

Stakeholder Input
in Puget Sound Nearshore Restoration:
an Application of the Advocacy Coalition Framework

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Abstract

Stakeholder Input
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The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) proposes strategic, Sound-wide shoreline restoration. PSNERP would change Puget Sound restoration from a small-scale, bottom-up approach to a large-scale, top-down one. I investigated PSNERP as a “nascent policy subsystem” per the Advocacy Coalition Framework (ACF).

I elicited input from 12 PSNERP stakeholder categories in the Whidbey Sub-Basin region. I examined three questions:

1. What are the overall values and preferences of Whidbey Sub-Basin stakeholders?
2. How do Whidbey Sub-Basin stakeholders trade off priorities?
3. Around what groups of shared values might coalitions of stakeholders form?

Findings can inform PSNERP’s restoration planning and future stakeholder involvement and outreach activities.

Using mixed methods, I spoke with 38 respondents. I used survey and interview data to identify respondents’ overall values and preferences, and to group respondents into potential coalitions. I used ranking exercises to understand how respondents trade off priorities.

Respondents' overall values were:

1. The environmental quality of the nearshore is poor
2. It is worth investing in restoration
3. Pollution is a major problem

Respondents' overall preferences were:

1. Manage impacts of stressors, rather than removing them
2. Focus on wildlife habitat for multiple species
3. Protection is more important than restoration

Respondents traded off private homes and shops to give high priority to natural habitat features. They gave high priority to water quality, ecosystem services and natural processes as objectives, and traded off preservation of commerce.

I identified five potential coalitions, based on respondents' shared values about causes, severity, types and solutions of problems. I labeled these coalitions: No Government Intervention; Property Rights and Development; Private Land Stewardship; Protect Undeveloped Areas; and Large-Scale Restoration.

Overall, I found support for ACF hypotheses, in that potential coalitions were identifiable by shared values, but coalition members did not share preferences or demographics. I recommend that PSNERP focus on these values, and not stakeholder categories, in future outreach activities. I also recommend that PSNERP proceed with its proposed restoration approach, with two caveats:

1. Conduct outreach about specific aspects of the program
2. Give higher weight to sites with anticipated water quality and wildlife benefits

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CHAPTER 1: BACKGROUND

Introduction

This research uses Advocacy Coalition Framework hypotheses to examine stakeholder input in Puget Sound nearshore restoration planning. The Advocacy Coalition Framework suggests that stakeholders form coalitions based on shared values, although they may not share preferences or demographics. This framework further suggests that values tend to be centered on beliefs about the causes, severity, and solutions of problems.

In this study, I examine three research questions:

1. What are the overall values and preferences of stakeholders in the Whidbey Sub-Basin region of Puget Sound with regard to nearshore restoration?
2. How do Whidbey Sub-Basin stakeholders trade off nearshore priorities?
3. What coalitions of Whidbey Sub-Basin stakeholders might form in the future?

This chapter describes the context for this study, which is the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP). PSNERP is a General Investigation study of the U.S. Army Corps of Engineers and the Washington Department of Fish and Wildlife. PSNERP aims to restore nearshore ecosystem processes throughout Puget Sound through strategic, large-scale restoration. In this chapter, I first discuss Puget Sound nearshore ecosystems and changes that have occurred to these ecosystems. Next, I describe PSNERP and its stakeholders. Finally, I illustrate the specific geographic setting of this research, which is the Whidbey Sub-Basin.

Puget Sound nearshore ecosystems and the issue of restoration

Nearshore ecosystems are the “key to life in the Puget Sound estuary” (Department of Ecology, 2007). Figure 1 shows the full extent of Puget Sound watersheds and marine environments. The Puget Sound nearshore extends from the top of shoreline bluffs to the depth offshore where light penetrating the water no longer supports plant growth. It also extends upstream in estuaries to the head of tidal influence. Figure 2 shows the range of features that make up the nearshore, including bluffs, beaches, mudflats, eelgrass beds, salt marshes, and estuaries (PSNERP, 2010).

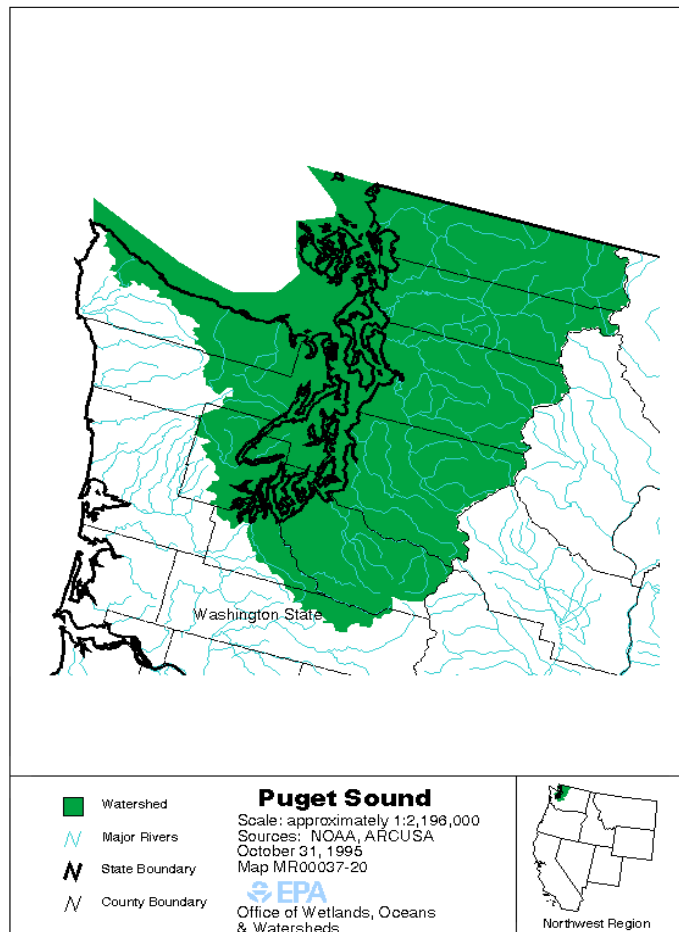


Figure 1: Puget Sound, including marine and watershed areas.

Source: <http://www.epa.gov/nep/programs/sheds/ps.gif>

The nearshore is an ecotone, or transitional zone, between other major ecosystem types: air, terrestrial, freshwater, and marine. Many of the important and unique characteristics of Puget Sound depend upon the nearshore, including its high productivity, complex food webs, diverse habitats, and the large numbers of plants and animals that occupy these habitats (Kozloff, 1973; Sound Science, 2007). As the second-largest estuary system in the United States, Puget Sound supports more than 200 species of fish, including several native salmon species, and ten species of marine mammals (Gelfenbaum *et al.*, 2006).

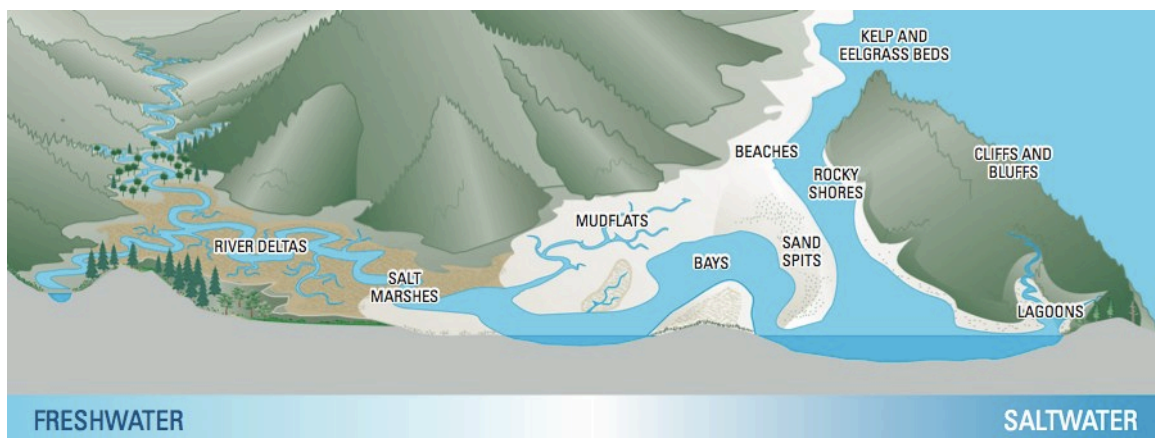


Figure 2: Puget Sound nearshore ecosystems. Source:

<http://www.kingcounty.gov/environment/watersheds/central-puget-sound/nearshore-environments.aspx>

The 4,300 total miles of the Puget Sound Nearshore (PSN) provide a number of ecosystem services, which are direct or indirect benefits to human well-being from natural

ecosystems (MEA, 2005). For example, the PSN prevents flood damage, initiates foodwebs, and organizes woody debris and sediments in ways that are critical to a variety of species, including humans. The PSN also maintains water quality by absorbing excess nutrients and sediments, and by providing habitat for filter-feeding bivalves, which help to remove pollutants from the water (PSWQAT, 2002).

The PSN has unique cultural, heritage, and economic values. For example, it has high biodiversity (WABP, 2010) and many important archaeological sites (NRHP, 2010). It offers numerous opportunities for human enjoyment and recreation, including 55 shoreline campsites (WWTA, 2010) and 1,300 miles of public beaches (Department of Ecology, 2007). Puget Sound as a whole supports \$20 billion worth of annual economic activity, which is nearly 10% of the State's gross product. This activity includes 4.3 million inhabitants, 2.2 million jobs, 62.5 million metric tons of annual cargo, and a \$147 million fishing and shellfish industry. It also includes the recreation, fishing, boating, shellfish, and tourism industries. The Puget Sound region accounts for 80% of all Washington state tourism and travel revenues (Department of Ecology, 2008).

Population growth and human development in the Puget Sound region have altered the form and function of nearshore ecosystems. This alteration is a result of direct impacts to the nearshore landscape and also of changes in the freshwater, terrestrial, and marine ecosystems that interact with the nearshore. Changes to the freshwater portions of watersheds from timber harvesting, agriculture, and urban development have modified the quantity, quality, and timing of water, nutrients, woody debris, and sediments entering the nearshore. Chemical and nutrient inputs from commercial, industrial, and residential sources have also degraded water and sediment quality in many areas. Within the PSN, practices like diking, dredging, filling, armoring, and aquaculture have displaced, destroyed, or modified nearshore ecosystems, taking away critical habitats. Changes in physical processes within the nearshore include depleted food and nutrient sources for marine life, deteriorating beach sediment movement, and altered flows of surface and groundwater (Fresh *et al.*, 2004).

Alteration of nearshore ecosystem structures and processes impairs ecosystem services, including water quality and timing, climate regulation, and mitigation of natural disasters. Altered nearshore processes and impaired nearshore ecosystem functions are critical factors in Puget Sound's overall decline in environmental quality (Gelfenbaum *et al.*, 2006).

Evidence supporting this hypothesis includes the dramatic population declines of multiple nearshore-dependent fish and wildlife species, including salmon, forage fish, marine mammals, and birds (West, 1997; Puget Sound Action Team, 2005). For example, the largest stock of Pacific herring in Washington State declined by 84% over the past decade. Surf Scoters declined by more than 50% and Western Grebes by more than 85% over the past 25 years. Common Murres and Marbled Murrelets also have declined more than 50% during this period (Nysewander *et al.*, 2001; Puget Sound Action Team, 2005). The number of marine species listed or proposed for listing under Endangered Species Act and State regulations continues to increase. The number and diversity of the PSN species in decline suggest systemic rather than isolated problems (Gelfenbaum *et al.*, 2006).

The Puget Sound Nearshore Ecosystem Restoration Project

The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) is a General Investigation study cost-shared between the U.S. Army Corps of Engineers and the Washington State Department of Fish and Wildlife. It proposes to address the systemic problems affecting the PSN through strategic restoration of nearshore ecosystem processes Sound-wide. The format of a General Investigation requires PSNERP to follow a lengthy process of: (1) analyzing the problems with the PSN (2) proposing solutions (3) developing objectives (4) identifying the differences between future conditions with and without the proposed solutions and (5) developing metrics of the project's benefit. The culmination of the General Investigation is a request to Congress for hundreds of millions of dollars in federal funding. This request requires that PSNERP demonstrate restoration of Puget Sound nearshore ecosystems is an issue of national importance.

PSNERP examined changes to the Puget Sound Nearshore (PSN) with digitized data from the 1850s and modern digital mapping data from 2005. This Change Analysis revealed four major physical changes and two major types of cumulative impacts in the PSN. Summarized, these are:

1. Dramatic loss of large river delta habitat
2. Elimination of small coastal embayments and their connections to the Sound
3. Major impacts to sediment supply and transport
4. Extensive loss of estuarine wetlands

5. The PSN has become overall shorter, simpler, and significantly more artificial
6. Many places have experienced multiple compound changes. For example, shoreline armoring and roads often co-occur, and frequently places that have experienced changes to the adjacent upland also have experienced changes directly on the shoreline (Fresh, 2010). Shoreline armoring hardens shorelines with things like bulkheads or rip rap, protecting infrastructure, but altering nearshore processes.

PSNERP used its Change Analysis data to develop a Strategic Needs Assessment, which then became the basis for a set of eight restoration and protection objectives. Change Analysis suggests that nearshore ecosystems have been altered and degraded to such an extent that protection of intact areas alone would be insufficient to restore ecosystem processes throughout Puget Sound. PSNERP's objectives are related to the strategic, Sound-wide, ecosystem process-based approach that PSNERP's Nearshore Science Team expects will be most effective in restoring the PSN and its associated wildlife and ecosystem services (Fresh *et al.*, 2004).

Yet, a strategic, Sound-wide, process-based approach presents some challenges for working with stakeholders. One of these challenges is the difficulty of communicating problems and solutions, which relate only indirectly to wildlife or economic benefits. Another challenge is communicating about problems and solutions on large spatial and temporal scales. A third challenge is seeking input into a project that contains a substantial amount of highly technical analysis and a great deal of scientific and political uncertainty.

Stakeholder involvement in PSNERP planning

Stakeholders are those groups and individuals who can affect, or may be affected by, a policy or project. "Stakeholders can be at any level or position in society, from global, national, and regional concerns down to the level of household..." (Grimble and Wellard, 1997, 175). Ecosystem restoration projects have traditionally been small and local. As such, they are typically "bottom-up" projects, meaning that they are developed and led by those most affected by their outcomes. Such projects are also typically "opportunistic" meaning that restoration sites and actions are chosen mostly for feasibility reasons. Restoration groups tend to prefer those sites that are most geographically proximate, or whose acquisition and

restoration costs are most affordable. Stakeholder involvement in small, local restoration projects generally consists of project development by stakeholders, and recruitment of volunteers to conduct the actual restoration work. The broad volunteer base that participates in smaller restoration projects helps to continually infuse stakeholder input into decisionmaking about the projects (Gold *et al.*, 2006).

PSNERP operates on a much larger scale with a “top-down” organizational approach, meaning restoration sites and actions will be selected and coordinated by government agencies. PSNERP also aims to conduct “strategic” restoration, focusing on areas with the greatest need, potential for recovery, and capacity to address outstanding scientific questions. Therefore, involving stakeholders will require an approach that meshes “bottom-up” input with “top-down” authority, producing the greatest possible social and environmental benefits (Throop, 2000).

PSNERP’s Stakeholder Involvement Strategy (unpublished internal document) specifies four modes of stakeholder involvement:

1. Fostering broad program understanding and support
2. Developing and reviewing restoration and protection goals and objectives
3. Involving stakeholders in National Environmental Policy Act (NEPA) procedures
4. Developing and advancing a PSNERP General Investigation site list

PSNERP’s science team can propose nearshore restoration sites and actions that have ecological merit. It can also inform Puget Sound stakeholders of scientific expectations of the efficacy of various restoration alternatives. However, developing and selecting restoration sites and designs based only on scientific information would leave social values unaccounted for. This is particularly important because human communities will pay for, and be affected by, the process and outcomes of nearshore restoration.

There are a number of ecological and social risks and trade-offs inherent in a restoration project of the magnitude PSNERP proposes. Therefore, PSNERP needs input from stakeholders to develop restoration objectives and sites that fit with their aesthetic, cultural, and environmental values and preferences. Effectively eliciting and incorporating stakeholder input will help PSNERP to maximize public value. Meaning, “...the results obtained are worth the cost of private consumption and unrestrained liberty foregone in producing the desirable results” (Moore, 1995, 29).

The Whidbey Sub-Basin and its stakeholders



Figure 3: PSNERP Puget Sound Sub-Basins. Source: PSNERP internal presentation document

To conduct Change Analysis, PSNERP divided Puget Sound into seven sub-basins (Figure 3). Divisions between sub-basins are based on oceanographic and watershed characteristics. Strategic Needs Assessment used Change Analysis data to produce a “storyline” for each Puget Sound

sub-basin. Each storyline focuses on the

dominant changes and stressors in that sub-basin. Stressors are human developments that degrade nearshore ecosystem processes. These include things like bulkheads, dikes, and marinas.

Strategic Needs Assessment was complete only for the Whidbey Sub-Basin (WSB) when I developed this research in Spring 2009. Thus, the WSB is the geographic focus of this study. With a more limited scope, I could more fully investigate “place-based and local values . . . tailored to local ecological conditions and local social concerns . . . this emphasis on local features and on local distinctiveness . . . fits especially well with the basic tenets of an adaptive management system . . .” (Norton and Steinemann, 2001, 488). Adaptive Management “ . . . treats actions and policies as experiments . . . In an adaptive approach, actions and policies are undertaken based on the best available knowledge and they are implemented in such a way as to produce new understanding that can inform subsequent actions” (Stankey *et al.*, 2003, 40). PSNERP has committed to an Adaptive Management approach and therefore should consider local values.

To summarize, the context for this research is the Whidbey Sub-Basin (WSB) region of Puget Sound. The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) plans to restore nearshore ecosystems in this and six other sub-basins throughout Puget Sound. PSNERP needs input and support from stakeholders to make their project successful and relevant. This research elicited stakeholder input in the WSB so that PSNERP can improve its site selection and stakeholder outreach efforts there. I focused this research on three specific questions about WSB stakeholders. What are their overall values and preferences? How do they trade off priorities? What do their values suggest about the potential formation of coalitions? These questions arose from working directly with PSNERP to understand their stakeholder input needs, as well as from the literature on large-scale restoration planning, stakeholder involvement, and the Advocacy Coalition Framework.

CHAPTER 2: LITERATURE REVIEW

In this chapter, I examine the literature relevant to my research context and questions. Namely, what are Whidbey Sub-Basin PSNERP stakeholders' values, preferences, trade-offs, and potential coalitions? I start this chapter by reviewing the literature on large-scale ecosystem restoration. Next, I describe some of the issues that arise when involving stakeholders in environmental planning and management. Finally, I provide an overview of the Advocacy Coalition Framework (ACF), including the hypotheses I used to structure this research.

I chose to use the ACF for a few reasons. First, it provides clear and well-tested hypotheses about stakeholder beliefs (Weible *et al.*, 2009). Second, ACF helps to identify potential coalitions. Given my limited sample size, it was important to identify patterns of beliefs that may be broadly applicable. Third, the issue of PSNERP restoration meets the key criteria for application of ACF (Sabatier and Jenkins-Smith, 1999).

The challenges of large-scale ecosystem restoration planning

Large-scale coastal restoration is a growing trend, in response to loss of habitat and ecosystem services in increasingly developed coastal areas (e.g., Wilber *et al.*, 2000; Steyer *et al.*, 2003; Kareiva and Marvier, 2007). Yet, restoration at large scales can be challenging. Although many of these challenges are scientific or technical (e.g., Cairns, 2000; Van Cleve *et al.*, 2004), “there is a growing recognition that public policy controversies are driven more by value differences than by technical deficiencies” (Weible, 2007). With growing coastal populations, and the poorly defined threat of climate change impacts in coastal areas, it is important to address social concerns and values in the context of coastal restoration.

Berghofer *et al.* describe a variety of social challenges associated with large-scale ecosystem restoration (2008). One challenge is that restoration requires value judgments, but traditional democratic structures do not correspond to the complexity and site specificity such judgments warrant. Another challenge is that an ecosystem approach is only precise at abstract levels. It does not provide concrete goals, policies, or structures. It also does not answer the question of what kind of system to restore or maintain (Berghofer *et al.*, 2008). A third major challenge for large-scale restoration projects is defining, and assessing the probability of, success given multiple issues at the site and landscape scales (e.g., Cairns,

1995; NRC, 2003). For example, success is often described as re-establishing a “healthy” ecosystem or restoring ecosystem “integrity” (Davis and Slobodkin, 2004). These vague, value-laden terms are frequently ascribed by scientists. Such terms tend to ignore the ways that social values interact with ecological theories, and ultimately affect restoration (Zweig and Kitchens, 2010).

Successful ecosystem restoration requires that restored sites ultimately become self-sustaining and resilient to normal and catastrophic disturbances (SERI, 2004; Hughes *et al.*, 2005). Yet, resilience of ecological systems is linked with that of human systems. Research suggests that linked social-ecological systems act as complex adaptive systems in which human economies, institutions, and policy decisions account for much of the success or failure of restoration (Costanza *et al.*, 2001; Janssen *et al.*, 2004; Waltner-Toews and Kay, 2005). So, understanding social values attached to nearshore ecosystem restoration is critical to both defining and achieving restoration success.

Stinchfield *et al.* recently reviewed the literature on institutions, beliefs, communication, and economic issues associated with Puget Sound restoration (2009). Their review exposed a dearth of information about the values and preferences of stakeholders in this region. They call this out specifically as a research need (Stinchfield *et al.*, 2009, 34). While most of the existing research focuses on stakeholders’ demographics, these have been shown to be relatively weak predictors of environmental attitudes and behaviors (e.g., Dietz *et al.*, 1998; Mertig and Dunlap, 2001). Values are better predictors of environmental attitudes and behavior than are demographics (e.g., Kollmuss and Agyeman, 2002; Teel *et al.*, 2005).

Involving stakeholders in environmental management

Stakeholder involvement provides critical legitimacy and support for large-scale restoration projects. Yet, limited planning budgets and timeframes often constrain the scope of stakeholder involvement (Stinchfield *et al.*, 2009). Furthermore, many natural resource decisionmakers have an educational background in the biological or physical sciences with little training in the social sciences (Brinson and Benson, 2002). These factors, especially when taken together, can limit the capacity of natural resource agencies to facilitate stakeholder involvement.

Stakeholder involvement in environmental management should ideally incorporate two-way communication. Environmental managers should “communicate out” to stakeholders about projects, plans, decisions, and new information. Stakeholders should also be able to “communicate in” to environmental managers about their values, preferences, and objectives. This information should help to shape environmental decisionmaking. A good stakeholder involvement process reaches out to all stakeholders, shares information openly and readily, engages people in meaningful interactions, and attempts to satisfy multiple interest positions (Webler and Tuler, 1996).

Adaptive Governance involves stakeholders in decisionmaking by providing information, dealing with conflict, and encouraging adaptation and change (Brunner, 2005; Dietz *et al.* 2003). However, stakeholders may resist pre-determined scientific definitions of environmental problems and solutions. Therefore, Lee recommends that stakeholders collaborate to define environmental problems and devise questions to be resolved by adaptive management before scientists are brought into a project (1999). Yet, stakeholders are rarely involved at the beginning of an environmental management process. Rather, stakeholder involvement is frequently not sought until the end of a process’ scoping phase. At this point, stakeholders are simply asked to review one or more pre-determined plans. Unfortunately, involving stakeholders this late in the process can prove expensive, both financially and politically, as new and important issues are raised too late to be easily resolved (Johnson and Dagg, 2003). PSNERP presents a unique opportunity to investigate the elicitation and use of stakeholder input in the “middle stage” of a restoration process – after scientific problem definition, but before the preparation of pre-determined plans.

The Advocacy Coalition Framework (ACF)

The Advocacy Coalition Framework (ACF), articulated by Paul Sabatier and others, explicitly identifies beliefs as the causal driver for political behavior (Weible *et al.*, 2009). The ACF proposes a hierarchical model of individual policy actors’ (stakeholders’) beliefs. The most immutable beliefs are called “deep core beliefs.” The most changeable beliefs are called “secondary beliefs.” Mid-level beliefs, called “policy core beliefs” are those around which groups called “advocacy coalitions” tend to form.

Policy core beliefs are normative and/or empirical. They are somewhat resistant to

change, but much more pliable than deep core beliefs. Policy core beliefs include perspectives on the severity, causes, and potential solutions of problems (Sabatier and Weible, 2007). Advocacy coalitions consist of “people from a variety of positions ... who share a particular belief system – that is, a set of basic values, causal assumptions, and problem perceptions – and who show a non-trivial degree of coordinated activity over time” (Sabatier, 1993, 25). Because substantial research using the ACF has shown that coalitions form around shared values, potential coalitions may be identified by examining sets of values around which stakeholders tend to group.

A long-standing debate within the ACF is the relative influence of material self-interests versus policy core beliefs on the coherence of advocacy coalitions. Some studies indicate that self-interest is more important for “material groups” (those organized around economic self-interest) and less important for “purposive groups” (those organized around an ideological position) (Weible *et al.*, 2009). The ACF also hypothesizes that actors within an advocacy coalition will show substantial consensus on topics related to the policy core (values), but they will be less aligned on topics related to secondary beliefs (preferences).

Assessing stakeholder values and preferences

According to Sabatier and Jenkins-Smith, ACF is best suited to cases with a few key criteria (1999). The case of PSN restoration meets most of these, including: a central role of scientific information; a policy subsystem as the primary unit of analysis; and a broad set of subsystem actors (Sabatier and Jenkins-Smith, 1999, 118-120). According to Leschine *et al.*, “ACF appears to offer a robust approach for examining ... arenas in which scientific and technical issues have the potential to gray into broader questions of human values and preferences” (2003, 23). According to Sabatier, ACF is an appropriate framework in which to integrate top-down and bottom-up approaches to policy implementation (1986).

Weible *et al.* assessed 80 recent applications of the ACF and found at least six studies on the issue of values and preferences (Weible *et al.*, 2009). ACF has traditionally been used to identify the beliefs and membership of established coalitions. However, Weible advocates for its greater use as a policy analysis tool (2007). In this research, I use ACF to frame an in-depth analysis of stakeholder beliefs and potential coalitions in the WSB. I designed this research to probe for WSB stakeholders’ values (policy core beliefs) and preferences

(secondary beliefs) in the case of the WSB nearshore restoration policy subsystem. I also looked for statements of economic self-interest among respondents.

Predicting the formation of advocacy coalitions

Most studies that apply ACF hypotheses examine policy processes in their latter stages, when advocacy coalitions have already formed. The goal of these ACF applications is to better understand the values and preferences of established coalitions and to use that understanding to promote policy change and learning among coalitions (Weible *et al.*, 2009). In contrast, my research is situated in the “middle stage” of a policy process and seeks to identify the types of coalitions that may form in the future in this subsystem.

Nearshore restoration has occurred at smaller sites in various Puget Sound locations for many years. However, collaborative, federally funded, ecosystem-wide nearshore restoration is a new proposal, and one that few stakeholders are already familiar with (only two of the stakeholders I spoke with mentioned knowing of PSNERP). Thus, I am not examining existing coalitions. Rather, I am looking at shared values around which coalitions could form. Understanding potential coalitions can give PSNERP important information for strategic outreach and involvement of stakeholders.

There is some literature on the subject of predicting coalition formation, or “nascent subsystems.” Sabatier and Jenkins-Smith acknowledge two types of nascent subsystems. The relevant type here is, “...those that arise when policy issues are reconceptualized or perceived differently due to new external developments” (1999, 137). In the case of the Puget Sound nearshore, PSNERP’s proposed restoration approach is a new external development. In a nascent subsystem, stakeholders’ values are expected to be vaguely formulated and susceptible to change (Sabatier and Brasher, 1993). I see this research as an opportunity to examine potential coalitions and actors in a more changeable state. The actual formation of coalitions is affected by a number of factors beyond shared values. Those factors include: access to resources (informational, authoritative, and financial), and the ability to mobilize those resources to overcome barriers to collective action (Fenger and Klok, 2001). This research does not examine other factors affecting the formation of coalitions. Rather, it provides a starting point for their examination.

In sum, large-scale ecosystem restoration presents a number of challenges. Possibly the greatest of these challenges is understanding and incorporating the values of human communities into restoration planning. Stakeholder involvement strategies can be crucial to the success of environmental planning and management. “Early and often” is the mantra for stakeholder involvement, yet PSNERP (like many projects) will involve stakeholders infrequently, and not until the middle stage of their planning process. Thus, it is important for PSNERP to elicit and understand values and preferences that its stakeholders seem to share, and those that may prove contentious. PSNERP can use an understanding of potential coalitions of stakeholders to conduct more strategic outreach and stakeholder involvement in the future. The ACF provides a well-tested theoretical framework for examining values, preferences and potential coalitions of stakeholders. Therefore, I used ACF hypotheses to examine the beliefs and potential coalitions of Whidbey Sub-Basin PSNERP stakeholders.

CHAPTER 3: RESEARCH QUESTIONS AND METHODS

I investigated three questions with this research:

1. What are Whidbey Sub-Basin stakeholders' values and preferences with regard to Puget Sound nearshore restoration?
2. How do Whidbey Sub-Basin stakeholders trade off nearshore priorities?
3. What do Whidbey Sub-Basin stakeholders' values about nearshore restoration suggest about the potential formation of advocacy coalitions?

I designed these questions to address both ACF hypotheses and PSNERP management needs. I am interested in stakeholders' values and preferences because, according to the literature, these beliefs strongly influence collective action. I am interested in how stakeholders trade off priorities because restoration cannot maximize everything. PSNERP can use information on values, preferences and trade-offs to select and design restoration sites. I am interested in potential coalitions of stakeholders that may form because these groups could affect restoration planning and Puget Sound environmental management in the future. PSNERP can use information about values and potential coalitions to inform targeted stakeholder outreach and involvement. To address my three research questions, I used a mixed-methods study design. Table 1, on page 22, shows the application of each method to each question.

Stakeholders' overall values and preferences

Information on Whidbey Sub-Basin (WSB) stakeholders' values and preferences can be useful in a couple ways. First, overall value and preferences may translate into social goals and objectives for PSN restoration (Item 2 in the Stakeholder Involvement Strategy). These goals and objectives are important in guiding adaptive management. Working backward from stakeholder goals, as well as those contributed by scientific input, PSNERP can formulate an adaptive management plan. This plan can include indicators of social and scientific goals, and a set of monitoring protocols to measure progress toward those goals. Second, understanding values and preferences can help PSNERP communicate better with stakeholders. PSNERP can use values information to frame communication products and stakeholder involvement activities in a more useful and less contentious manner (Laessoe, 2007; Lakoff, 1995).

I investigated the values and preferences that many stakeholders share, general points of disagreement about values and preferences, and the values shared only by certain groups. I asked stakeholders specifically about the severity of problems, types of major problems, causes of problems, solutions to problems, and priorities for the PSN. I also asked sub-questions about:

- A vision of the future PSN
- Approaches to PSN restoration
- The role of science in restoration
- Ecosystem services as a restoration tool

How stakeholders trade-off priorities

Much of the difficulty in large-scale restoration planning lies in trading off desirable elements. For example, in a perfect world, shorelines would produce abundant salmon habitat, human recreation opportunities, food crops, housing, and economic opportunities. However, in the real world, recreation opportunities often conflict with housing development, crop production may conflict with salmon habitat, and economic development can reduce available space for wildlife, recreation, and food production. Therefore, I asked WSB stakeholders to rank a variety of items, including:

- Features of the PSN
- Nearshore restoration objectives
- PSN shoreforms
- Stressors in the PSN

Potential advocacy coalitions

The Advocacy Coalition Framework (ACF) suggests that stakeholders will form coalitions around shared values, despite differences in preferences. These coalitions are expected to cross traditional stakeholder categories. It also suggests that some stakeholders may form coalitions around shared economic interests (Weible *et al.*, 2009). Therefore, I analyzed stakeholders' values in two ways:

- For values around which stakeholders tended to cluster
- For statements of strong, and possibly shared, economic interest

Introduction to the methods

I begin this section with the key question, "Who are the stakeholders?" Many government agencies have a mandate to involve stakeholders in environmental planning and

management, but this means different things to different agencies. I focused this research on a specific subset of stakeholders who are important to PSNERP planning, but have not yet provided input. After discussing stakeholders and sampling, I outline my mixed-methods research design, and explain why it is appropriate to my research questions and context. Finally, I outline each method used in detail and describe the analysis of each type of data.

Stakeholders and sampling

Respondents' level of involvement

Figure 4 illustrates the large group that can be considered PSNERP stakeholders. At the most basic level, a PSNERP stakeholder is anyone who pays federal income taxes in the United States, as their money will be used for PSN restoration, instead of other projects. At the next higher level of involvement, PSNERP stakeholders are all residents of the Puget Sound region, who may be impacted by local nearshore restoration. At the highest level of

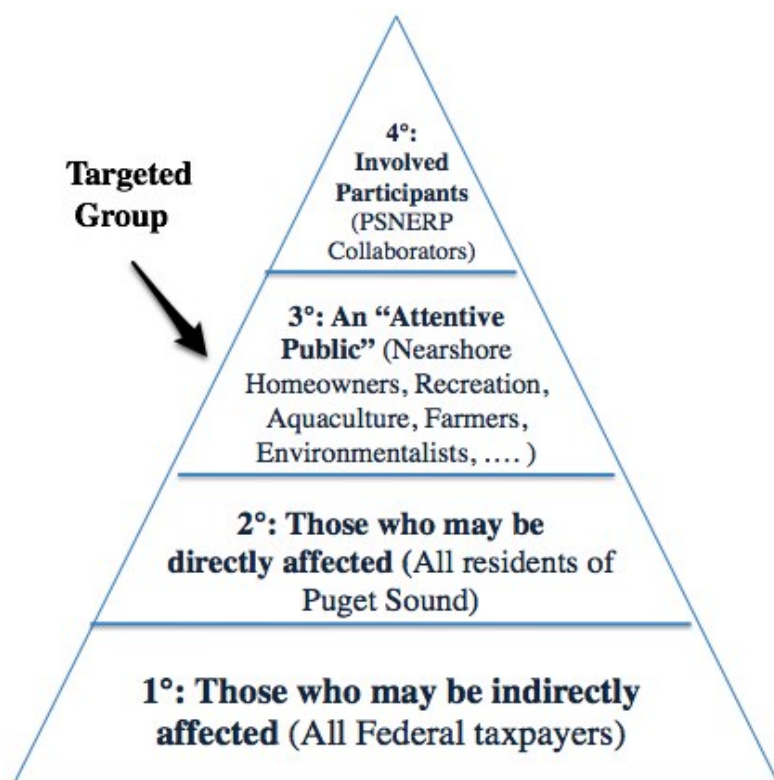


Figure 4: Hierarchy of PSNERP stakeholders. Those most invested in PSNERP are nearest the top of the pyramid.

involvement are those stakeholders who already collaborate directly with PSNERP. Throughout the General Investigation, PSNERP has been a collaborative effort with involvement of the Puget Sound Partnership, U.S. Geological Survey, Department of Ecology, Nature Conservancy, and many others. These stakeholders will continue to have considerable input into PSNERP. With this research, I elicited input from a "tertiary" level of stakeholders ("Targeted Group" in Figure 4). These respondents have a more explicit stake in the PSN than the general public, but are not involved in high-level PSNERP planning.

Stakeholder categories

I identified 12 categories of Whidbey Sub-Basin (WSB) stakeholders from which to select respondents. These categories are based on previous research (Iceland *et al.*, 2008), conversations with PSNERP science team members familiar with restoration issues in the WSB, and internet research. The 12 stakeholder categories are:

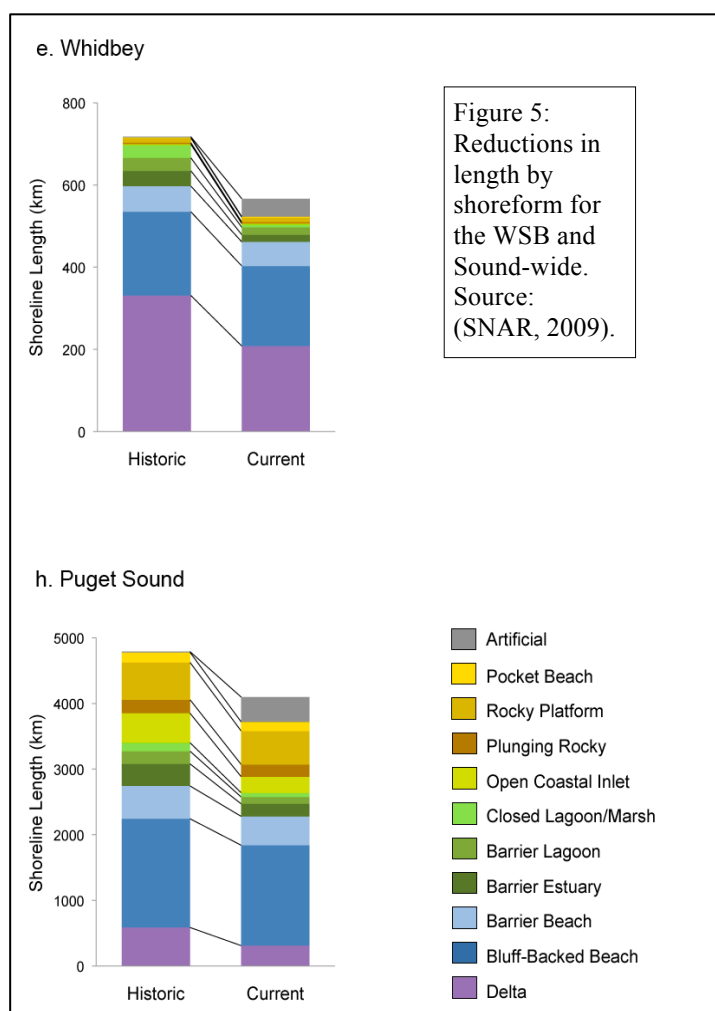
1. Agriculture: The Skagit Valley is a major area of agricultural production within the WSB. Many farms are created from diked former delta wetlands. Some agricultural groups have opposed nearshore restoration projects in the past (Breslow, 2001).
2. Aquaculture: There are a few major aquaculture operations in the WSB, including shellfish growing operations and salmon net-pens.
3. Development and home-building: The WSB has seen substantial housing development in recent years and there are many large and small developers and home-builders in the region.
4. Environmental: Many education, advocacy, and land trust organizations work to promote Puget Sound environmental quality in the WSB.
5. Fishing: A few commercial fishing operations and fisheries advocacy groups exist in the WSB. They may have input into nearshore restoration, as restoration could affect their livelihood.
6. Governments: The WSB encompasses three counties. County governments are responsible for some environmental planning and land development, including Shoreline Management Plans. City governments, Conservation Districts, and State Parks and Wildlife Areas are also major planners and land managers in this region.
7. Historical societies: A few such societies exist in the WSB and may ascribe strong values to both the human and natural history of the region.
8. Nearshore homeowners: 55% of shoreline modification in Washington occurs on single-family residences (Berry and Kazakov, 2004). I selected homeowner respondents from three different groups: “Shore Stewards,” who self-select to receive formal training in environmental stewardship of their shoreline property; members of shoreline homeowners associations; and members of property rights groups. This cross-section of groups should reflect the breadth of homeowner attitudes.
9. Ports and marinas: Change Analysis data identified 25 marinas in the WSB. They are

considered to be a “dominant stressor” because they combine several stressors of nearshore processes, and can have drastic localized effects (SNAR, 2009). Yet, representatives of ports and marinas likely see their industries as economically and/or recreationally important in the PSN.

10. Recreation: This category includes organizations that represent hikers, kayakers, sport fishers, and game hunters, among others.
11. Tourism: Tourism is a major PSN industry. In the WSB, tourism includes whale-watching tours, boutique hotels, and local tourism bureaus.
12. Tribes: The Swinomish, Stillaguamish, Upper Skagit, and Tulalip tribes are located in the WSB. All of these tribes manage natural resources and reservation lands, and engage in fishing, shellfish gathering, and other natural resource harvest activities.

Why the Whidbey Sub-Basin

The WSB is an interesting pilot region for eliciting PSNERP stakeholder input for a number of reasons. First, the WSB has experience nearshore changes similar to those of the overall PSN (Figure 5). These changes include: loss of delta habitat; loss of coastal embayments; and degradation of sediment supply and transport due to development and armoring along shorelines (SNAR, 2009). Second, the WSB has mid-range scores for degradation of nearshore ecosystem processes (SNAR, 2009). So, it is likely that PSNERP will plan a number of restoration and protection actions there.



Finally, because major portions of the WSB are agricultural lands composed of diked former delta wetlands (especially in the Skagit Valley), this sub-basin has been the site of disputes between farmers and salmon recovery proponents (Breslow, 2001). There have also been some interesting demographic changes in the WSB, particularly in Island County. This county's Housing Element highlights issues of decreasing home affordability, significantly increasing population, and a significant shift toward an older population (ICCP, 1998). In essence, this illustrates the expansion of housing development, particularly serving a growing retirement community of wealthy individuals.

WSB stakeholders are in many ways similar to stakeholders in other Puget Sound regions. All categories of stakeholders are well represented in the WSB. However, some stakeholder categories are predominant in some areas of Puget Sound. For example, agriculture is a major industry in the WSB. Most Puget Sound aquaculture operations are located in the South Sound and Hood Canal sub-basins. Environmental organizations are mostly centered around Seattle and Olympia, and there are more government agencies based in Olympia (South Central sub-basin). In sum, I expect that WSB stakeholders, by category, are reasonably similar to those in other sub-basins. I did not compare demographics across sub-basins because demographics are poor predictors of environmental attitudes (Kollmuss and Agyeman, 2002; Teel *et al.*, 2005). Although I did not investigate the beliefs of all Puget Sound stakeholders, I have no reason to believe they are significantly different from those of WSB stakeholders whose input I elicited in this research.

Purposive sampling design and sample sizes

I chose a purposive sampling methodology because I wanted to focus in-depth on a relatively small group of people. I also wanted to examine a heterogeneous group reflecting the breadth of WSB stakeholders (Patton, 2002, 230-246). I purposively sampled three respondents from each of the 12 stakeholder categories by contacting agencies and organizations within those categories using publicly available information. All respondents were affiliated with an organization that had a website, or otherwise listed its information online. All respondents were senior, or at least managing-level, members of their organizations. Findings from this group of respondents are not statistically generalizable, but

the sample elicited input from a breadth of individuals whose beliefs may well be representative of WSB stakeholders generally.

Two respondents brought an additional person with them to our meeting. These respondents did ranking exercises collaboratively with another member of their organization. In one case, two members of an organization completed separate surveys. In the other, the two members of the organization complete a survey together. Also, I had a fourth respondent in the Homeowner category. I had not planned to use this respondent's data, but cluster analysis revealed the importance of including this respondent. Two respondents did not complete proxy sites. So, the sample size is different in different parts of this research, ranging from an N of 34 for cluster analysis (because some respondents skipped one or more questions, and thus could not be clustered) to an N of 38 for total survey respondents.

Mixed Methods

Why a mixed-methods approach

I used a “triangulation” mixed-methods approach to this research (Creswell, 2003, 16). I gathered qualitative information from interviews, quantitative information from surveys, and both types of information from ranking exercises. Triangulating stakeholder beliefs with qualitative and quantitative data gave me a more accurate and thorough perspective. This mixed-methods approach was best for addressing my questions because I was interested in both specific values and preferences, related to PSNERP questions, as well as general opportunities for identifying potential coalitions and points of consensus. I needed both quantitative information on preferences and trade-offs, and information in stakeholders' own words. Survey data provided specific responses to PSNERP questions and a clear view of stakeholders' values. Interview data provided support for coalitions identified through survey data, and generated additional themes and interpretations not considered in the surveys. Ranking exercises forced trade-offs and allowed for some quantitative analysis, but also provided qualitative data on stakeholders' thinking about which aspects of the PSN and its restoration should take precedence. Another benefit of the triangulation mixed-methods approach was that I could mitigate some of the limitations of each individual method with the benefits of other methods. This is described further in the Caveats and Limitations to Methods section.

In some cases, I measured the same concept in several ways. For example, I used three methods to examine the topic of ecosystem services. I asked an open-ended question about ecosystem services as a tool for restoration planning (Appendix C). I then used the relationship of ecosystem services to shoreforms and developments in ranking exercises (Appendix D). Finally, I used trade offs of ecosystem services in proxy sites (Appendix E). I took this approach because I suspected ecosystem services would be a difficult concept for respondents, and I wanted to see if individuals' responses to questions about ecosystem services would be internally consistent. The use of ecosystem services as a communication and planning tool is becoming increasingly popular, so I wanted to explore whether stakeholders reliably and consistently relate to the concept. Table 1 shows how each research question was addressed with each method.

Table 1: Summary of questions, methods and analysis

Question	Method	Analysis
1. What are WSB stakeholders' overall values and preferences?	surveys	descriptive statistics
	interviews	thematic content analysis
2. How do WSB stakeholders trade off priorities?	ranking exercises	descriptive statistics
	proxy sites	<i>not yet analyzed</i>
3. What do WSB stakeholders' values suggest about potential coalitions?	surveys	cluster analysis
	interviews	thematic content analysis

Data collection process

All respondents first signed a consent form (see Appendix A), then completed a survey (Appendix B), and then engaged in an interview. Interviews started with open-ended questions, moved on to ranking exercises, and concluded with proxy sites. Data and analysis from the proxy sites exercise are not reported here. They will be part of a forthcoming PSNERP Technical Report, accessible as of October 2010 at <http://www.pugetsoundnearshore.org>. Complete descriptions of all methods are in subsequent sections. The Institutional Review Board at the University of Washington reviewed all research methods and data collection tools used in this study. The Human

Subjects Review Coordinator issued this study a Certificate of Exemption status on September 18, 2009, under Administrative Approval Application #37032.

Introductory information and the use of images

Before asking respondents to complete surveys, I provided some introductory information. I explained the purpose and format of the study and asked participants to sign consent forms. I then provided images and descriptions of the PSN, so all respondents were referencing essentially the same landscape. I used images in this and other sections of data collection to facilitate conceptual understanding of complex or potentially unfamiliar concepts. Pre-testing suggested respondents liked the use of images, and needed images to understand some PSN restoration concepts.

Using images is common in elicitations of environmental preference (e.g., Ryan, 2005; Tilt *et al.*, 2007; Wolf, 2005). Research suggests that humans experience nature visually and thus reactions to visual input can provide important data (Kaplan and Kaplan, 1989). Studies also suggest that using pictures as surrogates for the natural environment poses no serious methodological problems (Pitt and Sube, 1987). I followed the Kaplan and Kaplan guidelines for sampling and choosing images and relied heavily on images that had already been employed in an elicitation exercise by the PSNERP science team (1989). Sometimes, respondents reacted to specific images, rather than the underlying concepts. When that happened, I redirected respondents and did not include that data.

Surveys

All respondents completed a short survey. Surveys contained 20 Likert scale questions focused on values that ACF hypotheses suggest may become policy core beliefs. These include beliefs about the severity, causes, and solutions of nearshore problems. The surveys also had seven questions requesting demographic information, including:

- stakeholder categories that respondents primarily and secondarily identify with
- cities in which respondents live and work
- length of time respondents have lived in the Puget Sound region
- frequency of respondents' participation in various nearshore activities

I did not analyze or report on demographic information here. I will include this information in the forthcoming Technical Report.

I administered surveys before conducting interviews because the surveys asked for background beliefs and helped to identify values. I did not want survey responses to be framed by issues that arose in interview questions. Survey responses provided an opportunity to cluster respondents based on quantitative data (see Cluster Analysis section). These clustered groups of respondents helped to frame analysis of qualitative data. The complete text of the survey is in Appendix B.

Interviews

Open-ended questions in a semi-structured interview format elicit broad, personal responses, in respondents' own frames and terms (Rubin and Rubin, 2005). These qualitative responses help to account for issues that I as the researcher, and PSNERP as an agency, may not have considered. They can also help to interpret survey data (Babbie, 2002). Semi-structured interviews are based on an interview guide, which is a predetermined list of questions (Kvale, 1996; Rubin and Rubin, 2005). To obtain qualitative data comparable across individuals, I adhered to an interview guide shown in Appendix C (Bernard, 1995).

Interviews consisted of four to five open-ended questions. I asked most interviewees all five questions, including a follow-up question about ecosystem services. However, I often got responses to this follow-up question within the initial question, and therefore skipped it. I followed the open-ended questions with ranking exercises and proxy sites exercises, described in subsequent sections. Respondents took between 40 and 180 minutes to complete the interview/ranking/proxy site process. I recorded responses to all interview sections by taking notes and, in 30 of 36 cases, audio-recording. I transcribed all recordings and notes with the help of an assistant. Transcriptions facilitated subsequent analysis of interview data.

Ranking exercises

Interviews contained a series of four "ranking exercises" addressing shoreline features (like private homes), geological shoreforms (like deltas), stressors of nearshore processes (like bulkheads), and restoration objectives (like increasing biodiversity). For each exercise, I gave participants cards depicting different items. For example, in the Features exercise, I

gave respondents 12 cards describing things like Farms, Wildlife Conservation Areas, and Private Homes. I asked respondents, for this exercise, to order the cards into high, medium, and low categories in terms of which features should get priority in the 200 meter swath of the nearshore. I prompted them not to think of adding or removing things to the existing landscape, but to picture a blank slate and rank features based on that. I occasionally used a second prompt, “What is the best use of the 200 meter area around where land meets sea in Puget Sound?” For the Features and Objectives exercises, I encouraged respondents to add to the provided cards if they felt something important was missing. Very few respondents did so. Features and Objectives ranking cards are shown in Appendix D.

For the Shoreforms and Stressors cards, I first asked respondents to state their “gut or aesthetic preferences.” I then informed respondents of the ecosystem services provided or impaired by each shoreform or stressor, and gave them the opportunity to alter their rankings. Many respondents did, in fact, alter their ratings and I noted the changes and their explanations for the changes. For Shoreforms, Stressors, and Objectives, I prompted respondents to consider “feasibility” (unlike their approach to the Features exercise). Data from Shoreforms and Stressors rankings are not reported or analyzed here, but will be available in the forthcoming Technical Report.

Proxy sites

I wrapped up all but two interviews with an exercise using five “proxy sites.” I designed each proxy site to represent a dominant stressor in the WSB, and a typical restoration action to remove that stressor. I identified dominant stressors from the preliminary PSNERP Strategic Needs Assessment Report for the WSB (SNAR, 2009). I selected the “before restoration” image, and designed the “after restoration” image for each proxy site with assistance from two members of the PSNERP science team: Hugh Shipman, Geologist with the Washington State Department of Ecology; and Charles “Si” Simenstad, University of Washington Research Professor in the School of Aquatic and Fishery Sciences. These two scientists are very familiar with the PSN and restoration issues.

For each proxy site, I listed the ecosystem services and other functions provided by the site before and after restoration to give a clear depiction of trade-offs. My goal with the proxy sites was to help respondents trade off priorities for different shoreforms, stressors, and

ecosystem services in a place-based fashion. I tried to ensure that the proxy sites were not so specific that respondents accepted or vetoed a specific plan or place. The “before” images were of real places in the PSN, but not in the WSB.

I introduced proxy sites to respondents by saying, “Each of these images shows a real site, but not (to my knowledge) a real restoration proposal. For the ‘after’ images, I used computer software to create hypothetical results of restoration. For each set of images, assume that the site is either on public land, or on land that was sold by a willing seller for a fair price. For each site, please look at the images, and the descriptions of ecosystem services, and tell me if you prefer the ‘before restoration’ or the ‘after restoration’ image, or if you’d rather see the restoration done differently.” An example of one proxy site can be found in Appendix E. I have not yet analyzed data from this exercise. However, I will include it in the forthcoming PSNERP Technical Report.

Pre-testing

I asked three PSNERP stakeholders in Seattle, who were similarly situated to my prospective WSB respondents, to test an earlier version of the research materials. I did not tell these three pre-testers that this was their role. However, I did tell them they were among my first respondents and any feedback they had on materials was much appreciated. Based on their input, I altered some interview and survey questions, and materials for the ranking exercises and proxy sites. The three pre-testers represented the categories of Environmental, Ports/Marinas, and Tourism.

Analysis

I coded all respondents with a number prior to entering their survey data and transcribing their interview data. I entered all interview and survey data along with respondents’ assigned stakeholder categories, and their self-selected primary and secondary stakeholder categories. I analyzed all responses individually, and based on stakeholder categories. This is also how I report the data. I informed respondents that they would be anonymous and that I would maintain the confidentiality of their data.

Descriptive statistics for survey and ranking data

I entered all survey and ranking data into Microsoft Excel spreadsheets, which I then input to PASW Statistics 18 (formerly SPSS). I created all descriptive statistics in PASW Statistics, and then exported some data back to Excel to build charts. Analyzing descriptive statistics of survey and ranking data provided a preliminary characterization of respondents' shared and divergent values and preferences.

Cluster analysis for survey data

I used cluster analysis to analyze survey data for groups of stakeholders who responded similarly to the 20 Likert scale survey questions. Cluster analysis is a multivariate statistical procedure that attempts to reorganize a sample into relatively homogenous groups (Aldenderfer and Blashfield, 1984, 7). The primary use for cluster analysis is “to find groups of similar entities in a sample of data” (Aldenderfer and Blashfield, 1984, 33). Cluster analysis can be achieved in a few different ways. I opted for a k-means, or iterative partitioning approach. This is an efficient approach to organizing a small sample (in this case, 38 respondents and 20 variables) (MacQueen, 1967).

K-means clustering requires the pre-determination of the number of clusters into which to sort the data. I attempted to fit respondents into everything from two to nine clusters. I then examined the p values for each variable under the different clustering scenarios. Of the scenarios that produced low p values for most variables, five clusters proved optimal for two reasons. First, in scenarios of more than five clusters, at least one cluster had only one member (respondent). Second, in the only scenario of fewer than five clusters that had low p values (3 clusters), the differences between clusters were flattened by the attempt to pull more respondents into fewer clusters. Thus, three clusters produced groups that could not be clearly differentiated from one another. Table 2 shows the iterations involved in creating five clusters of my respondents and variables.

Table 2: Iterations in cluster analysis with five clusters

Iteration History*					
Iteration	Change in Cluster Centers				
	1	2	3	4	5
1	3.240	2.966	2.958	3.097	3.391
2	.402	.458	.000	.426	.000
3	.000	.542	.000	.246	.000
4	.000	.000	.000	.000	.000
*Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 4. The minimum distance between initial centers is 6.083.					

Thematic content analysis for interview data

I examined interview data through content analysis, looking for patterns of responses and major themes (Patton, 2002). I used a coding scheme to analyze the entire qualitative data set, and then sorted and organized codes into thematic groups (Rubin and Rubin, 2005). By sorting data into codes, and codes into themes, I was able to better understand respondents' overall values and preferences. This process also made it easier to examine potential groups of respondents based on shared values.

One code that I specifically looked for was the mention of personal economic interest. Some examples of respondents mentioning economic interest are:

- a farmer emphasizing the need to maintain infrastructure to keep farming affordable
- a port commissioner stating the importance of increasing alternate sources of revenue
- a tourism operator discussing the oppressive cost of regulations on his small business
- a homeowner suggesting that shoreline homeowners should receive incentives to manage their land for environmental benefits.

By coding all interview responses I generated a total of 303 individual codes. I then grouped codes into themes based on the main word or idea in the code. This generated a total of 27 themes. Finally, I eliminated from consideration all codes suggested by only one respondent. This reduced the set to 184 codes. I opted not to consider the number of times an individual respondent mentioned a particular code. My focus was not on how unique or insistent an individual respondent was. Instead, I was looking for values and preferences that are shared widely, or shared among certain groups.

I report in the following chapter on Findings only those codes and themes that are directly relevant to my questions about stakeholders' values and preferences. I created themes following Patton's guidelines for convergence and divergence and validated the themes by comparing them with those of another coder (2002, 465-466). I do not report codes that the other coder generated here because I used her coding scheme only to validate my own.

Caveats and limitations to methods

The scope of this research is limited. I focused exclusively on a subset of PSNERP stakeholders within a sub-basin of Puget Sound. I spoke with only 38 individuals. Therefore, I am unable to generalize the results of this research to "all PSNERP stakeholders" or even to "all Whidbey Sub-Basin PSNERP stakeholders." In addition, two respondents did not give completely individual opinions, because they brought an additional person to the interview. In both of those cases, a pair of respondents answered interview questions and collaborated on ranking exercises. This could indicate that respondent pairs altered their statements somewhat because of their perceptions of the other person in the room. In one case, the pair of respondents (from the same organization) gave survey responses that put them into different potential coalitions. This may suggest that doubling or tripling the sample size would have generated different findings about overall beliefs and potential coalitions.

I used a mixed-methods approach to this research to mitigate some of the limitations of each method, as applied to this case. For example, the major limitation of survey methodology in this study is that I had a small sample size. It would require a much larger sample for the results of such a survey to be broadly generalizable. In this small study, survey results may be interesting or meaningful, but not statistically significant. I mitigated this limitation of my survey data by comparing survey findings against interview data. The major challenge with interview data in this study was managing and analyzing the vast amount of qualitative data that 36 respondents produce. I mitigated this limitation by framing my analysis of the interview data using the survey data. I focused my qualitative analysis with the quantitative data. This helped to derive coherent overall responses, as well as potential coalitions. Ranking exercises required respondents to make quantitative trade-offs and give qualitative explanations of their reasoning in making these trade-offs. The major limitation of

my use of this method is that it was not “real world.” Meaning, I was not asking stakeholders to tell me how many ports they would trade for how many acres of fish habitat in the PSN. I was not asking them to say where exactly each of these things should be located, or how much money should be spent on them. I was simply asking how they ranked one feature versus another, assuming restoration can not maximize everything. I mitigated this limitation of ranking exercises by using “real world” proxy sites to try to focus the conversation on actual trade-offs in actual places. Again, analysis and findings from the proxy sites exercises are not described here, but will be in a forthcoming PSNERP Technical Report.

CHAPTER 4: FINDINGS

In this chapter, I describe the results of my research in four major sections. First, I examine some overall values and preferences of WSB stakeholders, as indicated by my respondents' survey and interview data. Next, I describe some areas of overall disagreement on preferences. Then, I show how respondents traded off nearshore features and restoration objectives. Finally, I illustrate some potential coalitions of stakeholders that may form in the WSB, by examining the values that groups of respondents share. Throughout this chapter, I discuss what respondents did in the past tense, e.g., "Respondents thought ..." However, my assumption is that the beliefs respondents expressed persist, so I refer to these in the present tense, e.g., "Pollution is a major issue."

Whidbey Sub-Basin stakeholders' overall values and preferences

Survey questions focused on five types of stakeholder beliefs:

1. Beliefs about the **severity** of nearshore problems
2. Beliefs about **major types** of nearshore problems
3. Beliefs about the **causes** of nearshore problems
4. Beliefs about **potential solutions** to nearshore problems
5. Beliefs about **priorities** for the nearshore

Three of these, according to the ACF literature, are typical values around which advocacy coalitions form: severity, causes, and potential solutions of problems. The other two types of beliefs were important considerations for PSNERP.

Tables in the following sections show overall responses to survey questions. The total sample size for survey responses is 38. However, not every respondent answered every question. I coded responses based on the following scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree; 4 = Agree; 5 = Strongly Agree. In the following tables (Table 3 through Table 7), I highlighted mean responses of **4 and above in bold**, and *those below 3 in italics*. These responses with high and low mean values indicate the variables with which respondents, on average, agreed or disagreed. They include: poor environmental quality in the PSN; a need for restoration; pollution as a major problem; and property rights and reallocation of resources as poor solutions.

Severity of Problems

Table 3 describes respondents' beliefs about the severity of nearshore problems. The statements shown in the left-hand column are those stakeholders responded to in surveys. The mean response values are for all respondents. I present some statistics in tables throughout this chapter, but reiterate that these results are not statistically generalizable.

Table 3: Beliefs about problem severity

Statement	Number who Agree or Strongly Agree	Total N	Mean Response	SD	SE Mean	95% CI
It is important to restore the Puget Sound shoreline so future generations can have a high quality of life	35	38	4.45	0.69	.19	4.22–4.67
It is important to spend money to restore the Puget Sound shoreline	34	37	4.30	0.70	.12	4.06–4.53
<i>The environmental quality of the Puget Sound shoreline is high</i>	<i>11</i>	<i>38</i>	<i>2.79</i>	<i>1.21</i>	<i>.11</i>	<i>2.39–3.19</i>

A large number of respondents disagreed that environmental quality of the PSN is high (71%), agreed that it is worth investing money in PSN restoration (92%), and thought investing in restoration is important for future generations' quality of life (92%). This contrasts with a previous study in which just 21% of respondents rated the environmental condition of waters in and around Puget Sound negatively, and only 39% thought there was a strong urgency to clean up and protect Puget Sound waters (FMMA, 2008). A number of factors could explain the difference between these two findings. First, the FMMA study contacted a random sample of Puget Sound residents, whereas my research focused on a specific subset of an "attentive public" or more-involved stakeholders. Second, in the Tribes and Governments categories in my study, I was often steered toward environmental planners. Thus, my overall results lean toward a more "environmental" attitude. Some differences emerge in the later section on potential coalitions, where some groups agreed more strongly with PSN problems and the need for restoration than did other groups. Third, my research focuses specifically on shorelines, with which people have a more tangible relationship (as

opposed to the quality of water bodies). People find it easier to acknowledge environmental problems in areas that they directly experience. Finally, in the year since Puget Sound Partnership received FMMA’s survey findings, they have invested heavily in increasing public awareness of water quality issues in Puget Sound. Some of that awareness may be reflected in my findings on beliefs about severity and types of problems.

Respondents in my sample only lightly touched on their beliefs about the severity of nearshore problems in interviews. However, in response to a question about the role of science in restoration, seven respondents mentioned a sense of urgency, that the degradation of the PSN is ongoing and we should start reversing this trend (as opposed to continuing to study the issue). Two respondents suggested that restoration efforts should focus on the biggest, fastest fix. Five respondents mentioned an existing “waiting list” of important restoration projects, and nine respondents stated a preference for large-scale restoration projects. All of these statements suggest that many respondents believe PSN problems are severe and urgent. Again, this sample of respondents contained a large number environmental planners, educators, and activists. However, these are often the people who take the time to be actively involved stakeholders in an environmental decisionmaking process. Thus, I contend that this is actually a representative (if not generalizable) sample.

Major types of problems

Table 4 shows respondents’ overall beliefs about major types of nearshore problems. While mean agreement was highest about pollution as a major problem, 66% of respondents agreed or strongly agreed that three of four problems are major. Again, bold statements are those with which respondents, on average, agreed (mean response of 4 or greater).

Table 4: Beliefs about major types of problems

Statement	Number who Agree or Strongly Agree	Total N	Mean Response	SD	SE Mean	95% CI
Pollution is one of the biggest environmental problems in the Puget Sound shoreline	25	36	4.00	0.99	.16	3.67–4.33

Too much human development is one of the biggest environmental problems in the Puget Sound shoreline	25	38	3.92	1.12	.18	3.55–4.29
Loss of wildlife habitat is one of the biggest environmental problems in the Puget Sound shoreline	25	38	3.87	0.91	.15	3.57–4.17
Fewer fish and shellfish available for harvest is one of the biggest environmental problems in the Puget Sound shoreline	20	37	3.73	0.99	.16	3.40–4.06

In survey data, respondents generally agreed that pollution was a major problem. Responses were more mixed about other PSN environmental problems. This is an important finding because the PSNERP science team would likely agree most with the statement that “too much human development is one of the biggest problems.” PSNERP plans to remove stressors in the PSN to restore PSN ecosystem processes. Removing stressors may indirectly promote wildlife habitat and water quality, but PSNERP will not measure program benefits in terms of habitat value or a reduction in pollution. I suspect that fewer respondents supported the statement about fish and shellfish because it emphasized harvest. Three respondents stated in interviews that they believe in the intrinsic value of nature.

Interview responses generally supported respondents’ belief that pollution is a major problem in the PSN. Twenty-one respondents stated that water quality and pollution are central concerns. Five respondents mentioned septic systems as a major issue. On the other hand, three of the respondents who were concerned with water quality also stated they believe Puget Sound environmental quality is pretty good and getting better. This could be because point-source pollution of Puget Sound has been regulated, and therefore reduced, since the 1970s. However, non-point source pollution continues to be a problem and the Puget Sound Partnership rated marine and freshwater quality as negative and declining in their most recent State of the Sound Report (PSP, 2007).

Respondents also frequently mentioned wildlife habitat as a major issue in interviews. Twelve people stated that habitat value is an important consideration when planning for PSN restoration. Six specifically mentioned bird habitat; 12 mentioned salmon habitat, and three thought that restoration should take a multi-species habitat approach. Eight respondents mentioned that they value the opportunity to see wildlife. In terms of human development, 13 respondents stated that houses right on the shoreline are a major problem and 18 thought that shoreline armoring was a major problem. 13 respondents thought that lack of public access to shorelines is a problem.

Causes of problems

Table 5 shows overall responses to statements about the causes of PSN problems. The overall responses show fairly wide variation among respondents in their beliefs about the survey statements regarding causes of problems. Note that at least half of respondents agreed with each of the listed causes.

Table 5: Beliefs about causes of problems

Statement	Number who Agree or Strongly Agree	Total N	Mean Response	SD	SE Mean	95% CI
Industrial activity is a major cause of environmental problems in the Puget Sound shoreline	22	38	3.55	0.92	.15	3.25–3.86
Mismanagement by government agencies is a major cause of environmental problems in the Puget Sound shoreline	19	38	3.47	0.92	.15	3.17–3.78
Private ownership and development is a major cause of environmental problems in the Puget Sound shoreline	20	37	3.43	1.24	.20	3.02–3.84

Mean survey responses about causes of nearshore problems suggest this group of stakeholders does not overall agree with one particular cause of PSN degradation. In the

section on potential coalitions, I show some interesting differences among groups in beliefs about causes. Respondents more commonly blame industrial activity for PSN degradation than government mismanagement or private ownership and development. Again, I suspect this reflects the framing of environmental problems from a previous era, in which water quality was the central issue and point-source pollution was the major cause.

Despite being the most commonly chosen cause of PSN problems in surveys, the issue of industrial activity was not mentioned much in interviews. However, the idea that private ownership and development are a major cause of PSN environmental problems was supported in the interview data. Five respondents mentioned that private ownership of tidelands is a problem. Four thought that shoreline landowners are generally unaware of the effects of their land use choices. Six respondents stated that people regularly ignore or circumvent regulations. Nine respondents thought that farms in the PSN are problematic because of their contribution of pollutants to the environment. On the topic of government mismanagement, four respondents stated that they thought governments are generally poor environmental managers. Two of those four thought that governments' priorities change as funding changes, and this impedes work on previously defined priorities.

Solutions to Problems

Table 6 shows overall responses to statements about potential solutions to PSN problems. A majority of respondents supported stronger regulatory enforcement and increased public ownership. Very few supported reallocation of resources or increased property rights. However, in the subsequent section on potential coalitions, I show major differences in respondents' beliefs about solutions to PSN problems. Italics show statements with which respondents, on average, disagreed (mean response is below 3).

Table 6: Beliefs about solutions to problems

Statement	Number who Agree or Strongly Agree	Total N	Mean Response	SD	SE Mean	95% CI
Stronger enforcement of existing regulations is a good way to improve the environmental quality of the Puget Sound shoreline	28	38	3.84	0.89	.14	3.55–4.13
Increased public ownership is a good way to improve the environmental quality of the Puget Sound shoreline	20	38	3.58	0.89	.14	3.29–3.87
<i>Allocating resources like fishing rights and land rights more fairly is a good way to improve the environmental quality of the Puget Sound shoreline</i>	8	38	2.95	0.80	.13	2.68–3.21
<i>Increasing private property rights is a good way to improve the environmental quality of the Puget Sound shoreline</i>	4	38	2.21	0.96	.16	1.89–2.53

I acknowledge the possibility that the word “increase,” in the survey statement about private property rights, caused some confusion. Typically, property rights advocates use the verb “strengthen” instead. However, I was able to observe respondents while they took the survey and very few seemed confused by this statement. On the other hand, several respondents were unfamiliar with the concept of “allocating resources more fairly.” Only a handful of respondents agreed that reallocation of resources is a solution to PSN problems. Yet, a number of respondents mentioned in interviews that they found current resource allocations unfair. Specifically, two respondents mentioned frustration with treaty rights allocations, and seven indicated that user groups often act selfishly (typically referring to recreational hunters, or sport fishers).

In interviews, respondents proposed solutions different to those in the surveys. Fourteen respondents cited the importance of educating people, and especially landowners, so that they

become better environmental stewards. Nine thought that buffers and setbacks are a good way to improve PSN environmental quality. Three respondents went so far as to articulate a vision of “strategic retreat” of humans from the nearshore (although only one used this specific terminology). Eleven respondents thought that it was more important to manage the impacts of stressors than to remove the stressors themselves. For example, six respondents suggested “softer solutions” as a response to shoreline armoring. Seven respondents thought that protecting undeveloped shorelines was important, and ten stated that they thought protection of nearshore ecosystems should take precedence over restoration.

Priorities for the nearshore

Table 7 shows overall survey responses to statements about PSN priorities. On average, respondents support aesthetic beauty and traditional industries. A majority of respondents agreed with all priorities, except for keeping costs low to preserve businesses. Bold statements are those with which respondents overall agreed (mean response of 4 or greater).

Table 7: Beliefs about nearshore priorities

Statement	Number who Agree or Strongly Agree	Total N	Mean Response	SD	SE Mean	95% CI
It is important to maintain the aesthetic beauty of the Puget Sound shoreline	33	38	4.24	0.63	.10	4.03–4.45
It is important to maintain the traditional industries of Puget Sound, like commercial fishing, aquaculture, and shipping ports	33	38	4.13	0.67	.10	3.91–4.35
It is important to increase the number of places for the public to engage in recreation activities along the Puget Sound shoreline	25	38	3.74	1.00	.16	3.41–4.07

It is important to promote tourism in the Puget Sound shoreline	21	38	3.61	0.86	.14	3.32–3.89
It is important to maintain farmland along the Puget Sound shoreline	20	37	3.59	0.93	.14	3.29–3.90
It is important to keep costs low to preserve businesses in the Puget Sound shoreline	13	38	3.18	0.96	.16	2.87–3.50

In interviews, respondents mentioned priorities not included in surveys. Nine respondents mentioned that they enjoy the scenic views in nearshore environments. Eleven respondents said they value seeing and/or spending time in undeveloped areas. Five respondents cited wetlands as a priority. Recreation seemed to be important to respondents, both in survey responses and in interviews. In interviews, 26 respondents mentioned interacting with Puget Sound shorelines recreationally. Eleven respondents specifically mentioned thinking that recreation is important. Nine respondents described some sort of mixed-use mosaic vision of the future PSN. The components of that mosaic varied greatly among respondents, however. Generally, the mosaic was some mix of habitat, recreation, and economic production. Most respondents could not or did not articulate how to determine or achieve an appropriate mix.

Table 8 shows a summary of the survey items with which respondents overall agreed and disagreed. Again, a small and purposive sample took this survey, so the responses are not generalizable to the greater population of the WSB, or to all PSNERP stakeholders. Table 9 shows a summary of common issues mentioned in interviews regarding beliefs about severity of PSN problems, causes of problems, types of major problems, potential solutions, and priorities.

Table 8: Summary of survey responses

AGREE	Mean response	DISAGREE	Mean response
It is important to restore the Puget Sound shoreline so future generations can have a high quality of life	4.45	Increasing private property rights is a good way to improve the environmental quality of the Puget Sound shoreline	2.21

It is important to spend money to restore the Puget Sound shoreline	4.30	The environmental quality of the Puget Sound shoreline is high	2.79
It is important to maintain the aesthetic beauty of the Puget Sound shoreline	4.24	Allocating resources like fishing rights and land rights more fairly is a good way to improve the environmental quality of the Puget Sound shoreline	2.95
It is important to maintain the traditional industries of Puget Sound, like commercial fishing, aquaculture, and shipping ports	4.13		
Pollution is one of the biggest problems in the Puget Sound shoreline	4.00		

Table 9: Summary of values mentioned in interviews

CODE	# WHO MENTIONED
Severity of PSN Problems	
Large-scale restoration is important	9
Degradation is ongoing; stop studying and start fixing	7
Major Types of PSN Problems	
Water quality and pollution issues	21
Shoreline armoring	18
Lack of public access	13
Houses right on the shoreline	13
Farms causing pollution	9
Septic systems	5
Causes of PSN Problems	
Selfish user groups	7
People ignoring and circumventing regulations	6
Private ownership of tidelands	5
Governments are poor environmental managers	4
Solutions to PSN Problems	
Educate people to be better environmental stewards	14
Manage impacts of stressors (instead of removing stressors)	11
Protection is more important than restoration	10
Install or maintain buffers and setbacks	9
Protect undeveloped areas	7
Replace shoreline armoring with softer solutions	6

PSN Priorities	
Recreation is important	11
Value spending time in undeveloped areas	11
Views are an important part of the shoreline	9
Vision of a mixed-use mosaic	9
Wetlands are important	5

Disagreements on preferences

In this section I describe some of the overall disagreements respondents had about preferences for PSN restoration, including views about urban areas, science, ecosystem services, ecosystem processes, and recreation.

Restoration in urban areas

In interviews, respondents had differing views about whether developed areas could return to a more natural state. Seven respondents suggested that this was possible. Many specifically cited Jetty Island, which is near Everett and was originally created from dredge spoils. The Port of Everett and other entities have recently invested in restoration at this site and many respondents listed it as one of their favorite places and mentioned that it provides wildlife habitat. On the other hand, five respondents believed that built environments can never become pristine, and are therefore not worth the investment of restoration dollars. It may be important for PSNERP to gather more information on whether its stakeholders generally support investment in urbanized areas.

Science

Seven respondents thought that “good science” was an important basis for making and justifying environmental decisions, but three stated that they are generally skeptical of science and scientists. This is important because PSNERP takes a strongly science-driven approach, and intends to invest in “scientific pilot sites” to resolve some outstanding major uncertainties about PSN processes and their restoration. The ACF suggests that scientific information has the potential to affect stakeholders’ values and coalitions, depending on how and when it is communicated (Weible and Sabatier, 2009).

Ecosystem services

Six respondents disagreed with the lists of ecosystem services that I connected with ranking exercises on shoreforms and developments, but another six stated in the ranking exercises that longer lists of ecosystem services were more compelling. Perspectives on ecosystem services are important because PSNERP plans to use ecosystem services as a key metric of the benefits of their restoration actions. If ecosystem services are contentious or poorly understood, PSNERP should consider either changing this metric, or doing some outreach to tertiary level stakeholders about ecosystem services. At the very least, those stakeholders who have ongoing input to PSNERP decisionmaking should understand ecosystem services. Further, if the Puget Sound public is to support PSNERP efforts and expenditures of public dollars, they should be more familiar with the metric of benefits they will receive in exchange.

Erosion and ecosystem processes

Respondents made conflicting statements about erosion. Five viewed it as an important natural process, but four saw it as a problem. This is important because PSNERP has defined the key PSN problem as degradation of ecosystem processes. Erosion is a key ecosystem process in the PSN. Bulkheads prevent the natural process of erosion, which limits sediment availability throughout the Sound. PSNERP proposes to remove bulkheads to restore erosion, and thereby sediment delivery. For PSNERP to be successful, it is important that its stakeholders are familiar with, and supportive of, its problem definition and proposed solutions. This means that most stakeholders should be familiar with PSN ecosystem processes and the ways in which these processes can be restored. Instead, many respondents proposed softer alternatives to shoreline armoring, and managing impacts of stressors. Ten stated that they prioritize protection over restoration. The PSNERP science team would argue that stressors should be removed entirely to restore ecosystem processes, and protection alone is insufficient to restore PSN processes at this stage. If many stakeholders are unfamiliar with the importance of natural erosion to the PSN, PSNERP may need to invest in some outreach and education on this topic.

Recreation

Recreation may be an issue that divides stakeholders, despite so many respondents stating that they engage in recreation. Although 11 respondents specifically stated that they think recreation is important, six mentioned that it can harm the environment. Although PSNERP is not considering recreation as part of its restoration proposal, this issue did come up in a recent large-scale restoration project. In the removal of the Nisqually dike near Olympia, loss of a trail on top of the dike was highly contentious, although recreational waterfowl hunters supported the dike removal.

Whidbey Sub-Basin stakeholders' overall trade-offs

I used ranking exercises to prompt respondents to trade off nearshore priorities. Respondents struggled with the ranking exercises on shoreforms and stressors. So, I focus here on their rankings of shoreline features and restoration objectives. 36 respondents (including the 2 two-member teams) ranked a variety of PSN features and restoration objectives as having higher or lower priority.

Ranking nearshore features

I asked respondents to rank features of the shoreline by choosing which things should get priority for the 200 meter swath around where land meets Sound. I gave respondents cards for 12 features, which they organized into categories of relative importance. The types of features were:

1. **Natural features:** Wildlife Conservation Areas; Areas with high native plant cover; Native shellfish areas; and Fish habitat
2. **Recreation features:** Public beaches and parks; Marinas; and Piers and boardwalks
3. **Other human use features:** Private homes; and Shops and restaurants
4. **Economic features (traditional industries):** Ports and shipping areas; Farms; and Aquaculture areas

Most respondents created three categories of importance: High, Mid, and Low priorities. However, some respondents created five categories, including Mid-High and Mid-Low categories. Figure 6 shows respondents' rankings of natural features of the PSN.

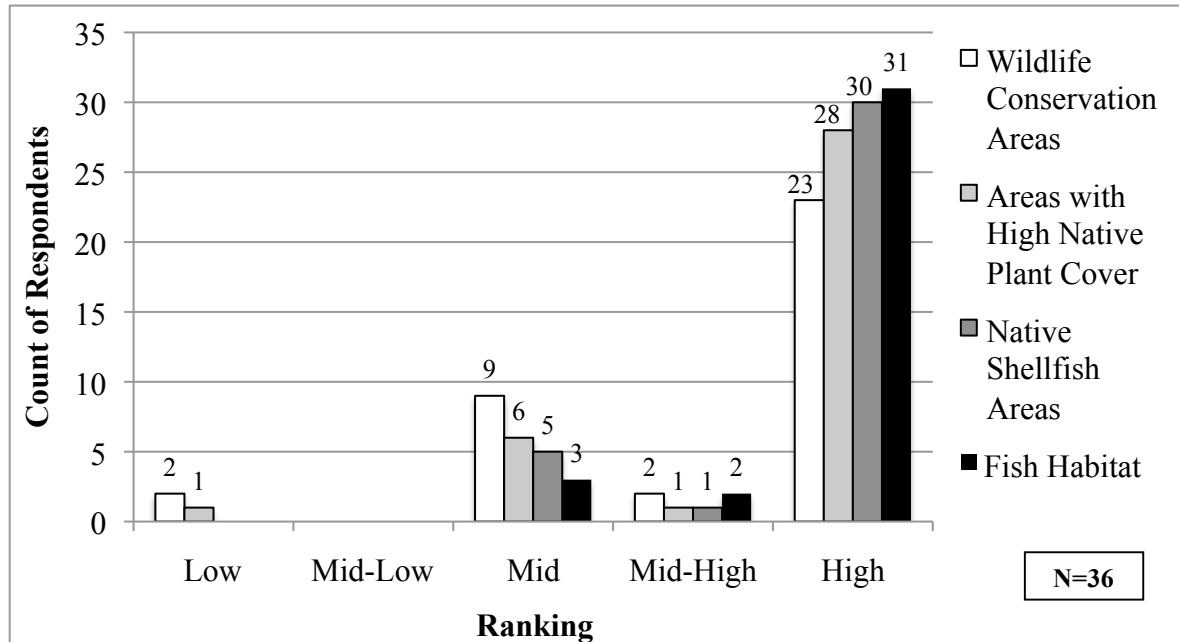


Figure 6: Ranking of natural features

Clearly, most respondents gave natural features high rankings. This may be partly because of my instruction not to think about the feasibility of adding or removing features, but to focus on their relative desirability. One possible explanation for the somewhat larger number of Low and Mid rankings for Wildlife Conservation Areas is that I specified that these areas “may also allow human recreation, but only if it is compatible with wildlife goals.” One respondent stated, in response to this card, “I don’t put wildlife ahead of humans.” Another response was, “... everybody should be able to use our natural areas.” A third respondent said, “I think Wildlife Conservation Areas just goes a little bit too protective [to the] exclusion of certain more economic things.”

The respondent who gave a Low ranking to Native Plant Cover said it is, “... a construct that’s just made up. It’s too broad, and in some areas ... it doesn’t mean anything.” One respondent who ranked both fish and shellfish habitat as Mid said that he’d reserved his High rankings for items that he labeled, “Economic Generation,” while he gave Mid rankings to items he labeled, “Habitat.” His category of items ranked as Low he called, “Human Use.” Another respondent who ranked fish and shellfish habitat as Mid did so because he was thinking in terms of his professional mandate. He ranked only ports, piers, and marinas as

High. Items he saw as indirectly part of his mandate (including habitat), he ranked Mid, and then items outside of his mandate were ranked Low, including parks, farms, and aquaculture.

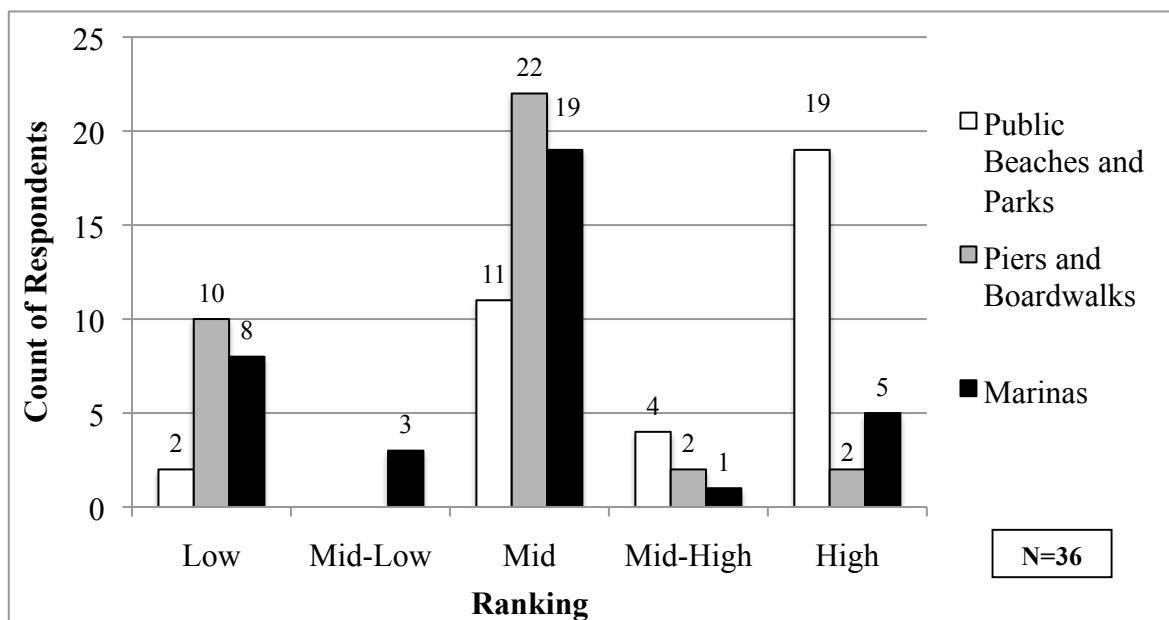


Figure 7: Ranking of recreation features

Figure 7 shows respondents' rankings of recreation-related nearshore features. Most respondents gave recreation features like marinas and piers a ranking of Mid. Parks are clearly the exception, where more than half of respondents thought they were a high priority. One respondent who ranked all three recreation features as Mid said his rationale was, "I think you need people's involvement in these [items he ranked Mid] to be able to fund these things [items he ranked High, consisting of the four natural features]."

Respondents supported parks as a high priority in interviews, too. Four respondents suggested that it was important to promote direct relationships and experiences with nature so that people will be motivated to support environmental efforts. One respondent suggested parks are, "a mix of public access and keeping the environment protected." Another respondent said of parks, "if we could have set this area aside in the first place, then it would be protected and there wouldn't be any question."

Respondents gave mixed responses about marinas. Generally, they saw marinas as a source of minor oil spills and other water pollutants. Yet, respondents did not advocate for removing marinas. Fourteen respondents mentioned that removing marinas is not politically feasible. One respondent said of her category of items ranked Mid, including marinas, "These

are things that I think there's a certain inevitability that there's going to be a market desire. You can not avoid it." A number of respondents approached this exercise in terms of what features must be within 200 meters of the shoreline, and what features could potentially go elsewhere. Because marinas and piers are water-dependent, many respondents ranked these items at least as Mid. One respondent who used this thinking said, "Some of these places, things can only go there ... Piers and boardwalks, that can only go in the marine shoreline."

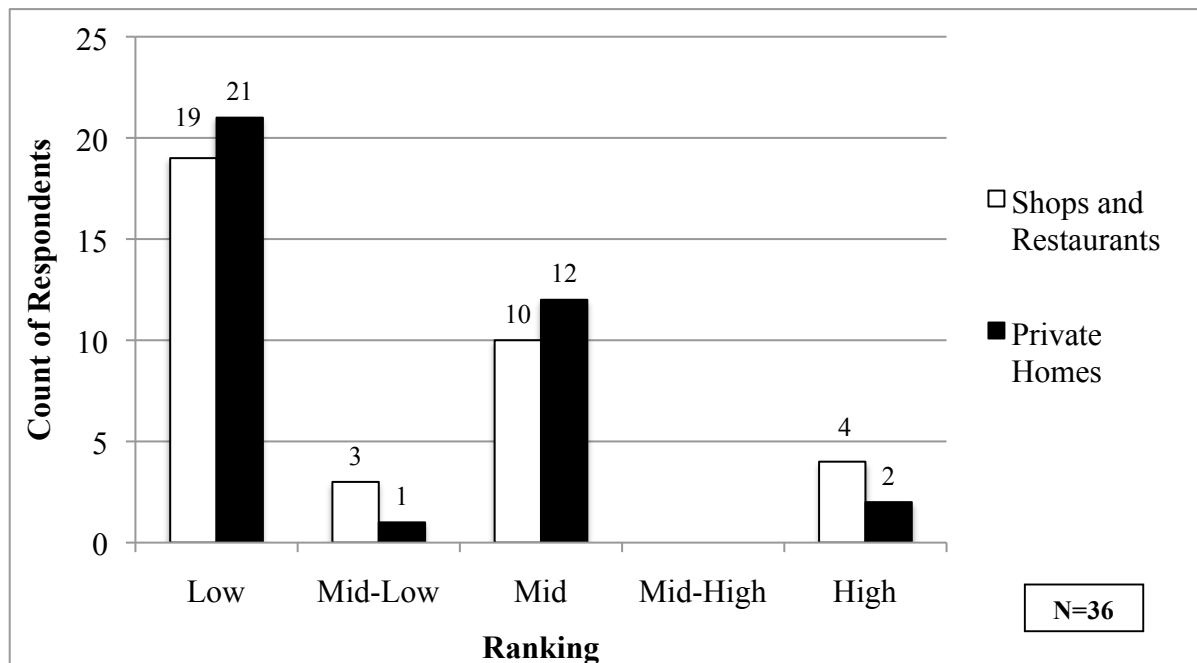


Figure 8: Ranking of other human use features

Figure 8 shows respondents' rankings of other human use features of the nearshore. Most respondents did not rank houses or small businesses on the shoreline highly. Many used the rationale that these things do not need to be within 200 meters of the water's edge. For example, one respondent said, "Private homes don't have to be there. They can be set back a ways." Numerous others echoed this sentiment. A number went so far as to say things like, "Private homes I would be putting probably as my last priority." Interestingly, all but one of the four nearshore homeowners and three developers that I interviewed ranked this feature as Low or Mid. Only a respondent from a property rights group ranked this item as High. Of the four respondents who ranked shops and restaurants as High, three spoke of themselves as representatives of the business community or of Conservative or Libertarian values. Two tourism promoters I spoke with did not rank this item as High.

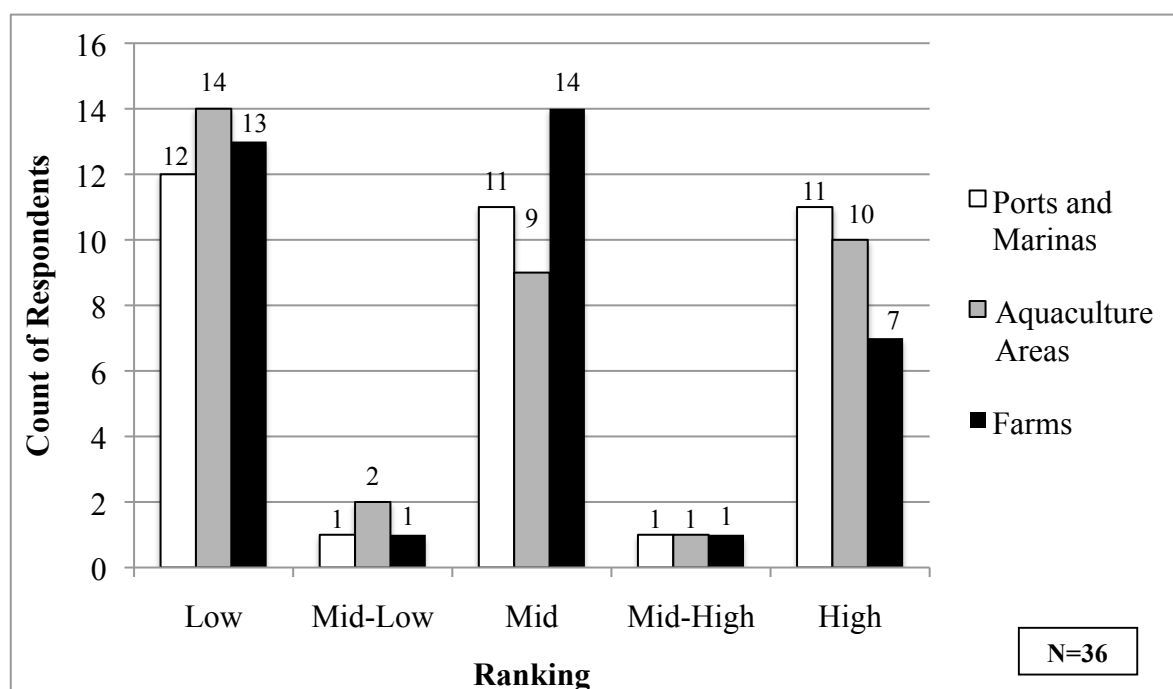


Figure 9: Ranking of economic features (traditional industries)

Figure 9 shows respondents' rankings of economic features, or traditional industries, of the PSN. Despite support for traditional industries in survey data, respondents seem split over rankings of features that represent these PSN industries, when compared with other nearshore features. Many respondents stated that ports are crucial for the economic security of our region. Some also mentioned the efforts ports have made recently to engage in environmental protection and restoration. When considering farms, respondents generally stated a desire to preserve farmland, but a concern about its placement so close to the Sound. This concern was largely related to water quality issues. Respondents often mentioned a dislike for salmon net-pens when considering the aquaculture card, but few saw shellfish farming as problematic.

In sum, most respondents ranked natural features, such as fish and wildlife habitat, highly. They were somewhat less supportive of native shellfish and plants. To rank natural features highly, respondents were generally willing to trade off human use features, especially those that they perceived as not water-dependent or environmentally harmful. Respondents were less willing to trade off recreation opportunities and public access to shorelines, especially those recreation features they perceived as environmentally benign or indirectly beneficial. Respondents gave economic features a variety of rankings. This was

especially true of ports, which many respondents stated have a huge economic impact in this region. In interviews, many respondents spoke of traditional industries, like farming and aquaculture as having negative environmental impacts. In surveys, most respondents were supportive of these industries in concept. Here, respondents gave traditional industries a variety of rankings. Figure 10 summarizes some of the features that respondents overall ranked High, Mid, and Low.

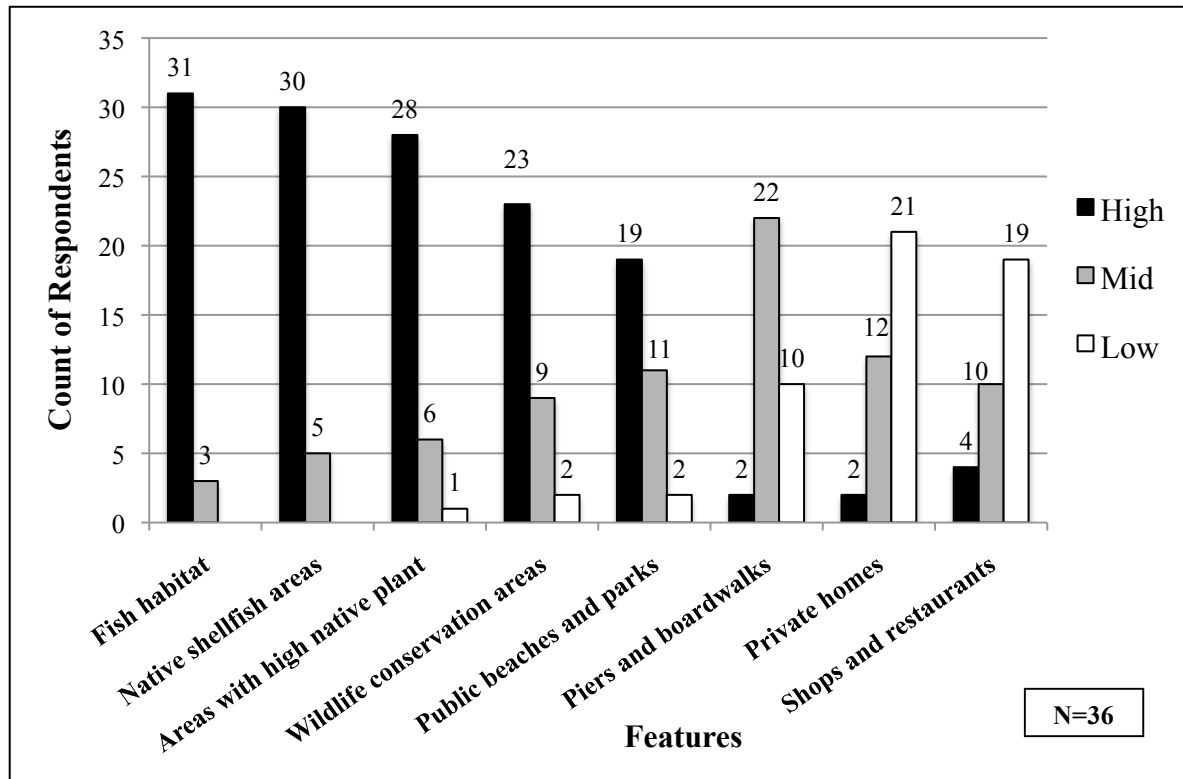


Figure 10: Overall rankings of nearshore features

Ranking restoration objectives

In another ranking exercise, respondents assigned Low to High rankings to ten restoration objectives. I drew most of these objectives from PSNERP planning documents, although I combined some objectives, and added two, based on responses from pre-testers. The additions were, “Improve water quality” and “Preserve commerce and heavily-used sites.” Many respondents had difficulty ranking objectives. Only 34 of them successfully ranked all objectives. There were four types of objectives listed on the ten ranking cards:

1. **Economic objectives:** Preserve commerce and heavily-used sites; and
Restoration should be low-risk and self-sustaining

2. **Direct species objectives:** Recover species; and Preserve or enhance biodiversity
3. **Indirect species objectives:** Enhance adjacency and connectivity; and Improve water quality
4. **Ecosystem objectives:** Protect rarity; Increase resilience; Restore processes; and Provide more ecosystem services

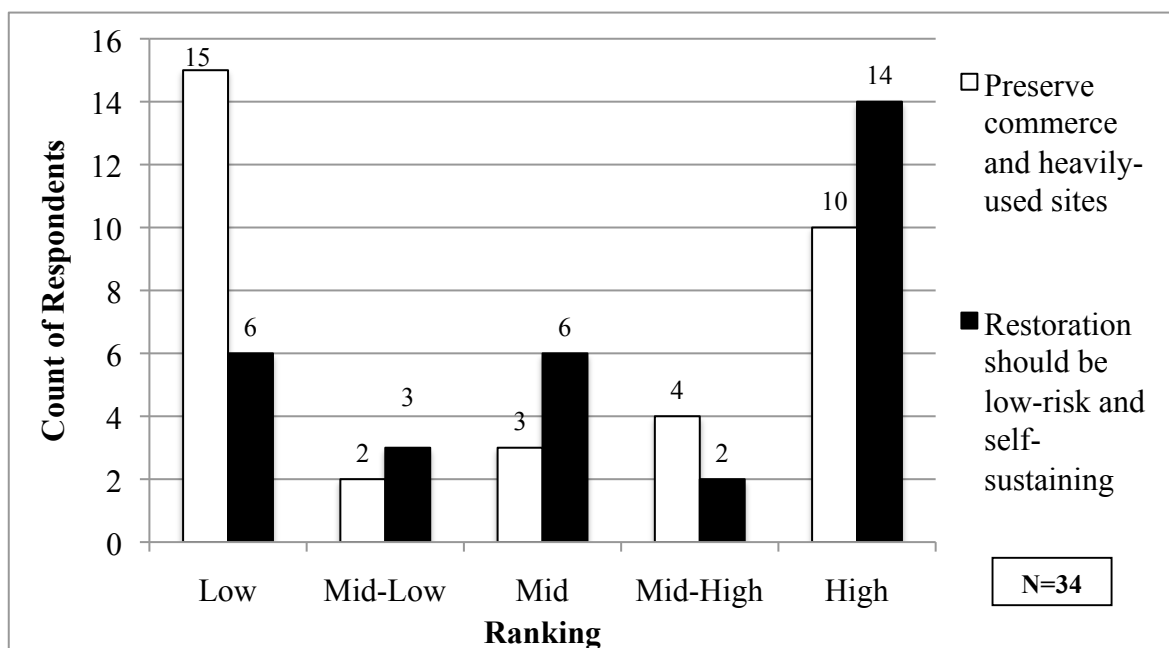


Figure 11: Ranking of economic objectives

Figure 11 shows respondents' rankings of economic objectives. Respondents assigned mixed rankings to economic objectives. With regard to preserving commerce, some respondents stated that this should be a restoration objective. Others seemed to read this card differently than I had intended. One respondent said, "Anything that's heavily used, we could work toward mitigation, but restoration would be lost." One respondent who ranked "preserve commerce" as High said, "We definitely want to maintain our money to support their socialist system." A respondent who ranked this card Mid said, "I'm not against commerce per se, just like I wouldn't want to have the shores all natural, because that would take away too many services."

A respondent who ranked both economic objectives as High said, "This is going to show a little bias, finally." He spoke of himself as a representative of the business community, with a strong focus on economics. One respondent who ranked "low risk" as Low said, "Low-risk

and self-sustaining? No. Sorry. We do want to maintain positive outcomes, but the two don't go together. The low-risk portion ... we want a high success rate, but there's no guarantee." Another respondent who ranked this card as Low said, "I wonder, on the restore projects, if we're smart enough sometimes to know what we need to do." A respondent who ranked this card as High had previously mentioned the requirement that developers do on-site mitigation for impacts to sensitive ecosystems. She mentioned that the success rate for these mitigation projects is low. Responding to this card, she said, "... self-sustaining, you don't have to go back and do a lot of work or maintenance to it. That's going to cost money or time."

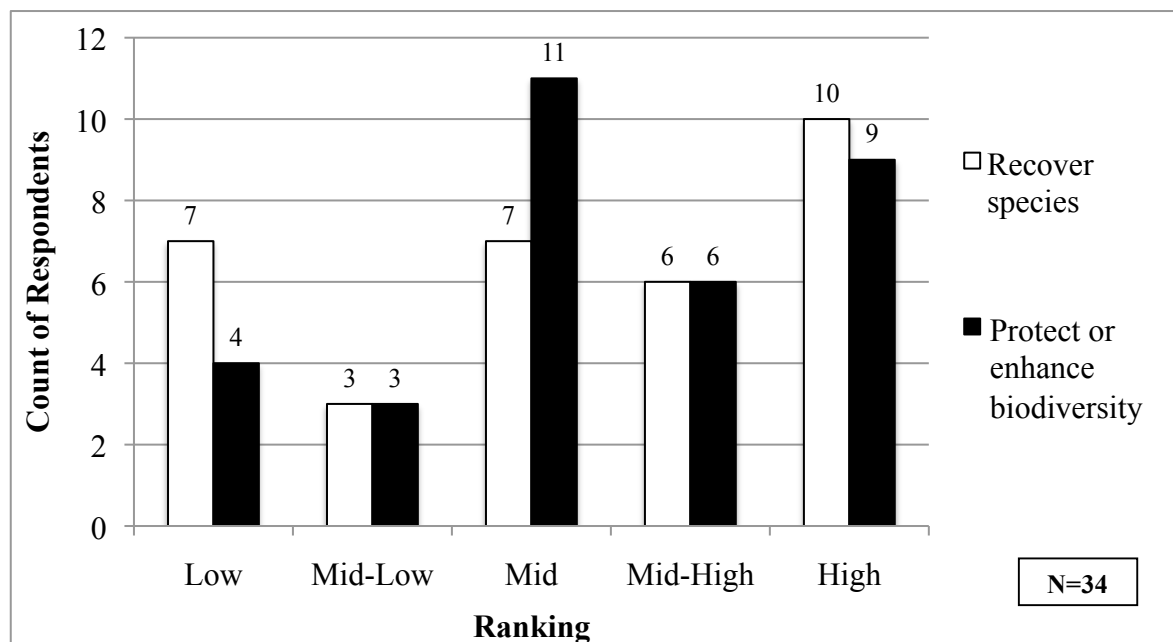


Figure 12: Ranking of direct species objectives

Figure 12 shows respondents' rankings of objectives directly related to promoting wildlife species. Rankings were mixed on these direct species objectives. Most respondents valued wildlife in some fashion, but a number of them had misgivings about policies regarding species recovery and biodiversity. Four respondents specifically stated that they thought the Endangered Species Act was a flawed policy or that it had not produced its intended outcomes. One respondent said, "I'm not a practitioner of single species management, so I'd put that down as a lower priority... It's the best we have and I understand it, the monumental effort it took to enact the ESA, but in principle, I think it's probably really helped sustain the, I call the '-ologist' community, and I haven't seen it

translate into actual meaningful habitat recovery or restoration.” In terms of biodiversity, one respondent explained her misgivings, “Biodiversity is different at different sites. You don’t always want to go for the most.” Another respondent said, “I don’t regard increasing biodiversity as itself a goal that is a good one in ecological terms. I see enough restorations where people throw in every species they can think of, because they’re increasing biodiversity, but it doesn’t really mean anything.”

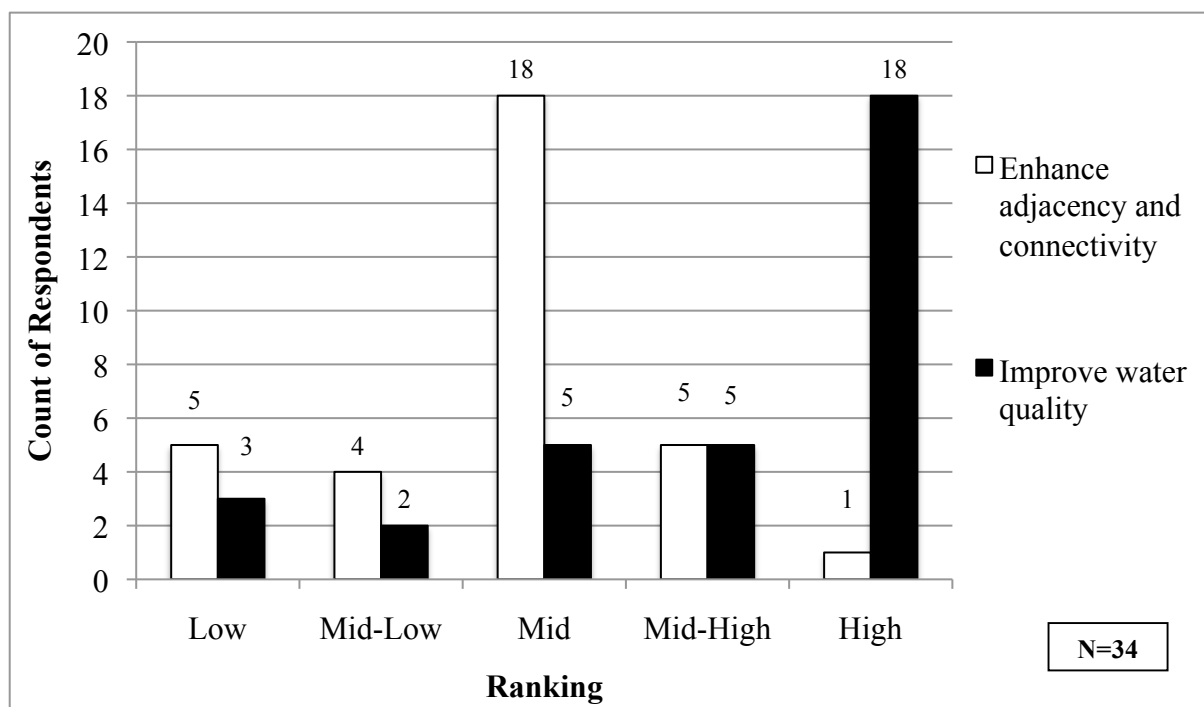


Figure 13: Ranking of indirect species objectives

Figure 13 shows respondents’ rankings of objectives indirectly related to wildlife species. Most respondents ranked water quality improvement as High. This idea was supported by the survey and interview data. One said of water quality, “...that’s the habitat [fish and wildlife are] living in, and that’s the whole purpose of restoration.” Some respondents saw water quality as secondary to a more general focus on ecosystem objectives, and a few mentioned that they thought water quality should not be the focus of shoreline restoration. A number of respondents thought adjacency and connectivity were not primary objectives. One said, “... things like that, those are nice, but they don’t focus on the main effort.” Others thought adjacency and connectivity were simply not feasible, given the level of development that has

already occurred in the PSN. One respondent said, “this is that whole connectivity issue ... with the Critical Areas Ordinance. That’s a hard one when you’re talking about land use.” Another said, “Adjacency is [ranked] low because it’s unlikely to be possible.” A few respondents did not believe this objective was valuable. One said, “I don’t know that connecting them is going to do much.”

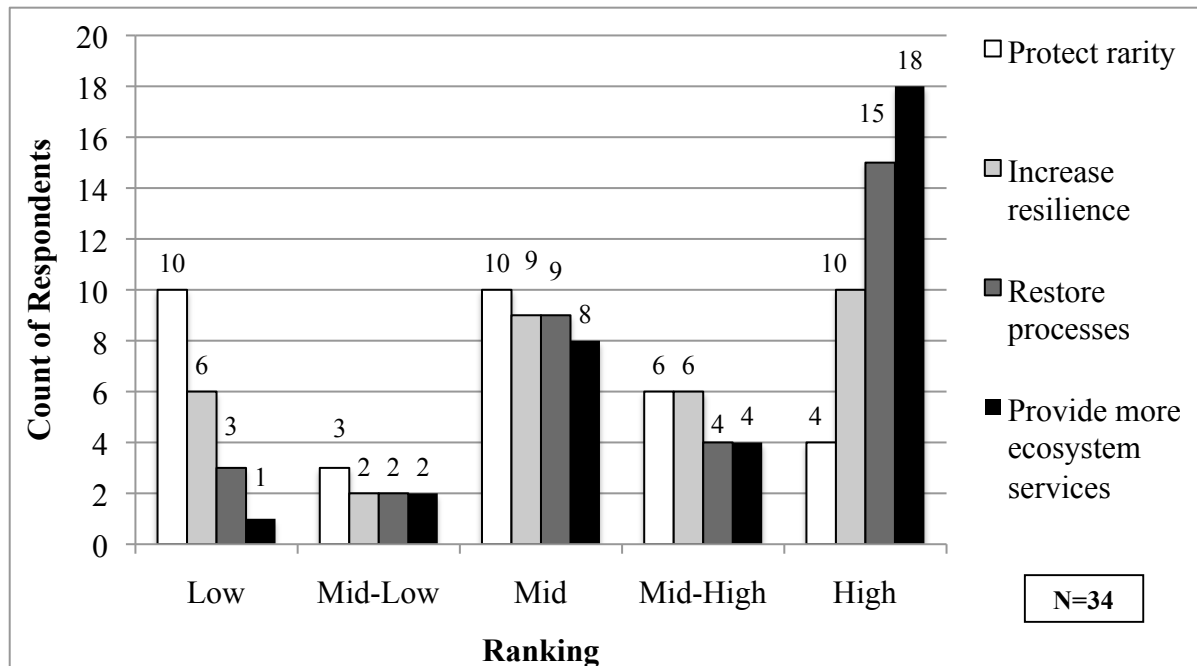


Figure 14: Ranking of ecosystem objectives

Figure 14 shows respondents’ rankings of objectives related to landscape-scale ecosystem protection and restoration. Respondents gave mixed responses about ecosystem objectives. A clear majority of respondents ranked processes as Mid-High or High. PSNERP Project Managers have been concerned that stakeholder have a limited understanding or appreciation for their approach. The PSNERP approach focuses on restoring ecosystem processes in order to provide more ecosystem services. In this exercise, respondents seem to support that approach.

Many respondents were uncomfortable with the concept of resilience. A few requested more information about resilience, beyond the definition on the card. One mentioned, “I went to a conference a couple years ago on resiliency and salmon restoration, and I just couldn’t get my arms around that term.” A number of respondents reacted to rarity in ecosystems as

an extension of protecting endangered species, although the text on this card read, “Focus on restoring or preserving sites that represent unique ecosystems.” One respondent said, “I would love to protect rarity, but the costs and benefits are usually not balanced, and extinction is a normal process.” Another said, “I disagree on this [rarity] ... It’s evolution. You either believe in evolution, or you don’t.”

Although 18 respondents gave the “provide more ecosystem services” objective high priority, other respondents gave mixed rankings to this objective. Respondents also made a variety of comments about ecosystem services throughout the interview process. One respondent, who mentioned the intrinsic value of natural ecosystems, ranked this objective as Low and said, “So again, ecosystem services are only the things that benefit humans.” Three respondents stated that ecosystem services were a difficult concept to understand. Six respondents said that they understood ecosystem services conceptually, but did not know how to apply or implement this concept. Seven respondents said ecosystem services would only make sense if tied to economic benefits, or put into economic terms.

In sum, the consistently highly ranked objectives were Ecosystem processes, Water quality, and Low-risk restoration. The objectives consistently ranked Low were Rarity and Commerce. Yet, there was not a type of objectives that was clearly preferred across the board, or a method to trading off these objectives that was widely shared. This suggests that while most respondents desire a balance of multiple uses and objectives for the nearshore, their ideas about how achieving balance are poorly defined and highly individualized. Figure 15 summarizes objectives that respondents overall ranked High, Mid, and Low.

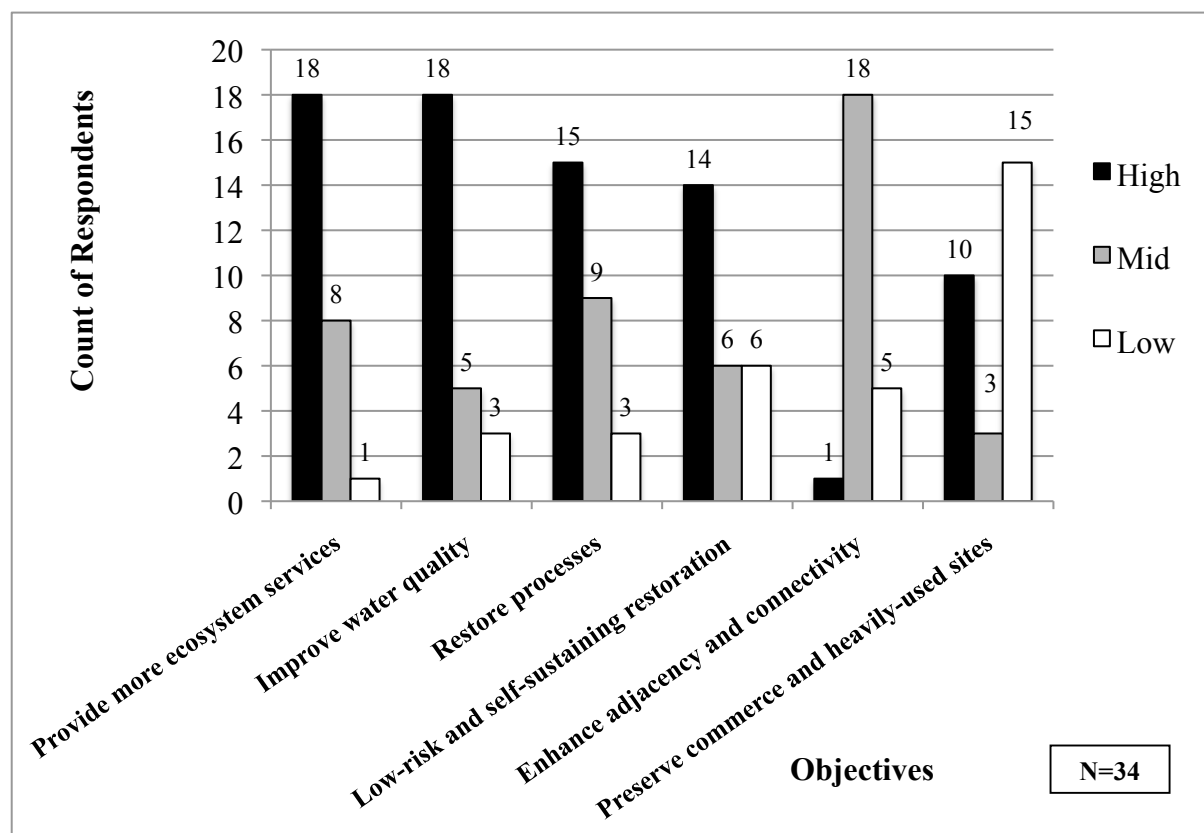


Figure 15: Overall rankings of restoration objectives

There are some limitations to this methodology of forcing rankings of nearshore features and objectives. First, I provided respondents no information about the items they ranked beyond a brief definition. So, respondents' personal understandings of these items could be quite diverse. Second, I did not give respondents any realistic context for these rankings. For example, I did not provide a quantitative assessment of, say, how much fish habitat would be compromised (and thus must be lower-ranked) by each port (if it is highly ranked).

Given the variance in survey, interview, and ranking data, it was important to identify trends in values among groups of respondents. I examined values that certain groups shared that were different from values of other groups, per the Advocacy Coalition Framework. My goal was to identify groups within my respondents and thereby to suggest potential coalitions. I used cluster analysis of survey data to identify preliminary groups based on similar responses to survey questions. I then confirmed the groups based on interview data. I ultimately found five potential coalitions of WSB stakeholders among my respondents.

Identifying potential coalitions

I identified potential coalitions among my respondents by first looking at the values they expressed in survey responses. Cluster analysis of survey responses yielded 5 clusters, or groups of respondents, that had some notable differences in their values (see cluster analysis section in Methods chapter). Table 10 shows the mean response of each group to each survey question. As before, 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; and 5 = strongly agree. Numerical responses that are in shaded boxes are those that differentiate a particular group from others. P values are shown for reference. Higher p values indicate variables for which the differences between groups are less significant. I ordered groups from left to right based on their relative support for public sector solutions to PSN problems. Although groups differ on a number of factors, the label applied to each group is based on its vision for the PSN. Details about each group are in the “Values of potential coalitions” section.

Table 10: Respondents clustered by survey data into five groups

STATEMENT	RESPONSE BY GROUP					P VALUE
	No Govern- ment Inter- vention	Property Rights and Develop- ment	Private Land Steward- ship	Protect Un- developed Areas	Large -Scale Resto- ration	
Problem Severity						
The environmental quality of the Puget Sound shoreline is high	4	4	4	3	2	.000
It is important to spend money to restore the Puget Sound shoreline	5	3	4	4	5	.000
It is important to restore the Puget Sound shoreline so future generations can have a high quality of life	4	3	4	5	5	.001

STATEMENT	RESPONSE BY GROUP					P VALUE
	No Govern- ment Inter- vention	Property Rights and Develop- ment	Private Land Steward- ship	Protect Un- developed Areas	Large -Scale Resto- ration	
Major Problems						
Pollution is one of the biggest environmental problems in the Puget Sound shoreline	5	3	4	4	5	.001
Loss of wildlife habitat is one of the biggest environmental problems in the Puget Sound shoreline	3	3	4	4	5	.000
Fewer fish and shellfish available for harvest is one of the biggest environmental problems in the Puget Sound shoreline	4	3	4	4	4	0.347
Too much human development is one of the biggest environmental problems in the Puget Sound shoreline	2	2	5	4	4	.000

STATEMENT	RESPONSE BY GROUP					P VALUE
	No Govern- ment Inter- vention	Property Rights and Develop- ment	Private Land Steward- ship	Protect Un- developed Areas	Large -Scale Resto- ration	
Causes of Problems						
Industrial activity is a major cause of environmental problems in the Puget Sound shoreline	3	4	4	3	4	.053
Private ownership and development is a major cause of environmental problems in the Puget Sound shoreline	2	2	4	3	5	.000
Mismanagement by government agencies is a major cause of environmental problems in the Puget Sound shoreline	4	3	4	3	4	0.154
Solutions to Problems						
Increasing private property rights is a good way to improve the environmental quality of the Puget Sound shoreline	3	4	3	2	2	.000
Increased public ownership is a good way to improve the environmental quality of the Puget Sound shoreline	2	4	3	4	4	.017

STATEMENT	RESPONSE BY GROUP					P VALUE
	No Govern- ment Inter- vention	Property Rights and Develop- ment	Private Land Steward- ship	Protect Un- developed Areas	Large -Scale Resto- ration	
Solutions to Problems						
Stronger enforcement of existing regulations is a good way to improve the environmental quality of the Puget Sound shoreline	3	3	4	4	4	.001
Allocating resources like fishing rights and land rights more fairly is a good way to improve the environmental quality of the Puget Sound shoreline	3	4	3	3	3	.091
Nearshore Priorities						
It is important to increase the number of places for the public to engage in recreation activities along the Puget Sound shoreline	3	4	4	3	4	.001
It is important to maintain farmland along the Puget Sound shoreline.	5	4	5	3	3	.001
It is important to maintain the traditional industries of Puget Sound, like commercial fishing, aquaculture, and shipping ports.	5	5	4	4	4	0.530

STATEMENT	RESPONSE BY GROUP					P VALUE
	No Govern- ment Inter- vention	Property Rights and Develop- ment	Private Land Steward- ship	Protect Un- developed Areas	Large -Scale Resto- ration	
Nearshore Priorities						
It is important to keep costs low to preserve businesses in the Puget Sound shoreline	4	4	4	3	3	.018
It is important to promote tourism in the Puget Sound shoreline	4	4	4	3	4	0.134
It is important to maintain the aesthetic beauty of the Puget Sound shoreline	4	4	4	4	5	.053
# of members per group	2	4	6	9	13	

Values of potential coalitions

In this section I describe the characteristics of each respondent group in detail. Again, these groups were created by clustering people with shared values. I chose to work with five groups because the quantitative data suggested this was an appropriate number and the qualitative data supported the differentiation between these five groups. I used labels to identify each group's vision of the PSN, but groups formed around several different values. PSNERP may be able to use an understanding of these types of groups to identify potential advocacy coalitions that may form. However, cluster analysis based on 34 WSB stakeholders can not be generalized to all Puget Sound stakeholders.

“No Government Intervention” group – Government intervention is the problem and deregulation is the solution. This group of respondents focused on the inability of government to successfully manage the environment, but acknowledged that there are some environmental problems in the PSN.

In this group there were only two respondents: one from a property rights group, and one who ran a small tourism operation. Both spoke extensively in interviews about frustration with the government and with government regulations. According to their survey responses, members of this group believe that PSN environmental quality is high, but they support spending money on restoration. Members of this group disagree that habitat loss and excessive development are major problems in the PSN, but they strongly agree that pollution is a problem. This group disagrees that private ownership is a cause of PSN problems, and that increased public ownership is a good solution. Yet, they were ambivalent about increasing private property rights, too. In terms of nearshore priorities, this group values traditional industries and farmland most highly, and public recreation areas least.

Interview data for this group shows that both members made statements about disliking government regulation. Both members of this group thought that governments are poor environmental managers, and that the priorities of governments change with funding, which means that stated goals are rarely accomplished. They both stated the scientific community is largely focused on maintaining its own funding, and both stated that they are generally skeptical of science. Both members see erosion as problematic, and both are concerned about the unintended consequences of restoration. Both mentioned the importance of maintaining commerce and local wealth in order to preserve the tax base, and both mentioned their own economic interest.

“Property Rights and Development” group – Private ownership and development of Puget Sound is not a problem; environmental quality is fine. This group agreed less with PSN problems than any other. They were also the only group supportive of increasing private property rights as a solution to PSN problems.

Survey responses of this group indicate they do not believe there is a problem with PSN environmental quality, and they do not support investing in restoration. They did not agree with any major problems with the PSN. Notably, more than other groups, they disagreed that there is a lack of fish and shellfish for harvest, or that pollution is a problem. Members of this group agreed that excessive development is not a major problem. They agreed that industrial activity is a cause of PSN problems, but disagreed that private ownership and development is a cause. This was the only group that agreed that increasing private property rights and

reallocating resources are good solutions. They agreed with all PSN priorities, but especially emphasized maintaining traditional industries.

In interviews, half of the members of this group mentioned an interest in cultural and natural history. Half stated that restoration sounds like “going backward” which is impossible. Two group members stated that human needs should take precedence over wildlife. Two mentioned the idea of simply concentrating PSN degradation in certain areas. Two stated the importance of property owners being allowed to use their land in “reasonable ways.” Two group members mentioned the idea that industrial areas can be mixed with public access. Two members of this group mentioned their personal economic interest. Both were from the Development category.

“Private Land Stewardship” group – Private landowners are good environmental stewards; we can use natural resources sustainably. This group focused on the ways that private landowners can be good stewards of natural resources. They emphasized excessive development as the major problem affecting the PSN.

In survey data, respondents in this group agreed that the environmental quality of the PSN is high, but they nonetheless supported restoration. They strongly agreed that excessive development is a major problem. They agreed with all of the proposed causes of PSN problems, but only agreed with stronger regulatory enforcement as a solution. They supported all shoreline priorities, but strongly agreed only with the need to maintain farmland.

In interview data, members of this group frequently stated that natural resources should be sustainably used. They mentioned that their favorite places are ones with which they have a long history of personal involvement. Half of this group’s respondents mentioned houses right on the shoreline as a major problem, but many thought there were opportunities to remove shoreline armoring. More than any other group, members of this one mentioned thinking that policies like the Endangered Species Act, and No Net Loss of Wetlands have failed to achieve their stated goals. One-third of respondents in this group mentioned people’s tendency to circumvent regulations. More than any other group, members of this one mentioned their personal desire to see wildlife, and especially to preserve bird habitat.

Members of the Private Land Stewardship group generally saw the role of science in restoration as being one of monitoring for outcomes. They perceived degradation of the PSN

as an ongoing trend, and restoration as something that should not be put on hold in the interest of further study. Two respondents in this group (and none from any other group) questioned how we know if restoration is successful. Members of this group also had strong opinions about farmland. Two mentioned that farms get unfairly targeted for restoration because they have large tracts of land. Two suggested that only unproductive farmland should be sacrificed to non-farming uses.

When asked about ecosystem services, members of this group found a long list of services compelling. Two members of this group stated that the difficulty with using ecosystem services as a planning tool is weighting and trading them off. This is a big concern for PSNERP, as well. Half of the members of this group stated that it is important to focus on different functions in different parts of the landscape. More than any other group, members of this one mentioned the idea that new bio-engineered solutions will be important in addressing PSN problems. Two-thirds of this group's members stated that landowners can be good environmental stewards, and one-third thought incentives and recognition for good stewards are important. Members of this group, more than others, mentioned the importance of getting "big bang for the buck" from restoration efforts. Half of this group's respondents mentioned their own economic interest at some point during their interviews, including two people from the Aquaculture category and one from the Agriculture category.

"Protect Undeveloped Areas" group – The public sector should protect undeveloped areas of the PSN. This group agreed that there are some problems with the nearshore, and they can be resolved through government intervention. However, they are mostly supportive of environmental protection and less confident about the benefits of restoration.

In survey data, respondents in this group were ambivalent about PSN environmental quality, but were somewhat supportive of restoration. They agreed that there are problems in the PSN, but rated them all equally of concern. They were ambivalent about the causes of PSN problems, but supported regulatory and public ownership solutions over private property rights. They value both traditional industries and aesthetic beauty as PSN priorities.

Interview responses provided more clarity on this group's beliefs. Generally, they value protection of undeveloped areas, but are not confident that restoration is effective. Four of five group members stated that they value seeing and spending time in undeveloped areas. Only four of 13 Large-Scale Restoration group members made this statement, and no

respondent from another group did so. Members of this group also frequently mentioned interacting with Puget Sound shorelines by walking, and having a personal preference for, or connection to, beaches. Four of nine members of this group made some version of the statement that the built environment cannot become pristine. Only one other respondent, in the No Government Intervention group, made this statement.

Members of this group overwhelmingly stated that houses right on the shoreline are a major problem. Seven of nine group members made this statement. This group consistently stated that shoreline armoring is a major problem, and that buffers and setbacks are a good solution. However, members of this group were unique in their consistent statement that one cannot change people's desire for shoreline property. They also frequently stated that people tend to ignore and circumvent regulations, and that user groups tend to be selfish. Members of this group consistently mentioned both the importance, and the difficulty, of providing recreation enhancements, such as parking lots and walking trails. Three of them stated that recreation can be environmentally harmful.

Like the Large-Scale Restoration group, members of this group frequently mentioned the need to consider habitat value in restoration planning. They specifically mentioned considering outcomes for salmon more often than did any other group. Nearly half of this group's members stated that "good science" is needed to justify environmental decisions. This was not a frequent statement in any other group. A key feature of this group is that they consistently mentioned that it is more important to manage the impacts of stressors in the PSN than to remove stressors. They were pessimistic about the feasibility of removing marinas, in particular. Members of this group often mentioned concerns about the unintended consequences of restoration. So, they want to protect environmental quality, but are not sure that restoration is politically possible or ecologically effective. Four of nine members of this group specifically mentioned their own economic interests, including respondents from the Agriculture, Development, Ports/Marinas, and Fishing categories.

"Large-Scale Restoration" group – PSN environmental problems are severe; the public sector can and should fix them through major restoration efforts. This group was strongly convinced of PSN problems. Like the Protect Undeveloped Areas group, they support public sector solutions, but unlike that group, they are convinced of the benefits of restoration and focus less on protection of PSN ecosystems.

This group was by far the largest, with 13 members. I suspect this is because when I recruited respondents from the Tribes and Governments categories, I was often referred to natural resource specialists. Survey responses from this group indicate they disagreed most that PSN has high environmental quality. They agreed most that lack of wildlife habitat is a major problem. Members of this group were most likely to see private ownership and development as a major cause of PSN problems. They agreed with increasing public ownership and regulatory enforcement as solutions, and disagreed with increasing private property rights. They strongly agreed with aesthetic beauty as a priority for the PSN, and agreed that tourism and recreation are important. Members of the Large-Scale Restoration group were ambivalent about the importance of maintaining farmland or keeping business costs low. In many respects, the survey responses of this group are similar to those of the Protect Undeveloped Areas group. However, this group was more emphatic about environmental problems and about the need for, and potential benefits of, restoration.

This group consistently mentioned in interviews that they value the PSN for the dynamic and complex ecotone that it represents. More than any other group, they were convinced that manmade or developed places can become natural. Eight members of this group saw shoreline armoring as a major problem, but four thought that “softer solutions” were a good way to undo armoring. Five members of this group thought habitat value should be a central consideration in restoration planning.

Members of this group mostly considered themselves well-informed about ecosystem services. Yet, four were not sure how to apply the concept. Five group members disagreed with some of the ecosystem services that PSNERP connected with shoreforms or stressors. More than any other group, members of this one cited ecosystem processes and functions as key goals of ecosystem restoration. They overwhelmingly stated a preference for large-scale restoration projects. Large-Scale Restoration group members often specifically mentioned key components of healthy PSN ecosystems, including eelgrass and other native vegetation, feeder bluffs, and protection of wetlands.

This group overwhelmingly cited the importance of educating landowners and the public to become better environmental stewards. They consistently mentioned the importance of recreation and public access in the PSN. Four members of this group mentioned that cost-benefit analysis is important in restoration decisionmaking. Only two group members

mentioned their personal economic interest, one from the Agriculture category, and one from Tourism.

Table 11 summarizes the key values of each potential coalition I found among my respondents based on their beliefs about the severity of problems, types of major problems, causes of problems, solutions to problems, and priorities in the PSN.

Table 11: Summary of potential coalitions' values

		POTENTIAL COALITIONS				
		No Government Intervention	Property Rights and Development	Private Land Stewardship	Protect Un-developed Areas	Large-Scale Restoration
BELIEFS ABOUT THE PSN	Severity of problems	PSN is fine, but it is worth investing in restoration	PSN is fine, and it is not worth investing in restoration	PSN is fine, but it is worth investing in restoration	Ambivalent about PSN quality, but supportive of restoration	PSN is not ok; it is very important to invest in restoration
	Types of major problems	Pollution	No problems are major	Excessive development	All problems are major	Wildlife habitat
	Causes of problems	Government mismanagement	Development is not a cause of problems	Development	Houses and armoring on shorelines	Development
	Solutions to problems	Not increased public ownership	Private property rights; reallocation of resources	Incentives and recognition for good stewards; new bio-engineering	Public sector protection of undeveloped areas; skeptical about restoration outcomes	Alternatives to armoring; education
	Priorities	Farmland; traditional industries	Traditional industries; humans over wildlife	Farmland	Buffers and setbacks	Aesthetic beauty; ecosystem processes and functions
	Other	Skeptical of science; erosion is a problem	Restoration = "going backward" – not possible; interested in history	People dodge regulations; get "big bang" for the restoration buck	People dodge regulations; user groups are selfish	Prefer large-scale restoration

Individual preferences of potential coalitions

Although I identified potential coalitions by shared values, there was still noticeable variation among individual coalition members' preferences. This is illustrated in a few ways. First, individual responses to some survey questions were widely different within each group. Table 12 shows some examples of this. Looking at this variation, I postulate that for the Large-Scale Restoration group, maintenance of farmland is more of a preference. Likewise, for the Private Land Stewardship group, beliefs about promoting tourism are more individual preferences rather than central to that group's core values.

Table 12: Examples of variation within groups' survey responses

Self-selected primary category	Group	It is important to maintain farmland along the Puget Sound shoreline
Agriculture	Large-Scale Restoration	Neither Agree nor Disagree
Education		Neither Agree nor Disagree
Environmental		Strongly Disagree
Environmental		Disagree
Environmental		Agree
Environmental		Neither Agree nor Disagree
Fishing		Agree
Recreation		Neither Agree nor Disagree
Tourism		Neither Agree nor Disagree
Tourism		Agree
Tribes		Agree
Tribes		Disagree
Tribes		Neither Agree nor Disagree
Self-selected primary category	Group	It is important to promote tourism in the Puget Sound shoreline
Agriculture	Private Land Stewardship	Disagree
Aquaculture		Agree
Aquaculture		Agree
Government		Strongly Agree
Government		Agree
Recreation		Neither Agree nor Disagree

Ranking exercises suggest that trading off priorities is more a matter of individual preference, rather than a set of potentially shared values. This is consistent with the ACF

assertion that values mostly have to do with beliefs about causes, severity, and solutions to problems. Table 13 shows some examples of the widely divergent rankings within groups.

Table 13: Examples of variation within groups' ranking responses

Self-selected primary category	Group	Ranking of "Public Beaches and Parks" feature
Development	Property Rights and Development	Low
Development		Mid
Development		High
Recreation		Mid
Self-selected primary category	Group	Ranking of "Restoration should be low-risk and self-sustaining" objective
Homeowner	No Government Intervention	High
Tourism		Low
Self-selected primary category	Group	Ranking of "Protect or enhance biodiversity" objective
Agriculture	Private Land Stewardship	Mid-Low
Aquaculture		Mid
Aquaculture		High
Government		Mid-Low
Government		High
Recreation		Low
Self-selected primary category	Group	Ranking of "Restore processes" objective
Agriculture	Protect Undeveloped Areas	High
Aquaculture		Mid
Development		Mid-Low
Government		High
Historical		Mid
Ports		High

A number of issues came up in interviews that seem to be matters of personal preference, rather than shared values. To illustrate this, original 303 interview codes, 39% of them were used only once (by just one of the 36 respondents). These codes included ideas like:

- the importance of inter-agency collaboration
- aesthetic issues surrounding aquaculture
- population growth eroding local character

Another 33% of codes were used by only two respondents, including:

- a personal connection to rocky shoreforms

- the importance of modeling and detailed spatial analysis to inform restoration
- affluent and urban individuals have greater political power

If PSNERP were to interview a larger sample of WSB stakeholders, they might find some of these statements to be more common. However, none of these codes is related to the types of beliefs that the ACF suggests tend to be values, including beliefs about severity, causes, and solutions of problems. Thus, I postulate that these beliefs are preferences and not values.

Coalitions versus categories

The survey and interview responses of the WSB stakeholders I spoke with were not differentiated by stakeholder categories. The potential coalitions identified through cluster analysis, and supported by interview data, are all made up of multiple categories of stakeholders. Table 14 shows group members by their assigned and self-selected stakeholder categories. Distance is a measure of how far each respondent is from the center of his or her assigned cluster, or group. A smaller distance number indicates that a respondent gave survey responses that were very close to those of other group members. The specific numbers aren't significant because of the small size of this sample.

Membership of the identified groups aligns with the ACF hypothesis that individuals who share demographics do not necessarily share values. In one case, two respondents of the same organization gave radically different survey responses, and were thus clustered into different groups. One of these respondents had experience working on salmon recovery issues, and it had apparently given that person a wholly different perspective from her colleague. As stakeholder categories appear not to be terribly cohesive, I expect that coalitions will indeed form around shared values, as predicted by the ACF.

Table 14: Group membership by stakeholder categories

Assigned stakeholder category	Self-selected primary stakeholder category	Self-selected secondary categories	Group	Distance
Homeowner	Homeowner	Marinas	No Government Intervention	2.958
Tourism	Tourism	Aquaculture, Fishing		2.958
Development	Development	(none)	Property Rights and Development	2.646
Development	Development	Recreation		3.162
Homeowner	Development	Environmental, Historical, Recreation		3.391
Recreation	Recreation	Environmental, Aquaculture		3.391
Aquaculture	Aquaculture	Recreation, Homeowner, Environmental	Private Land Stewardship	2.102
Agriculture	Agriculture	Homeowner, Environmental		2.723
Government	Government	Agriculture, Environmental, Historical, Tourism		2.843
Recreation	Recreation	Environmental		3.122
Aquaculture	Aquaculture	Environmental		3.122
Ports	Government	Environmental		3.617
Historical	Historical	Environmental		2.323
Government	Government	Environmental	Protect Undeveloped Areas	2.417
Agriculture	Agriculture	Recreation		2.954
Aquaculture	Aquaculture	Fishing		3.029
Development	Development	Business Community		3.101
Historical	Historical	Recreation, Tourism		3.241
Ports	Ports	Fishing		3.408
Development	Development	Marinas, Recreation		3.457
Fishing	Fishing	Agriculture		3.690

Tribes	Tribes	(none)	Large-Scale Restoration	2.403
Fishing	Fishing	Homeowner, Environmental, Historical		2.588
Homeowner	Environmental	Government		2.733
Environmental	Education	Environmental		2.788
Tourism	Tourism	Environmental, Historical, Recreation, Ports		2.857
Tourism	Tourism	Homeowner, Government, Environmental		2.910
Recreation	Recreation	(none)		2.949
Environmental	Environmental	Nonprofit		3.064
Tribes	Tribes	Government, Environmental		3.235
Fishing	Environmental	Homeowner, Recreation, Tourism, Education		3.454
Agriculture	Agriculture	Aquaculture, Environmental, Recreation, Tourism		3.542
Tribes	Tribes	Aquaculture, Environmental, Recreation		3.793
Environmental	Environmental	(none)		3.894
Government	Government	Government, Environmental, Historical, Recreation	Skipped 1 or more questions, so could not be clustered	
Historical	Agriculture	Environmental, Government, Recreation, Tourism		
Homeowner	Homeowner	Aquaculture, Environmental, Development, Historical		
Ports	Ports	Environmental		

Economic interest versus shared values

The ACF predicts that members of “material groups” will more often form coalitions around shared economic interests, while members of “purposive groups” will form coalitions around shared values (Sabatier and Jenkins-Smith, 1999). Therefore, I noted in interviews any respondent’s mention of personal or organizational economic interest. A total of 14 respondents mentioned this type of economic interest at some point during interviews. These respondents generally had a material investment in the PSN, including respondents from the following stakeholder categories:

- Agriculture (3 respondents)
- Development (3 respondents)
- Aquaculture (2 respondents)
- Ports/Marinas (2 respondents)
- Tourism (2 respondents)
- Fishing (1 respondent)
- Homeowners (1 respondent)

Respondents from “purposive groups” such as Environmental, Government, Historical, Recreation, and Tribes, did not mention economic interest. This supports the ACF hypothesis that economic interests have more importance to material groups.

I also noted, in interviews, that members of two categories seemed to use similar terminology, suggesting some prior coordination. For example, all three respondents from the Agriculture category said similar things in similar words about the need for every acre of farmland, the need for infrastructure to support farming, and the relationship between farms and ecosystem restoration in the WSB. Two of three respondents from the Development category also shared some terminology and messaging. They mentioned the response of the development community to policies like the Critical Areas Ordinance and Growth Management Act, and asserted that future population growth in the Puget Sound region would not be accommodated along the shoreline. In contrast, while all three aquaculture operators mentioned the water quality benefits of shellfish, and the stewardship functions of aquaculture operations, they did not share terminology when discussing these issues.

Respondents from the nine other stakeholder categories had fairly individual ideas and terminology about PSN restoration, and particularly about the economic aspects of restoration. Two-thirds of respondents mentioned either getting “big bang for the buck” or the importance of cost-benefit analysis. A number of respondents also mentioned the major costs they presumed were associated with things like removing fill and purchasing private

property. Yet, economic considerations did not seem to be a primary concern for most respondents. Even those who mentioned their economic interests did not seem to dwell on this subject. In general, respondents seemed concerned that money should be used wisely in this time of economic recession, but they are mostly supportive of PSN restoration, and do not seem to think it is a threat to their economic well-being. Only the two members of the No Government Intervention group seemed to think that restoration could harm them personally.

Therefore, I expect WSB PSNERP advocacy coalitions will mostly form around shared values and not shared economic interests. Clearly, there can be a fine line between these two things, and I suspect that the farming community in the Skagit Valley may be the one category to form a more “material group.” Indeed, the definition of an advocacy coalition is not just a group that shares values; it must also engage in ongoing coordination. Agriculture representatives have done that in the past, and may do so again. However, all three Agriculture respondents that I spoke with were open to the idea of restoration if some of their specific needs and concerns were met, including maintaining farmland, demonstrating clear benefits, and a multi-species habitat approach. A larger sample size, or a sample of respondents in other sub-basins may indicate that economic interest is more important.

Areas of inter-coalition agreement

I noted a few values shared by more than one of the five groups. For example, the No Government Intervention and the Property Rights and Development groups agree that too much human development is not a major problem, and that private ownership and development is not a major cause of PSN problems. These two groups also support stronger enforcement of regulations less than do the other three groups. Finally, these two groups strongly agree that traditional industries should be maintained in Puget Sound. This is an interesting finding, as none of the members of these groups affiliated themselves with a traditional industry. They were developers, a homeowner, a tourism operator, and a recreation supporter. Despite the areas of agreement between these groups, there were a few notable areas of disagreement. The No Government Intervention group agreed more with the problem of pollution, and of the need to spend money to restore the PSN. The Property Rights and Development group agreed more that increased public ownership could be a good solution to PSN problems, despite also supporting private property rights.

There are also several areas of agreement between the Large-Scale Restoration and the Protect Undeveloped Areas groups. They both identified fewer fish and shellfish as a major problem, disliked increasing property rights as a solution, and agreed that it is important to restore the PSN to promote future generations' quality of life. Both of these groups were neutral on maintaining farmland and keeping business costs low, whereas other groups approved of these things. However, the Large-Scale Restoration group much more strongly agreed that private ownership and development is a major cause of PSN environmental problems. They also more strongly agreed that PSN problems are severe. Members of the Protect Undeveloped Areas group made far more pessimistic statements in interviews about the potential for environmental improvement through restoration.

To reiterate, coalitions of stakeholders are dynamic and created based on not just shared values, but ability to coordinate. The groups, or potential coalitions, that I identified, are not composed of people who know each other. They will not necessarily form coalitions. However, the identification of potential groups with shared values offers PSNERP an opportunity. With this information, PSNERP can understand the breadth of value systems, and thereby tailor their stakeholder involvement activities and outreach efforts and materials.

In sum, findings showed some values and preferences on which respondents overall agreed. These include a belief that PSN environmental quality is poor, that pollution is a problem, and that restoration is worth the investment. Findings also showed some priorities that respondents overall shared. These priorities include a willingness to trade off private homes and businesses for natural shoreline features, and to trade off commerce for restoration of ecosystem services and water quality. Findings also identified five preliminary groups of respondents with shared values. I labeled these groups, based on their visions of the PSN: No Government Intervention; Property Rights and Development; Private Land Stewardship; Protect Undeveloped Areas; and Large-Scale Restoration. As the issue of large-scale, top-down PSN restoration evolves, advocacy coalitions may form in the WSB around shared values similar to the ones that I identified here. However, factors not considered in this research will be important in determining the actual structures and values of future coalitions (Weible and Sabatier, 2009).

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

In this chapter I reflect on the findings in Chapter 4 and draw some conclusions by connecting my findings with the theoretical frameworks outlined in the literature review in Chapter 2. I begin the chapter by examining the findings in light of ACF hypotheses. I find support for the application of these hypotheses in the case of PSNERP restoration in the WSB. Next, I reflect on the applicability of these findings to WSB stakeholders generally. I then consider how PSNERP might work with potential coalitions of stakeholders before those coalitions have formed, given the literature on ACF and Adaptive Governance. I also propose ways for PSNERP to use the findings and conclusions to inform future stakeholder involvement activities and to make decisions about restoration sites and actions. My recommendations are targeted specifically to PSNERP, but some recommendations may be applicable to similar projects.

Reiteration of major findings

I asked three research questions in this study. The first was, “What are WSB stakeholders’ overall values and preferences?” My findings indicate that respondents in this study, overall, disagreed that the environmental quality of the PSN is high, and believed it was important to invest in PSN restoration. Respondents thought degradation of the PSN was ongoing, and it was important to start working on protection and restoration. Respondents thought water quality, pollution, lack of wildlife habitat, and shoreline houses and armoring were major problems. In general, respondents thought that people who are uninformed, or who circumvent regulations cause problems in the PSN. Respondents mentioned buffers, setbacks, education, softer solutions to shoreline armoring, and better regulatory enforcement as good solutions to PSN environmental problems. These overall findings are affected by a majority of respondents who were “environmentally oriented.” Different findings are reflected in the potential coalitions. However, the reality of stakeholder involvement efforts is that the most involved individuals self-select to participate. In environmental decisionmaking, the most involved individuals tend to be environmentally oriented.

The second question was, “How do WSB stakeholders trade off priorities?” My findings show that respondents were willing to trade off “other human use” features like private homes and shops in the PSN in favor of “natural features” like fish and shellfish habitat.

They were willing to trade off the objective of preserving commerce in favor of objectives like providing more ecosystem services and improving water quality.

The third question was, “What do values suggest about potential coalitions of stakeholders in the WSB?” The findings suggested five potential coalitions of WSB stakeholders, based on shared values about causes of problems, types of major problems, severity of problems, solutions to problems, and priorities in the PSN. The five potential coalitions had a spectrum of beliefs about public versus private sector solutions, and different visions of the future PSN.

Beliefs about ecosystem services

I asked respondents about ecosystem services throughout this study. I asked in an interview question if respondents thought ecosystem services were a good tool for restoration planning. Most respondents thought they were a good tool, but also wanted this tool to be combined with others, like considerations of habitat value, or economics. I also asked respondents to consider geological shoreforms and stressors in the PSN based on lists of ecosystem services that they provided or impaired. Most respondents changed their minds about what is most important in the PSN when confronted with long or short lists of ecosystem services. For example, some respondents ranked deltas as a low priority at first. However, after looking at the long list of ecosystem services provided by deltas, most of these respondents changed their rankings and gave deltas high priority.

Respondents’ statements about ecosystem services in these exercises indicate that they are supportive of this method of decisionmaking in concept. Yet, three respondents specifically stated they don’t understand ecosystem services, and a number of other respondents made statements that implied they don’t understand this concept. For example, one respondent said, “I don’t see, like your shoreline county policy or state policies for shoreline regulation, which seems to be really important.” This respondent seemed not to grasp the difference between “regulating services” in an ecosystem (like timing of water flow) and regulations in a social system. Another respondent said, when reviewing a list of all ecosystem services, “I think it itemizes for people exactly the extent of why it’s important. Like, when you wash your car, the water that you use ... affects everything.” While it is important that individuals understand the environmental consequences of their actions, a list

of ecosystem services is not intended for that purpose. A list of ecosystem services does not tell us, necessarily, that things are interconnected in an ecosystem, or that actions have consequences. Rather, ecosystem services are a way to conceptualize the benefits that nature provides to human well-being.

Other respondents did not know how one would apply the concept of ecosystem services to restoration planning. For example, one respondent said, “I guess I’m a little confused as to how it would be used.” Another said, “How do you quantify some of these things and the value behind some of these things? Our members ... want certainty and predictability.” A third respondent said, “In terms of selling people on the idea that they’re connected to the natural world...it’s an excellent tool...but in terms of planning for restoration, I’m a little dubious about its practicality.” These statements suggest an appreciation for the difficulty of applying the ecosystem services concept. PSNERP has chosen a unique method for the application of ecosystem services to restoration, but has not shared this method publicly.

Beliefs about the role of science in restoration

Respondents made a number of statements about science and restoration in interviews. The three most commonly mentioned ideas about science were:

1. Transparent, replicable science is important for justifying decisions
2. Environmental monitoring is important, but underfunded, and thus rarely done well
3. Scientists are mostly focused on maintaining their own funding

Many respondents’ statements suggested that they are not familiar with the scientific aspects of restoration. One respondent said, “I believe in science. Though I don’t understand much of it, I believe in it.” Another said, “Everything seems so cyclic, even in the scientific world ... There are buzzwords and hot topics ... but, science in and of itself, I’m very supportive. If you don’t have the science, you don’t have a leg to stand on to ask people to change. So it is important.” A third said, “I personally don’t think there are a ton of unanswered questions. I think the biggest unanswered question is, if they actually did all the good things they should do, which would prove the most beneficial the most quickly to the natural resources? So, I would be more inclined to spend the money on getting the projects done, versus studying them some more.”

Connecting findings with Advocacy Coalition Framework hypotheses

Generally, my findings about potential coalitions support the ACF hypotheses. The methods identified potential groups of policy advocates (stakeholders) through shared values about causes, severity, and solutions of Puget Sound nearshore problems. Stakeholders from a variety of categories and demographic backgrounds made up the groups, but nonetheless shared values. However, in many cases, members of the five groups did not share preferences. Instead, there was noticeable variation among individuals in terms of preferences. All of this is consistent with ACF hypotheses.

I found limited support for the potential formation of coalitions based on shared economic interests. I do not expect that economic considerations will be the major determinant of coalition formation in the WSB for two reasons. First, although nearly half of all interviewees mentioned their economic interest, none of them mentioned it frequently throughout the interviews or seemed emphatic about this aspect of their beliefs about PSN restoration. Second, I do not foresee vast economic opportunity in the future of the PSN. Further development opportunities are limited by lack of available land and regulations such as the Growth Management Act and Critical Areas Ordinance. Commercial fishing opportunities in Puget Sound are now quite limited and not expected to improve. Most small-scale aquaculture operations and farms have gone out of business, or aggregated into a few larger holders.

Comparison of findings with other studies

Woolley and McGinnis used a Q method study to investigate values related to environmental restoration among 26 scientists, industry representatives, private property owners, and government agency representatives (2000). They found four groups within their respondents. They labeled the first group “categorical restorationists.” Members of this group regarded restoration as “factually necessary... and... ethically mandated” (Woolley and McGinnis, 2000, 345). This group is similar to my Large-Scale Restoration group. The second group they called “conditional restorationists.” Members of this group thought “restoration may be justified (and is technically feasible) only if other competing claims can be adequately addressed” (Woolley and McGinnis, 2000, 345). This group supported private property rights and questioned science and is similar to my No Government Intervention and

Property Rights and Development groups. The third group Woolley and McGinnis identified they called “ecophilosophers.” This group questioned humans’ ability to restore nature, and especially the technology involved in doing so. “Ecophilosophers” were much more strongly in favor of protection of natural areas, similar to my Protect Undeveloped Areas group. Finally, these authors identified a group of “ecosocietal restorationists” who see restoration as essentially philosophical and political. Most of their respondents were in the first two groups (Woolley and McGinnis, 2000).

Breslow studied Skagit Valley farmers’ beliefs about salmon restoration and riparian buffers in relation to the Conservation Reserve Enhancement Program (2001). Her respondents’ beliefs are seemingly similar those of my Private Land Stewardship and No Government Intervention groups. Breslow focused on farmers’ descriptions of loss: of land, livelihood, control, and food. She also identified major questions farmers had about the causes of salmon decline and about the use of buffers as a solution to environmental problems caused by farms. Breslow’s respondents were often skeptical of science and wary of hidden agendas. Instead of buffers, they proposed incentives for people to change their practices, increased public ownership of riparian buffer areas, and site-specific approaches (Breslow, 2001). Breslow’s current dissertation research also examines the beliefs of people in the Skagit Valley about restoration. In this research, she finds three groups with unique views: Farmers, Tribes, and Restorationists (Breslow, 2010, *pers. comm.*). So, it seems that her research found stakeholder categories to be more important in determining values than my research did. However, our research questions and methods are different. Breslow’s study is designed as an Anthropology investigation and mine uses political science frameworks.

Caveats to findings and next steps

Although I identified five groups with shared values, I do not expect these groups to translate directly into advocacy coalitions. Coalition formation and stability are dependent on a number of factors, including the resources, perceived legitimacy, and ability to mobilize of the stakeholders involved. Also, coalitions may split, or form sub-groups or networks, based on a number of circumstances. These circumstances include policy windows, changed policy venues, extreme views of some coalition members, and changes in resources (Weible *et al.*, 2009). “... the coalition concept should not lead researchers to assume homogeneity among

group members either in beliefs or in coordination patterns. Instead, researchers are encouraged to look for principal and auxiliary members or other membership types, sub-coalitions, explanations for defections over time, and coalitions that dissolve” (Weible *et al.*, 2009, 130). If PSNERP wishes to better understand WSB stakeholders’ potential coalitions, values, resources, and likelihood of coordination, they should conduct more in-depth stakeholder analysis.

The next step in further identifying potential coalitions in the WSB would be to create and distribute a wider survey to validate these findings, both in terms of overall values and preferences, and in terms of the differing values of potential coalitions. Once such a survey better identifies potential WSB stakeholder coalitions’ values, I suggest analyzing the histories, finances, and written work of the organizations that make up each potential coalition as part of a strategic stakeholder analysis process (Weible, 2006). Based on feedback from respondents, I recommend adding two stakeholder categories to future research. One is Education, as a number of environmental organizations identify more as educators than as environmental advocates. Another category to add is Industry. This could include major landowners like Boeing, or the Navy. A more extensive or sub-group exploration of nearshore homeowners would also be warranted in the future.

Thorough stakeholder analysis could provide much clearer insight into the nature of potential coalitions in the WSB. Such a survey would require substantially more breadth than this research to produce generalizable findings. This is especially true if PSNERP wishes to expand stakeholder analysis throughout Puget Sound. However, at this stage, I believe PSNERP plans to push forward along its project timeline. It likely does not have significant time or resources to invest in further stakeholder analysis. Therefore, PSNERP may need to simply work with these findings, and other sources of information on their stakeholders, to inform ongoing outreach and involvement efforts.

If other groups were to apply this methodology to elicit stakeholder input, I suggest a modified version of this study. I recommend first conducting limited interviews to obtain a breadth of statements on the issue. I would then conduct a large-scale survey based on the statements obtained in interviews. Finally, I would use values identified in surveys, plus stakeholder analysis of relevant organizations (including information about their resources and public statements) to develop a thorough picture of stakeholders’ beliefs and potential

coalitions. Finally, I would use this information to inform further stakeholder outreach and involvement. Specifically, I would:

1. Tailor outreach materials to reflect the breadth of value systems
2. Elicit stakeholder input through Community Advisory Groups that reflect the breadth of value systems on the issue
3. Provide scientific and programmatic information in a way that is neutral with respect to the stakeholder values and potential coalitions

What the findings suggest about Whidbey Sub-Basin stakeholders generally

Although the nature of this research does not allow for statistical significance or direct extrapolation to the broader community, I am convinced that my respondents are a fairly representative group of WSB PSNERP stakeholders. Although I would not use this research draw conclusions about WSB stakeholders, it does suggest hypotheses about overall values and preferences, trade-offs, and potential coalitions in the WSB. These hypotheses could be tested with a broader survey effort, as suggested in the section above on next steps.

A key finding for PSNERP and other projects is that groups with shared values do not necessarily align with stakeholder categories. Instead, I found heterogeneous groups with shared values. Also, while some regional differences were notable in stakeholder beliefs, demographics did not dictate shared values. Because this finding aligns with ACF hypotheses, which have been widely applied, I expect that it is an important consideration as PSNERP and other organizations plan for stakeholder involvement. Specifically, involving stakeholders by category or region does not mean that an agency has involved all potential stakeholder groups. Rather, it is important to understand stakeholders' value systems and to involve a sample of stakeholders that represents the breadth of values.

Stakeholder involvement in large-scale, top-down restoration projects

This research is situated within a broader management question. Namely, "How can an agency effectively involve stakeholders in the middle stage of a large-scale, top-down environmental restoration effort?" Findings from this research, and my personal experiences with PSNERP, suggest a few responses to that question. First, collaborating at a high level of planning is important. PSNERP has consistently involved large nonprofit organizations, state

and federal agencies, county governments, and research scientists in its planning process. As such, it has formulated a restoration proposal that reflects the interests of at least those highest-level stakeholders (see Figure 4). This group of highly involved stakeholders has also helped PSNERP consider some of the concerns of less-involved stakeholder groups.

Second, my findings reflect the minimal investment PSNERP has made in outreach to lower levels of stakeholders. Aside from three poorly attended NEPA scoping meetings and a minimal website, PSNERP has done very little public outreach. Most of the tertiary level stakeholders I spoke with seemed unfamiliar with PSNERP's analyses of changes in the nearshore, and of degradation of ecosystem processes and impairment of ecosystem services. They had apparently not heard about PSNERP's proposed restoration solutions, either. I did not directly ask respondents about PSNERP, but respondents' statements throughout interviews, and their beliefs in surveys, suggest a lack of familiarity with PSNERP's framing of Puget Sound nearshore problems. Instead, respondents were focused on issues of wildlife, pollution, and managing impacts of stressors (not removing them). I suggest that for a project at the PSNERP (Puget Sound-wide) scale to be successful, even less-involved stakeholders (in this case, the Puget Sound public) should be generally aware of the project and its goals. This is especially true because of the large amount of public funding that PSNERP is seeking to use for nearshore restoration. Therefore, I suggest PSNERP increase its public visibility by:

- investing in a more thorough, engaging, and regularly maintained website
- setting up outreach tables at events around Puget Sound
- collaborating more regularly with environmental education groups

Third, my experiences gathering data for this research suggest that this tertiary level of WSB stakeholders is interested in communicating their beliefs and willing to share their time. Almost everyone I requested to interview responded positively. Respondents were willing and able to spend between one and three hours of their time with me. At least three respondents mentioned involvement in other environmental decisionmaking groups, like a Salmon Recovery Funding Board group, or a Marine Resource Committee. About half of respondents in this study completed the optional section of my survey asking for their contact information if they would like to give further input or get more information in the future. The potential benefits of greater stakeholder involvement at this level include greater support for

allocation of congressional funding to PSNERP, and less likelihood that aspects of the project could be obstructed. So, I commend PSNERP on involving stakeholders at the highest level. I also strongly suggest greater public outreach and more involvement of tertiary stakeholders through focus groups and/or surveys. Involvement of tertiary stakeholders at this stage should focus on verifying site selection methods and criteria, as well as objectives. Restoration sites will be the visible product of PSNERP actions and expenditures. Obtaining the input and support of key stakeholders could improve general support for restoration sites and goals. PSNERP should produce the results that stakeholders want, in the places they want them. Of course, this also should be balanced with scientific input in an Adaptive Governance framework.

Working with potential coalitions

If this study's respondents are indicative, the PSNERP stakeholder community is much more complex than the dichotomies of supportive/not, or environmental/not. The five groups I identified, and the interview statements I heard, suggest that most WSB stakeholders consider themselves "environmental" to some extent, but also practical and fiscally responsible. Their definitions of this vary, especially in terms of how they frame issues of stewardship, regulation, and science. Working with diverse stakeholders requires ongoing two-way communication. Stakeholders should have ample opportunity to provide input and to know how their input will shape decisionmaking (Brunner, 2005).

Understanding potential coalitions gives PSNERP a number of opportunities. First, it creates an opening for targeted outreach. Some individuals and groups I spoke with were noticeably more well-informed than others about PSN degradation and restoration. PSNERP can use information about stakeholders' different levels of understanding, as well as different values, to create specialized outreach materials and presentations. For example, some individuals, and one potential coalition, focused on water quality, and did not perceive development as a problem. A carefully neutral presentation of the problems with various nearshore stressors could be very effective in working with these groups (e.g., Maharik and Fischhoff, 1993). Another example is the Private Land Stewardship group, whose members suggested that farmland is important, and unfairly targeted in restoration efforts. They also questioned past regulatory efforts, like buffers and implementation of the Endangered

Species Act. Outreach to individuals or organizations whose values align with this group should focus on efforts to harmonize farming and restoration. Restoration ecologists and government agencies should communicate with groups like this about recent efforts to work collaboratively to prevent extinction and promote biodiversity.

Second, understanding potential coalitions allows PSNERP to better involve the breadth of stakeholders in planning and outreach efforts. Involving stakeholders by category or geographic location does not guarantee that the breadth of beliefs is represented. However, by considering those two factors, plus potential coalitions, PSNERP can reach a more representative group. For example, if forming Community Advisory Groups, PSNERP should do this by county, and make sure all 12 stakeholder categories are represented (if not a few more). Yet, they should also make sure that all five potential coalitions are represented. They could interview a number of possible Advisory Group members to establish which group each might fall into, and then ensure that at least the five groups that I identified are represented within each Community Advisory Group.

Third, the ACF suggests that once coalitions have formed in staunch opposition to one another, they tend to use scientific information to support their own arguments, regardless of the evidence (Weible and Sabatier, 2009). A number of additional studies have confirmed coalitions' "... political use of science in bolstering pre-existing beliefs to legitimize arguments against an opponent" (see citations in Weible *et al.*, 2009, 130). Providing tailored data and communications to stakeholders at this stage could prevent the formation of uninformed, antagonistic coalitions.

The ACF also suggests some potential problems with entrenched coalitions. One is that they tend to engage in a "devil shift" meaning that they exaggerate the bad intentions and unwavering positions of opposing coalitions (Sabatier *et al.*, 1987). Once entrenched, separate coalitions often require a "hurting stalemate" in order to renegotiate based on their policy preferences. This means that both sides must be suffering from the status quo and thus view negotiation as better than the alternative (Sabatier and Weible, 2007). Therefore, in addition to targeted communications and outreach, PSNERP should facilitate communication among different stakeholders before they form coalitions. Working with stakeholders now should help PSNERP meet its first mandate from the Stakeholder Involvement Strategy, to foster broad program understanding and support. Focus groups leading to Community

Advisory Groups, in addition to greater public outreach, may be good ways to prevent entrenched coalitions and share scientific information in a useful fashion.

Although identifying advocacy coalitions in their nascent stage is an inexact science, this type of research has value from an Adaptive Governance perspective. This is one way of understanding stakeholders' problem definition, and thereby helping to direct planning and management with both stakeholder and scientific input. Also, understanding differing value systems can be helpful in directing program resources, communication strategies, and negotiation tactics. Woolley and McGinnis suggest the following use for information about potential coalitions, or, in their parlance, "conflicting discourses:"

... the task for a practical mode of community-based restoration is to discover a way to engage discourses, and to guide them toward cooperative and shared modes of participation in restoration activity. For those interested in fostering a more collaborative process for the planning of restoration activity, it is critically important that restorationists be aware that values are not uniform, and that diverse discourses should be taken into account in planning. Identifying the diversity of discourses, bringing them into the conversation and talking about them, will turn out to be an important part of restoration planning. When this is done, restorationists will find it easier to find common ground with a sizable constituency of participants and supporters. When it is not done, the development of a clear and well-defined consensus among participants will be put off. In such cases the restoration effort is likely to be limited or compromised, not by the limitations of scientific or technological knowledge, but by discourses and the inevitable conflict among them.

Future stakeholder involvement activities

In this section, I consider the geographic scale at which PSNERP should involve stakeholders in the future, and future ways to reach out to stakeholders and the public.

Geographic scale of stakeholder involvement

Although I used a sub-basin approach to gathering stakeholder input, I do not recommend this for the future, unless sub-basins are broken out into smaller regions that are more socially sensible. For example, in the WSB, my respondents seemed to think "regionally" at

about the county level. The issues raised by respondents in Snohomish, Skagit, and Island counties were noticeably different from one another. Snohomish county respondents mentioned the railroad along the PSN there as a major barrier to restoration. Whidbey and Camano Island (Island County) respondents were more concerned about population growth and septic system issues. Skagit County respondents frequently mentioned farms and the tidal barriers (dikes and levees) that protect them. Although PSNERP can communicate findings about the PSN to stakeholders at relevant ecological scales, this information should also be translated into relevant social scales.

Methods of future stakeholder involvement

I suggest focus groups as a good approach to further involvement of tertiary PSNERP stakeholders. These are people like those in my 12 categories: an attentive public interested in nearshore issues, but not necessarily involved in PSNERP planning. It is important to understand how these stakeholders with different perspectives, and from different categories, consider and negotiate their values and preferences in a heterogeneous group setting (Norton and Steinemann, 2001). Weible *et al.* suggest, "... cross-coalition learning is more likely to occur where discussions focus on secondary beliefs, when the issues are technical or tractable, when conflict is at intermediate levels, and when there is a professional forum" (2009, 130). Jenkins-Smith advises that a good professional forum is one that provides an institutional setting allowing coalitions to safely negotiate, agree, and implement agreements (1990). Participants in one-time focus groups may be recruited to form more permanent Community Advisory Groups.

Creating and seeking regular or ad-hoc input from Community Advisory Groups could help PSNERP obtain ongoing input from tertiary level stakeholders. PSNERP could establish advisory Groups in relevant regions, perhaps by county. A pared-down version of Advisory Groups could be Site Selection Committees that include tertiary stakeholders, as well as PSNERP scientists and collaborators. These Committees could help PSNERP obtain stakeholder input as needed, without slowing down the General Investigation timeline. Site Selection Committees could meet irregularly to select restoration sites and actions after hearing about the scientific and other merits of a group of vetted proposals.

Committees or Advisory Groups should be large enough to incorporate sufficient diversity, but small enough to hear all voices and limit scheduling difficulties. According to Norton and Steinemann, this number is likely around 10-20 participants (2001). Committees and Advisory Groups have been used elsewhere in Puget Sound. Specifically, Marine Resource Committees and the Salmon Recovery Funding Board use this model. Most people I have spoken with suggest that this model works well, with one caveat. Regional groups tend to advocate for regional equality of investment, sometimes called “the peanut butter approach.” For example, if all 12 Puget Sound counties had a PSNERP Site Selection Committee, they might advocate for an equal distribution of the initial 15 proposed PSNERP sites. Thus, stakeholder input should be balanced with scientific understanding of strategic restoration site selection.

Engaging stakeholders and the public

If my sample is indicative, tertiary level stakeholders in the WSB are unfamiliar with both PSNERP itself, and PSNERP’s problem definition. Yet, they do seem supportive of some aspects of PSNERP’s proposed solution to nearshore degradation. To foster greater understanding and support, PSNERP should turn its problem statement into a public messaging campaign to be channeled through the Puget Sound Partnership. Many respondents were familiar with Puget Sound Partnership as the key organization addressing Puget Sound environmental problems. PSNERP and Puget Sound Partnership have a Memorandum of Understanding in place that governs how they collaborate. So, it should be simple for Puget Sound Partnership to integrate more PSNERP messaging into its outreach efforts for the Puget Sound public. For example, as the Puget Sound Partnership communicates with the public about the importance of preventing non-point source pollution, they could also integrate messaging about how estuaries improve water quality, and the importance of restoring estuaries, since Puget Sound has lost so much of these ecosystems.

PSNERP should also consider sharing the results of its Cost Effectiveness Incremental Cost Analysis (CEICA). This is an Army Corps of Engineers process that demonstrates clearly the “bang for the buck” and “benefit-cost analysis” that many respondents requested. PSNERP plans to use reduction in ecosystem service impairment, and reduction in ecosystem process degradation, as metrics of benefit. So, before sharing CEICA widely, PSNERP will

need to do extensive outreach about ecosystem processes and ecosystem services so that stakeholders are fully aware of the actual benefits proposed.

Finally, PSNERP has shared its Change Analysis results with county governments and other members of the environmental, government, and planning sectors. However, they have not distilled those findings into a format that is neutral and widely available. I suggest that they do so. Change Analysis results and Strategic Needs Assessment have, to some extent, been presented in documents illustrating PSNERP plans and seeking stakeholder and public support. However, this is different from simply presenting accessible data. There is some possibility that data could be questioned or manipulated for political purposes. This risk may be lessened if PSNERP scientists and program managers can be available to answer questions about the data (Chase *et al.*, 2008).

Using ecosystem services to communication with stakeholders

In the course of this study, I discovered a number of respondents who misunderstood ecosystem services conceptually, or did not know how to apply them to restoration planning. Also, when shown lists of ecosystem services provided by shoreforms or impaired by stressors, respondents tended to just look at the length of each list and not consider the specific services. This research supported the finding of Iceland *et al.* that stakeholders tend to value water-related ecosystem services including water quality, quantity, and regulation. Yet, there is a risk, with these types of findings, of setting up a feedback loop. For example, efforts to restore Puget Sound have focused on water quality since the 1970s, so stakeholders believe that this is important, so they tell Puget Sound Partnership (via the Iceland study) that water quality is important, so Puget Sound Partnership focuses on water quality, so stakeholders continue to believe that it is paramount.

Ecosystem services may be a useful currency for PSNERP to communicate out to stakeholders, if three conditions are met. First, stakeholders should better understand ecosystem services conceptually, and in application to PSNERP restoration planning. Second, stakeholders should understand why PSNERP focuses more on some services than others. Third, PSNERP should acknowledge stakeholders' desire for a unique approach to ecosystem services, including:

- quantification and economic valuation where possible

- a focus on wildlife as separate from capture fisheries or livestock
- a general appreciation of intangible services, like intrinsic value, aesthetic beauty, public access, and historical value

Reworking the list of cultural ecosystem services may help PSNERP to communicate with stakeholders that focus on intrinsic value or other intangibles. PSNERP could enumerate the current three categories of cultural services proposed by the Millennium Ecosystem Assessment into five or more categories, with much clearer and more relevant descriptions.

In terms of stakeholders communicating in to PSNERP, many respondents cited a vision of a sort of mixed-use mosaic. For example, several respondents mentioned support for ongoing production of farmed goods and capture fisheries, balanced with long-term sustainability of water quality and non-consumptive existence value of fisheries. If stakeholders work more closely with PSNERP and understand better how these trade-offs operate, they can more clearly communicate the appropriate balance that they perceive, as PSN restoration continues and PSNERP learns more about the outcomes of restoration.

Using values, preferences and trade-offs for site selection and design

The most challenging objective of this research was to suggest ways to incorporate stakeholder input into PSNERP planning. How should PSNERP select and design restoration sites in the WSB, given the input I elicited from respondents? Looking at overall values and preferences, I infer a few suggestions for site selection and design in the Whidbey Sub-Basin.

Water quality and wildlife

Although respondents supported PSNERP's strategic, process-based restoration approach, they were also very concerned about water quality and fish and wildlife habitat. This is evidenced by a number of things:

1. Strong overall agreement that pollution is a major problem in surveys
2. Twenty-one respondents mentioned water quality issues in surveys
3. Most respondents ranked "natural features" high, indicating strong support for wildlife habitat
4. Twelve respondents mentioned the importance of habitat value in interviews and 12 specifically mentioned the importance of positive outcomes for salmon

Respondents also supported increasing ecosystem services and providing environmentally benign recreation opportunities and public access to the PSN. Therefore, when selecting and designing sites, PSNERP should use its proposed approach, but should consider giving more weight to sites and designs that have “added benefits” like water quality improvements, wildlife habitat, and recreation opportunities. PSNERP should communicate the value of ecosystem processes and services, but also focus on sites and actions that clearly have added benefits. Sharing some early successes in terms of these added benefits may dramatically increase stakeholder support for PSNERP and thus enable stakeholders to endorse subsequent actions that are more process-focused or experimental in nature.

Scientific pilot sites

PSNERP plans to allocate five of its initial 15 sites as scientific pilots. Of the 20 respondents that gave a numerical answer to the question of how many sites they would allocate to applied science, the average response was 32%, or slightly more than the five sites that PSNERP proposes. However, a number of responses suggested that stakeholders are confused about the role of science in restoration decisionmaking. So, I suggest PSNERP proceed with its suggested allocation of scientific pilot sites, but increase its communication with stakeholders about the nature of these sites, how they will be selected and monitored, and how the information gleaned will be used to inform future restoration sites and actions.

Natural features and ecosystem services

Respondents’ ranking data shows that they place High priority on natural features, including fish and wildlife habitat. They gave Mid rankings to recreation features. This suggests that they think recreation is important, but should be secondary or complimentary to a focus on habitat. In terms of objectives, provision of ecosystem services, restoration of processes, and water quality were consistently ranked High. Objectives that were mostly ranked Low were protecting commerce and rarity. Therefore, when it comes to selecting restoration sites and designs, PSNERP should be clear about the features to be provided and objectives to be met. They should focus on those sites and designs that they expect to provide habitat, restore processes and provide ecosystem services. They should be less concerned with protecting rarity, preserving commerce, or affecting private homes and businesses.

Restoration sites and progress

A number of respondents mentioned that there is a long list of waiting restoration projects, and it is important to get to work soon on restoring the PSN. Although PSNERP cannot control the speed of a General Investigation process, they can do everything possible to stay on schedule. Further, PSNERP is currently preparing to do a “Community Consultation” of restoration practitioners to verify information for projects in its nearshore database. I recommend that PSNERP extend the scope of organizations and individuals to be included this consultation. Currently, the database is composed just of proposals that have been submitted to the Estuary and Salmon Restoration Program (ESRP). It seems likely that many more proposals exist in the restoration community that could or should be included in the database PSNERP will use for site selection. Although the first portfolio of PSNERP restoration sites will be selected only from among the projects already vetted through the ESRP process, subsequent portfolios could come from a more inclusive list.

Support for restoration on private land

A number of respondents’ statements suggest that PSNERP should not focus exclusively on restoring public land. Many respondents thought that houses built right up to the edge of the shoreline and shoreline armoring were major problems. A number of respondents disapproved of private ownership of tidelands, and supported increased public ownership of shorelines. Finally, most respondents ranked private homes low. Given these responses, it seems that there is support for restoration on private land, assuming it is sold by a willing landowner at a fair price (stipulations I provided when asking questions in this study). It seems that private property rights advocates are a minority, but one that has historically been vocal and obstructionist (according to some respondents). PSNERP should consider reaching out to this group to hear more about their views, but should not avoid working on private land because of fear of this group’s backlash. Of course, many respondents also mentioned that buying up significant amounts of private land would be overly expensive, so PSNERP should be cautious of appearing decadent in its site selection.

Expanding existing collaborations

Most respondents discussed issues beyond the scope of PSNERP's restoration plans, including:

- water quality
- wildlife habitat
- buffers and setbacks
- stronger regulatory enforcement
- environmental education
- septic systems
- recreation
- treaty rights
- aquaculture regulations

Respondents seemed to appreciate not just a strategic approach, but also a comprehensive one. Therefore, PSNERP should consider partnering with other organizations to address stakeholders' other interests. For example, WSB stakeholders I spoke with are supportive of traditional industries, such as fishing, farming, aquaculture, and ports, yet concerned about the impacts of these industries and their associated nearshore stressors. PSNERP could partner with organizations working to mitigate impacts of stressors, especially when those stressors cannot be removed through PSNERP restoration. Specifically, PSNERP should work with Conservation Districts, WSU Extension programs, Puget Sound Partnership, and the Department of Ecology to achieve these ancillary goals that support PSNERP objectives.

GLOSSARY

ACF: Advocacy Coalition Framework, an examination of policy processes that focuses on policy actors' beliefs and the coalitions they form around those beliefs. See authors Paul Sabatier, Chris Weible, and Hank Jenkins-Smith.

Endangered, Threatened, Candidate Species: Per the Endangered Species Act, an endangered species is "in danger of extinction" a threatened species is "likely to become an endangered species" and a candidate species is one for which the U.S. Fish and Wildlife Service "has sufficient information on their biological status and threats to propose them as endangered or threatened."

General Investigation: A traditional and common way for the U.S. Army Corps of Engineers to help a community solve a water resource problem. In this program, the Corps jointly conducts a study with a non-federal sponsor and, if shown by the study to be feasible, constructs the project. This approach requires that Congress provide the Corps with authority and funds to first accomplish a feasibility study and secondly, to construct the project. Local sponsors share the study and construction costs with the Corps, and usually pay for all operation and maintenance costs. This approach may be used to address any one of a variety of water resource problems, including navigation, flood damage reduction, and ecosystem restoration.

Nearshore: The nearshore extends from the top of shoreline bluffs to the depth offshore where light penetrating the Sound's water falls below a level supporting plant growth, and upstream in estuaries to the head of tidal influence. Its component ecosystems include bluffs, beaches, mudflats, kelp and eelgrass beds, salt marshes, gravel spits, and estuaries.

PSN: Puget Sound Nearshore

PSNERP: Puget Sound Nearshore Ecosystem Restoration Project

Shoreline armoring: A class of modifications that hardens the shore, including bulkheads, seawalls, and rip rap

Stakeholders: Groups or individuals who can affect, or may be affected by, a policy or project

WSB: Whidbey Sub-Basin, one of seven sub-basins of Puget Sound. Divisions between sub-basins are based on oceanographic and watershed characteristics

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APPENDIX A: Consent Form**UNIVERSITY OF WASHINGTON CONSENT FORM****TITLE**

Eliciting and Using Stakeholder Values and Preferences to Guide Puget Sound Nearshore Restoration

RESEARCHER

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RESEARCHER'S STATEMENT

I am asking you to take part in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to participate in this study. Please read it carefully and feel free to ask questions about the purpose of the research, what I may ask you to do, the possible risks and benefits of volunteering for this study, your rights as a volunteer, and anything else about the research or this form that is not clear. When I have answered all of your questions, you can decide if you want to participate in the study or not. This process is called "informed consent." I can provide a copy of this form for you, upon request.

STUDY PROCEDURES

If you choose to be involved in this study, I will ask you to participate in a survey that should take about 15 minutes and an interview that should take roughly one hour. I plan to conduct 36 or more interviews and surveys in total. If you consent to be part of this study, I will ask you to fill out a survey that asks you to agree or disagree with a set of statements, and to provide some demographic information. I will then ask you to reply to some open-ended questions, to rank some things related to the Puget Sound shoreline, and to respond to some images of parts of the current and future Puget Sound shoreline.

With your permission, I will record our conversation using a tape recorder. This recorder will aid in my note-taking so that I may better focus my attention on you. No one other than me will have access to the recording, which will be deleted immediately after I transcribe the contents into a password-protected computer. You have the right to modify the recording or to ask for it to be deleted immediately at any time. If you do not wish to be recorded, I respect your wishes and we may proceed without recording.

RISKS, STRESS & DISCOMFORTS

There are few foreseeable risks associated with participating in this interview and survey. They include possible fatigue and discomfort associated with a lengthy period of sitting and

talking, as well as possible stress associated with considering your values and preferences. To try to mitigate these risks, I can provide snacks or beverages for your refreshment, and you can request to take a break at anytime. You may also stop the interview at anytime for any reason.

BENEFITS OF THE STUDY

The purpose of this study is to better understand the values and preferences of stakeholders that are potentially affected by shoreline restoration in the Whidbey Sub-basin region of Puget Sound. This is an opportunity for you to reflect on your ideas and to help inform restoration planners. This will help planners to design restoration projects that have both environmental and social benefits, and broader public support. It will also help restoration planners and other environmental managers better understand how to elicit and incorporate stakeholder input in the middle stage of their planning efforts.

OTHER INFORMATION

All interview and survey data will be confidential, anonymous, and stored in a secure location. The data will only be accessed by me, the principal investigator, and will only be retained as long as needed to develop the final project report (due in September 2010). All interview data will be anonymous, and no links between any interview and any individual participant will be kept. If you choose to be part of this study, you will be asked to sign this consent form prior to taking part in the interview.

Rachel Lipsky

Printed name of researcher

Signature of researcher

Date

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask about the study. If I have questions later about the research, I can ask the researcher listed above. If I have questions about my rights as a research subject, I can call the University of Washington's Human Subjects Division (206) 543-0098. I will receive a copy of this consent form if I request one.

Printed name of subject

Signature of subject

Date

APPENDIX B: Survey

* The version of this survey given to respondents was 2 pages, in landscape format

This section of the survey asks for your beliefs about the Puget Sound shoreline. For each statement below, please CHECK ONE answer.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The environmental quality of the Puget Sound shoreline is high.	☐	☐	☐	☐	☐
It is important to spend money to restore the Puget Sound shoreline	☐	☐	☐	☐	☐
Pollution is one of the biggest environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Loss of wildlife habitat is one of the biggest environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Fewer fish and shellfish available for harvest is one of the biggest environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Too much development is one of the biggest environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Industrial activity is a major cause of environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Private ownership and development is a major cause of environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Mismanagement by government agencies is a major cause of environmental problems in the Puget Sound shoreline.	☐	☐	☐	☐	☐
Increasing private property rights is a good way to improve the environmental quality of the Puget Sound shoreline.	☐	☐	☐	☐	☐
Increased public ownership is a good way to improve the environmental quality of the Puget Sound shoreline.	☐	☐	☐	☐	☐
Stronger enforcement of existing regulations is a good way to improve	☐	☐	☐	☐	☐

the environmental quality of the Puget Sound shoreline.					
Allocating resources like fishing rights and land rights more fairly is a good way to improve the environmental quality of the Puget Sound shoreline	☐	☐	☐	☐	☐
It is important to increase the number of places for the public to engage in recreation activities along the Puget Sound shoreline.	☐	☐	☐	☐	☐
It is important to maintain farmland along the Puget Sound shoreline.	☐	☐	☐	☐	☐
It is important to maintain the traditional industries of Puget Sound, like commercial fishing, aquaculture, and shipping ports.	☐	☐	☐	☐	☐
It is important to keep costs low, such as property taxes and regulatory costs, to preserve businesses in the Puget Sound shoreline	☐	☐	☐	☐	☐
It is important to promote tourism in the Puget Sound shoreline	☐	☐	☐	☐	☐
It is important to maintain the aesthetic beauty of the Puget Sound shoreline	☐	☐	☐	☐	☐
It is important to restore the Puget Sound shoreline so future generations can have a high quality of life	☐	☐	☐	☐	☐

This section of the survey asks about your background. Please try to answer all the questions in this section.

In what cities do you live and work?

How long have you lived in the Puget Sound region (check one)?

- ☐ < 1 year
 ☐ 1-5 years
 ☐ 6-10 years
 ☐ > 10 years

Which stakeholder group do you primarily identify with (check one)?

- | | | | | |
|--------------------------------------|-------------------------------------|--|-------------------------------------|------------------------------------|
| ☐ Agriculture | ☐ Commercial | ☐ Development | ☐ Historical | ☐ Tribes |
| ☐ Aquaculture | fishing | and Home- | societies | ☐ Ports and |
| ☐ Shoreline | ☐ Government | building | ☐ Recreation | Marinas |
| homeowner | | ☐ Environmental | ☐ Tourism | |

Which other stakeholder groups do you feel you belong in (check all that apply)?

- | | | |
|---|---|--|
| ☐ Agriculture | ☐ Government | ☐ Recreation |
| ☐ Aquaculture | ☐ Development and | ☐ Tourism |
| ☐ Shoreline | Home-building | ☐ Tribes |
| ☐ homeowner | ☐ Environmental | ☐ Ports and Marinas |
| ☐ Commercial | ☐ Historical societies | |
| ☐ fishing | | |
| ☐ Other (please explain) | | |

About how often to you participate in the following activities around the Puget Sound shoreline? For each activity, please CHECK ONE answer

	Less than once a year	One to four times a year	More than four times a year, but less than once a month	Once a month or more, but less than once a week	More than once a week
Recreation activities, such as beach-combing, boating, swimming, hiking, and wildlife viewing	☐	☐	☐	☐	☐
Environmental activities, such as beach clean-ups, wildlife surveys, propagating native plants, or removing invasive species?	☐	☐	☐	☐	☐
Policy activities, such as writing or calling legislators, signing or circulating petitions, or attending rallies	☐	☐	☐	☐	☐

Do you have any other comments?

APPENDIX C: Interview Guide

INTERVIEW GUIDE

Introductory Information (5 minutes):

Thank you for agreeing to be interviewed today. My name is Rachel Lipsky and I am a graduate student in environmental policy at the University of Washington. I am speaking with you as part of my independent research for my master's degree.

A number of local government and nonprofit groups are planning to restore the natural ecosystems of the Puget Sound shoreline. These restoration groups can use input from science teams to help maximize the environmental benefits of their projects. They can also use stakeholder input to help maximize social benefits. Stakeholders are people like you, who live, work, and depend on the Puget Sound shoreline. I am interviewing a wide variety of stakeholders. I will use the input that you and others give me to write up my thesis and a technical report that restoration groups can use to help them make decisions about their projects.

The goal of our interview today is to understand some of your values and preferences related to shoreline restoration through a series of questions and activities. Before our interview, I will ask you to complete a brief survey. This survey will ask for your opinions on shoreline problems, their causes, and ways to resolve them. It will also ask for some background information about your relationship with the Puget Sound shoreline.

Altogether, the survey and interview should take about an hour of your time. Taking part in this study is voluntary. You can stop at any time and you can choose not to answer any question for any reason. Information you provide is anonymous. I will take notes on and tape record our interview. None of these notes, recordings, or survey responses will ever be linked to your name in any way. All study information will be kept secure and confidential.

Do you have any questions? Do I have your consent to continue with the survey and interview? If so, can you please read and sign this form (*show Consent Form*)?

Survey (10 minutes)

To begin, I would like you to complete this survey. This asks you to consider how you feel about some important environmental issues in the Puget Sound shoreline. Although I prefer to have responses to all questions, you are free to skip any question for any reason.

Open-ended questions section (15 minutes):

First, I'd like to ask you to respond to some open-ended questions.

Nearshore understanding and aesthetic preferences: When I talk about the Puget Sound shoreline, this is what I mean (*show Overall and Whidbey Shoreline images*).

Q1: Can you name and describe some of your favorite Puget Sound shoreline places?

Q2: What about these places makes them so memorable?

Vision: The Puget Sound shoreline has changed a lot since the 1850s. Here are some images that reveal these changes (*show Puget Sound and Whidbey Change images*). Ecosystem restoration can not return the shoreline to the way it was in the 1850s.

Q1: So, what do you think the future shoreline should look like, given some mix of development and restoration?

Prompt1: What are the most important elements or features of that vision?

Ecosystem Services: This is a list of ecosystem services (*show Ecosystem Services list*), which are contributions that natural ecosystems make to human well-being. This is one way that restoration planners think about the environmental and social benefits of projects.

Q1: Do you think this is a good tool to use for planning restoration, or would you prefer that planners use a different one, such as habitat value, ecosystem processes, historical condition, or economic benefits?

Q2: Are there important services that are not on this list?

Pilot Sites: The primary goal of most restoration projects is to improve environmental quality. Sometimes projects also help to answer scientific questions. Alternatively, restoration projects can have a primary goal of answering scientific questions and secondarily improve environmental quality.

Q1: If you had a budget to complete restoration projects at 15 sites, how many sites would you choose that focus primarily on answering scientific questions and how many would you choose that focus primarily on improving environmental quality?

Ranking section (15 minutes):

Now, I'd like you to do an exercise to consider some of your preferences. I am going to give you four sets of cards. Each set of cards has a different theme and each card lists a single item. I'd like you to organize the cards to show me which items you think are relatively the most and the least important.

Shoreline Features: For the first set of cards, the theme is, "Features of the shoreline." Please look at all of the cards and then try to put them into 3 categories of "High" "Medium" and "Low" priority in terms of the use of the 200 meter swath around where land meets Sound. These blank cards and the pen are for you to make additional cards if you think there are important features that I didn't include.

Prompt1: Think of this exercise in terms of a "blank slate" – don't worry about the feasibility of adding or removing things on the landscape.

Q1: Can you tell me why these are of high importance?

Q2: Can you tell me why these are of low importance?

Shoreforms: Next, I'd be like to ask about your preferences for different physical types of coastlines. Scientists classify the shoreline into five categories of "shoreforms" (*show front side only of Shoreforms images*).

Q1: Would you prioritize protection or restoration of some of these over others from a gut or aesthetic standpoint?

Different categories of shoreforms provide different ecosystem services (*show Shoreforms images, revealing ecosystem services info on the back*).

Q2: Given this information, do you have a different idea about prioritizing some of these over others?

Q3: Can you tell me why you prioritized things this way?

Stressors: Scientists have identified a number of human developments along the shoreline that impair natural ecosystem processes (*show front side only of Developments images*).

Q1: Would you prioritize protection or restoration of some of these over others from a gut or aesthetic standpoint?

Different developments impair the production of different ecosystem services (*show Developments images, revealing ecosystem services info on the back*).

Q2: Given this information, do you have a different idea about prioritizing some of these over others?

Q3: Can you tell me why you prioritized things this way?

Objectives: This last set of cards show some of the many objectives restoration planners can use to design their projects. Please look at all of the cards and then try to put them into 3 categories of “High” “Medium” and “Low” priority. These blank cards and the pen are for you to make additional cards if you think there are important objectives that I didn’t include.

Q1: Can you tell me why you prioritized things this way?

Prompt (for all ranking exercises): If 3 categories is too hard, please just focus on choosing the most important

Proxy Sites section (10 minutes):

Now I would like you to look at some images of hypothetical restoration sites. Although these are real places, the projects shown are imaginary. The ‘after restoration’ images are my attempt to depict a rough idea of what could happen if the hypothetical restoration took place. For all of these images, please assume that the sites are either publicly owned or sold by a willing landowner at a fair price. Keeping all that in mind, please look carefully at the images of these five sites and tell me about your preferences (*Show Proxy Sites images*). Feel free to refer back to the list of ecosystem services and their descriptions (*Show Ecosystem Services list*).

Q1: Given the trade-offs in ecosystem services, do you prefer the ‘before’ or the ‘after’ at this site and why?

Q3: Would you prefer that the site be restored differently?

Interview Wrap-Up Section (5 minutes):

Is there anything you would like to add before we wrap up our interview?

APPENDIX D: Features and Objectives Ranking Cards

* Respondents interacted with these as cards, printed on paperboard and cut along the lines

Features

PRIVATE HOMES apartments, condominiums, and single family residences within 200 meters of the Puget Sound shoreline	AREAS WITH HIGH NATIVE PLANT COVER including coastal forests, shrubs, and kelp and eelgrass within 200 meters of the Puget Sound shoreline
FARMS land areas dedicated to the production of fruit, vegetable, grain, flower, or seed crops or the rearing of livestock for meat or milk, within 200 meters of the Puget Sound shoreline	PUBLIC BEACHES AND PARKS semi-natural areas, owned and maintained by local, state, or federal agencies, open to all for recreation, within 200 meters of the Puget Sound shoreline
WILDLIFE CONSERVATION AREAS natural areas within 200 meters of the Puget Sound shoreline that are preserved for wildlife populations. These may or also allow human recreation, but only if it is compatible with wildlife goals	SHOPS AND RESTAURANTS places to eat and purchase goods and services within 200 meters of the Puget Sound shoreline
PIERS AND BOARDWALKS structures over and along the Puget Sound shoreline that allow people to walk easily and patronize businesses	AQUACULTURE AREAS places where fish and seafood are farmed in net pens, tubes, floats, or other enclosures. These are typically located in coves and on tidelands
HABITAT FOR SALMONIDS AND OTHER NATIVE FISH natural places that provide food and shelter to juvenile salmon and trout, rockfish, and small, schooling fishes that are key prey items for larger predatory fish and wildlife in a marine food web	NATIVE SHELLFISH AREAS places that promote the existence and growth of shellfish like geoduck clams, Dungeness crabs, hardshell clams, and Olympia oysters

MARINAS sheltered harbors where boats are kept in the water and there are services geared to the needs of recreational boating	PORTS AND SHIPPING AREAS facilities for receiving large commercial ships and transferring cargo
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Objectives

RESTORATION SHOULD BE LOW-RISK AND SELF-SUSTAINING Focus on sites that scientists believe are highly likely to produce the intended outcomes and to maintain positive outcomes over long time periods.	ENHANCE ADJACENCY AND CONNECTIVITY Focus on restoring or preserving sites that are next to other natural areas, or help to connect two other natural areas.
PROTECT RARITY Focus on restoring or preserving sites that represent unique ecosystems.	PRESERVE COMMERCE AND HEAVILY-USED SITES Focus on preserving sites that have high economic benefit as-is, or are used by a lot of people on a regular basis.
IMPROVE WATER QUALITY Focus on restoration that will help Puget Sound and its associated waters to have fewer toxic substances, chemical imbalances, and unwanted microorganisms.	RECOVER SPECIES Focus on restoring or preserving sites that are expected to increase the abundance of threatened or endangered wildlife.
PROVIDE ECOSYSTEM SERVICES Focus on restoring or preserving sites that provide a relatively high amount of ecosystem services.	PROTECT BIODIVERSITY Focus on restoring or preserving sites that have a wide variety of native plant and animal species.

INCREASE RESILIENCE Focus on restoring or preserving sites that are expected to improve the overall ability of the region to withstand stresses such as natural hazards, climate change, and population growth.	RESTORE PROCESSES Focus on restoring or preserving sites that are expected to restore important processes like sediment and nutrient cycling.
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APPENDIX E: PROXY SITE EXAMPLE

* Respondents interacted with these in landscape format, cut in half, printed on paperboard



Aerial view of road area along coastline
BEFORE restoration.



Aerial view of road area AFTER restoration.
Road segment is removed. Dock is also removed
because it no longer has road access.



Surface view of road area BEFORE
restoration. Ecosystem services provided:
Recreation (driving along coastline and use of
the dock). Also, transportation.



Surface view of road area AFTER restoration.
Ecosystem services provided: Water purification
(cleaner water because of less run-off), Recreation
(beach combing - larger, quieter beach). Also, fish
habitat (because of sandier beach).