret and consistently applied.
- Map out areas to show where shoreline facilities allowed and prohibited.
- Assemble regional database of available science.
- Regarding #2: 5 if it can be shown that pollution threatens human health, otherwise #4.

Water quality

Shaw/Waldron Islands

Post-It Comments

- Eliminate dumping of pharmaceuticals into the water – what are appropriate alternatives?
- Publicize household products by brands that are least harmful to the environment. (Surfactants!)
- Identify the toxics that are in our waters.
- Political pressure brought to bear on Canadian oil tankers that use waters around San Juans. They should measure up to our standards. Pilot ships required.
- Educate builders, loggers, property owners how to prevent or lessen erosion.
- Prevent realtors from selling properties which have no adequate sewage disposal or treatment on site; raw sewage does go into our seawater from homes.
- Need more data on how much water we have and where it is.
- Identify household products by brand that are less harmful and publicize list.
- Clamp down on sewage dumping into seawater.
- Stop selling plots of land without adequate sewage disposal.
- Use marine taxes to invest in green technology – marina battery banks to charge electrical craft/solar tidal power.
- Toxin taxes to clean up impacts – i.e. a gas tax at marina fuel depots. Added sales tax on pesticides.
- "Kill all the real estate agents and developers." Wm. Shakespeare
- Treat unused medicines as Hazardous Waste. County regulation especially with licensed facilities.
- Identify safer household products (consumer education)
- Market the eco aspects of SJC so as to attract the "right" property buyers (sales will happen, so let's choose the neighbors we want).
- Gather systematic baseline data on contaminants.
- End fossil fuel fishing (commercial and sports) by 2020.

Discussion Guide Comments

- Use marina taxes to invest in green technology locally with marina battery banks to charge electrically powered marine craft (for a charge to users). This power could be generated with solar panel banks at marinas, and gradually investing in tidal power technology.
- Set a goal that by 2020 all fossil fuel fishing, both commercial and sports, be ended in WA State. For now, initiate pilot programs with supplemental fishing, seasons open only to non-fossil-fuel powered craft.
- Set goal that by 2050 all refineries in western WA will be closed.
- Identify household products by brand that are least harmful, and publicize list.
- Impound rainwater.
- No tankers in Puget Sounds.
- Lobby County officials to move forward on permitting and promoting grey water systems and catchment systems.
- Educate people!!
- I don't know how to prioritize any of these things! If an oil spill occurs it certainly tops the list, but day to day I think #3 or #1 because it happens frequently (bilge pumping).
- #2 and #4 should be paired.
- Clamp down on people's sewage-dumping into seawater. Stop realtors from selling plots of land without having sewage disposal on that land that treats it before release.

- Limitation on building near shoreline and size of structure minus larger houses equals more waste. Insure there is adequate water and septic systems away from water.
- Product education - rating system for all products in regard to pollution.
- On Waldron Island, most people are already pretty aware and involved with water, as well as other stuff. In general, level of awareness about water (in and out) is pretty low.
- Regarding #1: try #6 first. Regarding #2: alone it's a 2, but with #4 it rises to a 4. Regarding #3: enforcement is difficult.
- Impound rainwater.
- Regarding #1: people don't think of what they flush. Perhaps use educational pressure? Regarding #2: support may be increasing-but imprison all developers. Regarding #3: education and regulation needed. Regarding #4: education and regulation by State of anchors.

San Juan Island

Post-It Comments

- Boycott Victoria (raw sewage) vs. the possibility that mixing of H20 does adequately dilute Victoria sewage.
- San Juan County septic tank management plans need to be enforced. Single-point polluters are a big problem.
- How does pollution in San Juan County affect human health? (1 green dot)
- Note: breast cancer incidence in SJ Co. is high (#2 in Washington State, which has the highest breast cancer incidence in the US.) Leukemia incidence is also high here. Are there other diseases occurring at high rates here possibly related to environmental pollution?
- Address changes to water quality that may occur due to global warming.
- Contact and employ SJC Beach Watchers for volunteer activities. (1 green dot)
- Need to look at pollution inputs from outside San Juan County and how they impact us. (e.g. TRI facilities in Bellingham, Victoria BC sewage, etc.) (1 green dot)
- Public access to cheap (free?) water analysis. (1 green dot)
  1. Get the results for person taking samples.
  2. Record the results for analysis.
  3. A test unit in the library might be a possibility.
- Increased level of water quality monitoring countywide – surface, ground, marine
- Centralized database of WQ data
- Data distribution to relevant agencies for action

Discussion Guide Comments

- Prohibit motorized recreational boats.
- Testing environmental samples to see what is a threat including to human health.
- San Juan County Septic System Plan
- Prohibit all sewage discharge into marine waters.
- Address change global warming could have on water quality.
- Start to monitor for a wide range of chemicals including pesticides/herbicides/medicines and publish results widely.
- Connect and employ Beach Watchers for help.
- Use water chemistry (wells, runoff, etc.).
- Assume forage fish prey are most important species for ecological effect of local water contaminants. Sponsor study of what contaminants accumulate in those species. Then mitigate flux of those contaminants at key (point or non point) sources.
- Better control on shoreline construction, such as siltation.
- Victoria should be forced (by treaty law?) to go to secondary sewerage treatment - primary does not remove the bad stuff (mercury, PCB's, etc.).
- Regarding #4, research to accurately establish a believable basis for loss - not just suspicion.
- Promote research education.
- Collection ponds for stormwater run-off.
- Regarding #1: 2, unless there is a published list of alternative products by brand then 4. Regarding #2: 4 is tied into safety of water, for human consumption. Regarding #3: 4 if evenly enforced, otherwise is may be ignored. Regarding #4: same as 2. Regarding #5: risk: depends on means of reduction.
- Test environmental samples to see what is a threat, not just to marine environment but also to human health.
- San Juan County Septic System Plan.

Water quality (cont.)

- Spectrophotometer (public access) provide results to person bringing in sample and record the data.
- Prohibit motorized recreational boats.
- Prohibit all sewage discharge into marine waters.
- Address change global warming could have on water quality.
- Connect and employ Beach Watchers for help.
- Start to monitor for a wide range of chemicals including pesticides/herbicides/medicines and publish results widely.

Lopez Island

Post-It Comments

- Provide tax breaks or grant funds for waterfront owners to fix failing septic systems.
- Give residents the equipment (or access to it) to test water themselves.
- Support independent and local monitoring of water quality.
- Stop allowing exempt wells.
- Get state support for rain catchment.
- High priority: seek funding for comprehensive collection of baseline data on water quality and use the data for local scientific research/facility/NGO such as Kwiaht.
- Establish baseline water quality data for shorelines including those of outer islands.
- Use water quality data from outer islands as baseline.

Discussion Guide Comments

- Develop a baseline of current water quality and hydrology. Update it frequently.
- Support independent water quality monitoring.
- Give landowners access to the tools to test water themselves.
- Water quality protection needs to be worked on a regional basis - San Juan County makes a relatively small contribution to water quality problems.

Orcas Island

Post-It Comments

- Find a balance between voluntary and regulatory measures.
- Combine independent studies into a single comprehensive assessment.
- Provide water catchment systems for all new buildings.
- Require tertiary treatment for all sewer systems.
- Establish water quality monitoring stations.
- Conduct education concerning water quality including computer sciences where information could be posted on a website. This could be a senior project.
- Preserve wetlands!
- Label products in local stores. Create a display of earth-wise materials. Support local merchants in identifying earth-wise products.
- Allow hunting to cull the harbor seal population.
- Enable cities in our greater watershed to revamp their storm/waste water systems.
- Provide proper ditching and treatment for roadside run off.
- Clean bilge water before pumping it out.
- Enforce the ban on waste disposal in the marine environment.
- Ban boat-based whale watching.
- Institute property tax reform to reflect real environmental value.
- Allow no building on land one meter or less above sea level.
- Study implication/impacts of different road surfaces.
- Enforce existing rules regarding water quality.
- Look at the broader geographical picture of contaminant zones; force the hand of other entities – Canada, etc.
- The MRC should serve to link and educate other groups so that we are all working together.
- Beef up public water quality monitoring of septic and other waste water discharge.

Water quality (cont.)

- A goal for the MRC is to become a recognized lobbying force.
- Make use of bioremediation.
- Partner with tribes, which have legal right to protect water resources.
- Educate young people. Provide programs during the school day, not after hours.
- Sponsor local testing of water quality at septic outfalls, in upland streams, and at other water sources.
- Require septic tank inspections every six years.

Discussion Guide Comments

- Promote and facilitate public access to all shorelines in San Juan County.
- Community testing.
- Further development limited to low-impact development.
- Educate the public - environmental educators in the Islands can be trained to carry stewardship and plan message - schools - non profit.
- Involve students in primary research.
- No building allowed on land one meter or less above sea level.
- Additions to threats: rain water catchment system and road contamination of surface water and wetlands.
- Ditching and planting of road sides to keep bio accumulative poisons from entering wetlands. Prevent bottom paints on boats and zinc and copper from getting into fresh and marine waters.
- "Got to make it personal for it to matter."
- Make "water test" days available - when people could test their own water! Or water test kits and education packets.
- Goal of water quality efforts assures health of marine mammals, including ourselves, who eat from this marine system.
- More testing of local fish, crab, etc. for contaminants. Get mainland and Vancouver Island to clean up.
- Promote property owner testing of septic outfall, well water testing.
- Random county-sponsored testing of water.
- Develop low cost water analysis kits for priority pollutants or indicator pollutants unique to San Juan County.
- Create easy to use disposal processes for pollutants. Make proper disposal easier than dumping.
- Regarding #1: not necessarily bans, but better handling and disposal. Regarding #2: find better chemicals for making roads. Regarding #3, find a way to contain pumped substances to dispose of them correctly.
- Believe only a very small percent give a damn.
- Water catchment systems required for all new buildings.
- Require tertiary treatment for all sewer systems.
- Mandatory septic tank inspections every six years (paired with tax evaluations and statements of inspection required).
- MRC should be part of permitting process for all development!
- A stronger political position should be taken, not just studies.
- Community testing.
- Regarding #1: too broad. Regarding #2: 5 if regulations are clear and consistently applied, otherwise 1. Regarding #3: see above.
- Promote property owner testing of septic outfall, well water testing.
- Further development limited to low-impact development.
- Regarding #1: provided adequate publicity is provided about substitutes. Regarding #2: 5 only if it can be shown that pollution directly threatens human health, otherwise 4.
- Random County-sponsored testing of water.
- Involve students in primary research.
- Regarding # 1-4: education can help support.

Marine mammals

Shaw/Waldron Islands

Post-It Comments

- Ideas and research and local and MRC input needs to be translated into real mechanisms to give real leverage on good regulations and new good enforcement. Main issue: decline of fish. Think about underlying causes of your lists of causes and how to effectively address these – think politically. (10 dots)

Marine mammals (cont.)

- Marine Stewardship Best Management Practices brochure – distribute throughout islands, ferries, coastal towns.
- Impose limits on realtors regarding communication about permitted shoreline activities and shoreline stewardship.
- Get County to enforce mooring buoy regs and dock permit applications. Pull abandoned mooring buoys.
- Need shoreline homeowners' package of guidelines for stewardship behavior/actions. One-stop shopping for help.
- Nearshore speed limits for boats – needed to avoid marine mammal and bird injuries.
- Have a seal derby to maintain seal population at reasonable level – too many now – too much fish predation!
- Stop whale watching enterprises from harassing the whale pods every time they surface. (1 dot)
- WA needs regulations regarding appropriate disposal of pharmaceuticals.
- Feature articles weekly on Marine Mammals and issues to introduce the other important resource issues – using "charismatic megafauna" marine mammals as the "hook".

Discussion Guide Comments

- Think about workable regulations and institutionalization of such, and how to enforce them.
- Methods to restore prey/predator balance
- Consider near shore speed limits for boats, less than 20 knots.
- Add to threats: *Persistent organic pollutants from current industrial and historical sources. *Human disturbance on water.
- #1 and 5 should be paired.
- The orca pods aren't seen as frequently as they used to be. I understand people's desire to observe these tremendously handsome, spectacular creatures in the wild. I would like to see whale watching discontinued. It's an insult to surround whales every time they surface - their hearing is acute. Tourism is not a reason.
- Educate public better about driving on shellfish beaches. Make signage for vulnerable beaches. Develop citizen observation of seal activity. I've observed seals over years heavily impacting juvenile salmon, adult salmon, forage fish.
- All equal need!
- Public outreach article series in Seattle, etc. papers. Series collect, desktop published and distributed at museums.
- Add to threats: human disturbances and persistent toxins.
- Regarding #6: hard to see how this directly related like the underlined parts as it relates to all policies.
- #2 and #3 are the same issue.
- Take seabird strategies and apply them to marine mammals. I do not understand why the seabird strategies are so much more detailed and broad.
- It is too difficult to prioritize. Need to know more.
- Ban chasing whales by while watching companies! I call them the paparazzi of marine mammals.
- Whale watching with telescopes only!
- Regarding #2: 2-4/5 depending on method used. Regarding #5: 2 to 4, depending on educational process/alternatives. Regarding #6: incentives are difficult.
- Most people know so little that it's hard to gain public support. It is either pocketbook driven, esthetics, or leadership driven.
- Regarding #4: most -lots of public demand. Regarding #5: could do at county level.

San Juan Island

Post-It Comments

- Use county permitting power to encourage marine-friendly development.
- County education to limit and eventually eliminate pesticide and herbicide use. (1 green dot)
- County could have permits cost less if native vegetation used instead of "manicured lawn' (2 green dots)
- Funded website to provide central core of information pertaining to marine environment in San Juan County.
- Connect more with SJC Beach Watchers. Employ them – they're volunteers. (1 green dot)
- Stop disturbance of seals and whales by tour boats.
- Limited-entry sustenance hunting harvest of seals for food and hides
- Restrict vessel approach to seal haul outs.
- Respect seal privacy.

Marine mammals (cont.)

Discussion Guide Comments

- Think about workable regulations and institutionalization of such, and how to enforce them.
- Methods to restore prey/predator balance.
- Consider near shore speed limits for boats, less than 20 knots.
- Add to threats: persistent organic pollutants from current industrial and historical sources and human disturbance on water.
- #1 and 5 should be paired.
- "The orca pods aren't seen anywhere near as frequently as they used to be. I understand people's desire to observe these tremendously handsome, spectacular creatures in the wild. I would like to see whale watching discontinued. It's an insult to surround whales every time they surface - their hearing is acute - tourism is not a reason."
- Educate public better about driving on shellfish beaches. Make signage for vulnerable beaches. Develop citizen observation of seal activity. "I've observed seals over the years heavily impacting juvenile salmon, adult salmon, and forage fish."
- All equal need!
- Public outreach article series in Seattle, etc. papers. Series collected, desktop published and distributed at museums.
- Additions to threats include human disturbances and persistent toxins.
- #2 and 3 are the same issue.
- Take seabird strategies and apply them to marine mammals - confusing why seabirds strategies are so much more detailed and broad.
- It is too difficult to prioritize. Need to know more.
- Ban chasing whales by whale watching companies! "I call them the paparazzi of marine mammals."
- Whale watching with telescopes only!
- Regarding #2: 2-4/5 depending on method used. Regarding #5: 2 to 4, depending on educational process/alternatives. Regarding #6: incentives are difficult.
- Most people know so little that it's hard to know public support. It is either pocketbook driven, esthetics, or leadership driven. Regarding #4: most -lots of public demand. Regarding #5: could do at county level.

Lopez Island

Post-It Comments

- Work with surrounding communities/counties to support efforts to reduce toxins in the food web.
- Impose stricter regulations on vessels.
- Coordinate international consistency for marine mammal health.
- Develop a non-motorized water-travel corridor through San Juan County ordinance and state law.
- Limit noise on the water by
  - Encouraging non-motorized recreation
  - Having zones of non mechanized travel for "safe areas"
  - Limiting use based on migration patterns.
- Water quality
  - Improve water quality by limiting population and waste generation on the island
  - Organize weekly trash (beach) pickups (not just on Earth Day).
- Educate people in urban areas about the impact of waste disposed of in the marine environment.
- Educate regional residents about plastics in the pelagic environment and their impacts on marine mammals, fish, algae and invertebrates.
- Sponsor celebrations dedicated to different issues (animals, water, etc.); celebrations that have educational elements (workshops, videos, pamphlets) as well as fun/music/story telling.
- Make it illegal to sell illegal fishing/harvesting gear.
- Ban boat-based whale watching.
- By SJC ordinance/state law, reduce noise in the submarine environment. Designate and enforce zones with no sonar, radio frequencies and marine noise.
- Create a network of community stewards to educate the public during marine activities, i.e. fishermen educating other fishermen – kayakers educating other kayakers.

Marine mammals (cont.)

- Develop a systematized naturalist stewardship training institute or program certification.
- Work with marine managers – and their wildlife biologists – to be more sensitive to wildlife and the protection strategies and needs identified in the MSA plan.
- Champion the National Wildlife Refuge system in the islands.
- Amend legislation to allow for subsistence harvesting of seals from abundant populations.
- Expand the kayak education and leadership program (K.E.L.P.) to other island areas including south Lopez.
- Restrict all non-emergency motorized traffic to specific marine travel lanes.
- Analyze the effect of vessel exhaust fumes at the water's surface.
- Marine noise pollution is an issue.
- Put Beach Watchers on ferries to educate people on stewardship practices.
- Expand the Soundwatch program in the San Juans and elsewhere in the Salish Sea.

Discussion Guide Comments

- Allow subsistence seal harvests.
- Work with surrounding communities/counties - particularly with regards to #5.
- Need strict regulations on vessels

Orcas Island

Post-It Comments

- Buy habitat, such as is being done in Oregon, prior to its destruction (preserve – vs. – restore).
- Strengthen local control with less top-down, more bottom-up governance.
- Develop broad educational materials for the general public.
- Write a specific education plan and identify current non-profit providers.
- Establish a "Marine Steward of the Month" program with awards and outreach. Develop the curriculum and materials to encourage involvement.
- Initiate a 10 year "buy back." End take on all species with a full inventory of species in conjunction with and prior to management for future take. Metaphor: when you find yourself in a hole, stop digging!

Discussion Guide Comments

- Continue to educate on the water at the point of impact, i.e. land-based whale watching, kayak tours, whale watch tours, museums, schools, and churches. Maybe ferries?
- Upland storm water control and low impact development
- Educate the public. Use an environmental education non-profit to carry MRC stewardship message.
- Limited entry seal hunt for food and fur.
- Raise standard for septic systems and require inspection for proper functioning.
- Ban whale watching.
- Support and coordinate the Whale-Wise and other conservation messages among the whale watching tour guides.
- Ban boat-based whale watching.
- Allow seal hunting.
- Teach and emphasize biology K-12.
- More international cooperation with whale watchers
- Cull harbor seal populations.
- Regarding #4: add "and kayakers."
- Would have preferred to fill this out at home for better interpretation and understanding.
- Believe only a very small percent gives a damn.
- Limited entry seal hunt for food and fur
- Ban whale watching.
- Education and outreach will increase these scores.
- Continue to educate on the water at point of impact, i.e. land based whale watching, kayak tours, wale watch tours, museums, schools, churches and maybe ferries.
- Cull harbor seal populations.
- Upland storm water control and low impact development
- Raise standard for septic systems and require inspection for proper functioning.

Discussion Guide Priority Rankings

In their discussion guides, participants ranked in order of priority the strategies associated with each of the eight topics. The point here was to learn which strategies within a particular topic were important to individual participants. Some attendees wrote in additional strategies and ranked those as well. This appendix presents one table for each topic. The table includes the rankings from all four meetings. For each strategy, the table shows how many attendees voted that strategy as having high priority, and how many voted it their #1, #2, or #3 priority. The table shows other votes, which included Xs, check marks and words such as "priority" or "yes." The table also shows that some participants used a ranking scale of 1-5. A sample discussion is shown on the following two pages.

Pacific Salmon Discussion Guide

Caring for San Juan County's Marine Environment

Taking action to preserve our marine resources

Instructions

1. Visit the Pacific Salmon Listening Post to discuss salmon, threats, and strategies.
2. Tell us what you think about the draft strategies.
   a. Review the strategies on the back of this discussion guide.
   b. Answer the questions #1-5 by recording your comments on the Post It sheets, one comment per sheet. Write large so your comment can be easily read from across the room. The recorder will assist you.
   c. For question #6, tell us which strategies should be priorities – in the "priority" column number your top 3 strategies (1 to 3).
   d. For question #7, tell us, and indicate your level of support for each strategy in the "level of support" column.
   e. Bring your completed discussion guide to the closing session to help us prioritize the strategies for all 9 resource groups.

The San Juan County Marine Resources Committee (MRC) has developed a draft plan to protect and restore the County's natural marine environment. The draft plan describes marine resources to be protected and restored. Pacific Salmon are among these resources. The plan identifies threats to salmon and strategies to protect and restore these species.

Photo by Mark Saunders

Photo by Jim Slocomb

A lot of work has gone into these draft strategies but we need to know what you think: Which strategies are most important? How can they be improved? Which are most likely to gain public support? Which should be carried out first?

Pacific Salmon Strategy Questions

1. Do these strategies address identified threats to pacific salmon? Why or why not?
2. What would you add to the strategies to make them better able to address the identified threats?
3. What specific actions do you suggest for implementing these strategies?
4. What other strategies would you recommend to address threats to salmon?
5. Which strategies would you remove? Why?
6. Which strategies have the highest priority?
7. Which strategies do you believe you and your community would be willing to support and carry out?

MARINE RESOURCES COMMITTEE
SAN JUAN COUNTY
WASHINGTON
OUR WATERS ARE IMPORTANT

Threats	Strategies	Priority? Top 3	Level of Public Support? On a scale of 1- 5, 1 = least supported and 5 = most supported
Non-local sources of salmon decline Predation by marine mammals Large oil spills Climate change Shoreline modification (docks, bulkheads, boat ramps, jetties, etc.) Persistent organic pollutants from current industrial and historical sources (in food web and sediments) Polluted stormwater runoff Fishing/harvesting activities Derelict fishing gear	*1. Protect and restore forage fish spawning habitat.*		
	2. Support regional herring recovery efforts.		
	3. Improve and coordinate incentives, regulation, enforcement and mitigation to better manage shoreline construction, bulkheads, docks, and anchoring.		
	4. Implement local salmon recovery plan (i.e. research to find how much salmon use the San Juan marine environment, conduct habitat protection and restoration projects, and improve hatchery and harvest management).		
	5. Connect with regional salmon protection efforts.		
	6. Minimize new bulkheads. Remove shoreline armoring (bulkheads, boat ramps, and docks) where appropriate. Educate and encourage shoreline landowners to choose soft shore treatments that do not harm the nearshore habitat.		
	7. Educate and engage citizens in the stewardship of the County's marine environment.		
	8. Provide education and outreach on the importance of nearshore habitat and best marine use/shoreline development practices to protect it.		
	9. Minimize chronic oil pollution from land and marine sources (medium spills and chronic events such as bilge pumping and fuel spills).		
	10. Reduce risk and improve response to oil spills.		
	11. County and its citizens do their part to reduce greenhouse gases. Recommend that the county plan for sea level rise and other impacts from climate change.		
	12. Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat and water quality.		
	13. Additional strategies you recommend.		

Enjoyment & Thriving Livelihoods Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	14 Respondents					23 Respondents					11 Respondents					35 Respondents				
Strategies	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Develop a vision of a San Juan County economy based on sustainable marine-based livelihoods.	**6**	3	1	2	0	**13**	4	5	2	2	**3**	0	1	1	1	**13**	5	2	0	6
2. Foster projects that engage residents in marine stewardship.	**6**	3	2	0	1	**7**	2	0	4	1	**3**	2	1	0	0	**13**	6	3	3	1
3. Identify and collaborate with existing marine stewardship voluntary programs.	**6**	4	0	1	1	**5**	2	1	0	2	**0**	0	0	0	0	**16**	3	7	5	1
4. Work with users, the County and port districts to develop criteria for facility sitings.	**3**	1	1	0	1	**9**	2	3	2	2	**3**	3	0	0	0	**11**	0	4	1	6
5. Work with federal, state, and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow harvest.	**7**	2	3	1	1	**11**	2	4	3	2	**7**	2	1	3	1	**19**	7	1	4	7
6. Where consistent with sustainability, promote harvest opportunities in the San Juan Islands.	**7**	4	2	1	0	**0**	0	0	0	0	**7**	3	3	0	1	**10**	1	4	1	4
7. Work with groups developing watershed management plans to include effects on the marine environment in those plans.	**3**	2	0	0	1	**1**	0	0	0	1	**2**	0	1	1	0	**10**	2	1	3	4
8. Promote water quality protection through best management practices to keep toxins and pathogens out of seafood.	**4**	0	2	2	0	**0**	0	0	0	0	**3**	0	1	2	0	**14**	4	1	2	7
9. Preserve and increase public access to natural shoreline and marine views, coupled with a strong stewardship message and compatible behavior expectations.	**1**	1	0	0	0	**0**	0	0	0	0	**2**	0	1	1	0	**12**	0	3	5	4
10. Feature the work of local artist and poets, inspired by the islands' marine ecosystem, in stewardship messages.	**2**	1	0	0	1	**2**	0	0	0	2	**1**	0	0	1	0	**9**	0	0	4	5
Additional strategies																				
New good rules & regulations & enforcement of these.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Create institutional mechanisms to give MRC & its base of local info a key role in setting sustainable fish levels.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0

Cultural Traditions Priority Ratings

Strategies	Shaw/Waldron Islands (15 respondents)					San Juan Island (23 respondents)					Lopez Island (9 respondents)					Orcas Island (35 respondents)				
	Total who voted this a priority	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Continue and build upon joint tribal-community events.	**5**	0	0	4	1	**12**	3	2	5	2	**4**	1	1	1	1	**19**	7	4	2	6
2. Identify and engage key partners as active marine stewards.	**10**	5	1	2	2	**11**	2	3	5	1	**5**	3	1	1		**19**	7	2	5	5
3. Support efforts to highlight traditional marine practices.	**4**	1	2	0	1	**14**	4	3	6	1	**1**	1	0	0	0	**10**	1	2	3	4
4. Promote water quality protection through established marine practices to reduce toxins and pathogens in seafood.	**10**	2	4	2	2	**11**	5	4	1	1	**8**	2	4	1	1	**25**	5	6	6	8
5. Educate and engage seasonal and year-round residents in the stewardship of the County's marine environment.	**9**	3	3	2	1	**15**	7	3	2	3	**6**	0	2	4	0	**29**	6	9	6	8
Additional strategies																				
Recognize local cultural practices.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0
Open an office of public archaeology.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Please work aggressively for more protection from big oil spills.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Raise environmental I.Q. - invite people to know the miracle of everyday more so they sense the thrill of being engaged in their environment wherever they live.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
County-wide & local resource celebrations - a western grebe party!	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Work with tribes that have a county history.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Use beach watchers more. Connect MRC with them better.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Encourage community gathering - story telling.	**0**	0	0	0	0	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0
Develop a Coast Salish Cultural Center.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Renew tribal cultural events to draw & educate locals & visitors	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**2**	0	2	0	0
Promote archeological record as traditional harvest/stewardship strategies.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0
Evaluate tribal crab harvest blitzes.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Restore and increase intertidal clam gardens/clam terraces at all suitable beaches. (see: John Harper - 2004-5)	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0

Seabirds Priority Ratings

Strategies	Shaw/Waldron Islands (19 respondents)					San Juan Island (27 respondents)					Lopez Island (11 respondents)					Orcas Island (34 respondents)				
	Total who voted this a priority	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted this a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Increase prey base.	**7**	3	3	0	1	**7**	5	0	1	1	**5**	2	1	0	2	**9**	2	3	1	3
2. Protect and restore spawning habitat for forage fish.	**11**	4	5	1	1	**8**	1	5	1	1	**6**	3	3	0	0	**19**	6	2	5	6
3. Support regional herring recovery.	**8**	2	5	1	0	**11**	2	3	5	1	**6**	3	2	0	1	**12**	1	6	3	2
4. Reduce disturbance from humans.	**6**	1	1	2	2	**3**	0	0	2	1	**5**	1	2	2	0	**11**	2	3	4	2
5. Remove derelict fishing gear.	**1**	1	0	0	0	**5**	0	2	1	2	**4**	2	1	1	0	**10**	3	0	2	5
6. Reduce risk and improve response to oil spills.	**6**	3	1	1	1	**1**	0	0	1	0	**2**	0	1	0	1	**9**	3	3	0	3
7. Minimize chronic pollution from land and marine sources.	**7**	0	3	3	1	**6**	1	1	1	3	**4**	0	0	4	0	**13**	1	3	3	6
8. Reduce greenhouse gas emissions. Plan for sea level rise.	**2**	1	0	0	1	**4**	1	1	1	1	**0**	0	0	0	0	**6**	0	3	1	2
9. Educate and engage citizens in the stewardship of the County's marine environment.	**9**	4	0	3	2	**13**	7	1	2	3	**1**	0	0	1	0	**21**	10	2	6	3
Additional strategies																				
Work with beach watchers more.	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0
Ban dogs on all beaches & rocky shores.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0

Pacific Salmon Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	13 respondents					26 respondents					11 respondents					34 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Protect and restore forage fish spawning habitat.	**7**	4	2	0	1	**18**	5	6	5	2	**5**	1	2	1	1	**17**	9	2	1	5
2. Support regional herring recovery.	**8**	6	1	0	1	**11**	1	6	2	2	**7**	2	1	4	0	**9**	0	4	1	4
3. Improve and coordinate shoreline management.	**3**	0	0	2	1	**3**	0	3	0	0	**1**	3	1	0	0	**10**	2	2	4	2
4. Implement local salmon recovery plan.	**3**	0	2	1	0	**10**	5	2	2	1	**8**	3	1	4	0	**17**	4	3	5	5
5. Connect with regional salmon protection.	**1**	0	0	1	0	**5**	1	1	1	2	**2**	1	1	0	0	**6**	1	0	3	2
6. Minimize new bulkheads. Remove shoreline armoring where appropriate. Encourage soft shore treatments.	**2**	0	0	1	1	**5**	1	1	2	1	**1**	1	0	0	0	**6**	2	1	0	3
7. Educate and engage citizens in the stewardship of the County's marine environment.	**7**	2	4	0	1	**9**	4	1	1	3	**0**	0	0	0	0	**10**	3	3	1	3
8. Educate about protecting nearshore habitat.	**5**	1	2	2	0	**6**	2	1	3	0	**1**	0	0	1	0	**10**	2	2	2	4
9. Minimize chronic oil pollution from land and marine sources.	**0**	0	0	0	0	**2**	0	0	2	0	**0**	0	0	0	0	**7**	1	0	1	5
10. Reduce risk and improve response to oil spills.	**1**	1	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**5**	0	2	0	3
11. Reduce greenhouse gas emissions. Plan for sea level rise.	**1**	0	0	0	1	**1**	0	1	0	0	**0**	0	0	0	0	**4**	1	0	2	1
12. Better manage upland activities.	**5**	0	2	2	1	**6**	3	0	2	1	**2**	0	2	0	0	**19**	0	6	7	6
Additional strategies																				
Protect our local spawning streams.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Good research has been done. Point here is to set up good regulations & enforce them.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Severely restrict fishing - MRC & local communities determine sustainable levels not fishing industry.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Implement citizen involvement in study and long-term monitoring of nearshore habitat	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Ban all marine motors - only sailboats.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Inform and employ beach watchers.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Protect pocket estuaries.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0

Pacific Salmon Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	13 respondents					26 respondents					11 respondents					34 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
Additional strategies (cont.)																				
Make San Juan County a no-take of any marine species for, say, 10 years.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Develop best management practices for land/home owners.	**0**	0	0	0	0	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0
Remove all dams to facilitate spawning.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Modify current fishing practice (site & method limits)	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	1	0	0

Rockfish, Lingcod and Greenling Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	16 respondents					27 respondents					12 respondents					33 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Reduce bycatch of select species	**7**	2	3	1	1	**9**	1	5	3	0	**4**	2	1	0	1	**10**	2	4	2	2
2. Suspend direct harvest of select species until recovery goals are met.	**12**	5	3	1	3	**17**	8	4	2	3	**6**	3	3	0	0	**33**	19	6	2	6
3. Educate the public about threats to rockfish, lingcod, and greenling.	**12**	5	4	1	2	**19**	8	4	5	2	**8**	0	2	5	1	**21**	7	6	3	5
4. Minimize chronic pollution from land and marine sources.	**4**	2	0	2	0	**7**	1	2	4	0	**2**	0	1	1	0	**10**	0	2	4	4
5. Reduce risk and improve response to oil spills.	**1**	1	0	0	0	**3**	0	1	1	1	**2**	0	1	0	1	**5**	0	1	2	2
6. Reduce greenhouse gas emissions. Plan for sea level rise.	**1**	1	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**3**	0	2	0	1
7. Better manage upland activities.	**6**	2	0	4	0	**2**	2	0	0	0	**7**	3	2	2	0	**18**	1	2	11	4
8. Educate and engage citizens in the stewardship of the county's marine environment.	**5**	3	2	0	0	**9**	3	3	3	0	**2**	0	0	1	1	**12**	5	2	0	5
Additional strategies																				
Reduce non-local harvests.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0
Have large no-take zones.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Prevent over-fishing of all species.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0
Juvenile habitat restoration.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Implement milk carton idea for releasing rockfish.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	0	1	**0**	0	0	0	0
Real regulations and new enforcements. New mechanisms to do ???	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Add bottom fish no take fish zones to WDFW San Juan Islands Marine Reserve.	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0
Graduated boat decal fees.	**0**	0	0	0	0	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0
Establish large no fishing sanctuaries to protect breeding fish stock	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Ban all spearfishing.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0

Habitat Priority Ratings

Strategies	Shaw/Waldron Islands (15 respondents)					San Juan Island (27 respondents)					Lopez Island (11 respondents)					Orcas Island (36 respondents)				
	Total who voted it a priority	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Improve & coordinate shoreline management.	**3**	1	0	1	1	**8**	4	1	3	0	**5**	3	1	1	0	**9**	6	1	0	2
2. Better manage upland activities.	**3**	1	1	1	0	**10**	1	3	3	3	**7**	0	4	3	0	**21**	3	7	6	5
3. Improve understanding of the ecology of sea grasses.	**6**	2	3	1	0	**9**	3	2	4	0	**2**	0	1	1	0	**10**	2	3	3	2
4. Improve understanding of kelp ecology.	**4**	1	2	1	0	**5**	1	1	2	1	**2**	0	1	1	0	**8**	1	1	2	4
5. Educate about protecting nearshore habitat.	**3**	0	2	1	0	**14**	4	4	4	2	**1**	0	1	0	0	**12**	4	1	3	4
6. Promote and adopt innovative development practices . . .	**6**	1	2	2	1	**7**	1	2	4	0	**4**	2	1	1	0	**16**	3	4	5	4
7. Implement local salmon recovery plan.	**1**	0	0	1	0	**4**	0	1	3	0	**3**	1	1	0	1	**6**	0	1	0	5
8. Coordinate with regional habitat protection.	**1**	0	1	0	0	**6**	0	1	5	0	**2**	0	0	2	0	**4**	1	0	1	2
9. Minimize new bulkheads. Remove shoreline armoring bulkheads, boatramps, & docks (where appropriate). Encourage soft shore treatments.	**1**	0	0	0	1	**9**	1	3	4	1	**3**	2	0	1	0	**5**	1	2	1	1
10. Minimize chronic pollution from land & marine sources.	**6**	0	3	1	2	**1**	0	1	0	0	**2**	0	0	1	1	**11**	1	3	3	4
11. Reduce risk & improve response to oil spills.	**4**	1	1	1	1	**3**	1	1	0	1	**0**	0	0	0	0	**2**	0	0	0	2
12. Reduce greenhouse gas emissions. Plan for sea level rise.	**3**	2	0	0	1	**3**	1	2	0	0	**0**	0	0	0	0	**4**	0	2	1	1
13. Educate & engage citizens in the stewardship of the marine environment.	**5**	3	2	0	0	**10**	6	1	0	3	**1**	1	0	0	0	**11**	7	1	1	2
Additional strategies																				
Research to determine how habitats are used and what human activities impact them.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Better control of activities to prevent over-fishing of all species.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0
Ban all marine motors.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Boat wakes - speed - hull & vessel design - as determinant of wake damage.	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Assemble regional database of available science.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0

Water Quality Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	11 respondents					25 respondents					11 respondents					37 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Prevent pollution . . .	**8**	1	5	2	0	**13**	4	3	4	2	**5**	1	1	2	1	**24**	11	2	4	7
2. Better manage upland activities.	**7**	2	2	2	1	**21**	4	8	5	4	**9**	5	2	2	0	**32**	6	15	5	6
3. Minimize chronic pollution from land and marine sources.	**5**	1	1	3	0	**17**	1	6	7	3	**9**	1	4	3	1	**27**	3	7	10	7
4. Improve understanding of the ecology of seagrasses.	**5**	1	1	2	1	**11**	6	1	2	2	**3**	1	2	0	0	**14**	3	3	4	4
5. Reduce risk and improve response to oil spills.	**7**	3	2	0	2	**5**	1	0	3	1	**2**	1	0	0	1	**11**	3	1	3	4
Additional strategies																				
Develop a baseline of current water quality & hydrology & update it frequently.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0
Support independent water quality monitoring.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0
Give landowners access to the tools to test water themselves.	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0
Toxins taxes: dedicated to cleaning up impacts. For example a gas tax at marina fuel depots, added sales tax on pesticides, other adverse chemicals.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Use marina taxes to invest in green technology locally with marina battery banks to charge electrically powered marine craft (for a charge to users) this power could be generated with solar panel banks at marinas, and gradually investing in tidal power technology.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Set a goal that by 2020 all fossil fuel fighting, both commercial and sports, be ended in WA State. For now, initiate pilot programs with supplemental fishing, sessions open only to non fossil fuel powered craft.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Set goal that by 2050 all refineries in western WA will be closed.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Identify household products by brand that are least harmful, and publicize list.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Impound rainwater.	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Prohibit motorized recreational boats.	**0**	0	0	0	0	**2**	1		1		**0**	0	0	0	0	**0**	0	0	0	0

Water Quality Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	11 respondents					25 respondents					11 respondents					37 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
Additional strategies (cont.)																				
Do testing of environmental samples to see what is a threat - not just to marine environment, but also human health.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
San Juan County Septic System Plan.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Prohibit all sewage discharge into marine waters.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0
address change global warming could have on water quality	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0
Start to monitor for a wide range of chemicals including pesticides/ herbicides/medicines and publish results widely.	**0**	0	0	0	0	**1**	0	1	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Promote and facilitate public access to all shorelines in SJ Co.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**2**	0	2	0	0
Community testing.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Further development limited to low impact development.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0
Educate public - environmental educator in the Islands can be trained to carry stewardship and plan message - schools - non profit.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Involve students in primary research.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
No building allowed on land one meter or less above sea level (un-mandate).	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0

Marine Mammals Priority Ratings	Shaw/Waldron Islands					San Juan Island					Lopez Island					Orcas Island				
	13 respondents					27 respondents					11 respondents					37 respondents				
Strategies	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other	**Total who voted it a priority**	Number 1 Priority	Number 2 Priority	Number 3 Priority	Other
1. Implement local salmon recovery plan . . .	**7**	3	1	3	0	**16**	4	4	5	3	**5**	0	1	3	1	**22**	7	4	5	6
2. Protect and restore spawning habitat for forage fish.	**11**	4	5	2	0	**21**	4	6	7	4	**6**	1	4	1	0	**28**	10	9	3	6
3. Support regional herring recovery efforts.	**8**	3	1	4	0	**11**	1	3	5	2	**6**	1	1	3	1	**11**	1	4	1	5
4. Reduce disturbance from vessels.	**5**	2	1	1	1	**8**	3	3	1	1	**6**	2	2	2	0	**14**	2	5	1	6
5. Support efforts to reduce toxins that accumulate within the food chain.	**9**	3	4	2	0	**18**	8	4	3	3	**8**	5	2	0	1	**19**	4	2	8	5
6. Improve and coordinate shoreline management.	**3**	0	1	2	0	**12**	1	1	6	4	**2**	1	1	0	0	**13**	3	3	4	3
Additional strategies																				
Think about workable regulations & institutionalization of such, & how to enforce them.	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Sustenance (for food & hides) killing of Harbor Seals.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Education of problem issues.	**0**	0	0	0	0	**1**	1	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0
Use Beach Watchers more.	**0**	0	0	0	0	**1**	0	0	0	1	**0**	0	0	0	0	**0**	0	0	0	0
Discontinue Salmon derbies.	**0**	0	0	0	0	**1**	0	0	1	0	**0**	0	0	0	0	**0**	0	0	0	0
Continue to educate on the water at point of impact. (land based whale watching, kayak tours, wale watch tours, museums, schools, churches . . . Ferries?)	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Upland storm water control - low impact development.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	0	1	0
Educate public - use environmental education non-profit to carry MRC stewardship message.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Limited entry seal hunt for food & fur.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Raise standard for septic systems & require inspection for proper functioning.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	1	0	0	0
Ban whale watching.	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**1**	0	1	0	0

Discussion Guide Community Support Rankings

With a 1-5 ranking, participants registered their views about which strategies would be most likely to be supported by the community. 1 indicated a low level of support and 5 a high level of support.

Enjoyment & Thriving Livelihoods Public Support Rankings	Shaw						San Juan						Lopez						Orcas					
	11 Respondents						16 Respondents						6 Respondents						27 Respondents					
Strategies	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Develop a vision of a San Juan County economy based on sustainable marine-based livelihoods.	0	0	3	1	3	1	0	0	2	2	8	0	0	0	0	2	2	0	0	1	5	4	9	1
2. Foster projects that engage residents in marine stewardship.	0	0	1	1	6	0	0	0	1	3	4	0	0	0	0	0	2	0	0	3	4	3	9	0
3. Identify and collaborate with existing marine stewardship voluntary programs.	1	1	3	0	4	0	0	0	3	2	2	0	0	0	1	1	0	0	1	3	5	5	8	0
4. Work with users, the County and port districts to develop criteria for facility sitings.	0	0	2	1	3	0	1	0	4	2	2	0	0	0	1	0	2	0	2	0	7	8	4	0
5. Work with federal, state, and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow harvest.	0	0	0	2	5	0	0	0	2	3	3	0	0	0	0	0	4	0	2	0	6	6	8	0
6. Where consistent with sustainability, promote harvest opportunities in the San Juan Islands.	0	1	0	1	4	0	0	0	3	0	6	0	0	0	1	0	4	0	1	1	8	3	7	0
7. Work with groups developing watershed management plans to include effects on the marine environment in those plans.	1	0	1	4	2	0	0	2	3	3	1	0	0	0	0	2	1	0	1	3	3	7	4	0
8. Promote water quality protection through best management practices to keep toxins and pathogens out of seafood.	1	1	1	2	3	0	0	0	1	4	4	0	0	0	0	1	2	0	2	1	2	4	10	0
9. Preserve and increase public access to natural shoreline and marine views, coupled with a strong stewardship message and compatible behavior expectations.	0	0	3	3	2	0	0	1	1	3	4	0	0	0	0	0	3	0	2	1	5	5	10	0
10. Feature the work of local artist and poets, inspired by the islands' marine ecosystem, in stewardship messages.	0	1	0	2	4	0	0	1	0	2	5	0	0	0	1	0	2	0	1	4	2	3	9	0
Additional strategies																								
Public wants things to work not just be ????	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Cultural Traditions Public Support Rankings

Strategies	Shaw (6 Respondents)						San Juan (18 Respondents)						Lopez (6 Respondents)						Orcas (29 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Continue and build upon joint tribal-community events.	0	0	0	3	1	0	0	0	3	2	7	0	0	1	0	2	2	0	2	0	8	6	9	1
2. Identify and engage key partners as active marine stewards.	0	0	1	1	3	0	1	0	1	1	7	0	0	0	3	0	2	0	1	3	3	9	8	0
3. Support efforts to highlight traditional marine practices.	0	0	1	1	1	0	0	1	5	1	2	0	0	0	1	1	1	0	2	3	6	5	6	0
4. Promote water quality protection through established marine practices to reduce toxins and pathogens in seafood.	0	0	1	1	3	1	0	0	2	5	5	0	0	0	2	2	1	0	0	2	1	7	12	1
5. Educate and engage seasonal and year-round residents in the stewardship of the County's marine environment.	0	0	0	2	2	0	0	1	5	3	6	0	0	0	3	1	2	0	3	0	2	5	16	0
Additional strategies																								
Establish an economic vision that allows all cultures to be expressed, including, the culture of stewardship.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Work with tribes that have a county history.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use beach watchers more. Connect MRC with them better.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Encourage community gathering - story telling.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Develop a Coast Salish Cultural Center.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teach in schools the history of Europeans strategy in Puget Sound.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Promote archeological record as traditional harves/stewardship strategies.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
More interpretative/educational efforts to promote stewardship.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Restore and increase intertidal clam gardens/clam terraces at all suitable beaches. (see: John Harper - 2004-5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Renew tribal cultural events to draw & educate locals & visitors.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Seabirds Public Support Rankings

Strategies	Shaw (8 Respondents)						San Juan (21 Respondents)						Lopez (6 Respondents)						Orcas (26 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Increase prey base.	0	0	0	2	2	0	0	0	3	1	5	0	0	0	0	1	1	0	1	1	6	3	7	0
2. Protect and restore spawning habitat for forage fish.	0	0	1	3	2	0	0	0	3	5	6	0	0	1	1	0	1	0	0	3	3	6	10	0
3. Support regional herring recovery.	0	1	1	3	2	0	0	0	3	1	8	0	0	0	0	1	3	0	0	2	4	4	9	0
4. Reduce disturbance from humans.	0	1	2	0	2	0	1	1	5	2	0	0	0	0	2	1	2	0	2	0	7	3	6	0
5. Remove derelict fishing gear.	0	0	1	0	4	0	0	3	1	1	6	0	0	0	2	1	1	0	1	2	2	2	10	0
6. Reduce risk and improve response to oil spills.	0	0	0	3	3	0	1	2	0	5	3	0	0	0	0	0	2	0	0	1	4	4	10	0
7. Minimize chronic pollution from land and marine sources.	1	0	3	2	1	0	1	2	4	2	3	0	0	0	2	1	1	0	2	1	5	5	8	0
8. Reduce greenhouse gas emissions. Plan for sea level rise.	0	0	0	2	2	0	2	4	6	2	0	0	0	0	0	1	1	0	2	1	7	3	5	0
9. Educate and engage citizens in the stewardship of the County's marine environment.	0	0	1	3	3	0	0	0	2	8	6	0	0	0	0	0	2	0	1	1	4	6	12	0
Additional strategies																								
More enforcement of existing law around sea bird colonies.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pacific Salmon Public Support Rankings

Strategies	Shaw (8 Respondents)						San Juan (21 Respondents)						Lopez (6 Respondents)						Orcas (26 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Protect and restore forage fish spawning habitat.	0	1	1	3	3	0	0	1	2	5	5	0	0	1	1	0	2	0	0	3	3	4	6	0
2. Support regional herring recovery.	0	2	1	3	3	0	0	0	2	5	3	0	0	0	0	0	5	0	0	2	5	2	7	0
3. Improve and coordinate shoreline management.	0	3	1	2	1	0	0	2	6	1	0	0	1	1	1	0	1	0	1	1	5	8	2	0
4. Implement local salmon recovery plan.	1	0	0	5	3	0	0	0	3	2	7	0	0	0	0	1	4	0	0	3	7	2	8	0
5. Connect with regional salmon protection.	0	1	1	3	2	0	0	0	0	5	7	0	0	0	0	0	2	0	0	3	1	4	6	0
6. Minimize new bulkheads. Remove shoreline armoring where appropriate. Encourage soft shore treatments.	2	0	2	0	2	0	0	2	8	3	0	0	0	0	2	1	1	0	3	4	5	2	2	0
7. Educate and engage citizens in the stewardship of the County's marine environment.	0	0	1	1	5	0	0	0	3	5	5	0	0	0	0	0	3	0	1	1	2	4	9	0
8. Educate about protecting nearshore habitat.	0	0	1	1	3	0	0	0	3	5	5	0	0	0	1	0	3	0	1	1	2	2	12	0
9. Minimize chronic oil pollution from land and marine sources.	0	1	2	0	2	0	0	4	1	1	4	0	0	0	0	0	3	0	1	3	3	3	8	0
10. Reduce risk and improve response to oil spills.	1	0	0	1	3	0	0	3	0	1	5	0	0	0	0	0	3	0	0	3	3	2	9	0
11. Reduce greenhouse gas emissions. Plan for sea level rise.	1	2	1	1	1	0	2	2	2	3	0	0	0	0	1	0	1	0	3	1	4	6	0	0
12. Better manage upland activities.	0	1	3	2	1	0	1	2	4	2	2	0	0	1	0	1	1	0	2	1	4	3	8	0
Additional strategies																								
Note: first column what citizen supports - second column what they think general public will support.	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inform and employ beach watchers.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protect pocket estuaries.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discontinue salmon derbies.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Develop best management practices for land/home owners.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nationalize oil companies.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protect our local spawning streams.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Rockfish, Lingcod and Greenling Public Support Rankings	Shaw						San Juan						Lopez						Orcas					
	10 Respondents						22 Respondents						6 Respondents						24 Respondents					
Strategies	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Reduce bycatch of select species	0	1	2	2	2	1	0	3	3	2	2	0	0	0	0	1	2	0	0	2	3	5	3	0
2. Suspend direct harvest of select species until recovery goals are met.	1	2	1	1	4	1	1	4	7	2	1	0	0	1	2	1	1	0	2	2	3	5	10	0
3. Educate the public about threats to rockfish, lingcod, and greenling.	0	0	0	2	7	0	0	1	2	8	6	0	0	0	1	0	3	0	1	3	3	2	9	0
4. Minimize chronic pollution from land and marine sources.	0	0	0	4	2	0	0	1	4	1	4	0	0	0	0	1	2	0	2	4	4	6	2	0
5. Reduce risk and improve response to oil spills.	0	0	0	3	4	0	0	1	2	1	1	0	0	0	1	0	3	0	0	2	3	4	6	0
6. Reduce greenhouse gas emissions. Plan for sea level rise.	0	1	1	2	2	0	1	1	3	2	0	0	0	0	1	0	2	0	5	1	2	5	1	0
7. Better manage upland activities.	0	2	0	2	3	0	1	0	7	0	1	0	0	1	0	3	1	0	4	1	7	3	5	0
8. Educate and engage citizens in the stewardship of the county's marine environment.	0	0	3	1	4	0	0	0	1	5	4	0	0	0	0	0	4	0	1	1	2	3	8	0
Additional strategies																								
Add bottom fish no take fish zones to WDFW San Juan Islands Marine Reserve.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Employ and inform beach watchers.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Establish large no fishing sanctuaries to protect breeding fish stock.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Cull seal population.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Ban all spearfishing.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Habitat Public Support Rankings

Strategies	Shaw (8 Respondents)						San Juan (21 Respondents)						Lopez (6 Respondents)						Orcas (26 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Improve & coordinate shoreline management.	1	2	2	2	1	0	1	2	8	1	2	0	0	1	1	2	0	0	1	0	7	10	3	0
2. Better manage upland activities.	0	1	2	5	0	0	1	2	6	1	2	0	0	1	1	3	0	0	1	2	6	5	7	0
3. Improve understanding of the ecology of sea grasses.	1	1	1	3	3	0	0	2	1	1	4	0	1	0	1	1	0	0	1	1	7	3	7	1
4. Improve understanding of kelp ecology.	1	0	3	1	3	0	0	1	1	4	4	0	0	0	2	1	0	0	1	1	8	4	4	1
5. Educate about protecting nearshore habitat.	0	1	1	3	3	0	0	2	3	5	6	0	0	0	0	3	1	0	2	0	4	1	12	0
6. Promote and adopt innovative development practices . . .	0	2	3	0	3	0	1	0	2	9	0	0	0	0	0	3	2	0	0	0	4	10	7	0
7. Implement local salmon recovery plan.	0	1	1	1	5	0	0	0	3	1	5	0	0	0	0	0	3	0	1	0	4	4	8	0
8. Coordinate with regional habitat protection.	1	0	1	3	2	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	3	5	8	0
9. Minimize new bulkheads. Remove shoreline armoring bulkheads, boatramps, & docks (where appropriate). Encourage soft shore treatments.	0	2	1	3	1	0	2	2	6	1	0	1	1	1	0	3	0	0	3	2	10	1	1	0
10. Minimize chronic pollution from land & marine sources.	1	0	2	2	3	0	1	2	1	0	2	0	0	1	1	1	1	0	0	0	9	6	7	0
11. Reduce risk & improve response to oil spills.	0	0	2	2	4	0	3	1	0	1	3	0	0	0	1	0	2	0	1	3	2	2	9	0
12. Reduce greenhouse gas emissions. Plan for sea level rise.	0	2	2	2	2	0	2	2	3	1	0	0	0	0	1	1	1	0	0	4	5	6	2	0
13. Educate & engage citizens in the stewardship of the marine environment.	0	0	0	0	0	0	0	0	1	5	7	0	0	0	0	1	2	0	0	2	3	3	12	0
Additional strategies																								
Stop plastic use & littering.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moratorium on new docks.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear, concise regs which are easy to interpret and consistently applied.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Map out areas which shoreline facilities allowed/prohibited.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assemble regional database of available science.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Water Quality Public Support Rankings

Strategies	Shaw (8 Respondents)						San Juan (21 Respondents)						Lopez (6 Respondents)						Orcas (26 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Prevent pollution . . .	0	2	0	1	1	0	3	0	6	7	1	0	0	0	2	2	1	0	3	2	6	7	8	0
2. Better manage upland activities.	0	2	1	0	2	0	1	3	5	5	5	0	0	1	1	4	0	0	2	1	7	5	12	0
3. Minimize chronic pollution from land and marine sources.	0	1	1	0	2	0	0	2	3	4	5	0	0	1	2	2	2	0	0	3	7	3	10	0
4. Improve understanding of the ecology of seagrasses.	1	0	1	1	2	0	0	2	3	4	3	0	1	0	1	1	0	0	1	1	5	1	12	0
5. Reduce risk and improve response to oil spills.	0	2	1	0	3	0	1	0	1	1	5	0	0	0	1	1	3	0	2	4	1	1	13	0
Additional strategies																								
Waldron - yes - most already are pretty aware and involved w/H2O in and out, as well as other stuff. In general, level of awareness about H2O in & out is pretty low. (written in column instead of numbers)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Impound rainwater.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limitation on building near shoreline and size of structure - larger houses = more waste. Insure there is adequate water & septic systems away from water.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Do testing of environmental samples to see what is a threat - not just to marine environment, but also human health.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
San Juan County Septic System Plan.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrophotaner(sp?) (public access) provide results to person bringing in sample and record the data.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Prohibit motorized recreational boats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prohibit all sewage discharge into marine waters.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Address change global warming could have on water quality.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Connect and employ beach watcher for help.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Start to monitor for a wide range of chemicals including pesticides/ herbicides/medicines and publish results widely.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Marine Mammals Public Support Rankings

Strategies	Shaw (9 Respondents)						San Juan (22 Respondents)						Lopez (6 Respondents)						Orcas (25 Respondents)					
	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other	Number 1	Number 2	Number 3	Number 4	Number 5	Other
1. Implement local salmon recovery plan . . .	1		1	2	5	0	0	0	2	3	10	0	0	0	0	0	3	0	2	1	3	7	9	0
2. Protect and restore spawning habitat for forage fish.	0	2	2	2	2	0	0	1	4	5	4	0	1	0	0	0	1	0	2	1	7	7	7	0
3. Support regional herring recovery efforts.	0	1	2	2	2	0	0	0	3	3	3	0	0	0	1	1	3	0	3	1	7	1	6	0
4. Reduce disturbance from vessels.	0	2		3	2	0	0	4	4	1	3	0	0	1	0	3	1	0	2	4	6	3	5	0
5. Support efforts to reduce toxins that accumulate within the food chain.	2	1	2	2	2	0	0	0	1	6	7	0	0	0	1	2	3	0	2	1	6	5	6	0
6. Improve and coordinate shoreline management.	1	3	1	2	1	0	0	2	8	2	0	0	0	1	2	1	0	0	0	2	6	8	2	0
Additional strategies																								
Publish a "best practices" list of detergents, cleaners, degreasers, etc. by brand.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sustenance (for food & hides) killing of Harbor Seals.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Re: #3: lack of understanding. #4: both lack of understanding & resistance. GO SOUNDWATCH! #6: resistance.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Discontinue Salmon derbies.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Marine Managers' Meeting Introduction

The following appendices documents the Marine Managers Meeting. Managers of federal, tribal, state and county agencies and non-governmental organizations with stewardship responsibilities in the San Juan Islands met on May 14 and 15, 2007 to discuss the Marine Stewardship Area Plan and the results of the community workshops. Managers considered ways their agencies and organizations could collaborate in supporting strategies important to citizens. Managers ranked the plan's strategies for protection and restoration in order of priority and then discussed possible collaboration on highly ranked strategies by responding to a three-part template:

- We are doing …
- We plan to do …
- We need partners to do …

Marine Managers' Strategy Polling

The following table presents the results of managers' ranking of strategies in order of priority. Each manager was given 10 green dots and three red dots with instructions to show support for a particular strategy by allocating 1-10 green dots and lack of support by allocating 1 -3 red dots.

Strategy Polling

Category	#	Protection Strategies	Marine Resource(s) Protected By Strategy	Green Votes	Red Votes
Stewardship & Education	23	Foster projects that educate and engage the public (seasonal and year round residents) in marine stewardship	Enjoyment/Livelihoods, Cultural Traditions, Habitat, Water Quality, Seabirds, Salmon, Rockfish, Lingcod and Greenling	16	0
Protect Habitat	8	Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat & water quality.	Habitat, Water Quality, Salmon, Rockfish, Lingcod and Greenling	12	0
Improve Public Access To Beaches	36	Preserve and increase public access to natural shorelines and marine views, coupled with a strong stewardship message and compatible behavior expectations.	Enjoyment/Livelihoods	12	10
Protect Fish	12	Reduce bycatch of select species.	Rockfish, Lingcod and Greenling	10	0
Protect Habitat	9	Improve understanding of sea grasses (such as eelgrass) & environmental conditions causing its loss to protect and restore it.	Habitat	9	0
Prevent Pollution	1	Reduce risk and improve response to oil spills.	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling	8.5	0
Protect Fish	13	Suspend direct harvest of select species until recovery goals are met.	Rockfish, Lingcod and Greenling	8	3
Stewardship & Education	26	Provide education and outreach on the importance of nearshore habitat and best marine uses/shoreline practices to protect it.	Habitat, Salmon	8	0
Protect Habitat	7	Improve and coordinate incentives, regulations, enforcement and mitigation to better manage shoreline construction, bulkheads, docks and anchoring.	Habitat, Marine Mammals	8	0
Protect the Food Web	21	Protect and restore spawning habitat for forage fish.	Seabirds, Salmon, Marine Mammals	7	0
Protect Marine Mammals	20	Reduce disturbance from vessels.	Marine Mammals	7	0
Stewardship & Education	25	Identify and collaborate with existing marine stewardship voluntary programs to coordinate marine stewardship in the County.	Enjoyment/Livelihoods	7	0
Coordination & Partnerships	29	Work with groups developing watershed management plans to include effects on the marine environment in those plans.	Enjoyment/Livelihoods	6	0
Protect Seabirds	19	Reduce disturbance from humans.	Seabirds	6	0
Coordination & Partnerships	30	Identify and engage key partners as active marine stewards.	Cultural Traditions	6	0
Coordination & Partnerships	32	Connect with regional salmon protection efforts.	Salmon, Habitat	6	0

Strategy Polling

Category	#	Protection Strategies	Marine Resource(s) Protected By Strategy	Green Votes	Red Votes
Prevent Pollution	2	Minimize chronic pollution from land and marine sources (medium spills and chronic events such as bilge pumping and fuel spills).	Water Quality, Habitat, Seabirds, Salmon, Rockfish, Lingcod and Greenling,	5.5	3
Protect Fish	15	Implement local salmon recovery plan (i.e., research to find how much salmon use the San Juan marine environment, conduct habitat protection and restoration projects, and improve hatchery and harvest management).	Salmon, Habitat, Marine Mammals	5	0
Remove Derelict Fishing Gear	38	Remove derelict fishing gear.	Seabirds, Salmon, Rockfish, Lingcod and Greenling, Marine Mammals	5	0
Prevent Pollution	3	Prevent pollution by product bans, incentives for substitutes, and better handling and disposal practices.	Water Quality	4.5	1
Address Climate Change	34	The County and its citizens do their part to reduce greenhouse gas emissions. The County plans for sea level rise and other climate change affects.	Habitat, Seabirds, Rockfish, Lingcod and Greenling, Salmon, Marine Mammals	4	9
Protect Habitat	10	Improve understanding of kelp & the environmental conditions causing its loss to protect/restore it.	Habitat	4	0
Protect Seabirds	18	Increase prey base for seabirds.	Seabirds	4	0
Coordination & Partnerships	33	Coordinate with regional habitat protection efforts.	Habitat	4	0
Stewardship & Education	27	Promote and adopt innovative development practices such as low impact development, green building, and smart growth to reduce harm to the environment.	Habitat	3	0
Protect the Food Web	22	Support regional herring recovery efforts.	Seabirds, Salmon, Marine Mammals	3	0
Coordination & Partnerships	31	Continue and build upon joint tribal-community events, such as hosting the tribal canoe groups when they pass through the San Juan Islands.	Cultural Traditions	3	0
Protect Habitat	11	Minimize new bulkheads. Remove shoreline armoring—such as bulkheads, boat ramps, and docks (where appropriate). Educate and encourage shoreline landowners to choose soft shore treatments that do not harm the nearshore habitat.	Habitat, Salmon	3	0
Protect Fish	17	Where consistent with sustainability, promote harvest opportunities in the San Juan Islands and the preservation and development of infrastructure so that as much as possible of the associated economic benefit is local.	Enjoyment/Livelihoods	2	3
Protect Fish	16	Work with federal, state, and tribal fishery resource managers to promote sustainability of marine resources at levels that will allow reliable commercial, recreational, and sustenance harvest in the San Juan Islands.	Enjoyment/Livelihoods	2	0
Prevent Pollution	4	Determine scope and nature of the water quality problem and develop implementation plan.	Water Quality	1	0

Strategy Polling

Category	#	Protection Strategies	Marine Resource(s) Protected By Strategy	Green Votes	Red Votes
Prevent Pollution	5	Promote water quality protection through best management practices to keep toxins and pathogens out of seafood.	Enjoyment/Livelihoods, Water Quality	1	0
Preserve Traditional/ Cultural	37	Support efforts to highlight traditional marine practices.	Cultural Traditions	1	0
Prevent Pollution	6	Support efforts to reduce toxins that accumulate in the food chain.	Enjoyment/Livelihoods, Cultural Traditions, Marine Mammals	0	0
Transportation	35	Work with users, the County and port districts to develop criteria for facility siting (barge landings, marinas, docks, moorings) that balance the need for marine resource infrastructure with protection of ecosystem function.	Enjoyment/Livelihoods	0	2
Stewardship & Education	28	Feature the work of local artists and poets, inspired by the islands' marine ecosystem, in stewardship messages	Enjoyment/Livelihoods	0	2
Stewardship & Education	24	Develop a vision of a San Juan County economy based on sustainable marine-based livelihodds and a communication strategy to promote this.	Enjoyment/Livelihoods	0	6
Protect Fish	14	Educate public to understand the status and threats to rockfish, lingcod, and greenling and take ownership for recovery.	Rockfish, Lingcod and Greenling	0	0

Marine Managers' Meeting Notes

The following summarizes managers' discussion and recommendations on May 14 and 15.

May 14 Round Table I Notes

- How can Tribes be assured that community-supported strategies are in line with science-supported strategies (see 5-S process workbook for documentation)? Such assurance is important for Tribes/agencies' ability to commit.
- Some threats that may be significant to agencies and Tribes did not make it to final level of serious threat in 5-S process. This group should flag these threats for MRC.
- Lack of data lending themselves to spatial analysis—we're getting there, but need help from the agencies and Tribes.
- NOAA: Turn "Be Whale-Wise" guidelines into regulations. Add as strategy to marine mammal threat.
- Education and outreach should be done in addition to, rather than "in lieu of" more rigorous management.
- Education regarding by-catch should be included in education/outreach efforts, specifically regarding seabirds, marine mammals, rockfish (WDFW).
- DNR: involved with eelgrass restoration, buoy management, creosote removal. The following are areas and examples of how the DNR is involved with partners:
  - Runoff issues
  - Cable crossing sitings
  - Barge landing site approval
  - Conservation/leasing programs
- Consider closing some bedland areas to harvesting, similar to Yellow Island salmon fishing closure example of partnering to protect/restore resources.
- Rethink concept that salmon are here because it's a healthy habitat-it may be all they have.

May 14 Round Table II Notes

- Split public access strategy into two different strategies in order to protect spawning beaches or other resource needs.
- "Increase public access" is too general. Increasing access may conflict with disturbance issues.
- Need for public access. All educational and spiritual resources are critical—balance with need for protection of resources.
- Public access doesn't necessarily conflict with environmental protection (land bank examples).
- Overall County public access plan needed. Combine agencies' resources, jurisdictions to achieve this, while preserving sensitive areas. Examples: X number of miles of shoreline/ X number of people is publicly accessible.
- List public beaches for public agencies. Pool educational outreach efforts on these, including education on which areas need restrictions and why.
- Connect public areas with trails to increase access, i.e. County Park to State Park to National Park, and etc. Example: trail to Granny's Cove whale watching area. Agencies support with money and/or politically.
- Share impact reviews regarding resources at areas proposed for public access.
- #34: red dots due to difficulty for agencies to impact greenhouse gas issues. Or not the purview of their agency; or agency can't take a stand for various reasons. Or not a good use of limited resources - too much time and effort, little "bang for the buck."
- Reds #13 on suspending harvest-may waste hatchery fish, or not part of recovery plan. Conclusion: need to be specific with strategy wording. "Tease out specifics."
- Recognize that some agencies don't naturally partner on several issues.
- Suggestion to lump categories to indicate partner areas.
- Oil spill reds – why? Explain concern to Carl Andersen, Ecology.
- Restoration of terrestrial habitat—needs to be emphasized in partnership discussion. Need more opportunity for public involvement and this is a good one.
- Access points—multi-use-very limited. County has responsibilities for zoning along shoreline. But responsibility for environmental issues falls to agencies.
- Include local health department in Marine Managers meetings.
- DNR endorsement of aquatic environmental reserve for Haro Strait.
- Focus impact where it exists today not "willy-nilly".

May 15 Recommendations

- Consider nominating particular aquatic reserves, such as the south end of Lopez or Haro Strait. Form a San Juan County reserve working group to nominate and propose site(s).
- MRC would like agencies/NGO's to take MSA strategies back to leadership level for their active support/assistance in implementation.
- Facilitate collaborative process for groups to advise agencies on tough issues and management actions, such as no-fishing in rockfish areas.
- MRC could act as advisory group to resource agencies.
- MRC should provide 5-S workbook to agency partners. Agencies can use it to support their own work, as well as to support MRC in proposals before County Council.
- Work together to develop and support new Critical Areas Ordinance (CAO) to provide protection to marine resources.
- MRC facilitate public participation in stewardship, via bringing in agency expertise on specific citizen-appropriate activities, to train whoever is interested.
- Review target species identified in 5-S plan.
- Connect strategies with specific programs and plans.
- Agencies review strategies and suggested partnerships; then discuss and commit to actions to achieve strategies.
- Have another "reality check" meeting of marine managers/MRC six months from now.

Opportunities for Collaboration Among Agencies and NGOs

The following list provides abbreviations of the agency names and programs used in the table *Opportunities for Collaboration*.

This list is provided as a legend for the table that follows.

Acronym	Agency	Acronym	Agency
ALEA	Aquatic Lands Enhancement Account	IOSA	Islands Oil Spill Association
BFRZ	Bottom Fish Recovery Zone	LEED	Leadership in Energy and Environmental Design
BLM	Bureau of Land Management	NPS	National Park Service
CDPD	Community Development and Planning Department	NWR	National Wildlife Refuge
DOE	Washington State Department of Ecology	PPS	People for Puget Sound
DNR	Washington State Department of Natural Resources	PWD	Public Works Department
ERPs	Enterprise Resource Planning	SJC	San Juan County
FHL	University of Washington Friday Harbor Laboratories	TNC	The Nature Conservancy
FSJ	Friends of the San Juans	USFWS	United States Fish and Wildlife Service
HPA	Hydraulic Project Approval	UW	University of Washington
IAC	Interagency Committee for Outdoor Recreation	WDFW	Washington State Department of Fish and Wildlife

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
#13 Suspend Direct Harvest of Selected Species	**WA State Parks** ☑ Support Bottom Fish Recovery Zones around parks ☑ Education **PPS** ☑ Building constituency among divers, recreational boaters, scientists, etc. **TNC** ☑ Yellow Island Steward educating boaters and fishers on MPA status at Yellow and Low Islands MPA ☑ Petition WDFW to close salmon fishery in Yellow Island MPA (directed at rockfish bycatch)	**TNC** ☐ Work with co-managers and local fishing community to identify new areas as rockfish nurseries/sanctuary ☐ Work with community to mobilize on-water stewards to educate public about refuges and BFRZs	**TNC** ☐ Need MRC, co-managers and fishing interest to identify areas for further rockfish protection ☐ Work with MRC, Whale Watch, USPWS, NGOs to develop conservation Power Squadron
#38 Remove Derelict Fishing Gear	**WDFW** ☑ Maintains data base and internet report form **USFWS** ☑ Supporting NW Straits through permitting access to refuge islands and letters of support for grants ☑ Reporting derelict gear around our preserves	**Tulalip Tribes** ☐ Tribal divers train to remove derelict gear	**WDFW** ☐ Educate fishers and divers to report gear

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
# 20 Reduce Disturbance to Marine Mammals from Vessels	**WA State Parks** ☑ Education on whale watch vessel guidelines **WDFW** ☑ Marine bird surveys stopped due to funding change (have 10 years bird distribution data) **USFWS** ☑ Limited monitoring **FSJ** ☑ Proposed vessel traffic ordinance to SJ Council **TNC** ☑ Contacting boats too close to haul-outs near our preserves and NWRs	**USFWS** ☐ Educate boating public to non-intrusive wildlife viewing techniques **TNC** ☐ Work w/ partners to develop conservation Power Squadron to educate	**WDFW** ☐ Investigate the impact of recreational vessels on marine bird foraging **DNR** ☐ Conservation programs (conservation leases, withdrawal, reserves)FSJ ☐ SJ County ordinance on vessel safety needs to be approved **USFWS** ☐ Investigate impacts of boating to seabird resource (disturbance, mortality) ☐ Work on educating using public
# 17 Promote sustainable harvest and preserve infrastructure for local economic benefit	**WDFW** ☑ Regulate and manage fisheries (Steve Burton 425-775-1311 x126) **DNR** ☑ Authorizations for marinas and other water-dependent uses ☑ Shellfish authorizations **Tulalip Tribes** ☑ Manage fisheries	**TNC** ☐ Explore conservation lease of aquatic lands – partners w/shellfish growers	
#15 Implement local salmon recovery plan	**SJC CDPD** ☑ Some regulation of upland activities to minimize development impacts **DNR** ☑ Creosote cleanup and piling removal **FJS** ☑ Providing stewardship guide to new land owners **TNC** ☑ Working to increase public funding for salmon recovery in Puget Sound	**SJC CDPD** ☐ Will improve regulations with update to CAO **SJC Land Bank** ☐ Restore freshwater wetlands for juvenile salmon **TNC** ☐ Continue to identify and increase funding for salmon recovery	**SJC CDPD** ☐ Help with science ☐ Help identify regulatory changes ☐ Provide support in public process **DNR** ☐ Conservation programs (conservation leases, reserves, withdrawals) **Skagit River System Cooperative** ☐ We want to continue to partner with local organizations in further refining needed elements of the Salmon Recovery Plan **TNC** ☐ Need partners to identify good projects and advance for funding
# 34 Address Climate Change	**Port of Friday Harbor** ☑ Using electric vehicles ☑ Talking about sea level rise ☑ Changing lighting to compact fluorescent **BLM** ☑ Riding my bike, kayaking ☑ Sharing rides	**BLM** ☐ Increase green transport in my area	**SJC Land Bank** ☐ Plan for change **WDFW** ☐ Develop list of "carbon foot print" "make up options" in marine environment **BLM** ☐ Share boat rides

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
#36 Preserve and increase public access to natural shorelines (where appropriate) and marine views, coupled with a strong stewardship message and compatible behavior expectations	**Port of Friday Harbor** ☑ Promote access - beach and boat ramp, small sail boat and canoe access **SJC Land Bank** ☑ Acquiring private lands **SJC Parks** ☑ Many shoreline access properties **WA State Parks** ☑ Provide access ☑ Continue to look for new opportunities for new trails **WDFW** ☑ Survey and map black oystercatcher nests **DNR** ☑ ALEA grants (through IAC) ☑ Public access through lease negotiations ☑ Acquisitions **NPS** ☑ Improving trail access to park units in concert w/ Island Trails Plan **BLM** ☑ Improving accessibility and infrastructure to enrich visitor experience **TNC** ☑ Preserving but not increasing public access	**SJC Land Bank** ☐ Acquiring private lands **BLM** ☐ Seek opportunities for acquisition	**SJC Parks** ☐ Could use educational materials ☐ Partner to present stewardship message - evening slide shows or presentations **WDFW** ☐ Implement seasonal closures where necessary ☐ Survey for birds, mammals and resources that shouldn't be disturbed **DNR** ☐ Acquisitions of tidelands **NPS** ☐ Help trails committee acquire easements and corridors **BLM** ☐ Need partner support to demonstrate the need for BLM participation and more public access
#8 Better manage upland activities (development, stormwater runoff, wastewater, septic systems, etc.) that can harm marine habitat and water quality	**SJC CDPD** ☑ Updating Critical Areas Ordinance (CAO) **SJC PWD** ☑ Eastsound stormwater outfall treatment **SJC Parks** ☑ We use no chemicals in grounds maintenance and no pesticides ☑ We scale new construction and limit impervious surfaces **BLM** ☑ Working on corrective trail maintenance **PPS** ☑ Educate and advocate for strong CAO/SMP, septic system regulations, stormwater regulations	**SJC PWD** ☐ Incentives for Low Impact Development **WA State Parks** ☐ Replace pit toilets with composting toilets **BLM** ☐ Work on connectivity with adjacent land owners - public/ private **PPS** ☐ Involvement in Puget Sound Partnership planning, SJC regulations	**SJC CDPD** ☐ Help us identify and understand science to guide the regulations (CAO) ☐ Identify specific regulations needed ☐ Provide support in public process **SJC PWD** ☐ Prioritize sensitive areas (water quality/stormwater) ☐ Public education re: water quality impacts of stormwater **SJC Parks** ☐ Develop waste water management and stormwater runoff **BLM** ☐ Identify shared interests, values, possibilities **Skagit River System Cooperative** ☐ We will work with SJC in the development of its revised CAO **FSJ** ☐ Local and state funds for outreach on stormwater **PPS** ☐ Coalition partners

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
#26 Stewardship and Education	**SJC Parks** ☑ We have public facilities where education projects could be conducted (venue to post materials) **SJC Land Bank** ☑ Set use guidelines for our shoreline properties **DNR** ☑ Nearshore education ☑ Creosote cleanup **BLM** ☑ Working with kids, developing environmental education programs **FSJ** ☑ Survey and educate shoreline property owners ☑ Providing stewardship guide to new land owners	**BLM** ☐ Seek interpretive opportunities for more outreach **PPS** ☐ Alliance for Puget Sound Shorelines "Mud Up!" program	**BLM** ☐ Help define a cohesive, comprehensive, unified priority message
#21 Protect and restore spawning habitat for forage fish	**SJC CDPD** ☑ Some regulation of upland activities to minimize impacts on eelgrass and forage fish habitat **SJC Land Bank** ☑ Acquiring and restoring tidelands **WA State Parks** ☑ Creosote surveys/removal **WDFW** ☑ Mapping and data base (Dan Penttila 360-466-4345 surveys) **DNR** ☑ Creosote removal ☑ Beach cleanup of garbage **BLM** ☑ Creosote log inventory on Lopez **USFWS** ☑ Maintain clean beaches on refuge islands **TNC** ☑ Protecting eelgrass habitat and potential spawning beaches ☑ Protecting and managing shoreline preserves in the San Juans - specifically Waldron Island shoreline	**SJC CDPD** ☐ Improve development regulations **DNR** ☐ Habitat Conservation Plan for state aquatic lands ☐ Policy changes on leasing of docks (consistent with Shoreline Management Act) **BLM** ☐ Work w/ DNR to acquire/protect designated areas ☐ Broaden inventory to all of SJC **FSJ** ☐ Providing stewardship guide to new land owners **TNC** ☐ Buy and protect new shoreline preserves	**SJC CDPD** ☐ Summarize related science ☐ Identify regulatory changes ☐ Provide support as we take regulations through public process **BLM** ☐ Identify shared interests, protection values ☐ Remove logs - partner to ensure coverage **USFWS** ☐ Survey islands w/ potential forage fish spawning habitat for presence/absence **FSJ** ☐ Better coordinated review of plans by County Health, CDPD and PWD **TNC** ☐ Continue to get project ideas from SJC Land Bank, San Juan Preservation Trust, FSJ, agencies, citizens

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
# 22 Support regional herring recovery efforts	**WDFW** ☑ Mapping and data base (contact Steve Burton 425-775-1311 ext 126 or Curt Stich 360-466-4345) **DNR** ☑ Creosote removal ☑ Garbage removal **FSJ** ☑ Ongoing survey of priority bays in SJC ☑ Providing stewardship guide to new land owners	**SJC Land Bank** ☐ Restore former herring spawn area **DNR** ☐ Policies to address leasing of docks ☐ Habitat Conservation Plan identifies best management practices for nearshore protection	
#1 Reduce risk and improve response to oil spills	**Port of Friday Harbor** ☑ Support IOSA - provide moorage and many members ☑ Sell oil spill pads, educate ☑ Work with others to remove derelict vessels **SJC Parks** ☑ Provide IOSA w/ water access points **WA State Parks** ☑ Member IOSA ☑ Recruit more park staff members **WDFW** ☑ Oil spill response team data base ☑ Marine bird and mammal surveys (no budget now, stopped) **DNR** ☑ Derelict vessel removal **DOE** ☑ Education ☑ Staging spill response equipment ☑ New mobile transfer rules ☑ Training ☑ Enforcement ☑ Bellingham staff ☑ Local contractor **USFWS** ☑ Maintain species use data base ☑ Review ERP **BLM** ☑ Working w/ IOSA **PPS** ☑ Work for state and federal legislation funding for year round tug to increase protection	**DOE** ☐ Education ☐ Enforcement ☐ Drill, train **BLM** ☐ Outreach more w/ IOSA **USFWS** ☐ Promote drills - actual and table-top **PPS** ☐ Lobby fed, lobby state	**DOE** ☐ Get the word out ☐ Local "eyes" ☐ Respond **BLM** ☐ Help identifying areas which may need boom anchors and BLM participation **PPS** ☐ Join in

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
#27 Promote and adopt innovative development practices such as low impact development, etc.	**WDFW** ☑ Regulations via HPA rules (David Brock 425-775-1311) **DNR** ☑ Policies restrict use of creosote in overwater structures	**Port of Friday Harbor** ☐ LEED certification goal in new building **DNR** ☐ Habitat Conservation Plan will include best management practices for overwater structures	**Port of Friday Harbor** ☐ Promote green building standards in public buildings ☐ Support county solar initiatives
#16 Promote sustainability of marine resources at levels that will allow reliable … harvest in the San Juan Islands	**WDFW** ☑ Seal food habitat study ☑ Marine bird and forage fish research ☑ Black oystercatcher survey and study ☑ Scoter study ☑ Contact Steve Burton 425-775-1311 ext 126) **DNR** ☑ Wild stock geoduck harvest and management ☑ Geoduck aquaculture ☑ Clam, oyster, mussel leasing **NPS** ☑ Writing long-term management plan that includes nearshore environment **USFWS** ☑ Refuge comprehensive conservation plan **TNC** ☑ Work w/ MRC to develop MSA plan and strategies	**TNC** ☐ Work w/ MRC, San Juan Initiative, County, agencies to define goals and identify funding	**NPS** ☐ Partner with DNR to promote protection of wider marine zone **TNC** ☐ Identify clear goals/success related to trust/target resource and implement/ measure/refine
# 9 Improve understanding of sea grasses and causes of loss to protect and restore them	**DNR** ☑ Nearshore science studies ☑ Derelict structure removal **NPS** ☑ Issue research permits for inventory and monitoring **FSJ** ☑ Ongoing survey and dialog w/ local/ state/federal seagrass experts in priority embayments **TNC** ☑ Eelgrass mapping around Yellow Island (contract w/ FHL)	**WA State Parks** ☐ Replacing moorage anchors w/ screws ☐ Establishing no-anchor zone – Sucia ☐ Monitoring eelgrass program – Sucia **TNC** ☐ Continue yearly surveys for three consecutive years, then go to every third year monitoring	**WA State Parks** ☐ Interpretive information for bulletin board **DNR** ☐ Control of buoys, floats and docks ☐ Garbage removal (floats) ☐ Notification of derelict vessels **NPS** ☐ Work with UW and DNR to promote research that informs management

Opportunities for Collaboration	We are doing:	We plan to do:	We need partners to do:
#2 Minimize chronic pollution from land and marine sources	**DNR** ☑ Best management practices for marinas (pumpouts, construction) ☑ Derelict vessel removal **DOE** ☑ Education ☑ Response to spills ☑ Enforcement **FSJ** ☑ Educate shoreline property owners (see brochure)	**DNR** ☐ Buoy planning ☐ Reduce impacts to eelgrass from docks **DOE** ☐ Respond to spills ☐ Educate ☐ Enforcement	**DOE** ☐ Respond to complaints ☐ Educate ☐ Notify

Norton-Arnold & Company, 1932 First Avenue, Suite 802, Seattle, WA 98101, 206.269.0229, Fax 206.269.0249, www.na-company.com

Produced for:
San Juan County Marine Resources Committee

APPENDICES C 1-2 Stewardship Area Benchmarks & Objectives

APPENDIX C.1 Long term benchmarks & findings

LT=Longer-term objective-strategies to be developed down the road;
F=Finding – no objectives/strategies to be developed

LT-1. Wintering harlequin duck population size and pelagic cormorant colony size remain stable at 2006 levels over or are increasing over a four year timeframe by 2025.
LT-2. Sedimentation rates are within 20% of historical rates in all embayments by 2025.
LT-3. Reduce rate of decline and restore coastal wetland habitats so that more than 75% of the fringing wetlands show less than a 10% decline in areal coverage by 2027.
LT-4. Overall native species richness and abundance of indicator species are 90% of historic levels and increasing, and invasive species coverage and distribution does not exceed 2007 levels in sand and gravel or rocky intertidal and subtidal areas by [to be determined (TBD)].
LT-5. The number of small spills reported to IOSA is reduced to 8 per year. (Current is 17-18)
LT-6. Reduce human disturbance along shorelines in sensitive areas by [TBD] (amount) by [TBD] (year).
LT-7. There is greater predictability in harvest openings from year-to-year.
LT-8. All identified physical marine cultural sites are protected from further degradation by 2017.
LT-9. On each ferry-served island, [TBD] % of the shoreline is publicly accessible by [TBD] (year). (Note, this is a combination of the miles of public shoreline and public access sites)
LT-10. The level of PAHs in sediments/clams are maintained below [TBD] in all areas of the MSA by [TBD].
LT-11. Locally-caught seafood is available for purchase from two or more vendors on each ferry-served island by [TBD] (year).

F-1. Levels of boating are such that on summer days: remote marine campsites do not have sites available, the level of boat traffic in certain channels is too high, remote anchorage sites are too crowded and safe and legal anchoring locations may not be available.
F-2. The current ratio of demand for boat moorage and storage to supply should be maintained. This is a combination of dry dock capacity, the number of long-term berths, and the number of safe and legal mooring locations.
F-3. The number of waterfront campsites accessible by land are insufficient.
F-4. The current number of shoreline public access sites and miles of accessible shoreline are insufficient.
F-5. The number and diversity of living-wage marine-based jobs are insufficient.
F-6. Marine views and view sheds are impaired by buildings and light pollution.
F-7. There is insufficient access to shell fishing areas.
F-8. Locally-caught and –raised seafood is too expensive.
F-9. Too few local fishermen are involved in commercial fisheries.

(This Page Intentionally Left Blank)

APPENDIX C.2 MSA Priority Research Objectives

Conservation Target: Rocky intertidal and rocky subtidal communities

R-6. Determine current viability/status of rocky intertidal target within the MSA.

R-7. Determine current viability/status of rocky subtidal within the MSA.

R- Better understand the role of kelp habitat and community dynamics. [strategies workshop 10/24]

Conservation Targets: multiple targets/system wide

R-1. Determine the cumulative impacts of docks and other over-water structures on habitats of interest.

R-2. Determine the current levels of PCBs, mercury, tributyl tin, flame retardants and other bioaccumulating contaminants in fish and shellfish in the San Juans that may have biological impacts, including to human health, identify which are priority causes for concern and establish appropriate threshold amounts. Determine local levels of consumption so that the threshold for human health risks is adjusted for local consumption rates.

R-3. Identify significant local sources of priority contaminants listed above and establish specific timelines to reduce these inputs.

R-4. Determine current and sustainable levels of PAHs by looking at sediments, the water column, or clams.

R-5. Determine the current abundance of sand lance and smelt in the MSA

R-8. Identify the current level of greenhouse gas emissions in San Juan County and a target and timeline for reduction.

R-9. Determine number and condition of physical marine cultural sites within the MSA.

R-10. Determine what level and frequency of fishing opportunities are needed to be considered viable (per SC-1).

Conservation Targets: rockfish, lingcod and greenling

R-. Follow-up on Eisenhardt research: repeat dive survey of other four sites in 2007. Repeat fishing pressure assessment. [MRC meeting, Nov 2006]

R - Research the population processes that control the abundances of rockfish, greenling and lingcod, and what role humans play in these processes. [Art Kendall technical review comments]

R - Determining the size structure of the adult populations in 1975 (used as a baseline year for the indicator) to provide the basis for comparison with existing size structures. [Todd Anderson technical review comments]

R - Looking at relative estimate of the density of recruits, use 30-m long transects, surveying a corridor of 2 meters wide x 2 meters high to count young-of-year rockfishes. [Todd Anderson technical review comments]

Conservation Target: Nearshore, sand, mud and gravel communities

R - Compile or collect better data on soft sediment environments [Jennifer Ruesink technical review comments.]

R - Determine how much the biological key attributes have changed (how much wetland loss? how much harder is it to find native clams? how much loss of Zostera japonica and gain of Spartina anglica?) [Jennifer Ruesink technical review comments.]

R - Determine how much shoreline modification has already happened, and the current rate of conversion. [Jennifer Ruesink technical review comments.]

R - Determine how many ships pass through San Juan County annually and rates of different sizes of spills. [Getting at oil spill threat. Jennifer Ruesink technical review comments]

Conservation Target: Pacific Salmon

R - Determine fragmentation of habitat as measured by the amount of piers, docks, groins, breakwaters per mile of shoreline as an indicator for the attribute, Condition of habitat present in the San Juan Islands. Condition: Migration Corridor. [Kurt Fresh Technical review comments]

R - Numbers of bulkheads in divergence zones as an indicator for the attribute, "Condition of habitat present in the San Juan Islands." [Kurt Fresh Technical review comments]

R - Determine salinity measurements as an indicator for the attribute "Distribution of Fraser Water in the SJI" [NOTE: This would be a hard index to make meaningful. The intent would be to reflect long term changes in salinity in the SJIs which refers to both amount and distribution. Perhaps there is a data record at FHL. I would use some sort of deviation from the mean to construct an indicator. Kurt Fresh Technical review comments]

Indicators without data that are either not rated or are rated fair to poor

Target	Key Attribute	Indicator	Current Rating
Rock Intertidal	Height and width of zones	need indicator	
	Age and stage structure	need indicator	
	Water column characteristics	Air and water temperature regime (need to define an indicator)	
	species composition/dominance	native species richness	
	Population size of selected species	abundance of barnacles	
	Population size of selected species	abundance of Fucus	
	Population size of selected species	abundance of limpets	
	Vegetative canopy	mean % cover of kelp	
Rocky Subtidal	Water column characteristics	sedimentation (need to define an indicator)	
	species composition/dominance	native species richness	

Target	Key Attribute	Indicator	Current Rating
	Population size of selected species	sea cucumber abundance in subtidal (-5 to -10 m)	
	Population size of selected species	sea urchin density in subtidal (-5 to -10 m)	
	Vegetative canopy	% cover of Nereocystis	
	Vegetative canopy	abundance of understory kelps	
Nearshore	Associated wetlands coverage for beaches	wetlands (areal coverage? Need to define indicator)	
	Associated wetlands coverage for embayments	wetlands (areal coverage? Need to define indicator)	Fair
	Substrate structure and characteristics in embayments	depth of anoxic horizon in embayments	Fair
	Substrate structure and characteristics in embayments	sedimentation rates in embayments	Fair
	water column characteristics in embayments	dissolved oxygen concentration in embayments	Fair
	Native aquatic vegetative canopy	year to year regional change in Zostera marina area in beaches	Fair
Rockfish, Lingcod, Greenling	juvenile rockfish refuge and foraging habitat	no indicators at this time (may include understory kelp)	
	Recruitment	Sufficient young of the year to fill available habitat in randomly sampled reefs	
	Rockfish species richness	Number of species using randomly sampled sites	Fair
	Population abundance of rockfish, lingcod, and greenling	Population size as estimated from harvest records	Poor
Pacific Salmon	abundance of prey items for salmon up to 100 mm	crab larvae/amphipod/zooplankton indicator	
	abundance of prey items for salmon up to 100 mm	surf smelt/sand lance larvae abundance	
	Juvenile habitat abundance along beaches	year to year regional change in Zostera marina area in beaches	Fair
	juvenile salmon population abundance	abundance of juveniles by species (to be decided)	
Seabirds	Nesting success	oystercatchers: # hatchlings/#nesting pairs	
	Nesting success	pelagic cormorants: # hatchlings/ # nesting pairs	Fair
	seabird food resource availability	forage fish abundance	Fair
	seabird food resource availability	zooplankton (euphausiid) abundance	
	Population size of selected species	Pelagic cormorant colony size	Fair
Marine Mammals	Food resource availability and quality	prey abundance for resident killer whales (salmon)	Fair

Target	Key Attribute	Indicator	Current Rating
	intraspecific communication	background noise levels? Frequency shift in communication?	
Human Enjoyment	Availability of locally-caught and -raised seafood	number and type of vendors (place holder)	
	Views and viewsheds	Views from water - % of shoreline with intact shoreline vegetation	Fair
	opportunities to learn about the marine environment	indicator TBD - should incl. cultural, nat. history and science	
Marine-based Liveli-hoods	Commercial marine harvest opportunities (tribal and non-tribal)	# of vessels fishing?	
	Diversity (variety) of living wage marine-based livelihoods	index of livelihoods (TBD)	Fair
	Diversity (variety) of living wage marine-based livelihoods	number of living wage marine-based jobs	Fair
	Ecologically sustainable marine transportation infrastructure	intermodal access (moving people)	Fair
	Ecologically sustainable marine transportation infrastructure	availability of mooring facilities for commercial vessels with freight movement capacity	Fair
	Opportunities for marine-based research	funding levels for research in the San Juans	
	Condition of physical marine cultural sites	condition of physical marine cultural sites	Fair
Cultural Traditions	appreciation of marine cultural sites and traditions	Extent to which (5?) representative cultural traditions are practiced	
	Recognition and acceptance of treaty rights by non-Indian public	Non-Indian public recognizes the existence and importance of tribal treaty rights.	Fair
	Subsistence Harvest Opportunity	Availability of commonly harvested species (e.g. hardshell clams, crabs, shrimp, salmon), year-round, in quantities suitable for subsistence purposes for tribal members.	Fair
	Subsistence Harvest Opportunity	Availability of commonly harvested species that are healthy to eat.	Fair
	Commercial Harvest Opportunity	Availability of commercially harvested species (e.g. hardshell clams, crabs, shrimp, herring, halibut, salmon), year-round, in quantities suitable to provide a moderate living to 75% of members of tribes with U&A rights in the San Juan Islands.	Fair
	Sustenance harvest opportunities	access to harvested resources	fair

APPENDIX D MSA Plan Technical Review Comments Summary

Reviewers

Rocky Intertidal Habitats & Rocky Subtidal Habitats (2 targets)
- Megan Dethier

Nearshore Sand, Mud and Gravel Communities
- Jennifer Ruesink

Rockfish, Lingcod & Greenling
- Art Kendall
- Todd Anderson

Seabirds
- Kolleen Irvine

Pacific Salmon
- Kurt Fresh
- Si Simenstad

Marine Mammals
- Robin Baird
- Brad Hanson
- Glenn R VanBlaricom

Rocky Intertidal and Subtidal Habitats

Reviewer: Megan Dethier

Megan Dethier
UW Friday Harbor Laboratories
mdethier@u.washington.edu

General Comments

Completing the viability and threat analysis for this target is hindered by lack of data. For most targets and attributes (with the exception of things like Orcas, a few seabirds), there are no historical data - anecdotes, or scattered quantitative data for a few spots might exist, but never enough to establish a 'baseline' against which we could really measure change, or at least not at the scale of the Stewardship area. Suggests planners pick some targets and attributes and start gathering detailed data now.

In the plan, definitions need to be clearer. Hard to understand when the plan is referring to Sources of Stress (eg oil spills) or Impacts of Stress on Attributes (eg compressed intertidal zones). Likewise, the term Irreversibility appears to be interpreted differently by different groups - does it or does it not encompass the likelihood/feasibility of the source of stress actually being stopped or removed (eg docks or boat wakes), or just the ability of the system/attribute to recover if the source of stress was removed. I believe it was the latter, so that is how I altered the ratings.

I was delighted to see, in the Overview, that the 'social-cultural targets' have been separated out from the resource targets - that way, for at least one set of targets, you are following the 5-S definition of a 'target' properly. It also makes it easier to acknowledge that improving a target on one list (a resource one) will often be directly at odds with improving a target on the other (social).

Viability Analysis

Additional comments were made directly to tables from the workbook. See these comments on page 57.

Nearshore Sand, Mud and Gravel Communities

Reviewer: Jennifer Ruesink

Jennifer Ruesink
University of Washington
ruesink@u.washington.edu

General Comments

The County Commissioners and San Juan MRC deserve high marks for embarking on this scientific process of evaluating conditions and changes in the marine environment. The Reviewer Instructions were complete and helpful – hopefully I have interpreted them correctly to provide feedback.

There is essentially no scientific justification provided for any part of the analysis of this marine resource. The Stress Source comments indicate substantial uncertainty (e.g. "placeholder", "do this differently", "guessing at this", "know more in next few months"). Also, the documents contain logical inconsistencies: 1) the threat comments include two stresses that are absent from the Excel spreadsheet (loss of terrestrial riparian vegetation, reduced sediment input); 2) the viability worksheet includes water column indicators for a key attribute that appears nowhere else; 3) multiplication of contribution and irreversibility give different answers (E23 and G41 = High x Medium = Low?; E35 = High x Very High = Medium?); 4) for some attributes, beaches and embayments are distinguished, whereas for others there is a single attribute with indicators separated for beaches and embayments.

It would be useful to know if the planning process is supposed to draw only from what's known about soft sediment environments in this particular area, or if scientific research in other places could also be applied. If the former, then I am a little surprised about how little soft-sediment research has apparently been carried out in San Juan County. If the latter, then this marine resource deserves substantial additional scholarship to document "integrative concepts" (structure-function relationships, major ecological processes) relevant to this habitat type.

Key Ecological Attributes

- Decline in native clam species diversity and abundance (2 indicators each for beaches and embayments)
- Change in sediment size distribution in embayments (3 indicators in embayments)
- Decline in native aquatic vegetation (2 indicators: beaches and embayments)
- Loss of wetland habitats (2 indicators: beaches and embayments)
- Change in sediment size class distribution on beaches (1 on beaches)
- Change in beach profile

Note: The viability worksheet includes 2 water column indicators that did not appear on the Stress-Source worksheet. The Comments Word document includes 2 additional indicators that did not appear on either Excel worksheet.

To summarize these key attributes: three emphasize species (native clams, aquatic vegetation, wetlands), and three emphasize physical variables (grain size in two areas, beach profile). These represent biological and abiotic characteristics – only the most basic aspects and a small part of the potential list, which could include ecological processes, interactions, critical causal links.

The biological key attributes make a lot of sense to me. That is, soft sediment environments are distinguished by the presence of clams and rooted macrophytes. I would also consider adding native oysters (certainly in Willapa Bay, where I work, they were structurally and functionally very important, formerly occupying up to 10% of bay area and providing hard substrate in a largely soft-sediment environment) and predators such as crabs and snails (this would add an ecological interaction to the list; in the broader scientific literature, predators are known to alter species composition in soft sediments, and J. Byers has published on the role of predators in the San Juan Islands). Finally, deposit-feeders in soft sediments can be major ecosystem engineers, but I do not know how common such species as Arenicola (polychaete worm) and Neotrypaea (ghost or sand shrimp) might have been in the area. They would be obvious candidates to add because they can actually modify local sediment grain size.

Sediment grain size, salinity, and temperature (water and air at low tide) are three critical abiotic variables that influence species composition in soft sediments. The selected key attributes disproportionately emphasize what

can be measured at low water, thus missing any aspects of water quality (except for 2 indicators on the Viability worksheet that appear nowhere else). One of the most compelling indicators in Chesapeake Bay, for instance, is a long time series of how deep it's possible to wade before white tennis shoes disappear from view (a rudimentary secchi depth).

Much peer-reviewed work on soft sediment stressors addresses whole-community composition via multivariate analysis (see Warwick and Clarke references and Primer software). So this sort of key attribute seems notably absent (albeit difficult to measure without substantial statistical acumen; and also sometimes difficult to interpret).

1. Are the indicator rating criteria (columns D-G [F-I?]) appropriate? In many cases we were unable to identify criteria for each rating based on the information we had available. Where this is the case, please feel free to suggest criteria.

I had a difficult time interpreting some of these indicator ratings. I'll address them in order: A. <X% of wetlands show <Y% decline: the problem with these ratings is that X and Y both change across levels, so it's not clear to me that 75% showing 10% decline is worse or better than 25% showing 50% decline (and are the <signs in the correct direction?). B. The depth of anoxic horizon can sometimes be within a few mm of the sediment surface. A change of >5 cm might be interpreted as the anoxic layer becoming 5 cm deeper, which could be viewed as an improvement in conditions. C. Within 25% of historic seems better than within 50% of historic (25% is closer than 50%). In any case, for grain size, it is not clear what exactly will be measured - % fines? average grain size? silt:sand ratio? organic content? Many of these aspects of sediment co-vary, but from an indicator perspective it would be good to focus on just one. D. Sedimentation rates undoubtedly have varied more than 10-20% over time, due to natural watershed and hydrological changes. At the other end, it is certainly possible that they could depart >90% from historic rates – for instance, a doubling of sedimentation would exceed this "poor" level. I would guess that the literature contains substantial data on variation in sedimentation rate, although I am not familiar with it. E. For clams and aquatic vegetation, there is inconsistency in terms of what is good vs. very good: is an increasing trend good or very good?

2. Does the current status and ratings (columns E and F [J and K?]) match your view of the current status of this indicator within the San Juans? If you do not agree with our rating, please distinguish between instances where you believe our interpretation is incorrect (in which case, please correct it) and instances where there is significant uncertainty or lack of data relating to the criterion.

I'm familiar with only a few datasets that would allow these indicators to be rated: DNR's eelgrass mapping and DOE's water quality (although I'm not sure the sampling is dense enough to evaluate all of SJ County's embayments). The ratings match my intuition, based on global trends. I would caution, however, that anoxia in sediments can be quite natural, so a change from baseline is more relevant than an absolute level.

3. Are the indicators (column C) appropriate for the key attributes? If not, please suggest an alternative with a detailed rationale.

See question above on how grain size will be measured. In fact, it occurs to me that the key attribute should be "sediment properties", and some aspect(s) of grain size should be the indicator.
Also, many of these indicators vary naturally in time and space – clam density or grain size, for instance. Where and how often will they be measured? I know that DNR is tracking eelgrass distribution and abundance, including the San Juans. Their sampling regime would be usefully acknowledged. It is also quite complicated statistically, so they are able to track eelgrass throughout the state in an efficient and statistically powerful manner. Something similar for clams and for physical attributes would be wonderful, but probably not realistic. Is this list practical or ideal?

4. Is there a critical key attribute that we have overlooked? If so, please suggest what it is and an appropriate indicator (?). [See comments above]

Stresses and Threats

1. Are the stress ratings appropriate?

My understanding is that the stress ranks should emerge from the indicator ratings. Thus, for example, the indicators for clams are in "good" shape, so the stress rank is medium (or, one could argue, low). It does not intuitively make sense to me that sediments in embayments currently have high stress, but I am not sufficiently

familiar with data in the San Juans to know for sure. More generally, it would be possible to cite literature about the vulnerability of bays to siltation due to land use change (at least, this is what I imagine prompts the high stress rank). It would be helpful to know how much the biological key attributes have changed (how much wetland loss? how much harder to find native clams? how much loss of Zostera japonica and gain of Spartina anglica?) This is the sort of information that would be very valuable in the comments provided with the table.

2. Have we overlooked any critical stresses?

Others that seem reasonable: Harmful algal blooms, local freshwater diversions and withdrawals, boat wakes, loss of eelgrass. I put these in because they are phenomena that tend to occur in more protected bays. "Loss of eelgrass" is sort of odd, because it's a key attribute (maybe the intention is to use loss of eelgrass as a threat for fish).

3. Do you agree with our assessment of how significant a contributor each source is to each stress?

Yes. High rankings are given to invasive species, shoreline modification, pollution, climate change and large oil spills. This list does point out something I find confusing, namely whether the ranks are based on actual or possible threats. For instance, shoreline modification has already claimed wetlands and altered sediments. Climate change may in the future cause sea level rise (presumably this affects wetlands) and shifts in species' distributions. (I'm not sure why sediment properties are expected to be so sensitive.) Again, for all of these evaluations, I can state that they make intuitive sense, but I have not found any scientific content to review. For factors such as shoreline modification, it would be useful to know how much change has already happened, and the current rate of conversion. For factors such as oil spills, it would be useful to know how many ships pass through San Juan County annually and rates of different sizes of spills.

Final comment: It's clear that these tables were created in a very rapid assessment of expert opinion. Consequently, there is little empirical support for any of the rankings – although they make intuitive sense to me. I suppose that means that, in a similar rapid expert assessment, I would come to similar conclusions. However, this process seems to miss the point of including actual data from the county or other soft sediment environments.

Rockfish, Lingcod and Greenling

Reviewers: Art Kendall, Todd Anderson

Art Kendall
NOAA Fisheries (retired)
art.kendall@noaa.gov

General Comments

Thank you for the opportunity to participate in the process of identifying critical population problems with the rockfishes, lingcod and greenlings in the San Juans. The review might seem negative, but it is not because the Core Team didn't do a good job. It's just that to my understanding, scientific information is not available to give satisfactory answers to many of the questions posed by the format that they were working with. In my view most of these questions do need to be answered for effective management of these resources to occur. Let's all hope that through this process we can make progress toward increasing our understanding of these populations so we can develop scientifically based management strategies and plans.

Stresses and Threats

It is obvious that considerable time, energy and thought has gone into preparing the tables for the Stress Analysis. The uncertainty exposed in the tables is also abundantly obvious and the scientific literature is completely inadequate to accomplish this task with any degree of precision. We simply know very little about the population processes that control their abundances, and what role humans play in these processes. These processes probably vary considerably among the taxa that are considered here. For example, the population of Puget Sound rockfish seems to be doing quite well. These are small planktivorous fish whose reproductive season in out of phase with that of other rockfishes in the area. Their population actually seems to have

increased in recent years, while the other rockfishes have decreased. Puget Sound rockfish are probably subjected to much less harvest than the other species, and this may relate to their different population trend, however changes in reproductive success due to environmental factors cannot be ruled out. Another pertinent example would be lingcod, the top piscivore in the system. Increases in their abundance (as seem to be occurring), may impact the other taxa under consideration negatively by increasing predation on them, particularly on their juveniles.

I agree with their first three sources of stress (historic harvest, present harvest, marine mammal predation). Historic overharvest probably decreased the populations before the impact was recognized. Further reductions in harvest, particularly of rockfishes, is probably not feasible: they are by-catch in both bottom fisheries and in salmon fisheries. Present regulations for recreational lingcod and greenling fisheries seem to be allowing these population to remain stable, or increase. As indicated here, population levels of several species of rockfishes may have been reduced to the point that reproductive potential has been affected. Rockfishes are slow growing fishes that take several years to reach first sexual maturity. Thus, it will take many years of continued restricted harvest to return the population to previous population levels and reproductive output. It has been shown in some species of rockfish that larval viability increases with the age of the parent, which further indicates that a quick fix is not likely. Also, larval survival and recruitment should be expected to be quite variable interannually, for causes that are largely unknown. In most fishes, there is a very weak link between reproductive output of adults and year-class strength, so strong recruitment might occur even at the present reduced population levels, and good recruitment cannot be guaranteed at much higher population levels. That is, even with adequate numbers of eggs (lingcod, greenling) or larvae (rockfishes) produced by the adults, successful recruitment in a given year is not assured.

Rockfish, Lingcod and Greenling

Todd Anderson
San Diego State University
todda@sunstroke.sdsu.edu

Viability analysis table
Key attributes, indicators, ratings, and current status.

(1) *Intact natural rocky habitat*. The indicator status ratings of < 60%, > 60%, and 100% of existing condition seems to have no basis; why not use <25% = poor, 26-50% = fair, 51-75%=good, and > 75% = very good? I question whether this is an appropriate attribute to use because variation in cover of rocky habitat would be expected to be very low to nil unless sedimentation is a problem. I did notice that dock development may be an issue? Unless rocky habitat is expected to vary considerably, it will not have much potential in explaining variation in rockfish population size or other attributes. The current indicator status has been left blank, but I agree that rocky habitat is in very good condition (simply because I expect it does not vary much spatially or temporally). The indicator (areal coverage of intact rocky habitat) is fine, although by "intact", does this mean that cobble or rip-rap habitats should not be included?

(2) *Age structure of the rockfish population*. Because the indicator is population spawning potential, I would recommend that the size structure of the population be used because fecundity (reproductive potential) is tightly coupled to female size (not age). Recent evidence does suggest, however, that older female rockfishes may produce larvae of higher quality.

I do not know where the indicator ratings come from, but if 1975 is the standard to use, then knowing something about the size structure of the adult populations at that time would provide the basis for comparison with existing size structures. The ratings for poor and fair are the same – it seems that you could use the same rating structure I suggest above (<25% = poor, 26-50% = fair, 51-75%=good, and > 75% = very good), but what do these percentages mean? Percentage of fish above a certain age (or size)? Because of natural variation in several of these attributes, it would seem that having 'very good' represent 100% of the existing condition is not reasonable. I would agree that the age structure of the population is "fair".

(3) *Juvenile rockfish refuge and foraging habitat*. Although no indicators are currently provided, what is important to the early life stages of some rockfishes is the areal coverage of understory macroalgae such as *Laminaria*, *Costaria*, *Agarum*, etc. that provide habitat for benthic juveniles of rockfishes. Young juvenile copper rockfish, for example, are positively associated with kelps. The presence of bull kelp (*Nereocystis*) can also positively affect recruitment, creating a canopy in the spring and summer months. However, because of the strong tidal currents in the San Juan Islands, recruitment is lower when stronger current flow is observed. I would recommend using the percentage cover of kelp habitat in the indicator ratings, using the categories of percentage cover that I have mentioned above for those two attributes.

(4) *Recruitment*. Recruitment is highly variable spatially and temporally. Because rockfishes are long-lived and slow to mature (except for the Puget Sound rockfish) rockfish populations can be sustained by occasional banner years of recruitment separated by several years of low recruitment. Consequently, recruitment in itself is not necessarily a good indicator of the status of rockfish populations. The indicator "sufficient young of the year to fill available habitat in randomly sampled reefs" does not make sense. Habitat limitation of rockfish recruitment cannot be assumed. It would be better to use some sort of relative estimate of the density of recruits. If empirical data are to be collected, then using 30-m long transects, surveying a corridor of 2 meters wide x 2 meters high should be sufficient to count young-of-year rockfishes. As for the indicator ratings, some arbitrary densities could be used such as < 2 recruits per transect = poor, 2-5 = fair, 5-15 fish = good, and > 15 fish = very good. These numbers are not strictly defined, but they can allow you to detect 3- to 7-fold differences in recruitment among years. Current status is unknown, but I would judge the current rating to be fair to poor given what I have observed in the past.

(5) *Rockfish species richness*. This key attribute might be defined better by species diversity than by richness. Species richness only provides that a species is present, whereas diversity considers both the presence of a species and its relative abundance to other target species. In the case of diversity, the number of fish along transects at sampled sites would be used in addition to the number of species. I think it is unlikely that a particular species would be extirpated from the system, but low abundance relative to other species would result in lower species diversity. I don't know why the current indicators of 1 standard deviation below historic is used. Are their historic data that show the number of species and their relative abundances? This could be the benchmark by which the indicator rating categories are established. My guess is that species richness as a current condition would be good to very good because these species are found on reefs even if in low abundance.

(6) Population abundance of rockfish, lingcod, and greenling. Again, I would use the indicator ratings I've mentioned for other attributes. Using population size as estimated from harvest records as the indicator is okay in the absence of other data, but some estimate of catch-per-unit-effort (CPUE) such as catch divided by number of days fishing or other measure would standardize population size when fishing effort varies among years and could provide a better estimate. I agree that the current status of these populations is poor.

Stress-source analysis

Stresses

In looking at the seven stresses (altered key ecological attributes), #4 (direct mortality of larval rockfish, lingcod, and greenling) and #7 (direct mortality of pre-settlement juvenile rockfish, lingcod, and greenling) appear to differ only in that #4 are larvae and #5 are pelagic juveniles that have not taken up a benthic existence. This is different from settlement per se, which is the transition of competent larvae to a benthic existence. You might rename #7 direct mortality of pelagic juvenile rockfish, etc.

Does low reproductive success (#2) mean that individual rockfish fecundity will decline because of their smaller size or other factors or is it that because the populations are in low abundance there should be low reproductive success of the population? In either case, the severity could be considered to be high. I assume that #1 (direct mortality of post-settlement…) has a severity of medium because of current restrictions on fishing? Or is this direct mortality by predators?

Unless there is specific information that species have been extirpated, I don't agree that low rockfish species richness has a severity of high or the scope is very high. I think this would be low to medium.

Stresses #1 and #4 are listed as severity 'high' but #7 as severity 'low'. What is the reasoning here? Is it that predators are more abundant in rocky habitat than in pelagic zones?

Sources of stress (threats)
It is difficult to assess some of these sources of stress due to lack of detailed information. The number of sources (12) plus 3 others mentioned appear to encompass most if not all of the relevant threats. I would agree with many of the estimates (guesstimates) of threat ranks. However, I am not sure why harvesting of rockfish, etc. has a 'high' rank for irreversibility with regard to low reproductive success and low rockfish species richness. I would rank these as medium for irreversibility. Same comment for marine mammals, but perhaps there are more data available that irreversibility is very high? Or is it that nothing can be done to reduce mammal populations?

Seabirds

Reviewer: Kolleen Irvine

Kolleen Irvine
US Fish & Wildlife Service
Kolleen_Irvine@fws.gov

Key Ecological Attribute: Nesting Success
Indicator: Oystercatches/ number of hatchlings/nesting pairs
Oystercatchers are a good choice for an indicator. Since there are no data on hatchlings or nesting pairs and this information is difficult to obtain, suggested using breeding territory as an attribute:

- Focus on occupancy of known breeding territories
- 1 to 2 birds comprise a viable breeding territory
- Indicator ratings could measure number of breeding territories occupied by birds during breeding season (i.e. poor: <20/65 territories occupied over 2 – 4 years)

Glaucous winged gulls may be a better way to measure nesting success of a colonial species. Nesting success for the gulls is being monitored on Protection Island and could be used as a model.

Key Ecological Attribute: Population size of a selected species
Indicator: Golden-eye winter population size
Concerned over current rating in the MSA plan: if a species is in slow decline, rating it as "good" according to the indicator status, means that we want to maintain the slow decline. The US Fish & Wildlife Seabird Conservation Plan suggests that even annual declines in populations can have long-term consequences since 25 years of slow decline can have devastating affects on a population.

Stress-Source Ranking

Threat: Human disturbance on water
Increased metabolic demands and failure to feed effectively resulting from human disturbance on water should be ranked as medium irreversible threats to seabirds.

Threat: Fishing/harvesting activities
Gill nets may be a major factor in declines of rhinoceros auklet at Protection Island National Wildlife Reserve. Gill nets may be a factor in mortality of murres, pigeon guillemots, marbled murrelets as well. Suggested change to "medium" threat contributing to nesting failure.

Fishing and harvesting activities identified as medium in terms of contributions and irreversibility of threat to direct juvenile and adult mortality. Suggest change from "low" threat rank.

Threat: Human disturbance on shore (walking, landing boats)
Sources of Stress--Nesting failure/Increased stress/Increased metabolic demand

Human disturbance on shorelines with nesting birds can result in increased predation, exposure of eggs or chicks to elements and even total abandonment of nests. This threat to nesting failure is not "easily reversible at relatively low cost" but will take aggressive education and enforcement. Suggest change to medium irreversibility for nesting failure, increased stress and increased metabolic demand.

Threat to system rank should be changed to critical because it has both short and long term consequences for bird populations through alterations in feeding, resting, and breeding behaviors.

Pacific Salmon

Reviewers: Kurt Fresh ,Si Simenstad

Kurt Fresh
NOAA Fisheries
Kurt.fresh@noaa.gov

General Comments

Conservation target for Pacific Salmon is too generic due to differences between species, prey, life-cycle, migration strategies, etc. Should include the rationale for ratings. Constructing indicator ratings that are defensible is a challenge. Did not see how to use data on stresses.

Site information should be defined explicitly to enable understanding of scale. Create better linkages (logic trees) using the four habitat functions listed above.
Choose indicators that can be measured and for which there are data.
Does not know why kelp habitat was chosen as an indicator for salmon.
Rephrase "juvenile habitat abundance" as it is a confusing term
Use indicators and attributes that are sensitive to long term changes in order to obtain trend analyses.
Improve match of attributes in the viability tables with the Stresses-Altered Key Ecological Attributes. (two reviewers suggested this)

Reword attributes to be neutral (i.e. Quality of Habitat instead of Reduced Juvenile Habitat). This would help line up concepts in the stress tables.

Uncertain about the usefulness of the attribute/indicator for the abundance of returning adults. Not sure that overall abundance of fish passing through the San Juan Islands is very useful.

Viability Analysis

The reviewer modified the elements in the framework for salmon categorized by the contributions of marine habitats to salmon population viability:

1) Food and place for high growth rates
2) Refuge from predators
3) Area for physiological transition
4) migration corridor

Additional comments were made directly to tables from the workbook. See these comments on page 61.

Stress-Altered Key Ecological Attributes and Threat Tables

Concerns/questions

Roll up for stress ranks were inconsistent and hard to understand in places. Could not understand weighting, relative importance between factors. Scale of sites was not clear (i.e. a single pier or all piers in San Juan County). Did not understand the terms "insufficient brackish water" and "non-local sources of salmon decline". Why was marine mammal predation treated as a threat and not as a factor affecting viability?

Recommendations
Include rationale (logic tree) for ratings with clear decision rules.
Manage expert opinion with a logically derived decision structure/rules not paragraphs for each decision.
Revise nomenclature—stress and threat appear to refer to two different things but are used interchangeably in places.
Reconsider including non-local sources of salmon decline if it is outside the geographic scope.

Pacific Salmon

Charles "Si" Simenstad
University of Washington
simenstd@u.washington.edu

Concerns/questions
Rationale for choice of stressors. Some choices not fully grounded in literature—particularly regarding juvenile salmon migration in the Marine Stewardship Area. Should attributes and stressors be listed in order of significance?
Unclear how the water column will be considered in the assessment (e.g. how to associate a water column organism such as crab larvae to a particular marine resource, such as rocky subtidal habitat.)

General comments:
Rationale for choice of stressors is needed.
Include acknowledgement of limitations of data and logic used for decision/rankings.
Confine comments to scientific validity and in particular, to whether inferences are based primarily on published scientific literature or secondarily on rigorous logic.
Include evaluation of uncertainty in the data and assumptions behind the assessment.
Direct impacts are considered to be more important than secondary or tertiary impacts (e.g. direct effects on fish are more important and certain than indirect effects on prey)

Some noteworthy stressors are missing, (i.e. loss of riparian vegetation, aquaculture, hatchery fish, septic systems, and wastewater discharges and small chronic fuel. and oil spills while some of less significance remain.

Conservation Targets
Difficult to assess the viability of Pacific salmon without considering species and life history stages—vulnerability to stresses varies extensively among species and stages of life history.

There is no scope for assessing positive changes or reversals (e.g. effect of climate change on brackish water habitat.

Key Attributes
Most of the prey of juvenile salmon are predominately pelagic organisms, especially when fish are >50 mmFL; terrestrial organisms such as insects may be important for juvenile Chinook. Because the distribution and abundance of pelagic organisms are exceedingly patchy and variable, their utility as a quantitative indicator is suspect. A few shoreline associated prey, such as gammarid amphipods would provide a more quantitative viability indicator.

The availability of brackish habitat as rearing habitat needs clarifying. Although juvenile salmon may be attracted to freshwater at stream mouths, the rearing habitat required by juvenile salmon for physiological adaptation should have occurred in the estuary of their natal system. The only exception might be the area near the Fraser River plume where salmon may still be following brackish water into the marine stewardship area.

The importance of kelp mats may be questionable for juvenile salmon.

Since abundance of juvenile salmon is driven predominantly by forces outside the marine stewardship area, their selection as an important attribute of the health of the marine ecosystem should be assessed.

Indicators
Indirect associations of salmon prey production, such as forage fish larvae that can be linked to shoreline integrity and productivity for spawning habitat is an appropriate indicator.

Most of the prey of juvenile salmon are predominately pelagic organisms, especially when fish are >50 mmFL; terrestrial organisms such as insects may be important for juvenile Chinook. Because the distribution and abundance of pelagic organisms are exceedingly patchy and variable, their utility as a quantitative indicator is suspect. A few shoreline associated prey, such as gammarid amphipods would provide a more quantitative viability indicator.

The Department of Ecology Northern Puget Sound Baseline Study and NOAA MESA studies do not substantiate that *Zostera marina* is a major habitat of juvenile salmon in the marine stewardship area.

Are kelps mats important to juvenile salmon and if so, does kelp coverage in the marine stewardship area directly correlate to the availability of floating kelp mats in the region?

Stress and Threats Analysis
Difficult to understand the consistently "low" rank for direct mortality of juvenile salmon when direct mortality of resident adults is "high" and reduced juvenile habitat is "medium". Given both the vulnerability and sensitivity of juvenile salmon, this ranking appears reversed from what one would expect.

Sources of Stress Analysis
Nutrient discharge and eutrophication should be identified as a source of stress.

Question why shoreline modification is rated "high" in terms of irreversibility. Docks and shoreline armoring are both removable and degrade.

Shoreline fill does not appear in the stress analysis.

Threat rank for large oil spills is too low for juvenile prey abundance and lacks any rank at all for direct mortality.

There is no scientific basis that the reviewer is aware of, that would substantiate juvenile salmon preference for native submerged aquatic vegetation to *Sargassum* or that *Sargassum* harbors fewer prey.

Climate change may contribute freshwater to brackish water habitat in the region. How does "medium" impact fit this prediction?

Polluted stormwater runoff is a stressor on resident salmon and returning adults.

Question a "medium" ranking for local freshwater diversions and withdrawals for their significance of physiological adaptation in juvenile salmon.

Marine Mammals

Reviewers: Robin Baird, Brad Hanson, Glen R. VanBlaricom

Robin W. Baird
Cascadia Research
RWBaird@cascadiaresearch.org

Viability Analysis

It is less important to consider absolute abundance of salmon as a food source for marine mammals than it is to consider the diversity of runs in terms of their spatial and temporal timing to provide year-round availability of prey.

There is a discrepancy between the indicator (population size) and ratings (declining, stable, increasing numbers in transects) for the population size and structure of harbor porpoises.

An indicator of good notes "stable numbers in areas of high vessel traffic transects" for harbor porpoises, however this implies that current numbers are what they should be rather than reflecting a historical reduction in population size. While populations have increased in the last ten years, it is not known whether they are back to historical status.

Why do the numbers used as indicator ratings for harbor seals include a range, with anything above the range considered bad? How is the upper limits chosen? Is this based on historical numbers? Increasing numbers reflect an increase carrying capacity.

Stresses and Threats

Stresses 1 – 5 and 7 – 8 are all influenced by humans (oil spills, persistent pollutants, overharvest of prey, disturbance, bycatch, climate change, but 6—does not fit in the mix, since an increase in harbor seal population size can only occur if carrying capacity increases.

Bycatch of harbor porpoises in gill and seine nets may be a significant source of mortality, yet is ranked "low" and would become a serious issue if these fisheries were to increase.

Marine Mammals

Brad Hanson
NOAA Fisheries
Brad.hanson@noaa.gov

Viability Analysis

Recent and ongoing research indicates that Chinook salmon appear to be important prey for the southern resident killer whales.

Affects of vessel sound on killer whale communication include the possibility of longer duration calls or increased amplitude of calls.

The annual rate of population increase is a commonly used measure because it incorporates mortality.

Estimates of harbor porpoise population are only obtained infrequently—about every 5 years. The confidence intervals associated with these estimates are relatively high so the ability to detect a decline is low. A better measure might be to look at distribution because if the population declines it is reasonable to expect that animals may disappear from the more marginal habitats first and this would be easier to detect.

Indicators of southern resident killer whale populations only express size, not structure. A possible metric to capture structure would be percentages of sex and age classes.

Questions why the Altered Key Ecological Threats didn't match to the Key Attributes listed in the target viability table.

Sources of Stress
Questions whether "disease" is being used synonymously for increased mortality.

Persistent Organic Pollutants aren't just from industrial sources, consumer products are likely sources of PBDEs.

Marine Mammals

Glenn R. VanBlaricom
University of Washington
School of Aquatic and Fishery Sciences

Concerns/Questions
Questions why Dall's porpoises were not considered or mentioned. They forage across a broad range of depths, have a diverse diet and are prey for transient orcas so may be important to the structure and dynamics of the mid-water food webs in the San Juan region. They are subject to the same types of stresses and threats identified for killer whales and harbor porpoises.

Questions why Steller sea lions, minke whales, gray whales, humpback whales and river otters are not considered since they are subject to a wide range of effects from human activities.

Indictor ratings
The ability to detect trends over time in marine mammals is difficult—requiring intense, expensive effort. Consider other metrics for trends in harbor porpoise populations or recognize that trends will be detectable only with a multi-year survey plan.

While data indicates high levels of persistent organic pollutants in resident and transient killer whales in the region, no clear links between contaminant levels and population dynamics/disease susceptibility exist so caution is required.

Recent research links southern resident killer whale abundance and distribution to changes in salmon populations in the inland marine waters of Washington and British Columbia.

Recent research on space use and distribution of southern resident killer whale pods should be considered in marine conservation planning for the San Juan region.

It would be useful to provide a higher level of detail on the issue of reduced prey availability and quantity as a source of stress to marine mammals.

Lack of reproductive success as a source of stress for killer whales should be replaced by a population trend metric such as population growth per year. This metric incorporates juvenile survival along with reproductive success.

Questions the rating of "low" for the increased metabolic stress caused by human disturbance on the water.

Viability Table Comments

ROCKY INTERTIDAL & ROCKY SUBTIDAL – MEGAN DETHIER COMMENTS

Entry assistance OFF					**Bold = Current** Indicator Ratings *Italics = Desired*						
Conservation Target Enter # of Target		Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Current Indicator Status	Current Rating	ADDITIONAL MEGAN COMMENTS
1	Rocky intertidal	Condition	Height and width of zones	need indicator: Fucus zone (height and width), top of Hedophyllum zone, top of Chthamalus zone	upper limits change by >6"vertical			upper limits do not change over several years	(need some measurements)	good?	
1	Rocky intertidal	Condition	Age and stage structure	need indicator: I can't think of any good candidates for this, except maybe Semibalanus cariosus? (low zone barnacle)	absence of either very small or very large individuals			Broad mix of sizes, dominated by young but including some old	(need some measurements)	good?	
1	Rocky intertidal	Landscape Context	Water column characteristics	Air and water temperature regime (need to define an indicator); it doesn't seem to me that Air temperature is a 'water quality char' - I would just stick to water temperature (measured	longterm seasonal averages show clear trends			longterm seasonal averages do not change	(need some measurements)	good?	

				seasonally)							
1	Rocky intertidal	Condition	species composition/dominance	native species richness	less than 75%; I might make this lower - in the san juans, with rocky intertidal richness being relatively low, you could get short-term drops in richness to the less than 75% mark without something really drastic having happened.	75-90% of historical richness	90-97% of historical richness	97-100% of historical richness	(need some measurements)	good?	
1	Rocky intertidal	Condition	Population size of selected species	abundance of barnacles	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range	(need some measurements)	good?	
1	Rocky intertidal	Condition	Population size of selected species	abundance of Fucus	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range	(need some measurements)	good?	
1	Rocky intertidal	Condition	Population size of selected species	abundance of limpets	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range	(need some measurements)	good?	

1	Rocky intertidal	Condition	Vegetative canopy	mean % cover of kelp	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range	(need some measurements)	good?	
2	Rocky subtidal	Landscape Context	Water column characteristics	sedimentation (need to define an indicator); something like seasonal or annual deposition - seasonal probably a better measure, would let you get a handle on causes better, if a change was found. Defining a change would again involve a number of years of 'baseline' (already shifted, probably!)					(need some measurements)	good?	this one will need a lot of baseline data in a number of areas, ie lots of sites and replicates within sites - but I agree is an important parameter.
2	Rocky subtidal	Condition	species composition/dominance	native species richness	less than 75%	75-90% of historical richness	90-97% of historical richness	97-100% of historical richness	no data	good?	
2	Rocky subtidal	Condition	Population size of selected species	sea cucumber abundance in subtidal (-5 to -10 m)	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range		fair?	
2	Rocky subtidal	Condition	Population size of selected species	sea urchin density in subtidal (-5 to -10 m)	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range		fair?	
2	Rocky subtidal	Condition	Vegetative canopy	% cover of Nereocystis	40% or less of historical range	40-70% of historic	70-90% of historic	90-100% of historical		very good?	

						al range	al range	range			
2	Rocky subtidal	Condition	Vegetative canopy	abundance of understory kelps	40% or less of historical range	40-70% of historical range	70-90% of historical range	90-100% of historical range		good?	
	Rocky subtidal		maybe add age structure of urchins?		absence of either very small or very large individuals			Broad mix of sizes, dominated by young but including some old			
how about additional condition indicators, for both intertidal and subtidal, of Absence of Introduced Species? Or is that whole concept taken care of under Stressors?											
Each of these looks like a major research project to me, establishing some baseline data.											

PACIFIC SALMON – KURT FRESH COMMENTS

Assessment of Target Viability for Salmon
(Chinook salmon).

			Indicator Rating				Current	Current	Desired	Comments
Condition	Attribute	Indicator	Poor	Fair	Good	V. Good	Status	Rating	Rating	
Feeding and Growth	Growth Rates of Chinook < 150 mm.	Otolith Increment widths for salmon < 150 mm								Numbers could be created for this metric from existing information.
Feeding and Growth	Growth Rates of Chinook < 150 mm.	Mean change in size of juveniles <150mm	< 0.25mm/d	0.25-0.75 mm/day	0.75-0.1.25 mm/day	>1.25m m/d	??	??	Good	Current status could be measured in situ. Numbers could be developed.
Feeding and Growth	Growth Rates of Chinook < 150 mm	Spawner biomass of herring in NPS.	declining	no change	increasi ng	steep increase	no change	fair	Good	Data is available. The herring that affect salmon in the SJI are not just local. I think having a more comprehensive index is advisable. I would use at least the SJI, Cherry Pt., Padilla, stocks.
Feeding and Growth	Growth Rates of Resident Chinook	Spawner biomass of herring in NPS.	declining	no change	increasi ng	steep increase	no change	fair	Good	Data is available. The herring that affect salmon in the SJI are not just local. I think having a more comprehensive index is advisable. I would use at least the SJI, Cherry Pt., Padilla, stocks.

Feeding and Growth	Amount of invertebrate food available to Chinook < 150 mm.	Total Biomass of crab larvae, euphausiids , amphipods, copepods in June and July.	declining	no change	increasing	steep increase	no change	fair	Good	This and next indicator would require some literature work to establish values for but I could do it if I had more time. I picked June and July assuming Chinook would be abundant. Could use July, August.
Feeding and Growth	Type of invertebrate food available to Chinook <150 mm.	Disribution of biomass by taxa of crab larvae, euphausiids , amphipods, copepods in June and July.	Sustained (5 consecutive years) disappearance of 3 taxa.	Sustained (5 consecutive years) disappearance of 2 taxa.	Sustained (5 consecutive years) disappearance of 1 taxa.	No change of taxa.	??	??	??	Historical data would be useful. Could use data from other areas like Canadian. Disappearance really means probably substantial reduction.
Physiological Transition	Distribution of Fraser Water in the SJI.	Salinity measurements.								This would be a hard index to make meaningful. The intend would be to reflect long term changes in salinity in the SJIs which refers to both amount and distribution. Perhaps there is a data record at FHL. I would use some sort of deviation from the mean to construct an indicator.
Predation	Abundance of Predators-Orcas	Number of Orca days (number of whales present multipled by number of days they are present)	Substantial increase	Increase	No change	Decline	??	??	Decline	NWFSC or NOAA regional office should have data. Use this to define current status.

		each year.								
Predation	Abundance of Predators-Seals and Sea Lions	Annual (or other index) counts of seals and sea lions.	Substantial increase	Increase	No change	Decline	??	??	Decline	I would use marine mammal data from sources like the PSAT, WDFW to define indicators and status.
Predation	Abundance of Predators-Birds	Index Counts of Fish Eating Birds.	Substantial increase	Increase	No change	Decline	??	??	Decline	This could be colony counts on protection island or numbers of terns nexting on Dungeness Spit. Not sure what bird data is available.
Migration Corridor	Habitat quantity present in the San Juan Islands.	Total amount of eelgrass (including both bays, beaches) present in the San Juan Islands.	25% decline from current levels	10% decline from current levels	No change	> 10% increase	10% decline	Fair	Good	I am just guessing on this but DNR has good data that could be used to establish indicator levels and current rating.
Migration Corridor	Condition of habitat present in the San Juan Islands.	Fragentation of habitat as measured by the amount of piers, docks, groins, breakwaters per mile of shoreline.								

Migration Corridor	Condition of habitat present in the San Juan Islands.	Amount of salt marsh	25% decline from current levels	10% decline from current levels	No change	> 10% increase	10% decline	Fair	Good	
Migration Corridor	Condition of habitat present in the San Juan Islands.	Numbers of bulkheads in divergence zones.								I did not fully flesh this out or the next two I believe that various stresses can and should be used as habitat indicators.
Migration Corridor	Condition of habitat present in the San Juan Islands.	Population density, permananet and seasonal residents.								
Migration Corridor	Condition of habitat present in the San Juan Islands.	Road density within 200m of the shoreline.								
Viability (all functions combined)	Abundance of resident Chinook salmon	CPUE of resident Chinook salmon by sport fishermen in the area.	Steep decline.	Moderate decrease.	No change.	Increase	??	??	V Good	I assume WDFW has data that could be used.
Viability (all functions combined)	Abundance of Juvenile Chiook salmon	CPUE of juvenile Chinook salmon by beach seine and townets at indicator sites in area.	Steep decline.	Moderate decrease.	No change.	Increase	??	??	V Good	Would have to develop and implement this.

APPENDIX E. Threats Summary and Contaminants Assumptions

	Table b. Threats Across Targets	Rocky intertidal	Rocky subtidal	Nearshore sand, mud & gravel communities	Rockfish, greenling and lingcod	Pacific salmon	Seabirds	Marine mammals	**Overall Threat Rank**
1	Large oil spills	Low	Low	High	Low	Medium	High	Very High	**High**
2	Climate change	Medium	Medium	High	Medium	Medium	Medium	Very High	**High**
3	Shoreline modification due to docks, shoreline armoring, boat ramps, jetties, etc.	Medium	Low	High	-	Medium	Low	High	**High**
4	Other (non-local) sources of salmon decline	-	-	-	-	High	-	High	**High**
5	Invasive species	Medium	Medium	High	Medium	Medium	-	-	**Medium**
6	Persistent organic pollutants from current industrial and historical sources (in biota and sediments)	-	-	-	Medium	Medium	Medium	High	**Medium**
7	Polluted stormwater runoff (metals, pesticides, PAHs from land sources)	Low	Low	High	Low	Medium	Low	-	**Medium**
8	Septic systems and wastewater discharge (including from vessels)	Low	Low	High	Medium	-	-	-	**Medium**
9	Predation by marine mammals	-	-	-	Medium	High	-	-	**Medium**
10	Historical harvest of rockfish, lingcod & greenling until 1999.	-	-	-	High	-	-	-	**Medium**
11	Disturbance by other wildlife	-	-	-	-	-	High	-	**Medium**
12	Fishing/harvesting activities	Low	Low	Medium	Medium	Medium	Low	Medium	**Medium**
13	Derelict fishing gear	-	Low	-	Low	Medium	Medium	Low	**Medium**
14	Small chronic fuel and oil spills	Low	Low	Medium	Medium	-	-	-	**Medium**
15	Human disturbance on shore (walking, landing boats)	Low	-	Low	-	-	Medium	-	**Low**
16	Sediment loading resulting from upland construction activities, logging, clearing and livestock (local and distant)	Low	Low	Medium	-	-	-	-	**Low**
Threat Status for Targets and Site		Medium	Medium	Very High	High	High	High	Very High	**High**

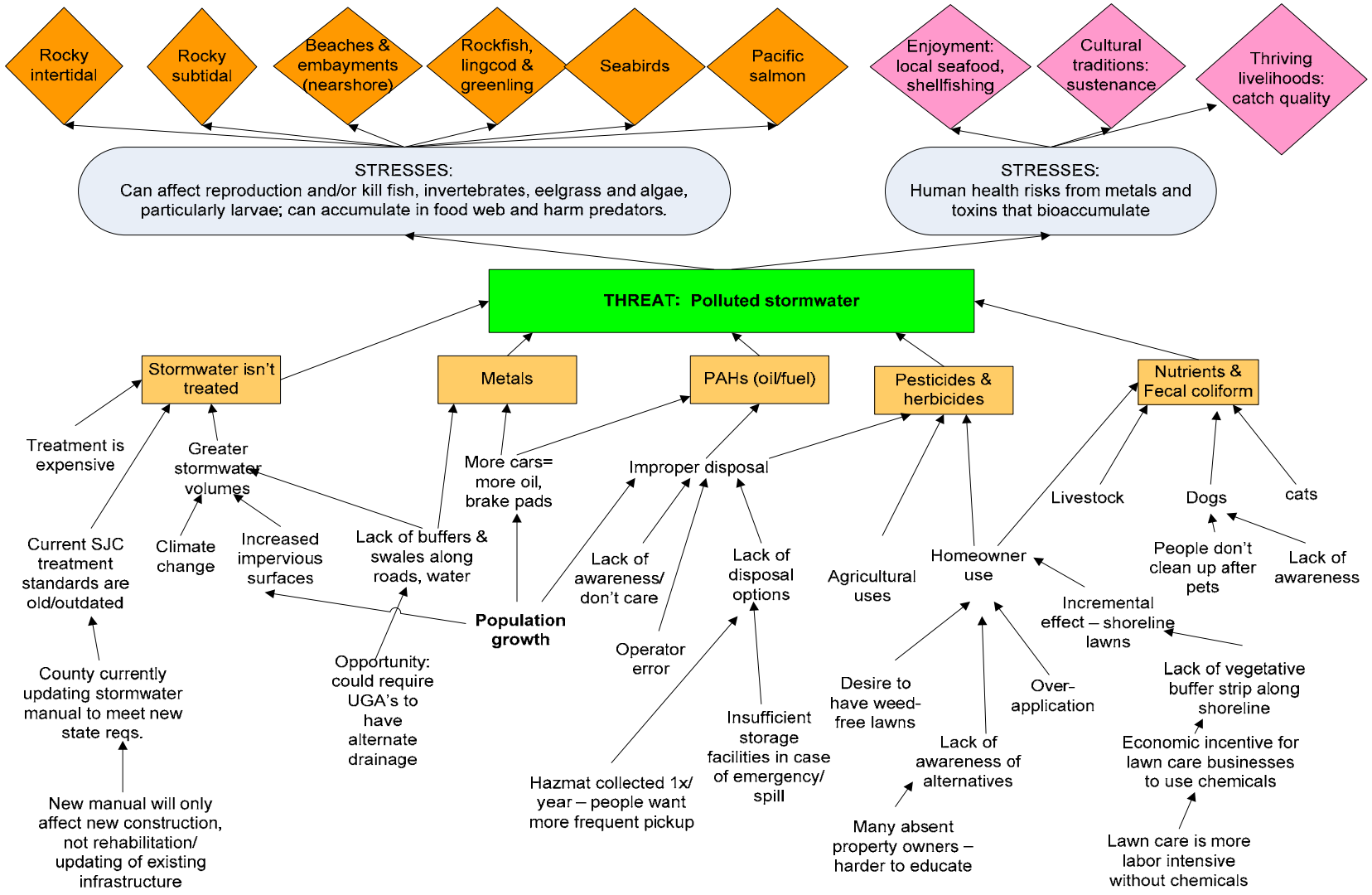
A note on contaminants:

We found it particularly difficult to address the threats posed by contaminants – compounds having adverse effects on marine organisms – using the Five-S Framework. In the Five-S Framework the stress is the impact(s) a particular contaminant has on an organism, such as disease, impaired reproduction and direct mortality, which, for many contaminants and species is not well understood. A source is defined as the human activity causing the stress, or in other words the human activities that result in a particular contaminant entering the system. Specific contaminants, and the term "contaminant" in general do not fit into either category. Thus, we created the matrix shown in Table a. to document our assumptions about the likely sources of each contaminant. The detailed stress-source analyses done for each target as part of the threat assessment include the sources listed in the rows. The impact of each source on the target is based on our understanding of the most likely impacts of the contaminants listed across the top.

Table c. Assumptions made regarding the sources of contaminants affecting MSA marine resources.

	Type of Contaminant								
Source: How it enters the MSA	PCBs, DDT & POPs	PAHs	Mercury	Tributyl Tin	Other metals	Endocrine disruptors	Fire retardants	Fecal coliform	Pesticide/ herbicide
Resident in biota due to bioaccumulation	X		X						
Big oil spills		X							
Small oil spills		X							
2-stroke boat engines		X							
Hull paint				X	X				
Boat discharges (bilge, wastewater)		X				X		X	
Stormwater runoff (in MSA)		X			X			X	X
Stormwater runoff (outside MSA)		X	X?		X			X	X
Leaky septic systems							X	X	
Wastewater discharge		X?	X?				X	X	
From Puget Sound			X		X?	X?	X?		
From Georgia Basin/Fraser			X		X?	X?	X?		

APPENDIX F. Situation Assessment Diagram, Polluted Stormwater Example



Reviewed/edited by MRC on 7/19/06

Comments: Friday Harbor has a separate stormwater system (not CSO) with onsite oil/water separators. Eastsound has some type of system. Lopez – not known what kind of system. Concern raised: Fire retardants used in firefighting run into the drains/water. Do these affect and/ or bioaccumulate in fish? Are these the same kind of fire retardants used in clothing?

(Back Page of San Juan County Marine Stewardship Area Plan)

(July 2, 2007)