

Protecting Our Place for Nature and People

Final Report of the San Juan Initiative

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Supporting Documents can be found on our website: www.sanjuaninitiative.org

- A. San Juan Initiative Protection Assessment: Nearshore Case Study Area Characterization: Andrea MacLennan and Jim Johannessen, 2008.
- B. An Assessment of Ecosystem Protection: What's Working, What's Not. (A Preliminary Report dated June 16, 2008):
 - a. Education: In depth assessment of the effectiveness of education programs in San Juan County.
 - b. Voluntary Protection Programs: In depth assessment of the effectiveness of voluntary / incentive programs in San Juan County.
 - c. Shoreline Owner, Community and Trade Group Research: Summaries of workshops, interviews and surveys.
 - d. Permit Review: Analysis of San Juan County permits for docks, bulkheads, and home setbacks.
 - e. Regulatory Protection Program Review: Analysis of state and local regulatory shoreline protection programs.
- C. Opportunities for improvement: Working papers for recommendations.
- D. Key steps for the San Juan Initiative: Summary of the SJI process.

Foreword

The Puget Sound we love so much is in trouble. Its shimmering beauty on the surface belies a different story underneath. It is a story of pollution, altered habitat and entire species on the brink of collapse.

The Puget Sound Partnership was formed to restore the health of this amazing resource. However, all our efforts will be for naught if we continue degrading the habitats and ecosystem processes that are still intact. With another 1.5 million people expected in the region by 2025, how we manage our use of the land and water will determine our success.

Can we grow and live sustainably with our environment? That's the question we must answer.

The San Juan Initiative is a critical assessment of whether our combined efforts in protecting our last, best places are working. It shows there is much room for improvement and public support to do the job well. The lessons we can learn from the Initiative transcend the shores of the islands and provides a guide for the rest of Puget Sound.

Once again we see that when we involve the very people most affected by a problem— citizens, property owners, builders, and government officials – we can construct solutions that work for the betterment of people and the environment. It doesn't have to be one pitted against the other.

This is democracy in the 21st Century. By working together, listening, caring and using our collective creativity we can solve problems that at first seem insurmountable.

William D. Ruckelshaus, November, 2008
Chair, Leadership Council
Puget Sound Partnership

The Initiative was made possible by funding from the National Fish and Wildlife Foundation, Salmon Recovery Funding Board, Bullitt Foundation, The Nature Conservancy, Puget Sound Partnership and the Community Salmon Fund.

Overview: Our Report to the San Juan Community and Others Working for Puget Sound.

(Policy Group Members listed on the side of this page)

The heart of the San Juan Initiative is a 24-member Policy Group, appointed by the San Juan County Council. Its task was to assess current ecosystem protection programs and recommend improvements. The group includes builders, real estate agents, marina owners, environmentalists, government officials and land owners.

This report presents our consensus on what is working and what is not for the protection of the San Juan ecosystem. It is our collective statement on what needs to be fixed. We hope that our conclusions and recommendations inspire you to act in whatever capacity you can- as a landowner, government official, private business owner or a nonprofit organization. For those of you working in other parts of Puget Sound we hope this report will serve as a model for engaging your community in ecosystem protection.

Together with the community, we set out to accomplish two key goals: **(1) Assess the effectiveness of programs aimed at protecting the San Juan ecosystem;** and **(2) Recommend specific ways to improve protection in a manner that supports other community interests and respects the rights of property owners.**

In summary we found:

1. Management programs and the community have made positive improvements over the last 30 years of environmental management and there is a lot to build on.
2. Some of the most sensitive parts of the marine shoreline are being altered and there is a high risk of losing more.
3. There is a lack of accountability to ensure that people and government successfully carry out their responsibilities in a way that results in ecosystem protection.
4. Current regulatory protection programs are turning people off and our education and incentive programs are not meeting the needs of the ecosystem or shoreline property owners.
5. There is tremendous opportunity to improve protection of the ecosystem through scientific advancements and the ethic of stewardship within the San Juan community.

We recommend tailoring protection efforts to the ecological qualities of each stretch of shoreline. This approach recognizes that the shoreline is not uniform; it is an assemblage of different geological and biological functions, as well as human uses. In recommending this tailored approach we are advocating a move away from "one size fits all" thinking, focusing instead on what will work best for each stretch of shoreline. This approach makes more sense for the environment and the people who use it. We also believe that by supporting property owner's desire for views, access to the shoreline and management of hazards, we will increase their support for actions that better protect the environment.

Over the last two years, we have worked with local and regional scientists, policy makers and community members to understand the challenges facing our ecosystem. We held over 18 public workshops and engaged land owners, real estate and construction industry professionals, and our science advisory team in intensive small group workshops.

The Initiative chose to put a strong emphasis on gathering information from those who live and work along the shoreline. We did not interview tourists, boaters or hikers who use the shoreline, nor did we interview indigenous people for whom many of the shorelines have special cultural and spiritual significance. We

hoped to capture these perspectives with the breadth of our Policy Group and recommend there be a continued effort to engage more people and capture their insights.

San Juan Island Introduction - The People and Place

There is a pace and heartbeat to the San Juan Islands. Some call it "Island Time." Others feel it in the daily ebb and flow of tides, in seasonal shifts between quiet winters to busy summers when the population swells many-fold, bringing boaters and ferries brimming with kayaks, people and bikes. This rhythm can be explored through the geography and human culture of the San Juans and is critical to the San Juan Initiative, both in terms of understanding what is happening to the landscape and identifying what solutions are possible.

The San Juan Islands collectively make up a unique archipelago which draws people from all over the world as a tourist destination, a vacation community, and as a place to call home. With 176 islands and reefs at high tide, and 743 at low tide, San Juan is the smallest of our State's 39 counties, with approximately 175 square miles of land area. Despite its small size, the county has over 408 miles of rocky and sandy waterfront, boasting more shoreline than any other county in the nation and home to a little less than 20% of the shoreline in Puget Sound.

The San Juans have a proud and long heritage of farming, ranching, logging and fishing, industries that are under transition as the Islands are discovered by the outside world. Island-grown businesses include food production, single-family home construction, commercial fishing, forest management, real estate sales and investment. The Islands are home to approximately 16,000 people. Seventy-five percent of the county population lives *outside* its three urban village areas of Friday Harbor (San Juan Island), East Sound (Orcas Island) and Lopez Village (Lopez Island).

Residents of the San Juan Islands share this special place with thousands of tourists and recreational boaters each year. The island's natural beauty and marine areas draw people from all over the West Coast and Canada, contributing 23 percent of the county's annual retail sales tax revenue. However, this seasonal influx of population, which is so vital to the local economy, also poses a special challenge to islanders seeking to protect the diverse ecosystem of the San Juan Archipelago.

Despite their beauty, the San Juan Islands are experiencing declines in important species. Rockfish species once commonly caught are no longer abundant. In the summer of 2008, there was a ten percent decline in the orca whale population for reasons not yet identified. There have been catastrophic losses of eelgrass in some of the most visited bays like Westcott Bay on San Juan Island. Marine birds are in decline, with some species that use the islands at ten percent of historic levels. Although the declines of these species may have their genesis in regional problems, our local system plays an important role. For instance, one third of all kelp in Puget Sound is found in San Juan County. Most of the Puget Sound salmon runs feed in the San Juans on their way to the ocean and again on their return.

In addition to direct protection of marine ecosystems, how we manage our immediate upland habitats is important because these ecosystems are all connected; no one in San Juan County lives further than a few miles from the shoreline, which makes every local landowner a player in determining the health of the marine ecosystem.

"There is an incredible ethic of stewardship among us living in the San Juans. Whether you are a builder, fisherman, farmer, retiree, conservative or liberal,

we all want the islands to be healthy and act to make them so.” Senator-Elect Kevin Ranker, 40th Legislative District and former San Juan County Council Member

Getting Started

Formation of the San Juan Initiative

The San Juan Initiative is a pilot effort to improve ecosystem protection in a manner that supports community values, respects property owner rights and builds local capacity to ensure that vital ecosystem processes and habitats are protected

In 2006, the Puget Sound Salmon Recovery Plan identified the need to assess the results of current efforts to protect the Puget Sound ecosystem. The Salmon Plan found that:

- The Puget Sound population is expected to increase by 1.5 million people over the next 17 years. This increase over our current population of 3.8 million will cause additional stresses on our natural resources.
- There are many efforts (laws, incentive and education programs) to protect the Puget Sound ecosystem, but few attempts have been made to evaluate the effectiveness of these efforts.
- Previously there has been no organization responsible for ecological stewardship in Puget Sound and no coordinating structure to ensure that the combined efforts of government, non-profits and private groups are efficient and effective. The new Puget Sound Partnership was created to meet this need.

Following the completion of the Salmon Recovery Plan, the nonprofit organization that created the plan, Shared Strategy for Puget Sound, was charged with starting implementation while the Puget Sound Partnership was being created by the Legislature and Governor. At the same time, San Juan County Commissioner Kevin Ranker was working with various governmental officials and private foundations nationally and on the West Coast to create a pilot project for ecosystem-based management in the San Juans. His hope was to create an on-the-ground effort to implement the recommendations of the Joint Ocean Commission which call for an ecosystem approach to management of the oceans and the connected uplands. Commissioner Ranker and staff from Shared Strategy had initial discussions to see how their interests could be combined for a pilot effort in the San Juans. They developed a general statement of intent for the Initiative and a framework for how it could be locally managed.

Commitment to move the project forward was formalized in 2006, with management responsibilities split between San Juan County and Shared Strategy. Subsequently, the Puget Sound Partnership adopted the San Juan Initiative as a pilot project to help improve protection of shoreline resources at the local level and inform accountability at the regional level.

To guide the process, the San Juan County Council appointed the Policy Group to lead the Initiative. The fourteen selected citizens represent different viewpoints from the Islands (including builders, realtors, environmentalists and landowners). The balance of the Policy Group was comprised of high-level staff from tribes, state and federal natural resource agencies, who bring important expertise to the effort and ensure that the recommendations can be implemented over time. The Policy Group was responsible for ensuring that the goals of the Initiative were met, local concerns were addressed and, most importantly,

that recommended solutions will work locally, as well as regionally. Our work has been supported by a small staff, several consultants and the Science Advisory Group.

Before we dive into what we found, we would like to highlight several key factors that contributed to the achievement of our goals. This project is a pilot and some of our success is due to good planning while other aspects are the result of good luck. Listed below are some factors that we account for our success. For a fuller discussion, please refer to the “Key Steps” document at our website, www.sanjuaninitiative.org:

1. Strong and balanced regional and community representation.
The Initiative needed credibility at the local level and buy-in from the state, tribes and federal agencies in order to evaluate the effectiveness of many different programs. The County Council selected local members who were strong advocates and worked well together, but who were able to step back from their own positions. Representatives from agencies and tribes with management responsibilities in the islands complemented the local perspectives.
2. Strong support by the San Juan County Council.
An important early advantage for the Initiative was strong support from the County Council. The County Council has shown consistent interest and support for this project throughout the two years, which has given it local credibility and increased the community's interest in it. One of the reasons the County was willing to get involved is that they saw an opportunity to craft a new approach that broke from the current state of environmental protection, which is largely regulatory, reactionary and litigious.
3. Strong local and regional science committee:
The Science Team provided essential insights that contributed towards identifying the most critical issues to address and helped design the assessment. The local and regional composition of the Science Team also provided a necessary link to other science processes underway in greater Puget Sound.
4. Outside funding sources
Because the County was financially constrained, they agreed to partner only if the Initiative received funding from outside sources, although they did allow the participation of County staff. The National Fish and Wildlife Foundation recognized the Initiative's importance to the region and provided the majority of funding. This funding combined with the County agreement created the commitments necessary for the Initiative to move forward and also made raising additional money easier.

Defining Protection

Improving protection of existing ecosystem processes and habitats is the central focus of the San Juan Initiative for several reasons. First, protection is the number one strategy of the Puget Sound Partnership's Action Agenda and the Puget Sound Salmon Recovery Plan. In addition, restoration is higher risk and is more expensive than protecting what remains. There are three key types of protection programs.

1. Regulatory programs

We addressed three regulatory levels: federal, state and local. State and local regulatory programs include the Shoreline Management Act, Critical Areas Ordinance, Hydraulic Permit Approval Process and local Unified Development Codes and Comprehensive Plans. Federal programs include Endangered Species Act and the Clean Water Act. As we developed our assessment, local and state regulatory programs were more rigorously analyzed than federal programs.

2. Education programs

Education tools include brochures, site visits, workshops, evening lectures and all the other ways that the community learns about how to steward its land. Programs can be conducted by government agencies, non-profit groups or for-profit groups. There are multiple groups in the San Juan Islands providing education, including Friends of the San Juans, San Juan Islands Conservation District, WSU Beachwatchers, the San Juan Nature Institute, The SeaDoc Society, Friday Harbor Labs, KWIAHT- Center for Historical Ecology of the Salish Sea, and The Whale Museum, among others.

3. Voluntary or incentive programs

Voluntary or incentive programs are those programs that encourage stewardship through rewarding desired behavior. Voluntary programs essentially break down into several kinds: conservation easements, land acquisition, grants, property tax reductions or low interest loans. There are several organizations doing this kind of work in San Juan County, including The San Juan County Land Bank, the San Juan Preservation Trust, the Nature Conservancy and the Trust for Public Land. In addition, the County participates in the Public Benefit Rating System which is a way for property owners to reduce their property tax.

We assessed the performance and recommend improvements for each of these types of protection programs.

What's Working, What's Not

Determining Focus:

At the outset we were confronted with the task of determining whether the numerous organizations and multitude of protection programs in the San Juans were working. Our first challenge was to determine a focus for our work: on what aspect of the ecosystem would we spend our limited time and budget? This is an ecosystem that ranges from deep marine waters, to hundreds of miles of shoreline and shallow bays, to a multitude of terrestrial habitats. Additionally, we resolved to do our work in a manner that recognized the human community as an integral, and often determinative, component of the ecosystem. We wanted to assess not just how well the programs are working for the environment, but also how they affect local communities. Ultimately, there is a need for solutions that preserve ecosystem functions as well as support public and private use.

Understanding the current health of an ecosystem like the San Juans is a complex task, especially since there isn't enough information to get a complete picture. It's not known what the magnitude and range of species and habitats were historically, nor do we fully know what is here now. Without this information, it is not possible to accurately analyze the trends of important ecosystem functions or the organisms that rely on them. Key features like feeder bluffs, shoreline vegetation and water quality have not been measured thoroughly and there is a lack of long-term studies for most marine resources.

As a result of this shortage of data, we recognized that we'd have a greater chance of success if we narrowed our scope. To help determine where to focus, we considered existing and significant gaps in

protection, where there are areas of remaining ecosystem functions and where we could best serve as a pilot for the rest of Puget Sound.

With these criteria in mind, we decided to focus on improving protection of the marine shoreline. This was chosen in part because of the newly accepted County Council Marine Stewardship Area Plan (MSA). The Marine Stewardship Area Plan conducted county-wide assessments of threats and strategies for the marine system. Additionally, it was recognized that there is a political and community opportunity to improve protection of the shoreline due to the high profile creation of the Puget Sound Partnership and the ensuing creation of the Action Agenda. Terrestrial habitat was our second option, not because it was less important, but because there is less available information. We hope that in the future there will be funds to conduct a similar process for protection of terrestrial habitats and understanding their connections to the sea.

We narrowed our focus even more by looking at physical changes to the marine shoreline, a decision made in consultation with our Science Team. The Science Team guided us to where the connections between human action and ecological impacts have the strongest links.

We did not address issues of water quality from stormwater run-off or from septic systems. While these issues are fundamentally important, they are being addressed by programs too new to assess.

Assessing the Situation:

The assessment phase of the project was essentially an audit of federal, state and local protection programs (education, regulatory and incentive-based programs) to determine whether they are achieving the level of protection required by federal and state laws, specifically “no net loss” of habitat function. The fact that our community was willing to audit itself is significant. The audit included independent members of the community and those involved in the programs being audited,

Science, Community, Management Systems

In examining the protection programs on the shoreline, we considered three inter-related perspectives: the science of the marine shorelines, the community's interests, opinions and knowledge about the shoreline, and the management programs used to protect shorelines. While the overlaps of these elements are significant, focusing on each one allowed us to create a clear picture from the individual vantage points of science, community and management. We then wove these three elements together to form a more complete understanding of the situation in the San Juans.

Science: To ensure that the conclusions reached were scientifically sound, we directed the collection of new data where possible given our timeframe and budget. We commissioned a study¹ to characterize geomorphic shore types and shoreline structures proven to impact the health of the shoreline: beach armoring, docks, mooring buoys, marine railways and changes to overhanging vegetation and vegetation within 200 feet of the shoreline. In order to generate enough specific data for our work, the study focused on four case study areas: one 9-mile stretch of shoreline on each of San Juan, Orcas, Stuart and Lopez Islands. Together, these areas totaled approximately 40 miles, which is about ten percent of the Islands' shorelines.

The case study areas represented the range of shoreline types found in the San Juan Islands (rocky, beaches and embayments), and each comprised critical marine habitat that has been impacted by human activities. The case study areas provided a strong representative sampling of the types of human modifications and uses affecting the Islands' shorelines: private development, state and national parks, and

¹ MacLennan, A., and Johannessen, J., 2008. San Juan Initiative Protection Assessment: Nearshore Case Study Characterization. Prepared for The San Juan Initiative.

marinas. In each case study area, we gathered existing biological use data such as eelgrass beds, forage fish spawning sites, kelp beds, and upland vegetation to overlay the geomorphic and human use data we collected. We also analyzed forest cover change along the shoreline over the last 30 years. (Insert a figure of our case study areas).

Community: Part of what made this effort innovative and unique is that we consciously focused on how well protection programs are working from the community's perspective. We engaged those people most affected by changes to shoreline management: shoreline property owners and building and real estate professionals. Many of the land owners who worked with us were long-time residents, averaging over 30 years living on the Islands. They were able to give us an historic perspective of human use and change to the shoreline and raised important questions about gaps in scientific information. The community members who participated provided an invaluable view of what was working and what wasn't, both for the environment and for their interests as property owners. Builders and other professionals in the trade are often on the front line, trying to communicate and explain the direct environmental programs to landowners and, conversely, trying to communicate the landowners' interests to governmental managers. Six public workshops were held with the building and real estate community. From those workshops we created small working teams to help us further develop our recommendations. Finally, we also conducted a number of forums for members of the general public. In total we held 18 public workshops over the last year on the three main islands.

Management System: In examining the tools we currently use to achieve shoreline protection, we analyzed four elements of the system: (1) the regulatory programs governing shoreline activities; (2) how shoreline permits reduced impacts from shoreline structures in our case study areas; (3) the level of shoreline protection gained through voluntary (or incentive-based) programs; and (4) the education programs and information available to landowners, contractors, builders and real estate professionals. For regulatory programs we focused particularly on those administered by San Juan County Community Development and Planning Department and the Washington State Department of Fish and Wildlife because they are directly tied to protecting shoreline habitats and species. Our staff held numerous work sessions with government staff responsible for administering the protection programs. We were fortunate that the Department of Fish and Wildlife had conducted an excellent assessment of its own regulatory programs and made it available to us².

Findings

The Policy Group's preliminary findings were released in June, 2008 in a report entitled, "An Assessment of Ecosystem Protection: What's Working, What's Not." A summary is provided below.

Overall, we reached the following conclusion: People in the San Juans care deeply about the ecosystem and landowners have done a good job of protecting the marine shoreline in many instances. However, with people's continuing desire to build along the shoreline and use the marine ecosystem, we don't believe our current protection programs will be effective at stopping ecosystem declines.

Our conclusions are supported by five key findings, presented below. More information from our assessment is summarized in "An Assessment of Ecosystem Protection: What's Working, What's Not" (A Preliminary Report dated June 16, 2008).

² Quinn, T., Kalinowski, S., Bicknell, R., Olds, C., Schirato, M., Price, D., Byrnes, C., Kloempkin, D., Barnard, R., 2007. A 2006 Pilot Study of Hydraulic Permit Compliance, Implementation and Effectiveness in Region 6. White paper for Washington Department of Fish and Wildlife.

1. Management programs and the community have made positive improvements over the last 30 years of environmental management and there is a lot to build on.

Many of the major environmental laws and programs in Washington State were enacted in the 1970s when our understanding of the nearshore was less developed. Many of the early protection efforts were developed to maintain the aesthetic quality of the shoreline. For example, regulations were created to require the screening of homes from the water and limiting the number of docks to prevent a “porcupine effect” along the shoreline. As scientists learned more about how the shoreline works from an ecological perspective, regulations and requirements have incorporated that information. For instance, in the early days of regulating shoreline armoring, it was thought that rock bulkheads that sloped far out into the intertidal area were providing fish habitat. Current science shows that, in fact, the opposite is true and current regulations require the placement of bulkheads as close to the bank as possible.

Incentive programs have also improved. In our assessment of shoreline easements, we found that easements written in the last 8 years more effectively protect eelgrass, forage fish spawning beaches and native shoreline vegetation.

Landowners have also taken responsibility to improve shoreline health. Many have upgraded septic systems to prevent discharge of untreated waste, maintained native vegetation along the shoreline and reduced their pesticide and herbicide use. In a survey of property owners in our case studies, reducing pollutants from run-off was the number two priority (after maintaining septic systems) for caring for their land.

Businesses have gotten cleaner, too. One marina owner in our Lopez case study area had gone to great lengths to “green” his marina and reduce its impacts on the neighboring bay. Another marine owner in West Sound, Ian Wareham, put it this way: “The bays next to marinas no longer turn red or blue when boat owners paint their hulls”.

2. Some of the most sensitive parts of the marine shoreline are being altered and there’s a high risk of losing more.

In each of the three shoreline types (beach, rocky, embayment) in our case studies, we focused on several key ecosystem indicators: shoreline vegetation, eelgrass, and forage fish spawning beaches. Based on the findings of the Marine Stewardship Area Plan, there have been significant declines in each of these indicators in the San Juan Islands. The exact cause of decline is not known for each indicator, but scientists expect it is a combination of factors, including direct impacts from human changes to the shoreline and adjacent upland areas. In addition to these ecosystem components, we added a focus on feeder bluffs due to their importance in creating habitat for eelgrass, forage fish spawning sites and neighboring beaches. For each of these ecosystem indicators, we used existing scientific information to determine whether the expected habitat-forming processes, structures and functions were present. Based on the recommendation of the Science Team and strong evidence of direct impacts to shoreline habitats, we focused on structural changes to the shoreline as a result of bank armor, docks, mooring buoys, and the removal of shoreline trees and ground cover.

With respect to each of the four ecosystem indicators studied in our assessment, we found:

Eelgrass Habitat - Eelgrass is a marine plant that grows in thick beds. It provides important shelter, feeding and rearing habitat for many species, such as salmon, crab, rock fish, herring, sea anemones, marine worms, snails, limpets, crabs, birds, and fish. Eelgrass is particularly important in the San Juan Islands because all 22 populations of Puget Sound Chinook Salmon (now listed as Endangered Species) use the San Juans to grow bigger and stronger before their journey to the open ocean, and again on their return. Eelgrass beds, however, have undergone a dramatic decline.

Our case study assessments indicated that 26% of the docks and 30% of mooring buoys were placed in areas of eelgrass. Scientists also suspect that the placement of shoreline armoring and the removal of natural ground cover can disrupt the necessary supply of sediment to eelgrass beds. The decline of eelgrass beds is being studied to assess what combination of factors -- including disease, changes to water quality and temperature, and human activities such as dock building, shoreline armoring, crabbing, and boat anchoring – are implicated in their loss.

Shoreline Vegetation

Shoreline vegetation, including trees and ground-cover, benefits the marine ecosystem by providing shade to spawning forage fish, dispersing rainfall, supplying terrestrial insects that feed marine organisms, and providing resting places for sea and shore birds.

Our case study assessments revealed that 88% of the shoreline's 1977 forest cover remains. However, the amount of forest cover retained on each parcel fluctuated between 95% and near zero, with an average vegetation loss of 25 percent for each development.

The greatest losses of forest cover occurred along armored banks. This is significant because armoring of the bank alters not only the beach but also results in the loss of shading, leaf litter or other organic material.

Feeder Bluffs

Sand and gravel are constantly transported by currents, tides and waves. Beaches are replenished by sediment from eroding bluffs, called "feeder bluffs." These areas are important because the erosion and replenishment of beaches is a habitat-forming process. Feeder bluffs provide the sand and gravel for beaches, which are the habitat for forage fish spawning areas as well as the bedding material for eelgrass beds.

Our case study assessments showed that feeder bluffs and pocket beaches are being armored disproportionately to other beach types. Of the 4.5 miles of feeder bluffs in our study area, 30 percent have been armored. This eliminates the source of sand and gravel for beaches, which not only impacting habitats, but altering sediment transport by drift cells, wave action and the rate of erosion of other, unarmored beaches.



Forage Fish Spawning Beaches

Sandy beaches throughout the Islands provide important habitat for sand lance and surf smelt. These so-called "forage fish" are a basic food source for many species. They are the base of the food web—without them the web unravels. Forage fish spawn in the upper tidal zones of beaches with mixed sand and gravel, generally within a few feet of the high tide line. Sandy beaches become the incubators for these species' eggs.

Science has shown that shoreline armoring has a direct impact on forage fish spawning beaches through burial of habitat, and by changing the type of beach sediment present. Our case study assessments found that 80 percent of the 4 miles of armored shoreline was constructed low enough on the beach to cover places where forage fish may spawn. In addition, almost half of the armoring has occurred along potential or documented forage fish beaches.



3. There is a lack of accountability to ensure people and governments successfully carry out their responsibilities in a way that results in ecosystem protection.

Accountability means ensuring that agencies and organizations are carrying out their responsibilities, private actions are in compliance with the governmental requirements, and we are getting the results intended for the environment. From the manner in which records are kept (no cross-referencing between County and State permits) to the information documented in files (lack of documentation about pre-existing site conditions or as-built drawings), it is difficult at best to know if a shoreline structure was built consistent with applicable regulations. Because of short staffing at the County and the heavy workload for DFW staff, there are no post-construction inspections and there is no periodic monitoring to detect illegal activities.

- In our case study areas we found over 200 parcels with shoreline armoring, but found only nine County and twelve State permits for those parcels. Interestingly, the nine properties that had obtained County permits were not the same as the twelve properties that had obtained State Hydraulic Permit approvals.
- In a small field sample of permitted structures (docks and bulkheads) we found that over 50% were out of compliance with permit conditions. Lack of compliance resulted in encroachment into sensitive areas.

Most regulatory programs focus on impacts only at the parcel level. One example is the process of permitting bulkheads on beaches. When citizens approach the government seeking help with erosion problems on their land, regulatory programs drive people to parcel by parcel erosion solutions like individual bulkheads. Current programs do not provide a way to create of a broader erosion control solution that may benefit the entire neighborhood and result in a better environmental outcome for that beach.

For instance, soft shore armoring may be able to address erosion on multiple parcels and, at the same time, improve the quality of an entire stretch of beach. Moving a home back may also be a cost effective long-term solution for property owners. But a bulkhead is an easier permitting process than either moving a home back or soft shore armoring. In other words, the solution with the greatest environmental impact is also the easiest to use. Additionally, the permit process for repairs of existing bulkheads involves almost no review of impacts to shoreline resources and places very few impact reducing conditions on the repairs. We looked at the impact of repairs in a small sample of bulkheads and found that most repaired bulkheads increased their footprint both into the intertidal zone and along the beach, which increases the impact to shoreline resources. We were also struck by the number of bulkheads (up to one-third) that were constructed on properties with no main structure.

There is a lack of consistency between science and management definitions which reduces the ability to track ecological outcomes of our management decisions. For instance, one of the primary methods for managing impacts from shoreline development is to require homes to be set back a specific distance from the edge of the bank. Scientists have mapped the shoreline using tidal elevation but this is not what is used to determine the setback. Setbacks for houses are identified by establishing "top of bank." Top of bank is more a term of art than a scientifically documented shoreline location. One particularly descriptive definition for top of bank we heard was, "The edge of where you would comfortably park your new Mercedes." This lack of a mapped "top of bank" makes tracking where the setback is, and how it may be changing over time, almost impossible. Although setback is one of the primary tools to retain vegetation, in our case study area we did not find a correlation between a greater setback and more retained vegetation.

4. Current regulatory protection programs are turning people off and our education and incentive programs are not meeting the needs of the ecosystem or shoreline property owners.

Successfully protecting the fragile ecosystem of the San Juan Islands requires clear laws and guidance. Such laws need the support of the entire community. In a free society, the rule of law is ultimately dependent on the will of the people to follow it. Laws that are seen as too rigid, that are unfairly administered or that fail to meet the needs of people are usually short lived. As John Evans, San Juan Builders Association, observed: "The needs of people must be given serious consideration and balanced when writing rules to control environmental impacts." What we learned through our evaluation is that the regulatory programs have not adequately considered the needs of the people they affect and, therefore, do not have strong support among members of the community. Unfortunately, the manner in which our laws are administered is turning people away from "doing the right thing," even when they may otherwise be willing and eager to do so.

In our community workshops we heard complaints regarding the current legal structure. We were told that the current protection systems are often so confusing or inconsistent that it causes people to lose interest in protecting resources. Many expressed deep frustration with the regulatory system for three main reasons: confusion about what is or is not allowed under the law; conflicting requirements both within and across programs; and a lack of enforcement. There is a general perception that the system is arbitrary and unfair. Without confidence that the protection programs will actually work, people don't feel that their participation will add value. The system also creates problems for contractors who want to do the right thing. Peter Kilpatrick, a builder, puts it this way: "Most contractors and builders want to do the right thing, but with no enforcement the few that don't comply create problems for the rest of us." Without adequate enforcement, responsible builders like Kilpatrick are put at a competitive disadvantage based on the time and expense it takes to build according to the law.

An important part of ensuring that people comply with regulations and best practices is education. In addition to the deficiencies noted with enforcing regulations, our assessment also found a lack of adequate outreach and education to property owners and contractors. Our current education programs are not targeted to those with the most sensitive properties, resulting in an inefficient shotgun approach. There is also limited technical assistance from public sources available to property owners to help them better understand the resources they are stewarding on their property. What education is available is provided by an advocacy group. While that group has done excellent work in the community, a number of property owners expressed concern about using them because of their litigation history. In interviews, shoreline property owners also indicated that much of the effort to inform them was not effective because it didn't address their needs or was provided in a manner that did not reach them.

The San Juan Preservation Trust and the Land Bank prefer to acquire large parcels with high ecosystem values because it is more cost effective and the land is more easily managed. Most of the shoreline in the San Juans was divided up many decades ago, resulting in many small parcels along some of our most sensitive places. Shoreline parcels with a conservation easement had, on average, 1200 linear feet of shoreline whereas in our case study areas, the average shoreline length was about 300 feet. Voluntary programs, like conservation easements, may not be effective in protecting important shoreline habitats due to the limitations of working with small parcels.

5. There is tremendous opportunity for improvement because of scientific advancements and the ethic of stewardship within the San Juan community.

Our current understanding of how humans impact the marine shoreline is evolving and improving each year. As new information becomes available, it needs to be incorporated into policy and management decisions. For instance, we now know that feeder bluffs are critically important for creating and sustaining habitats. Current regulations recognize this importance, yet feeder bluffs remain unmapped. Having information like the location of feeder bluffs publicly available would lead to immediate improvements in protection.

Another example of science providing new opportunities to improve protection is the development of new technology that allows alternative designs for rock and concrete bulkheads. New soft shore approaches

have been developed and these new techniques provide an opportunity to improve how we resolve erosion concerns along our shores.

In workshops with contractors, builders and excavators, we gained a clear sense that they are looking for ways to do their work in the most ecologically sensitive way possible. According to them, one of the benefits of working along the shoreline is that property owners often have the resources to choose more environmentally friendly options.

Based on recent work by the San Juan Initiative and by the Marine Resources Committee through their Marine Stewardship Plan, we know that there is a strong ethic of stewardship in the Islands. This sense of responsibility represents an opportunity. With a clear focus on which protection efforts are most important, and evidence to back up the importance of these efforts in the context of larger ecosystem impacts, this stewardship ethic can be harnessed to drive protection efforts.

What's Next? Recommendations for Improving Protection of Marine Shorelines

How We Developed Our Recommendations

Based on the findings of the assessment, we again decided to focus our attention on matters that could make a difference in the near-term. Rather than develop recommendations for all programs affecting all of the ecosystem indicators, we chose to improve the whole system of protection for two important areas: shoreline vegetation (trees and ground cover) and natural beach-forming sedimentation processes (erosion). There are other important ecosystem functions and community interests that will need similar attention, like the placement of docks and marine access. However, we believe that by implementing improvements to the whole suite of protection programs affecting shoreline vegetation and erosion, there will be ancillary benefits for other ecosystem functions and public interests. Two examples of this are that improvements to the pre-building site assessment can be easily transferred to apply to terrestrial parcels, and improvements to enforcement will improve compliance to all land use laws.

We also recognized that our recommendations needed to consider the same three inter-related perspectives as our assessment:

Science: In developing our recommendations we kept in mind the ecosystem and the people who would be most affected by the actions necessary for its protection. We are recommending changes to a suite of protection programs in order to have a healthy, functioning marine shoreline. Eelgrass, forage fish spawning grounds, and shallow marine waters used by juvenile salmon are the basis of the marine food chain. This food chain relies upon functioning natural erosion/beach forming processes, shoreline trees and ground cover to provide the necessary substrate, ecosystem structures and clean water.

Community: Our greatest asset is the people who live and work here. San Juan County residents want to protect the shoreline, but they need improved access to information. They need to know what is important to protect in their area and how they can be good stewards while enjoying their property. They need clear guidance and consistent interpretation of the regulations and permitting processes. They need voluntary programs to encourage good stewardship and easy access to technical assistance. Shoreline property owners need a clear process that is protective of the environment while allowing shoreline views and access to the shore.

Management Systems: Our governmental managers need clearer rules that they can consistently apply, and sufficient resources to apply them. Regulatory, education and incentive programs need to be tailored to the sensitivity of the shoreline and its ecosystem functions. The County and State need to fairly and consistently enforce the regulations. People involved in implementing education, regulatory and incentive programs for shoreline protection need to work collaboratively and involve both the public and private sector.

To ensure an effective protection program to preserve shoreline vegetation and sedimentation processes, we developed the following criteria:

1. Tailor protection efforts to match the level of ecological function and sensitivity.
2. Increase consistency in requirements and increase certainty in the buying, permitting and building processes.
3. Foster a collaborative approach involving both the public and private sectors to increase communication and effectiveness.
4. Provide information to decision makers, whether County planners or property owners, in a accessible, relevant and timely manner.
5. Reward actions that protect ecosystems and discourage actions that are damaging or not in compliance.

San Juan Initiative Recommendations to Improve Protection of the Shoreline

The Policy Group members, as managers, property owners and concerned citizens, share the community's concerns. We have personal, first-hand experience with the challenges of living, building, and managing the shoreline. We have drawn upon our personal and professional experiences to craft the following recommendations that are innovative, feasible and supported by current science. Implementing the recommendations will be the responsibility of the respective managers of each program. There will need to be more public and management deliberations before the recommendations can be adopted, but we hope they are designed in a manner that can be implemented quickly. It is also important to remember that the recommendations work together and will not be effective if just one element is implemented.

A Tailored Approach

We recommend a coordinated and tailored approach which matches protection efforts to the ecological qualities of each stretch of shoreline. This approach recognizes that the shoreline is not uniform; it is an assemblage of different geological, biological, and human uses. In recommending this tailored approach we are advocating a move away from "one size fits all" thinking and focusing instead on what will work best for a given shoreline type. By using a fairly simple classification of shoreline types (Shipman, 2008³) and incorporating ecological information, we propose a suite of protection approaches that are tailored to the specifics of a site and will provide lasting protection of shoreline vegetation (trees/ground cover) and natural beach formation/erosion processes where it is most needed.

There are three shoreline types found in San Juan County: rocky, beaches and embayments. These shoreline types help identify stretches of coast that are sensitive to alteration and provide the basis for the tailored approach. We have focused on rocky and beach shore types, but we recognize the importance of

³ Shipman, H. 2008. A Geomorphic Classification of Puget Sound Nearshore Landforms. Puget Sound Nearshore Partnership Report No. 2008-01. Published by Seattle District, US Army Corps of Engineers, Seattle, Washington. Available at www.pugetsoundnearshore.org

embayments and recommend that as we move forward in implementing these recommendations, we consider the ecological, community and management needs of embayments more fully.

The proposed approach adds specific management goals and strategies to achieve necessary protection in areas that are more sensitive, thereby ensuring that we are not losing critical ecosystem function from piecemeal development. Implementing the tailored approach will require changes to existing protection programs. The changes will involve all the protection tools, including incentive, education, and regulatory programs. How these tools will be applied to specific places will be mapped and publicly accessible. We believe that the following recommendations, if applied, will ensure that these resources will be adequately protected.

We have organized the recommendations by shore type. Some of the recommendations are applicable to all shore types and are listed in a general improvements section.

Rocky Shores:

Rocky shores make up between 50-60% of the San Juan Islands' shoreline. Rocky shores are characterized as non-erosive, and can be lumped into three categories: plunging, platform or pocket beaches. Rocky shores, like the west side of San Juan Island, may have kelp beds or rockfish habitats which require clean water and nutrients from adjacent lands. From a sediment supply perspective, rocky shorelines are the least sensitive to the placement of shoreline armoring. Armoring along these beaches does not impact sediment supply nor does it increase erosion on neighboring properties. Vegetation along these shores does not provide slope stability, although it filters run-off and may provide important nutrient inputs to the shoreline food chain in the form of leaf litter and insects. In order to maintain the health of rocky shorelines, we recommend that the County and State:

1. Improve and clarify County regulations governing the retention of shoreline trees and ground cover and recognize their important function of maintaining water quality and nutrient inputs. Create regulatory language to address hazardous tree removal and tree clearing for views both throughout the life of the main structure and during construction.
2. Retain the setback in current County Unified Development Code, 50 feet or 100 feet depending on presence of vegetation for screening house from shore.
3. On pocket beaches with forage fish spawning habitat or eelgrass, apply the management approach for beaches described below.

Beaches:

Beaches include both bluffs and barrier shore types. In our Case Study Characterization, we broke these two shore types down further, based on sediment supply characteristics. For instance, feeder bluffs are an eroding shoreline bank critical to providing the sand and gravel to neighboring properties, to forage fish beaches and eelgrass beds. They can range from several feet high to several hundred feet high. They are connected to transport zones where the sediment is moving from one shoreline type to another. The sediment finally lands and accretes creating a barrier beach.

Protection of the natural beach forming and erosion processes is critical to the overall health of the shoreline ecosystem. However, these processes are not well protected under our current education, regulatory or voluntary programs.

Beach systems make up around 30% of our shoreline. Forage fish habitat is relatively rare – only 20% of the shoreline has potential or documented forage fish habitat. Feeder bluffs are even rarer; they account for only 12% of the shoreline within our case study areas, and are likely to be a much smaller percent of the

total shoreline. Pocket beaches were one of the most frequently armored shoreforms in our case study characterization. Although technically a rocky shore, pocket beaches can provide forage fish spawning habitat and may provide important areas for juvenile salmon.

The goal in these areas is to maintain eroding bluffs and preserve the beach forming processes, shoreline trees and ground cover necessary to support the ecological diversity of the Islands' nearshore. In order to preserve these ecosystem resources, we recommend that the County and State:

1. Implement an educational effort that focuses the most resources in support of property owners that have bluffs, forage fish, eelgrass or barrier beaches. The educational programs will focus on those places with remaining ecosystem function that are the most sensitive to alteration, with the goal of educating property owners in how to steward their land in such a way as to preserve these ecological functions. The strategy could include mailings, community workshops, site visits and news articles.
2. Provide County staff with technical assistance during site visits and permit review. In particular, make technical experts available in the fields of stormwater planning, low impact development, habitat biology, and coastal geology (through retainers or other contractual relationships).
3. Provide free technical assistance in these areas to encourage options for soft shore armoring, home relocations, maintenance of native trees and ground cover.
4. Change the regulations for clearing and grading to focus on the function provided by retaining trees and ground cover and explicitly require the maintenance of existing overhanging vegetation. Allow a specified amount of tree limbing or clearing for a filtered view or pedestrian access to the shoreline. Along these areas, overhanging and native vegetation is of paramount importance in maintaining sediment inputs, shoreline temperature, clean runoff and organic inputs necessary to retain the 12 miles of documented forage fish habitat and 80 miles of potential forage fish habitat.
5. Discourage the installation of hard shore armoring by providing assistance in the form of financial incentives, education and technical information to property owners whose existing homes may be threatened by erosion. Property owners will be encouraged to enhance vegetation and/or make drainage improvements, or to pursue soft shore alternatives if needed.
6. Change the existing standard for the placement of shoreline armoring to a threatened main structure. "Threatened" is currently described in other counties as the main structure being undermined in the next 3 – 5 years. Please refer to the "Consensus and Differences" section below for a fuller discussion of this recommendation.
7. Require new homes built within these areas to set their homes farther back to reduce the necessity for future shoreline armoring. The amount of setback would be determined by an average erosion rate for the area and the life expectancy of a home (75 years is standard). If homeowners want to reduce the setback, they would be required to hire a coastal geologist or other qualified professional to prove that a closer setback will not result in the need for hard shore armoring during the life of the home. Develop an exception to this rule when the homes on either side are closer than the allowed setback. (A key issue to be considered is whether hard shore armoring, when placed on neighboring properties, would result in accelerated erosion on subject property).
8. Work with San Juan Preservation Trust and San Juan County Land Bank to encourage the purchase of feeder bluff properties to maintain natural erosion and beach forming processes. Create a pilot project that targets multiple smaller properties.

9. Create a program to provide financial incentives, such as low interest loans and grants, for moving homes back and for soft shore erosion control when a home is threatened by erosion, to encourage the use of alternatives to hard shore armoring.
10. Encourage techniques that mimic natural processes (soft shore) where feasible when new shoreline armoring is needed. "Feasible" would be defined by a coastal geologist and would consider fetch, sediment, orientation to the waves and other relevant factors.
11. Require repair of bulkheads to be accomplished in a manner that minimizes impacts to shoreline resources like eelgrass, forage fish spawning or feeder bluffs.

General Recommendations for All Shoreline Types:

Provided below is a description of the recommended changes to the various programs that are not specific to any particular shore type.

1. Develop a monitoring program to assess the effectiveness of these recommendations. This monitoring program would assess education, regulatory, and voluntary programs after a short (2yr) and long (7-10 yrs) time period.
2. Map feeder bluffs.

Education:

1. Adapt and expand the shoreline property database accessible through the County Assessor's website. Add information showing shoreline types and relevant ecological features. The website would connect users to information about regulatory programs that may affect their property as well as technical assistance that may be available.
2. Expand and promote pre-building site assessments that are currently offered by the County to identify building setback requirements.
 - o Include identification of forage fish beaches, presence of eelgrass, feeder bluffs and retention of vegetation in the site assessment as specific ecological issues to be considered in building on the subject property.
 - o Provide more explicit guidance about what vegetation clearing is allowed before and after construction, accompanied by photographs showing what "adequate vegetation" looks like. Also provide guidance about how native vegetation should be retained to ensure stability of the soil and water quality.
 - o Encourage collaborative relationships among County stormwater and planning staff, landscapers, builders, design professionals, property owners, and realtors to allow a full discussion of the property's ecological issues and building options.

Regulatory:

1. Refine the requirements for bulkheads and other shoreline armoring to require that new bulkheads meet the standards recommended below and document pre and post construction conditions. Maintain this requirement even if repairing a bulkhead is exempt from the shoreline substantial development permit

2. Allow homes to be moved back and remain non-conforming in areas that are the most ecologically sensitive to shoreline armoring, like feeder bluffs and forage fish beaches.
3. Require before and after construction inspections of new shoreline structures like bulkheads or removal of shoreline vegetation.
4. Support current efforts to create financial penalties issued by the County for removal of trees or placement of bulkheads. Penalties should be sufficient to deter activity.
5. Work with the Department of Fish and Wildlife to find ways to administer their regulations in a way that is consistent with the recommended changes to County regulations.
6. Work with State DOE or WDFW to implement a code enforcement inspection and monitoring program that periodically inventories the most sensitive shoreline areas to deter and prevent illegal activities.
7. Create a design commission that allows staff, property owners and contractors to recommend solutions for sites where the standard regulations do not make sense for protecting shoreline resources.

Consensus and Differences

The recommendations set forth in this Final Report are the result of many hours of analysis, discussion, listening and brainstorming. We reached consensus on all but one of the above recommendations. We did not reach consensus on changing the standard for allowing armoring of the shoreline. Staff recommended changing the standard from current practice to a much more restrictive standard in areas highly sensitive to damage from shoreline armoring: bluffs, including feeder bluffs and potential and documented forage fish beaches. The majority of our group felt strongly that protection of the public resource and limiting the impact on a neighbor's property are more important than the protection of an individual property owner's lawn or accessory buildings. This view was not held by two members of our group. Instead, they believe that:

- Resources should be used to create new technology that both protects the home and maintains the ecosystem function. Resources should not be spent on restricting property owners' ability to use their land regardless of the sensitivity of the ecosystem function or value.
- Changing the standard to allow the loss of lawns, gazebos, trails or any other upland use to erosion is immoral because it diminishes the value of the land.
- Preventative armoring should be allowed. If armoring will be allowed later when the home is threatened, then it should be put in before the property owner has lost their landscaping or other uses.

We recommend that the County Council and WDFW adopt new regulations to allow bulkheads along bluffs and beaches only when a main structure is threatened and to consider the opinions listed above in their decision-making process.

The other contested decision was whether to apply the same management approach on both documented and potential forage fish beaches. In the end, we reached consensus and recommend treating them the same, but we also request greater clarity about the habits of spawning forage fish. It was not clear from the information we had whether forage fish always return to the same beaches to spawn. If they do, some members of the group believe we should not treat potential spawning beaches the same as ones where spawning has been documented.

Implementing the Recommendations

We recognize that these recommendations come at a time of diminishing financial resources for our local, state and federal governments, as well as for businesses and citizens. We also recognize that our natural resources are in a precarious state and if we don't make substantial changes to all our protection programs we may lose the ecosystem that sustains our community. In order to reconcile these issues, we commit to securing the resources to begin implementing these recommendations. We also see that many of these changes can be made now by shifting resources to those places that are most sensitive to damage. Part of the appeal of the tailored approach is that our limited resources will be focused on those places where it is most needed.

While additional work is needed to determine the cost of the recommendations described above, we have done a preliminary analysis of what it would cost to begin implementing them and how we think this work should be paid for. There are essentially three sources of funding: property owners, government and non-profit grants and re-allocation of current funds. We estimate that to fully implement the recommendations would require \$350-500,000 in start-up costs. We believe the on-going costs will be much less: between \$100-125,000 annually for education, technical expertise and website maintenance. These costs would be borne partially by the County and foundation grants.

There are some costs that would be borne by property owners because of the direct benefit they would receive. There would be an increase in the costs of purchasing property and construction for property owners who availed themselves of the voluntary programs we are recommending. We also feel strongly that property owners should pay for the cost of adequate inspections to ensure compliance. Because of these limited increases in costs, we see the tailored approach as an economical way to more effectively protect the most sensitive places.

We also hope that with the Governor's new Action Agenda to restore Puget Sound by 2020, there will be additional money available. This money will hopefully go to local governments that are working actively to implement the priorities listed in the Action Agenda. Implementing the recommendations of the San Juan Initiative is a listed priority for our action area.

Concluding, Celebrating and Continuing On

The San Juan Initiative provides a pilot process for other communities interested in improving protection. Our findings and recommendations will be useful to other communities, provided they undertake a short process to determine if they have the same challenges as those found in San Juan County. In San Juan County, we recognize that all of these recommendations need additional science and policy work. The local regulatory changes must occur through the ongoing Critical Areas Ordinance update and upcoming Shoreline Master Program. We look forward to helping County staff and citizens as we take on these challenges. Our recommendations demonstrate our collective commitment to making and supporting these changes. We believe the recommendations and new data and analysis give the County a jump-start in making these public processes substantive and meaningful both to the people of San Juan and the ecosystem.

We started with the huge task of improving protection for the entire ecosystem of San Juan County but we quickly realized that we needed to focus our resources to achieve results. We continued to winnow throughout this process in order to achieve our goals in the time frame and with the budget we had. For instance, instead of analyzing the entire shoreline, we studied 10% of the 404 miles and produced significant, timely and applicable results at a smaller cost. Using the same focused approach, the recommendations address just two ecosystem components, natural sediment processes and shoreline trees and ground cover, realizing this would concretely move us toward our ultimate goal. Despite the focus on just two ecosystem components, we believe the proposed suite of recommendations can positively influence

every ecosystem process and function in the San Juan Islands. By improving technical assistance, targeting education, improving the website, and clarifying regulations and compliance, we have laid the groundwork for improved protection of terrestrial and marine ecosystems.

Indeed, the goal of managing an ecosystem for the benefit of both humans and non humans is tremendous. We used our skills, both as individuals and as a group, to decide what was most important, and what would result in concrete benefits to the San Juan Islands and would continue to bring us together to inspire change.

Acknowledgments

Successful efforts like the San Juan Initiative are never done alone or from a single viewpoint. Our success is a result of the community's willingness to look at itself critically, and its ability to openly discuss how we live and our impact on our portion of the Puget Sound ecosystem. We wish to thank the many people and organizations who gave generously of themselves in this process:

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