

THE CURRENT STATUS OF ENVIRONMENTAL INTERPRETATION IN
WASHINGTON STATE PARKS ON PUGET SOUND

by

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The Puget Sound Initiative (PSI) is a large-scale federal and state restoration effort to improve the health of Puget Sound. Among many broad-scale initiatives involving Washington State and local governments and tribes, the PSI has identified 24 State Parks on Puget Sound as sites to model Sound friendly development with restored shorelines and advanced stormwater and wastewater treatment facilities. The lack of public awareness of Puget Sound's eroding health in the communities surrounding the Sound has been identified as a major barrier to gaining the support needed for successful restoration and protection of watershed natural resources. This thesis describes the potential of an environmental interpretation component of the PSI to educate and encourage environmentally responsible behavior in the millions of citizens who visit Washington State Parks on Puget Sound. It also provides an assessment of the current status of environmental interpretation in those parks. Current research suggests environmental interpretation in public parks can be an important and effective natural resource management tool. Analysis reveals that environmental interpretation is a stated natural resource management policy objective of the PSI and Washington State Parks agency and specific interpretive plans have been created to showcase the "Puget Sound Friendly" wastewater and shoreline development improvements in Washington State Parks. An embedded case study of several Green Vision parks (parks specially designated as models of "green practices") compares stated environmental interpretation policy objectives with actual implementation as well as assesses the level of support for interpretation in Washington State Parks. Most of PSI cleanup efforts in the parks have

been completed, yet there is minimal evidence of implementation of the environmental interpretation plans designed to accomplish the PSI goals. Lack of financial resources remains the principal barrier to increased environmental interpretation and implementation at these sites.

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1. INTRODUCTION

In response to growing evidence of increasingly complex environmental problems such as pollution and declines in species diversity, the United States and many countries around the world have identified environmental education as essential for their citizens (UNESCO, Tbilisi Declaration, 1978). Much of the focus to provide environmental education is in formal education settings, such as integration of environmental concepts and content into the K-12 classroom curriculum. Providing environmental education in formal programs is important to improving environmental literacy and yet research shows there are even more opportunities to reach children and adults outside of their school experience, while they are recreating (Falk and Dierking, 2002). Environmental education that occurs in these non-formal settings is usually referred to as environmental interpretation and shares the same goals to increase our understanding, motivation, and skills to care for our world sustainably. This thesis addresses an example of an environmental problem about which the surrounding local citizenry is largely ill informed and the role environmental interpretation can play to build an engaged and supportive community.

Puget Sound, as the watershed basin that houses marine life and waters where local rivers and watersheds empty, is an important local natural resource that is highly impacted by the large surrounding urban population. The vast majority of its people believe Puget Sound is in good or excellent health (Puget Sound Partnership (PSP), 2008; PSP, 2013) and yet the truth is far different and scientists believe much of the ills of Puget Sound are caused by human actions (EPA, 2014). Although scientists, federal, and

state policy makers have identified the human causes for Puget Sound's degradation and designed large-scale restoration efforts to fix many of its environmental issues, lack of public awareness is recognized as a key obstacle in garnering support needed for success. In response, a major part of the most recent state and federal restoration action plan, called the Puget Sound Action Agenda, calls for citizens to improve their understanding and take steps individually and collectively to protect, restore, and maintain the health of Puget Sound by 2020. This thesis examines the need for increasing environmental education for those living in and recreating in Puget Sound to help people become aware of the plight of Puget Sound and understand how we can support something we treasure.

The inspiration for my research came from an initial observation I made while recreating in a popular public park along the shorelines of Puget Sound; it led me to wonder, "Why don't I see any public education about Puget Sound in this incredible venue?" My perspective came from a career in environmental education and interpretation, together with training in Puget Sound ecology and conservation policy. I wanted my MES thesis to represent a culmination of my academic and professional background with a focus on the role of public education in environmental policy to create the necessary awareness, attitudes, skills, and behaviors among various targeted populations. The thesis' main questions stemmed from my wanting to know more about current public environmental education efforts in what my observations suggested were underutilized and yet strategic non-formal settings with great potential for creating environmentally engaged and supportive citizens.

This thesis provides both an analysis and assessment of environmental interpretation's role in public education and natural resource management of Puget Sound

in Washington State. It includes original research on the current status of environmental interpretation in Washington State Parks on Puget Sound. The thesis is essentially an examination of the potential, policy, and practice of environmental interpretation in Washington State Parks on Puget Sound.

My research presented in the thesis' literature review indicates that many studies support the use of environmental interpretation in public parks as a central component of any comprehensive strategy for fostering environmentally responsible behavior (Negra and Manning, 1997). Parks often identify stewardship of cultural or natural resources in their mission and have goals to increase a visitor's knowledge or skills regarding the resource with the intention that informal learning and meaningful connections with the resource will support conservation activities. The mission becomes a mandate for learning objectives with behavioral outcomes and research suggests that environmental interpretation can be an effective component in achieving these goals (Falk, Heimlich, and Foutz, 2009). If natural resource management efforts to restore Puget Sound by 2020 are to be successful, these management efforts need public support. In the strategically located and heavily visited Washington State Parks on Puget Sound shorelines, it makes sense to align Washington State natural resource management goals with enhanced State Park environmental interpretation services in these parks.

In addition to an analysis of the potential of environmental interpretation, this thesis also provides an assessment of the current status of environmental interpretation in Washington State Parks on Puget Sound. These findings suggest where to focus development and resources going forward. My original research was in the form of a case study that included an assessment of policy and support of environmental interpretation

in Washington State Parks in general as well as what is being implemented in practice through first-hand surveys of selected parks.

In 2005, legislation and funding supported a Puget Sound Initiative (PSI) to kick-start a renewed focus on Puget Sound restoration. Part of the cleanup efforts targeted 24 Washington State Parks on Puget Sound to make environmental improvements and model “Puget Sound friendly” development with restored shorelines and advanced storm water and wastewater treatment facilities (DOE, 2006). I chose to examine these Puget Sound parks for the case study, to investigate what environmental interpretation about Puget Sound was currently available for recreating park visitors. I also conducted an embedded case study for Fort Flagler, Twanoh, Saltwater, and Fort Casey State Parks, parks that are part of the Puget Sound Initiative’s “Green Vision” strategies that resulted in specific environmental interpretation plans. The embedded case study provided an opportunity to examine more fully how implementation of environmental interpretation is or is not supported on the ground.

Analysis revealed that environmental interpretation is well supported in stated policy objectives with goals to showcase Puget Sound Friendly wastewater and shoreline development improvements in the 24 Washington State Parks. Most of the Puget Sound Initiative-driven cleanup efforts in the parks have been completed. However, case study results from direct observations show that after eight years since the projects were started, the environmental interpretation plans designed to accomplish the PSI public awareness and engagement goals have not been implemented.

Lack of financial support and staff resources proved to be the principal barrier to implementing stated policy and goals for increased environmental interpretation and implementation at all these sites. Analysis revealed that, although Washington State Parks has not carried out its specific implementation plans, its employees nevertheless sustains an interest in keeping true to its own mandates and vision, and continue to work toward these goals, slowly but surely. In addition, I found that some interpretation is happening on a smaller scale, thanks to the passion of inspired and resourceful individuals who capitalize on alternative avenues of support. I conclude the thesis with highlighting environmental interpretation's potential in Washington State Parks on Puget Sound and why we should prioritize its support to achieve the ultimate goal of restoring the health of the Puget Sound ecosystem. I also include some recommendations regarding a highly underfunded but worthwhile endeavor and some possible solutions based on the positive initiatives that I observed.

2. LITERATURE REVIEW

My literature review was based on specific research questions I describe here along with the literature review methodology I used to answer them. Research involved examining the field of *environmental interpretation* to provide a clear understanding of how this form of environmental education is unique, appropriate, and important for use in natural resource management efforts such as those in place for Puget Sound's large-scale environmental restoration. In this chapter, I review the concepts behind environmental interpretation's promise in recreational settings and provide background and context for the case study that examines its practice in Puget Sound's Washington State Parks. A large part of the literature review provides background on Puget Sound's environmental degradation and long history of natural resource management efforts to reverse its decline. This served to illustrate the enormity and importance of the problem but also to put in perspective the challenge of its surrounding communities being largely unaware of its plight and the importance of an effective public awareness and engagement campaign to solving the problem.

2.1 Research Questions and Methodology for Literature Review

- 1) How is environmental interpretation distinct from other forms of environmental education?
- 2) How is environmental interpretation employed in natural resource management?

- 3) What does current research suggest about the effectiveness of environmental interpretation?
- 4) Do current natural resource management plans for restoring Puget Sound involve environmental interpretation? If so, in what ways?
- 5) How do Puget Sound natural resource management plans include the Washington State Parks and Recreation agency?

A significant research component was in the form of a literature review to investigate the potential of environmental interpretation in natural resource management efforts, including Puget Sound. To examine the field of environmental interpretation and distinguish this strand of environmental education, I read numerous relevant books and articles from practitioners and researchers, including theses that have examined comparisons between environmental education and environmental interpretation. I used the recommended texts from the National Association for Interpretation professional certification courses and United States National Park Service documents to help define and summarize environmental interpretation goals and methodology. I studied the use of environmental interpretation (EI) in natural resource management and current research into how this communication approach may contribute to raising public awareness of natural resource issues and to promoting conservation attitudes and behaviors. Because this thesis focuses on environmental interpretation programs and services offered to the general recreating visitor in a public park, I tried to find any research conducted on this specific type of audience. This led me to review tourism-based studies and relevant

research from “Free Choice” learning studies that point to the importance of recreational, informal education opportunities and their promise for supporting environmental literacy.

To characterize Puget Sound natural resource management efforts, I read U.S. federal and Washington State agency reports and peer reviewed scientific research papers that inventory the wealth of Puget Sound’s natural resources and assess the health of Puget Sound. I also studied restoration plans for Puget Sound prepared by the United States Environmental Protection Agency (EPA) and Washington State natural resource agencies, as well as plans for the Puget Sound Initiative prepared by its State governing body, the Puget Sound Partnership. I examined all these plans to see if environmental interpretation was part of Puget Sound natural resource management. I also reviewed available statistics on the general public's environmental literacy and perceptions of the health of Puget Sound.

Results from my literature review to help answer my research questions presented in section 2.1 are summarized and separated into sections headings 2.2 Environmental Interpretation; 2.3 Natural Resource Management of Puget Sound; and 2.4 The Puget Sound Initiative and Washington State Parks.

2.2. Environmental Interpretation

Here I summarize research results that provide background for understanding the type of public environmental education this thesis examines, including defining environmental interpretation (EI), concepts behind EI’s methodology, its use in natural resource management, and its potential in reaching citizens in outdoor

recreational settings. I will start this section with a few key terms relevant to explaining environmental interpretation.

Environmental Education:

A definition of "Environmental Education" first appeared in *The Journal of Environmental Education* in 1969:

Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

(Stapp, W.B., et al., 1969).

Since 1969, the importance of environmental education has gained worldwide recognition. The following list contains some of the environmental education definitions created by the United Nations Environment Programme (UNESCO-UNEP), the International Union for Conservation of Nature (IUCN), and the U.S. Environmental Protection Agency (EPA).

- Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among humans, cultures, and their biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behavior about issues concerning environmental quality (IUCN, 1971).

- Environmental education is a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978).
- Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions (EPA, 1990).

While there are many forms of communication strategies involved in environmental education, with various terms used to describe aspects of the educational setting, target audience, and methodology, all have the same ultimate goal of the promotion of responsible environmental behavior. The term “environmental education” is often considered to be the “formal” aspect, undertaken in schools or higher education where students participate in a sequential learning process (Knapp, 1997; Falk and Dierking, 2002). The North American Association for Environmental Education (NAAEE) uses the following definitions for “non-formal” and “informal” environmental education:

Non-formal Environmental Education:

Education about the environment that takes place at non-formal settings such as parks, zoos, nature centers, community centers, youth camps, etc., rather than in a classroom or school.

Informal Environmental Education:

Any unstructured environmental education activity outside the formal system where people learn from exhibits, mass media, and everyday living experiences.

Also referred to as free-choice environmental education (NAAEE, 2009).

The terms “non-formal” and “informal” environmental education are frequently used interchangeably to describe environmental education that occurs outside the traditional education system (Falk, et al., 2009, NAAEE, 2009).

In *Environmental Communication: Skills and Principles for Natural Resource Managers, Scientists, and Engineers*, the authors provide a way to distinguish between formal and non-formal environmental education, using two representative case studies with differing institutional settings of the informational exchange and audience focus. To illustrate “formal environmental education,” the authors reference “Project Wild,” an environmental education program targeted to K-12 students that provides curriculum and teacher workshop training and, “is the most widely used environmental education program in the United States” (Jurin et al., 2010). To provide an illustrative example of “non-formal environmental education,” the authors provide another case study:

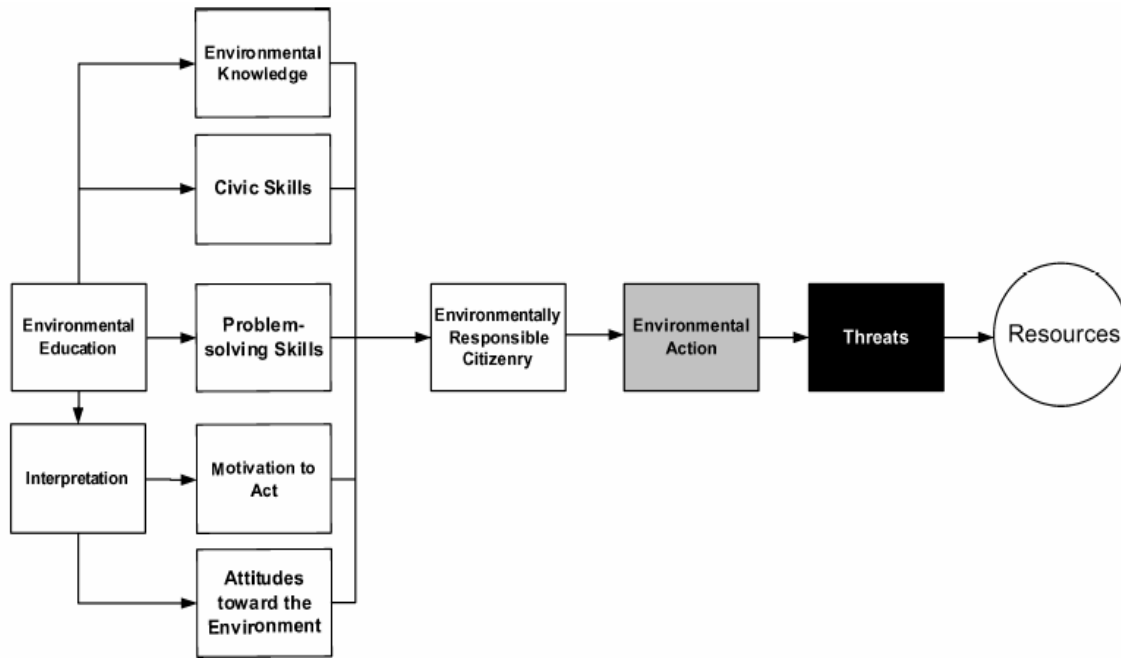
Environmental Interpretation: Great Barrier Reef Marine Park...It is a National Park, a United Nations World Heritage Site, and the largest coral reef system in the world...visited by 4.9 million people a year...and supports an array of educational and interpretive services, including traditional media such as signage, rangers, fact sheets, and newsletters, plus more elaborate means including cutting edge websites and ReefHQ, an aquarium containing 4 million liters of coral creatures on display for park visitors (Jurin et al., 2010).

The type of non-formal environmental education illustrated in the above case study example is similar to the environmental interpretation this thesis examines and discusses below in more depth.

Environmental Interpretation:

In the research journal, *Applied Environmental Education and Communication*, an article entitled “Putting Environmental Interpretation to Work for Conservation in a Park Setting: Conceptualizing Principal Conservation Strategies” presented a conceptual model on environmental interpretation’s relationship to environmental education, seen in Figure 1 The concept model is based on Tbilisi Declaration, and shows that interpretation contributes to environmental education programming by promoting positive environmental attitudes and motivation to act.

Figure 1. Concept model of relationships linking interpretation with environmental education (Kohl, 2005).



The overlap between interpretation and environmental education has been discussed by many but, in general, environmental interpretation is considered an aspect of environmental education with a similar mission that aims to raise public awareness of environmental issues and motivate people to engage in environmentally responsible behavior (Knapp, 1997; Ham and Krumpel, 1996; McClelland, 2002). However, regardless of similar mission and goals of environmental interpretation and environmental education, the methodologies to achieve them are what separate the two. Environmental interpretation involves non-formal communication activities that are voluntary (“free-choice”) and located in informal settings (Kohl, 2005; Falk, et al., 2009; Ham, 2013).

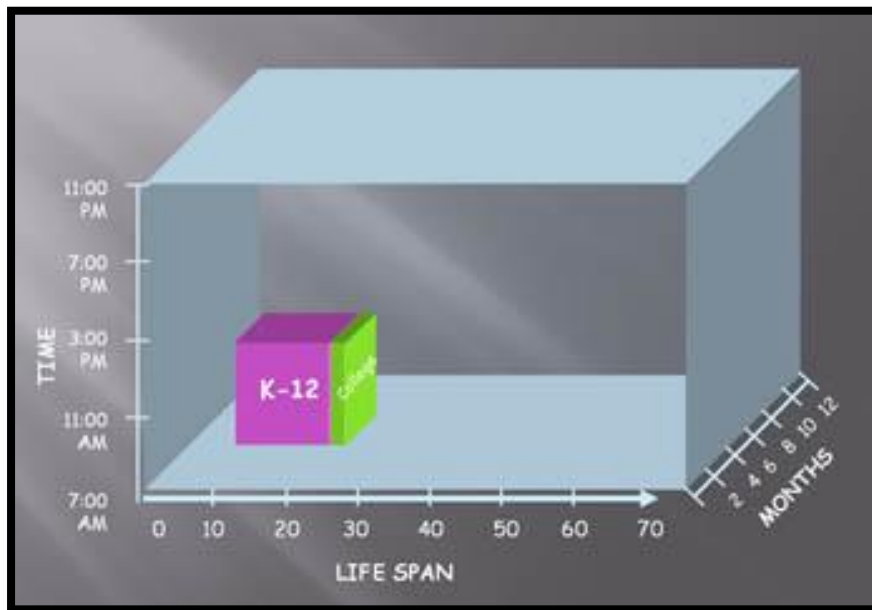
An important distinction about the kind of informal education associated with environmental interpretation is the “free-choice” orientation of the participant doing to

the learning. In the introduction to the book *Free-Choice Learning and the Environment*, the authors state that free-choice learning is a term “to describe learning that occurs in environmental education when the learning is largely under the choice and control of the learner” (Falk, Heimlich, and Foutz, 2009). They go on to define this kind of learning as,

A personally and socially constructed mechanism for making meaning in the physical world. Our definition is a broad one and includes changes in cognition, affect, attitudes, and behavior (p.11).

There is a growing understanding of the significance of “free-choice” learning because studies have shown that young people and adults spend most of their lives learning outside of the formal school system (Falk and Dierking, 2002; Falk, Storksdieck, and Dierking, 2007). Research shows people spend less than 10% of their learning in formal education settings (Figure. 2) and that we learn about science and the environment primarily through non-formal education that includes programs and activities in museums, zoos, aquariums, science centers, and other community educational institutions and organizations as well as media-generated sources such television, radio, newspapers, and the Internet (Falk, et al., 2007; National Research Council, 2009).

Figure 2. Visual representation of amount of time average U.S citizen spends in formal educational system in their lifetime (NRC, 2009).



Environmental interpretation occurs in protected natural resource sites such as public parks and is considered free-choice non-formal environmental education. Environmental interpretation is based on the general concepts behind interpretation of protected resources or heritage sites. From the National Parks and protected areas of the United States came the concept of interpretation to advocate for the sites' protection and to generate enthusiasm and appreciation for the natural and cultural resources of the country (Ham, 1992; McClelland, 2002). In *Interpreting Our Heritage*, Freeman Tilden was the first author to define interpretation; Tilden's definition is the operating definition for interpretation still used today for the U.S. National Park Service (NPS, 1999/2003):

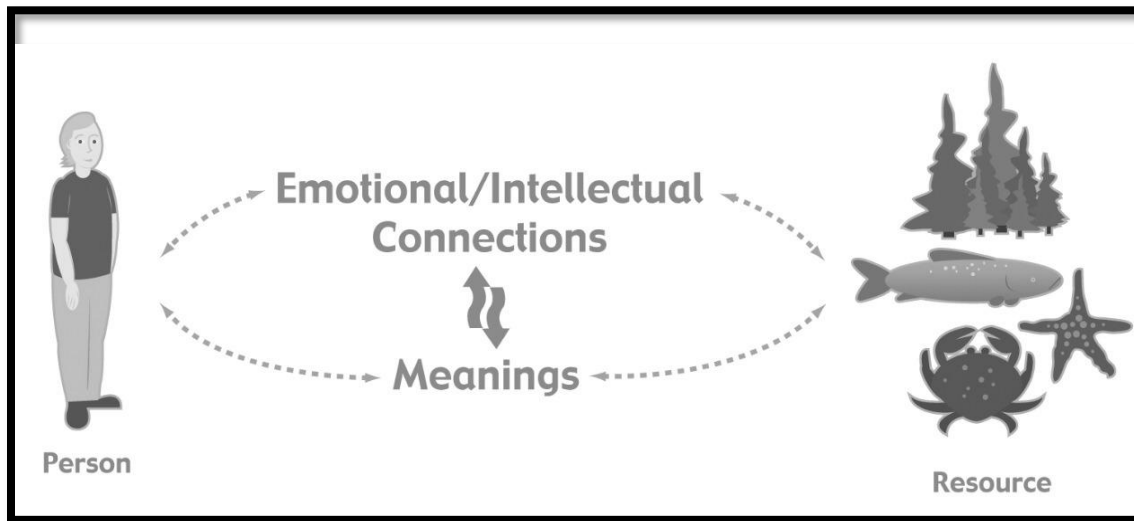
An educational activity which aims to reveal meanings and relationships through the use of original objects, by first hand experiences and by illustrative media, rather than simply to communicate factual information (Tilden, 1957).

The United States' interpretation professional association, National Association for Interpretation (NAI), and The Definitions Project (a consortium of over two dozen federal and non-profit organizations that came together to agree on common terminology used by interpreters, environmental educators, and others in non-formal settings), define interpretation as follows:

Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource (NAI, 2014).

Interpretation services may be either personal, i.e., delivered by a human person, or non-personal, i.e., delivered by physical objects, signage, or print or audiovisual media (Brochu and Merriman, 2002). Whether personal or non-personal, interpretation services aim to provide opportunities for intellectual and emotional connections between people and resources (Figure 3).

Figure 3. Conceptual model of processes (connections and meanings) defining the person-resource relationship (Miller, 2010).



Resource interpretation provides communication tools to federal and state land and water managing agencies, local public sector service providers, and private non-profit organizations that assist them in their efforts to promote appreciation and conservation of site resources and processes (Brochu and Merriman, 2002; Ham, 1992; Larsen, 2003). Resource interpretation's meaning-making and meaning-revealing processes assist resource management entities accomplish their goals.

The communication tools of interpretation are well suited for delivering messages to the public, including resource values and preservation and visitors' appropriate behaviors (Ham and Krumpel, 1996; Knapp et al., 1997; Kohl, 2005). The idea is that people who make intimate, personal connections to the resources can experience a change in their emotions, intellect, or both and thus can transform their relationships to site resources. When an interpretive experience successfully facilitates personal connections to resource meanings, the audience forms a personal bond with the resource; its meanings act upon them and they value the resource more. Through opportunities for

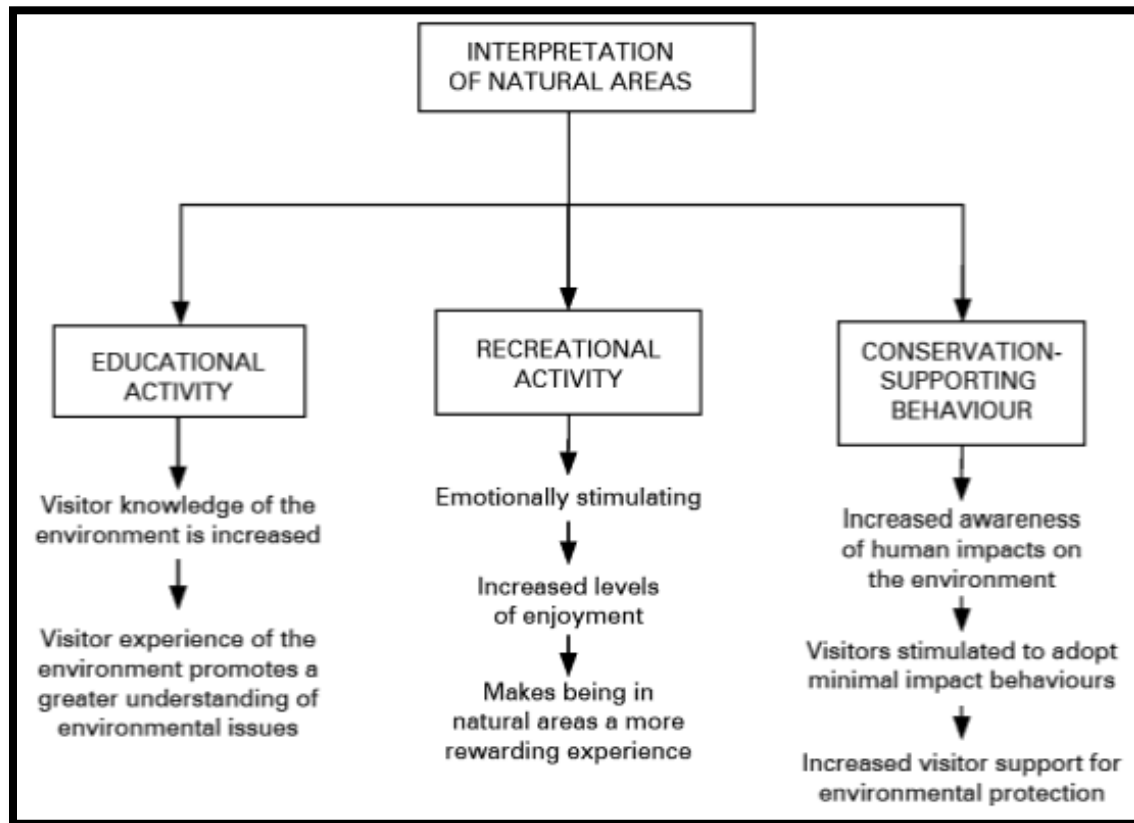
connections to resource meanings, people come to care about natural and cultural resources and, over time, to care for them (Larsen, 2003).

Sam Ham, Professor of Communication Psychology at the University of Idaho and author of the book, *Interpretation: Making A Difference On Purpose*, argues that it is the personal connection and individual meaning-making aspect of interpretation that distinguishes it from other forms of communication,

Most important is its emphasis on connection making and the audience, since these two elements are at the heart of the difference interpretation can make, at least if it's done well. The definition is consistent with dozens of studies that have demonstrated that the more an audience is provoked to do its own thinking and make its own connections, the stronger and more enduring their attitudes about related things will be as a result (Ham, 2013, pp.8).

Ham highlights that interpretation is a purpose-driven, mission-based communication strategy with three main outcomes: 1) enhancing experiences, 2) facilitating appreciation, and 3) influencing behavior (Ham, 2013). In his book, *Environmental Interpretation: A Practical Guide for People with Big ideas and Small Budgets*, author Sam Ham popularized the term “environmental interpretation” for interpretation put to explicit environmental purposes (Ham, 1992). Environmental interpretation is the communication approach used in protected natural areas such as public parks with the goal of fostering support for conservation based behaviors (Figure 4).

Figure 4. Communication approach and outcomes of interpretation in natural protected areas (Newsome et al, 2013)



Public parks often identify stewardship of cultural or natural resources in their mission and have goals to increase a visitor's knowledge or skills regarding the resource with the intention that informal learning and meaningful connections with the resource will support conservation activities. In *Interpretation of Cultural and Natural Resources*, the authors state,

The goal typical of most U.S state park systems aims to stimulate appreciation and awareness of the environment and motivate involvement in the conservation of natural resources (Knudson, Cable, and Beck, 2003).

Parks agencies also use interpretation as a means to influence the visitor to cooperate with resource management. As described by Sam Ham's "From Interpretation to Protection: Is There a Theoretical Basis?" (2009) and "Interpretation as Strategic Communication in Protected Area Management" (2012) there are many examples of interpretation that have proven to be effective at reducing a variety of undesirable behaviors in parks' natural settings including problems of improper food storage by campers in bear country, off-trail hiking, improper wildlife feeding, theft of petrified wood and other artifacts, and dogs off leashes in protected areas. Other interpretive strategies aim to promote environmentally responsible behaviors such as encouraging visitors to pick up litter left by others, proper tidepool exploration etiquette, and convincing tourists to donate to local conservation funds.

In "Putting Environmental Interpretation to Work for Conservation in a Park Setting: Conceptualizing Principal Conservation Strategies", author Jon Kohl states, "the use of interpretation to reduce visitor impacts in a park is the most commonly cited conservation application" (p. 8). He goes on to describe the main behavior change theories behind influencing visitor impacts to parks, such as the Theory of Planned Behavior and Elaboration-Likelihood Model. These theories operate on the idea that visitor beliefs (beliefs about the actions, social norms, and personal capacity to affect resources) influence attitudes, which influence intentions to act, which influence the possibility that a visitor behaves in a certain way (Kohl, 2015, p.8). Therefore, the use of interpretation to influence visitor behavior in relation to their visit to a particular site is an important management tool with the capacity to reduce inappropriate behavior through

education. However, while it is important to maintain this function, Ballantyne (1998) urges interpreters to extend their vision beyond the needs of the site itself.

Interpretation which challenges visitors to examine their environmental attitudes and the impacts of their actions, and develops visitors' skills in identifying, analyzing, evaluating and applying solutions to environmental problems can contribute to this ultimate goal (p. 78).

There is a growing body of research that examines the factors and theoretical frameworks underlying environmental interpretation's potential as a rewarding, meaning-making process and its ability to deepen and expand environmental awareness, appreciation and concern and the development of intentions to take or refrain from specific personal actions that have an impact on the environment as a whole (Ballantyne and Packer, 2005, p. 8). One of the main difficulties of assessing environmental interpretation's ability to influence development of conservation awareness, attitudes, and behaviors is the fact that, like all of free-choice learning experiences, visitors differ greatly in their knowledge, values, interests, and motivations (Falk and Dierking, 2000). However, there are several factors about environmental interpretation in outdoor recreational settings such as parks that suggest these venues can motivate visitors to learn and develop supportive attitudes and behaviors in relation to the natural environment.

The book *Free-Choice Learning and the Environment* consolidates understandings from existing research that investigates visitor factors that contribute to learning and behavior change in free-choice environmental contexts. In discussing the role of motivations the authors state,

Most human learning is self-motivated, emotionally satisfying, and personally rewarding. A number of investigators have found that humans are highly motivated to learn when they are in supporting environments; when engaged in meaningful activities; when they are freed from anxiety, fear, and other negative mental states; when individuals have choices and control over their learning; and when the challenges of the task meet the person's skills. (Falk and Heimlich, 2009, p.30).

Since most, if not all, of these conditions apply to the contexts of environmental interpretation for recreating park visitors this thesis considers, it follows that parks should be highly motivating settings for people to learn about the environment. In Negra and Manning's study (1997) of state park visitors, the researchers found that recreation and appreciation of natural beauty are perceived to be most important motivations to visit parks but opportunities for learning about protecting and respecting nature are also important (p. 10). Contextual factors also underscore the potential of environmental interpretation in public parks to affect the attitudes of visitors who come to recreate in natural environments.

Yocco (2010) reviews studies that have shown that individuals feel stronger connections to natural environments than built environments; that feelings of higher connectedness correlate with environmental attitudes; and that connectedness can increase based on experiences in natural settings (p. 29). Researchers' evidence that some people obtain health and psychological benefits from time spent in natural settings (Louv, 2005) may "explain some of the positive emotions toward nature, and may suggest which natural settings will facilitate learning positive affect" (Myers, Saunders, and Bexell,

2009, p. 55). Positive emotions and feelings of connectedness towards nature may be the most important aspects of enhancing environmental literacy, especially in nature near the places where they live, work and play (Schubel, Monroe, Schubel, and Bronnenkant, 2009, p. 123). Appeals to emotions and focusing on affective elements are also important because “rational decision-making processes are not sufficient to explain engagement in such behaviors without taking into account the power of emotions and emotional affinity toward nature” (Ballantyne and Packer, 2009, p.160). Environmental interpretation can also serve to reinforce and affirm positive sentiments towards nature already held by park visitors and in public parks mission-based natural resource protection frameworks.

In an article entitled, “Promoting Environmentally Sustainable Attitudes and Behaviour Through Free-choice Learning Experiences: What Is the State of the Game?”, Ballantyne and Packer (2005) present their summary of research findings regarding the factors that contribute to the effectiveness of environmental interpretation in influencing the adoption of environmentally sustainable attitudes and practices. Influences that have been most consistently identified include using appeals to the emotions and focusing on affective elements. In addition, focusing on the evidence of an environmental problem (particularly in relation to human impact and mismanagement), the effects of the problem (particularly in relation to wildlife and wildlife habitats), and the efforts needed to alleviate the problem (practical steps the learner can take) allows the cognitive, affective and behavioral elements to be effectively integrated (p. 8).

In a 2014 article, “Structural Relationships Between Environmental Attitudes, Recreation Motivations, and Environmentally Responsible Behaviors”, the authors’ study of hikers on a 1000-mile-long nature trail found that natural environments that provide

opportunities to recreate generate support for those areas, and that natural environments help foster pro-environment attitudes and environmentally responsible behaviors. They suggested the implications were that public land managers shape more than just the immediate experiences for visitors in an area. The authors suggested therefore that strategies of increasing awareness about and appreciation for their natural areas through outlets such as mass media, internet, and on-site interpretive programs can influence pro-environmental attitudes and behaviors (Kil, Holland, and Stein, 2014).

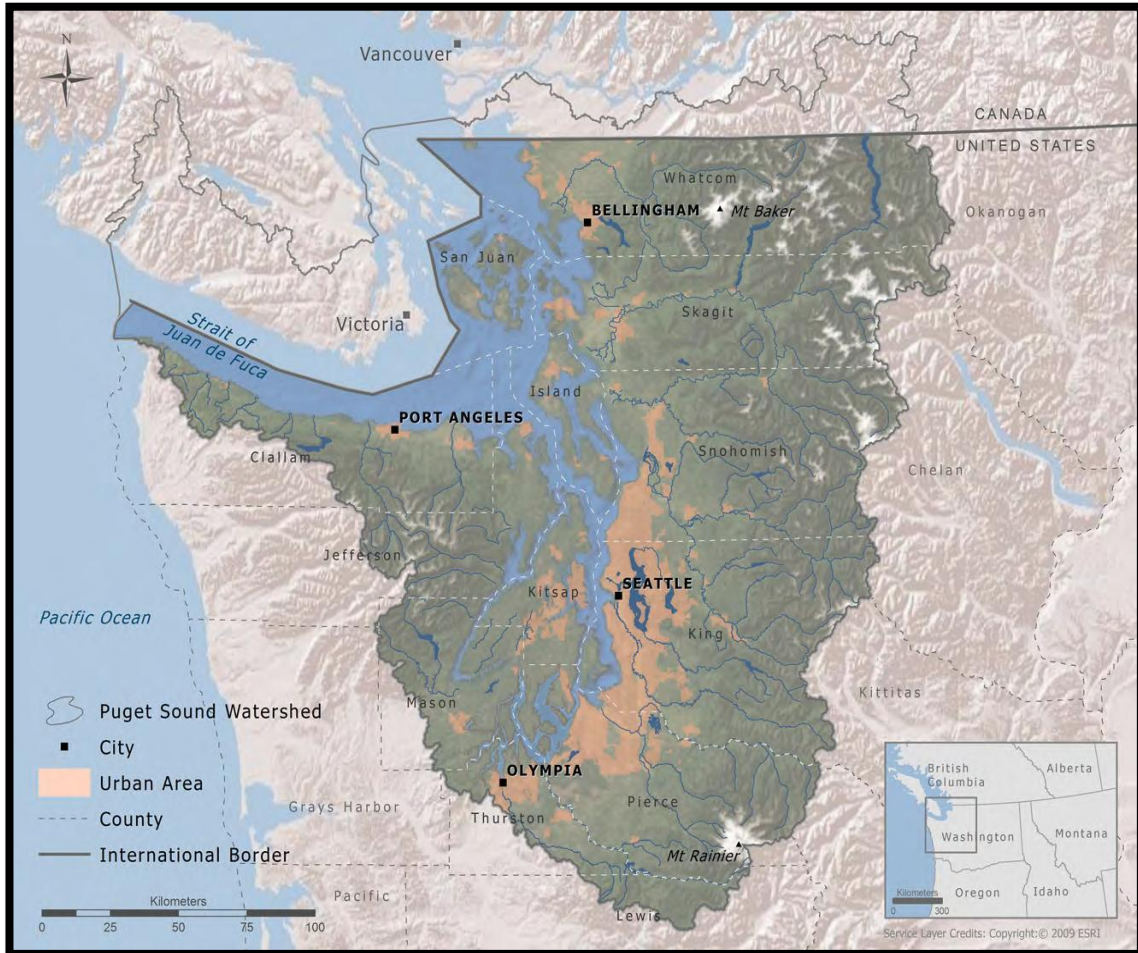
Falk and Heimlich (2009) point out that a major benefit of site-based natural resource agencies is that most visitors come with a bias in support of the organization's mission; visitors to these environmental sites come with the pre-disposition toward an inherent valuing of the site they choose to visit and thus. Thus, "the opportunities for environmental organizations and institutions to use their physical settings and facilities to help their visitors and users learn desired outcome messages is tremendous" (p. 12). The authors also cited an article that reviewed a report for the U.S Fish and Wildlife Service National Conservation Training Center's Division of Education Outreach (Byers, 2003) which described sixteen examples of the successful use of free-choice environmental learning in natural resource agency settings. Researchers that analyzed the results found the key to success in each of the sixteen cases was that the education programs were tied directly to the mission of that the organization was attempting to achieve. In this way, the free-choice learning opportunities were viewed as essential, instead of as public relations or "nice to do" but not necessary activities (Ady and Potter, 2009). The authors of the findings concluded, "Clearly, free-choice environmental learning can be a critical factor in designing and implementing environmental policy" (Ady and Potter, 2009, p.178).

2.3 Natural Resource Management of Puget Sound

Puget Sound is the second largest estuary in the United States, encompassing 1.6 million acres of land and water. The Puget Sound region encompasses marine waters, the coastal areas that border the Sound and watersheds that drain into it. Fourteen large rivers and ten thousand streams in nineteen major watersheds all drain into the fjord-carved marine basin with over 2,500 miles of shorelines (Figure 5). Marine environments include bluff-fed beaches, mudflats, salt marshes, small and large river deltas, kelp and eelgrass beds, and deep-water habitat. Its temperate climate zone and habitat diversity create incredible biological productivity. The basin's marine environment supports over 220 species of fish, more than 100 species of birds, 26 species of marine mammals, and a multitude of invertebrates and plants (EPA, 2010; PSP, 2008).

Washingtonians enjoy and depend on Puget Sound's natural resources that define Washington State's heritage, culture, and quality of life. The region is home to over four million people, who constitute 70 percent of the population of the state of Washington, and is expected to increase to over 5 million by 2020 (Stinchfield, et al., 2009). However, despite Puget Sound's beautiful and bountiful appearance, effects of urbanization and development from the region's rapidly growing population have contributed to a number of serious environmental problems in the Sound.

Figure 5. Map of Puget Sound's watershed (PSP, 2012).



Polluted by decades of industrial, residential, agricultural, and transportation related activities, toxic chemicals wash into Puget Sound and enter its food chains. Low oxygen levels caused by pollutants are causing measurable harm. Critical habitat like salt marshes, eelgrass beds and estuaries are damaged by development along shorelines and pollution washing off all the hard impervious surfaces. Over the years, these and other environmental threats have combined to cause major declines in populations of marine birds, fish, and marine mammals (U.S E.P.A, 2010; Gaydos and Brown, 2011; PSP, 2008). Pollution and less productive environments seriously degrade Puget Sound's water

quality and important habitats for native wildlife and also threaten the surrounding human community's health, recreational opportunities, and economic activity.

Figure 6. Newspaper announcement on toxics in Puget Sound



Although as early as the 1920s people in the region began to become concerned about the health of Puget Sound (Encyclopedia of Puget Sound, 2014), it was not until the 1970s and 80s that media alerts (Figure 6) on industrial toxics in sediment-dwelling fish significantly impacted the way the public viewed the health of Puget Sound (EPA, 2014). This new understanding of the human threat to Puget Sound led to the creation of two federal Superfund sites and new approaches to ecosystem management across Puget Sound. In 1985, the Washington State Legislature made a commitment to protect and restore Puget Sound when it created an independent state agency, the Puget Sound Water Quality Authority. The legislation required the agency to develop and implement a regionally coordinated, comprehensive water quality management plan. First published in 1987, The Puget Sound Water Quality Management Plan covered many natural resource management strategies to restore Puget Sound watershed basin habitats.

Responding to similar concerns at the national level, Puget Sound became one of the first areas designated under the National Estuary Program (NEP). Congress established the NEP under Section 320 of the 1987 Clean Water Act (CWA) Amendments as a U.S. Environmental Protection Agency (EPA) place-based program to protect and restore water quality and ecological integrity of estuaries of national significance. EPA approved Washington's *Puget Sound Water Quality Management Plan* as the federal Comprehensive Conservation and Management Plan (CCMP), jointly managed by EPA, Washington's Department of Ecology, and the Puget Sound Water Quality Authority (later the Puget Sound Action Team under the office of the state Governor and eventually the Puget Sound Partnership). "Puget Sound" in the natural resource management plans includes all the inland marine waters between Washington and British Columbia, and the rivers and streams draining to Puget Sound (Figure 5). Puget Sound has been an EPA priority under the Clean Water Act for more than 25 years.

Signs of Puget Sound's unhealthy conditions became highly evident once again in the early 2000s with widespread hypoxia-induced fish kills, contaminated shellfish bed closures, and the federal listing of local salmon species and orcas under the Endangered Species Act. Although previous natural resource management work has made strides in addressing toxic chemicals and metals from industrial pollution, threats continue to evolve from the aggregate impact of the region's 4.5 million residents' daily lives (PSP, 2014). The numerous pollutants from these "non-point" sources washing into the Sound from urban development's paved surfaces and untreated wastewater significantly damages important habitat and ecosystem processes (DOE, 2008).

In response, in 2005, Washington Governor Christine Gregoire announced a renewed focus on the part of state government to clean up Puget Sound. She created the Puget Sound Initiative (PSI), the latest incarnation of large-scale federal and state restoration efforts to improve the health of Puget Sound. The initiative involves local, state, federal and tribal governments, business, agriculture and environmental communities, scientists, and the public. The PSI came with an initial infusion of over 50 million dollars to add to the nearly 100 million coming from other state and federal support. The Governor appointed a high-level advisory commission called the Puget Sound Partnership to examine Puget Sound recovery efforts and recommend ways to do it better and craft an Action Agenda to restore Puget Sound by 2020. The legislature replaced the Puget Sound Action Team with the Puget Sound Partnership, as the new lead agency to coordinate Puget Sound's cleanup. Its Action Agenda became EPA's CCMP for Puget Sound in 2008. As outlined in the Puget Sound Initiative's *Action Agenda, Protecting and Restoring the Puget Sound Ecosystem by 2020*, the Legislature tasked the Puget Sound Partnership with three basic responsibilities:

- Define a 2020 Action Agenda that identifies work needed to protect and restore Puget Sound, based on science and with clear and measurable goals;
- Determine accountability for achieving results including performance, effectiveness, and the efficient use of money spent on Puget Sound; and
- Promote public awareness and communication to build support for a long-term strategy (PSP, 2009).

Although public awareness and education had been a goal of previous natural resource management plans for Puget Sound, the Puget Sound Partnership and EPA's

Action Agenda strive to prioritize this aspect as key to success. A major part of the Puget Sound Action Agenda natural resource management plans calls for citizens to improve their understanding and take steps individually and collectively to protect, restore, and maintain Puget Sound. The Action Agenda's introduction specifically states:

Public support, engagement, and a broad shift in public behavior is critical and central to achieving the long-term, multiple objectives of the Action Agenda.

Puget Sound recovery is ultimately a social challenge, with virtually every impact and recovery strategy rooted in the interaction between the Sound's natural resources and its human residents (PSP, 2013).

In addition, public awareness and education are supported by the legislation that created the recovery initiative and the leadership agency. The legislative statute, RCW 90.71, contains multiple references to the need for public involvement, engagement, education, awareness, and participation in Puget Sound protection and recovery:

"... Public involvement will be integral to the success of efforts to restore and protect Puget Sound." RCW 90.71.200.1d

"... Educate and engage the public ..." RCW 90.71.200.1d

"Promote extensive public awareness, education, and participation in Puget Sound protection and recovery" RCW 90.71.230.1g

"Engaging and educating the public regarding Puget Sound's health, including efforts and opportunities to restore Puget Sound ecosystems" RCW 90.71.240.5b

"... Conducting public education activities regarding threats to Puget Sound and about local implementation strategies to support the action agenda" RCW 90.71.250.5d

The focus on raising public awareness and engagement resulted from work done by the Puget Sound Partnership to assess the public's perceptions about the health of Puget Sound and restoration efforts. According to a state-commissioned survey in 2006, only a minority of citizens was aware of the health and condition of waters in and around Puget Sound.

- Three out of four residents rated the environmental health of Puget Sound region “excellent” (7%) or “pretty good” (66%), compared to 19% who rated it “not so good” and 5% who rated it as “poor” (PSP, 2006).
- The restoration of Puget Sound is not a salient issue for the public today. It is not a leading top of mind issue concern overall, or when it comes to environmental concerns.
- When looking specifically at environmental concerns, the public is most concerned about issues related to water quality.
- The most likely sources of pollution are generally believed to be business and industry or sewage (point sources). Non-point sources of pollution are not top of mind for most. People don't see their own personal activities as having much of an impact on pollution.
- Due to the fact that there is no current sense of urgency or great concern regarding environmental issues in the Sound, the public does not yet see the value in paying for restoration efforts.

In response to these findings, the Puget Sound Partnership identified the lack of public awareness about Puget Sound's eroding health as a major barrier to its recovery and created the *Public Education and Awareness Plan* (PSP, 2006). This plan served as

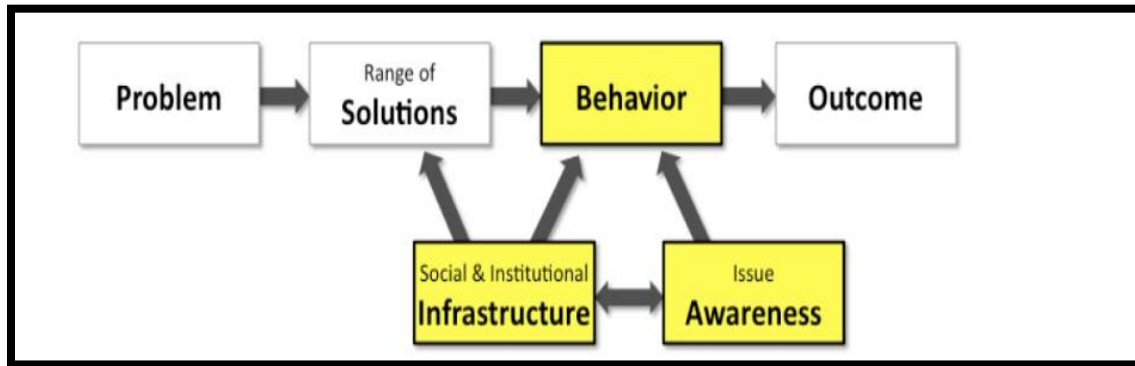
the foundation for the Puget Sound Partnership’s regional approach to public stewardship of Puget Sound with an integrated three-pronged strategy containing the following goals:

- To significantly advance public awareness and understanding of the issues facing Puget Sound, individual and cumulative impacts on the Sound’s resources, and the public’s ability to contribute to a sustained recovery effort.
- To cultivate broad-scale practices among Puget Sound residents that benefit Puget Sound and work to promote such behavior changes.
- To build social and institutional infrastructure to support broad-scale public engagement, foster stewardship, and advance specific beneficial practices and behaviors (PSP, 2006; PSP, 2014).

The goal of raising public awareness also came with a specific initial target to “increase public awareness/concern about Puget Sound – and the land around it – by 35% points (from around 25% to 60%) by June 2009” (PSP, 2006).

Figure 7 shows a visual representation of the Puget Sound Partnership’s model for Puget Sound’s recovery and found in the Public Education and Awareness Plan and Puget Sound Action Agenda. The model describes the roles and relationships of the three goals involving issue awareness, behavior change, and social and institutional infrastructure. Both plans describe the third goal, called ‘social and institutional infrastructure’, as consisting of “the social and communication networks by which we communicate change.....creating the foundation on which change in issue awareness and behavior can occur (PSP, 2006; PSP, 2014).”

Figure 7. Visual model of Puget Sound Action Agenda recovery model (PSP, 2014)



The Puget Sound Partnership’s plan to support social and institutional infrastructure focused on specific communications strategies to raise public awareness of Puget Sound’s health. These included, “mostly paid advertising,” “earned media from special events,” and the creation of a “network of existing resources of educators and communicators already working on behalf of Puget Sound’s health” to help coordinate messages (PSP, 2006). The EPA provided funding support for the Puget Sound Action Agenda, with grants from its Outreach, Education and Stewardship Support Program. In 2009, the EPA awarded six million dollars over five years to the Puget Sound Partnership’s Stewardship Program for implementing the Action Agenda’s Public Awareness and Engagement plans.

Figure 8. EPA Outreach, Education, Stewardship program grant funding to Puget Sound Partnership to implement comprehensive public engagement program to advance Puget Sound 2020 Action Agenda (EPA, 2009).

Outreach, Education, and Stewardship Program Grants

Puget Sound Outreach and Stewardship Coalition: Action Agenda E-4 Implementation
Amount: \$2,000,000 – with incremental funding \$1,000,000 for four years
Matching funds: First year match is \$1,075,000 provided, followed by \$1,000,000 annually for four years thereafter.
Grantee: Puget Sound Partnership
Project description: This project will establish a lead entity of a coalition of more than 300 agencies and organizations to lead public outreach, education, and stewardship efforts across the 12-county Puget Sound region. Working together through a coordinated approach, the grantee will provide the coalition the opportunity to develop, implement and administer a comprehensive public engagement program that will significantly advance the key public education and involvement priorities in the Puget Sound 2020 Action Agenda. It will also create effective social marketing frameworks targeting measurable behavior change.
Outcomes: Awareness and education; stewardship and behavior change

As seen in Figure 8, the description of the project states,

A lead entity of a coalition of more than 300 agencies and organizations to lead public outreach, education, and stewardship through a coordinated approach, the grantee will provide the coalition the opportunity to develop, implement and administer a comprehensive public engagement program that will significantly advance the key public education and involvement priorities in the Puget Sound 2020 Action Agenda (EPA, 2009).

Outcomes of the project were listed as “Awareness and education; stewardship and behavior change” (EPA, 2009). The project also stated the lead entity (the Puget Sound Partnership), “will also create effective social marketing frameworks targeting measurable behavior change” (EPA, 2009).

Recognizing that issue-awareness alone is often insufficient to motivate people to change their behavior, some resource agencies are turning to techniques like “social marketing”, which are specifically designed to influence public behavior (PSP, 2013, WDFW, 2014). Employed since the 1970s in the health field for disease and injury

prevention, it is only relatively recently that social marketing entered the natural resource management vocabulary. In *Social Marketing to Protect the Environment: What Work*, McKenzie-Mohr *et al.* describe social marketing and its relation to promoting environmentally sustainable behaviors.

Social marketing borrows concepts and strategies from commercial marketing and behavioral psychology and applies them to programs designed to influence personal action for positive social and environmental change (2012).

Social marketing focuses on behavior change, not necessarily on making people better informed, and the behavior change is almost always voluntary. Best practices for social marketing aim to identify and understand specific target audiences to improve the relevancy and quality of public communications; identify barriers to behavior change; develop strategies to reduce the barriers; pilot the strategies; and then evaluate the strategies once broadly implemented (McKenzie-Mohr *et al.*, 2012; WDFW, 2014).

To address the identified barrier of lack of public awareness of Puget Sound's poor health, the Puget Sound Partnership's Action Agenda comprehensive public awareness and engagement plan focused on a social marketing approach to directly motivate and support targeted actions among the region's 4.5 million residents through the use of a media campaign called, Puget Sound Starts Here (PSSH).

The PSSH campaign seeks to increase awareness of the magnitude of Puget Sound's pollution problem, and to motivate residents to adopt new behaviors that will decrease the amount of pollution entering the Sound through stormwater runoff and other sources of pollution. The tools developed to achieve these goals include a recognizable brand, television advertisements, a Website designed to

foster behavior change, and public outreach tools for use by PSSH partners at a local, grassroots level (PSP, 2013).

The Puget Sound Starts Here Campaign launched in 2009 and claimed to distribute video clips to 16 television stations with viewers projected to have seen the PSSH public service announcement 15 times, for 53 million views and 99% coverage of Puget Sound population by end of 2009 (PSP, 2009). In addition to the creation of web and social media sites, 60,000 PSSH public outreach toolkits were distributed around Puget Sound and included the following:

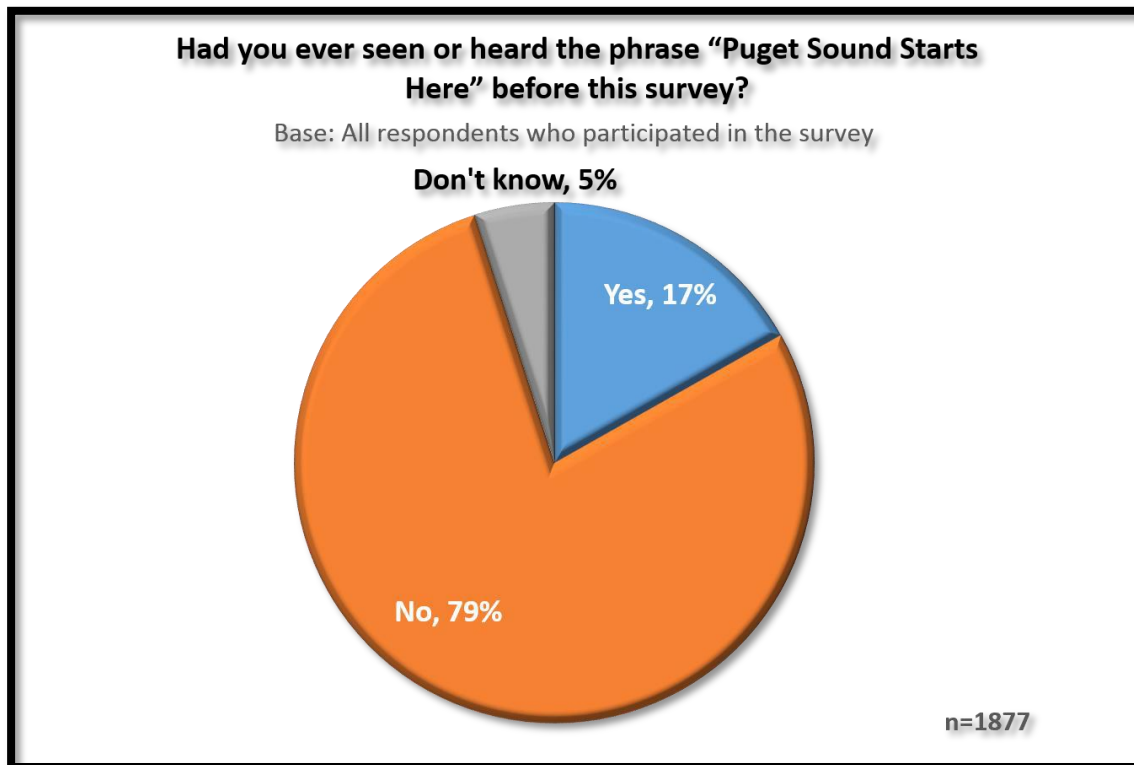
- Reference documents and Powerpoint presentations
- Posters
- Photography
- Logos and other branding elements
- Additional artwork
- Website widgets (links to PSSH website from other websites)

The PSSH website states, “We encourage PSSH partners to use the campaign photos and artwork to tie into their environmental education, communication and outreach efforts.”

In 2011, the Puget Sound Partnership engaged post launch research to evaluate its Puget Sound Starts Here campaign. The Elway Poll measured Puget Sound Starts Here brand awareness and found that by 2011, 26% of Puget Sound residents had heard of the phrase, but didn’t necessarily understand it. The Communication Campaign Recall and Impact research also found that car wash water and pet waste were the least recognized residential pollutants, despite the messaging and media weight dedicated to those issues (Elway Research Inc., 2011). The Puget Sound Partnership set a target goal of raising

brand awareness to 50%, but survey research in 2013, showed brand recognition had dropped to 17% of Puget Sound residents, meaning almost 4/5ths of the population had never heard of the Puget Sound Starts Here phrase. Web use metrics were used to attempt to measure engagement with the campaign, but results showed that of the 17% who had heard of the phrase PSSH, only 3% of those had ever visited the PSSH website.

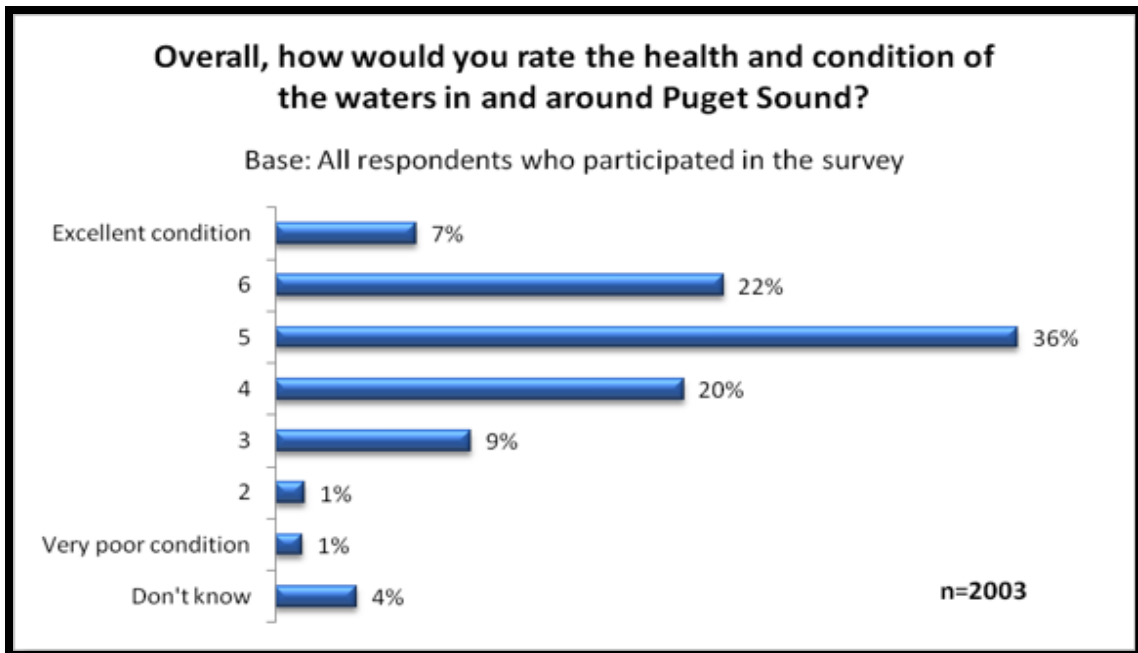
Figure 9. Awareness of phrase “Puget Sound Starts Here” among Puget Sound residents in 2013.



Surveys conducted since the creation of the Puget Sound Initiative, the Puget Sound Partnership, and its EPA multi million grant funded Stewardship Program’s communications/public education plan have found that the majority of residents in the Puget Sound region still falsely believe Puget Sound is in good to excellent condition. Figure 10 shows results from PSP commissioned surveys in 2012 and 2013 in which

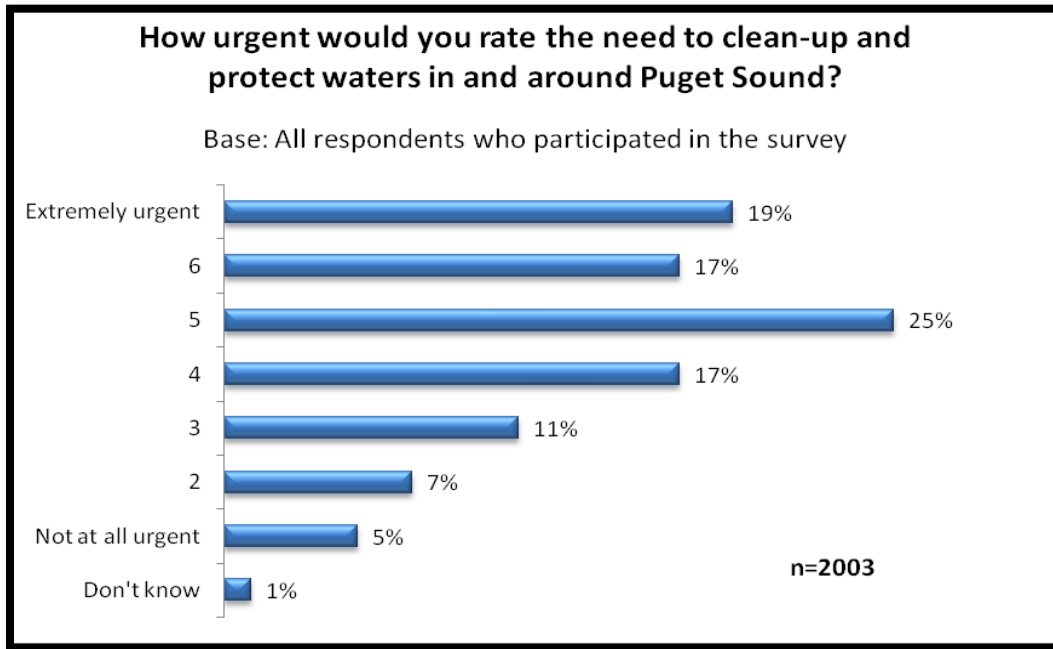
Puget Sound residents were asked to rate the health and condition of the Puget Sound waters on a scale from 1 (very poor condition) to 7 (excellent condition). Most respondents rated the health of the Puget Sound waters at a 5 or better (65%), with seven percent rating the condition of the Puget Sound waters as excellent (PSP, 2013).

Figure 10. Rating of health and condition of Puget Sound waters among Puget Sound residents in 2013.



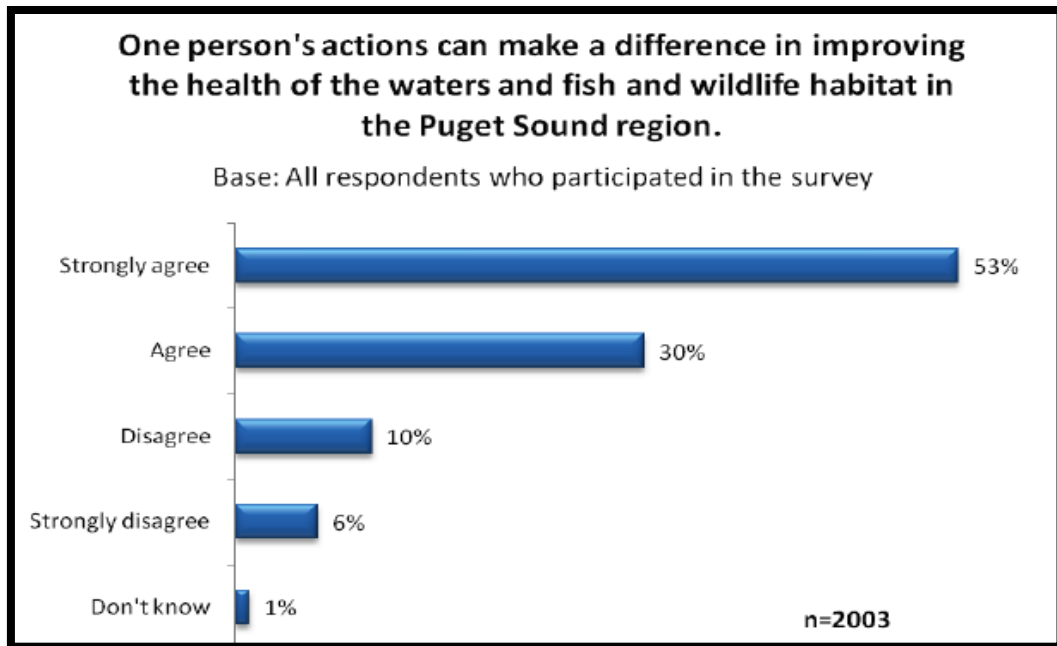
The survey findings also indicated a majority of those same residents (61%) agreed when asked if the need to clean up and protect Puget Sound was urgent (Figure 11; PSP, 2013).

Figure 11. Rating of how urgent the need to clean up and protect Puget Sound waters in 2013.



Even though most respondents were not aware of the poor health condition of Puget Sound, the survey found an overwhelming majority (83%) agreed that an individual's actions can contribute to Puget Sound's health (Figure 12).

Figure 12. Agreement ratings for 'one person's actions can make a difference in improving the health of the waters and fish and wildlife habitat in the Puget Sound region' among Puget Sound residents in 2013



In 2014, the Washington Department of Fish and Wildlife (WDFW) conducted similar surveys directly to Puget Sound shoreline property owners. WDFW is currently working to implement a social marketing campaign targeted to Puget Sound shoreline owners, using audience survey information to identify barriers and incentives for adopting shoreline friendly behaviors. Survey results reported that shoreline property owners tend to:

- Think Puget Sound is in good health;
- Have a personal/emotional connection to their land and Puget Sound;
- Strongly believe that shorelines should be protected for future generations;
- Want to do the "right" thing but don't know what that is in terms of shorelines and shoreline armor;
- Have strong voting habits;

- Shoreline property owners are hungry for more information about how to manage their shorelines responsibly and have both a desire and capacity for detailed information (WDFW, 2014).

These survey findings, among this more segmented group of Puget Sound residents, also found a lack of awareness of Puget Sound's conditions but also a desire to know more and contribute to its health.

2.4 The Puget Sound Initiative and Washington State Parks

When Governor Gregoire created the Puget Sound Initiative in 2005, the state legislature provided increased funding to add to the federal support for Puget Sound research and cleanup going to state agencies. The Washington's Department of Ecology's Toxics Cleanup Program and the Washington Department of Fish and Wildlife's Marine and Nearshore Program accelerated efforts to clean, protect, and restore habitat and ecosystem functions within Puget Sound. Scientists identified the leading sources of pollution and habitat decline as coming from the cumulative activities of the region's rapidly growing population and urban development along its shorelines. Three areas of primary concern are impacts from stormwater runoff, untreated wastewater flows, and hard armoring of shoreline habitat.

Stormwater runoff refers to what happens when rain hits land paved over with impervious surfaces. The water, no longer able to soak into the ground, runs off roads, parking areas, rooftops and other hard surfaces, creating "storm water." Because less water soaks into the ground, drinking-water supplies are not replenished and streams and wetlands are not recharged. Stormwater running over developed land picks up oil, grease,

metals, yard and garden chemicals, dirt, bacteria, nutrients and other pollutants from paved areas, and carries them to streams, rivers, wetlands and Puget Sound. Scientists declare that storm water accounts for 75% of the pollution entering Puget Sound (DOE, 2008).

Another major source of pollution stemming from the surrounding community's residents is "wastewater." There are about 472,000 septic tank systems in the Puget Sound region that are not connected to sewage treatment plants. Many of these septic tanks are aging and in disrepair and allow human waste to reach the Sound (DOE, 2006). This pollution forces the closure of shellfish beds to protect public health; these closures in turn create economic hardship for shellfish growers. The portion of Puget Sound called the Hood Canal experiences seasonal and expanding areas of low oxygen levels, known as "dead zones." Dead zones, caused part by raw sewage from these septic systems and other pollution, are lethal to many marine life forms (WDFW, 2014).

Shoreline "hard armoring" is the practice of constructing rock retaining structures such as "bulkheads" and "riprap" to armor shorelines against water-caused erosion. More than a quarter of Puget Sound's 2,500-mile shoreline is currently lined with bulkheads or other types of hard armored shoreline structures. Hard armoring disrupts erosion's natural processes of supplying much of the sand and gravel that forms and maintains beach habitats that are critical habitat for herring, surf smelt, salmon, and many other species in Puget Sound. Over time, shoreline armoring causes once sandy beaches to become rocky and "sediment starved," making them inhospitable to many of our native species (WDFW, 2014).

With the Puget Sound Initiative, natural resource management recovery efforts turned towards reducing impacts from stormwater runoff, wastewater pollution, and altered shorelines. Restoration aims to implement innovative solutions such as natural drainage and “low-impact development” activities to protect or restore water quality and abundance of iconic marine species such as salmon and orca. Low-impact development (LID) is a stormwater and land use management strategy “intended to replace and mimic the pre-disturbance processes of infiltration, filtration, storage, evaporation, and transpiration of stormwater” to help protect water quality and aquatic natural resources (DOE, 2006).

In 2005, Washington Governor Gregoire and the legislature identified that state agencies should lead the way for good stewardship and targeted Washington State Parks as appropriate places to provide model projects to Puget Sound residents on how to care for the Sound (EPA, 2006). In 2006, the state legislature added in a supplement to existing Washington State Parks and Recreation Commission statutes to accommodate the Puget Sound Initiative driven plans and allocated 17.3 million dollars in the 2005-2007 biennium and later another 10 million went specifically to address water quality in 24 Washington State Parks on Puget Sound. The Department of Ecology’s restoration work was to demonstrate the latest concepts in best management practices, low-impact development, and necessary facility renovations to fulfill the PSI’s intent to make these “Sound Friendly” and “Green Vision” model parks (DOE, 2006; PSP, 2006).

3. ORIGINAL RESEARCH DESIGN AND METHODOLOGY

In addition to examining the potential of environmental interpretation in parks for natural resource management, this thesis provides a summary and assessment of current environmental interpretation in parks adjacent to Puget Sound. An analysis of the current status of environmental interpretation in Puget Sound should suggest where to focus development and resources. Research is aimed specifically at assessing the current state of environmental interpretation in Washington State Parks along Puget Sound, which collectively constitute the largest public ownership and access to protected natural resources along its shorelines. Furthermore, I wanted to assess the current state of environmental interpretation in Washington State Parks in general; I examined stated policy, goals, and what kinds of resources were dedicated to supporting implementation.

3.1 Research Questions

- 1) What are the goals for providing environmental interpretation services as outlined in Washington State Parks and Recreation Commission policy?
- 2) What environmental interpretation services are currently available for recreating visitors in Washington State Parks on Puget Sound?
- 3) Does the environmental interpretation in the parks address Puget Sound natural resources, conservation issues and management efforts?
- 4) Does the level of environmental interpretation I see on the ground reflect stated implementation goals in Washington State Parks environmental interpretation plans?

- 5) How are interpretation services supported in Washington State Parks?
What kind of financial support is there for interpretation services? What staff resources are dedicated to interpretation delivery?
- 6) How does the level of current interpretation services support compare to past support of interpretation in Washington State Parks?
- 7) What are the current barriers to implementation of environmental interpretation in Washington State Parks?

3.2 Methods for Original Research

In order to answer my research questions, I chose a case study method, drawing on the methods described in major texts on case study research design and methodology (Yin, 2009; Stake, 1995). A case study is a research strategy, an empirical inquiry that investigates a phenomenon within its real-life context. Case study methodologies involve mixed-method data-gathering strategies and a variety of data types. Data from multiple, diverse sources are triangulated to strengthen and reveal consistency or inconsistencies in one's findings. In this case study of environmental interpretation in Puget Sound Washington State Parks, quantitative data and qualitative data were collected to understand the what, where, when, who, and why in my research questions. I did not examine formal educational programming, such as for school groups or organized field trips. Instead, my focus was environmental interpretation available for the general visitor exploring the shoreline parks along Puget Sound. Methodological triangulation used qualitative and quantitative data from first-hand observations of the parks, review of state park documents, and interviews with State Parks staff.

To examine current environmental interpretation in individual parks, I focused my research on 24 Washington State Parks on Puget Sound. The case study did not include every Washington State Park adjacent to Puget Sound, but I chose this particular group of parks for specific reasons. My research uncovered Washington State Department of Ecology natural resource management plans for Puget Sound that included 24 state parks on Puget Sound (Figure 13). To support the state's Puget Sound Initiative to restore Puget Sound, legislation was passed and funding appropriated so these state parks could make environmental improvements to "model Sound friendly development with restored shorelines and advanced storm water and wastewater treatment facilities" (DOE, 2006). In addition, this grouping targeted a majority of easily accessible and relatively heavily visited shoreline parks that are well dispersed throughout the Puget Sound basin.

Figure 13. Washington Department of Ecology Puget Sound Cleanup Projects



Therefore, I found it logical to include these particular parks for the case study. I wanted to see if there was an environmental interpretation component in these environmentally “Sound Friendly” Washington State Parks.

Over the course of two years, from summer 2012 to summer 2014, direct-observation data was gathered to determine what was currently happening on the ground in the following 24 state parks: Bay View, Belfair, Birch Bay, Blake Island, Camano Island, Deception Pass, Dosewallips, Fort Casey, Fort Ebey, Fort Flagler, Fort Worden, Illahee, Kitsap Memorial, Kopachuck, Larrabee, Penrose Point, Pleasant Harbor, Potlatch, Scenic Beach, Saltwater, Sequim Bay, Shine Tidelands, Triton Cove and Twanoh. (Figure 14).

Figure 14. State Parks on Puget Sound with PSI Projects (map from WSPRC Green Vision Plan).



I visited each park in person and documented any evidence of environmental interpretation of Puget Sound natural resources that I encountered as if I were a recreating adult park visitor who drove into the park for a day's excursion. I focused on self-guided,

non-personal interpretation but noted if there were any guided, personal interpretative opportunities (such as volunteer guided tours, junior ranger programs, etc.) available to visitors in the parks.

Direct observation data was primarily in the form of field notes and photographs of park communications for the general park visitor. Specifically, I documented what was communicated on park information signs, kiosks, displays, trails, and exhibits. Physical artifacts were collected when possible, such as copies of park brochures and available interpretive program materials. A review of Washington State Parks online digital media delivered by the agency website and mobile phone application yielded data on environmental interpretation potentially available to a park visitor.

During my research, I discovered “Green Vision Plans” for 3 of the 24 Washington State Parks involved in Puget Sound Initiative’s cleanup projects. In December 2005, the Governor and Legislature directed Washington State Parks and Recreation Commission (WSPRC) to provide model projects to Puget Sound residents on how to care for Puget Sound. These parks were designated to “model sustainable design and low-impact development practices by the Puget Sound Initiative” and, “demonstrate best practices that contribute to Puget Sound community health.” Therefore, I chose to examine Saltwater, Fort Casey, and Twanoh State Parks (Figure 15) in more depth as this provided an opportunity to inspect implementation of specific environmental interpretation of Puget Sound conservation and natural resource management efforts.

Figure 15. Washington State Parks selected to showcase Green Vision Plans.



I chose an embedded case study method to closely examine interpretation services in the 3 Green Vision parks as well as Fort Flagler State Park where inspiration for the thesis began. The embedded case study is an empirical form of inquiry where the goal is to describe the features, context, and process of a phenomenon, in a more detailed level

(Yin, 2009). I gained greater access to each park's interpretation services after I talked with park staff and described my thesis project. My open-ended, guided interviews and interactions with staff and volunteers provided data for research questions about the park's interpretation support and any barriers to implementation.

With respect to examining environmental interpretation in the Washington State Park system as a whole, a large effort was put into mining government documents such as Washington State laws relevant to Washington State Parks, Washington State Parks and Recreation Commission policy and mission statements, reports, and meeting minutes. This was accomplished by searching the Internet using Google search for key words, "Washington State Parks" and "environmental interpretation". To understand if there are any efforts to align Puget Sound natural resource management efforts with environmental interpretation in Washington State Parks, I searched on-line Washington State Parks and Recreation Commission public records for key words, "interpretation", and "Puget Sound" and "Puget Sound Initiative".

Interviews with Washington State Parks and Recreation staff provided valuable information on interpretation policy, the current status of environmental interpretation, and how environmental interpretation services are supported. For in person and phone interviews, I used a recording device and/or good note taking during my guided open-ended conversations. I conducted some interviews through email conversations that were initiated by sending specific questions to relevant state park staff. Questions for park staff involved gaining an understanding of current resources dedicated to environmental interpretation program support and delivery, such as budget and staffing levels, as well as how current efforts compare to historical efforts and future development goals. During

the interviews, I tried to understand any barriers to implementing the environmental interpretation goals stated in Washington State Parks and Recreation policy. I interviewed Washington State Parks staff involved in water quality enhancement construction projects to understand what role Washington State Parks play in the natural resource management of Puget Sound and if environmental interpretation was part of the role.

An archival analysis of internal records supplied by parks staff and on-line public records yielded some sources on interpretation program delivery data, interpretation plans for individual parks, visitor use statistics, and an internal baseline survey of interpretation services. I used Google's news/mass media search service and "Google alerts" for key word "Washington State Parks" to follow mass media articles and parks public news releases. This data provided information on public parks funding, staffing levels, and changes in state support that affected parks' operations. In addition to the data gathered from the case study formal research protocol, I made informal participant observations as a park user myself and in casual social interaction with other park users, staff and volunteers. During the course of my research, I became a candidate for a parks interpretive staff position and this added insight into Washington State Parks interpretation program support.

3.3 Methods for Data Analysis

This thesis examined the potential of Washington State Parks as venues of Puget Sound environmental interpretation and case study research to answer questions and to make some judgments about the current status of their environmental interpretation

efforts. A variety of techniques were used to analyze data, with some analysis set up as a series of comparisons between potential, policy and practice.

Washington State Parks' overall interpretation policy goal of having interpretation services in all parks was compared with the quantitative evidence from a recent internal parks survey of what is currently implemented in its parks. For environmental interpretation specifically, park agency policy statements on implementation goals were compared to the evidence of implementation as seen from my case study of parks on Puget Sound. Quantitative data was analyzed to compute what fraction of the case study's 24 parks has environmental interpretation about Puget Sound. In addition, I compared data gathered for the embedded case study on current environmental interpretation offered in Fort Flagler, Twanoh, Saltwater, and Fort Casey State Parks with stated goals outlined in Puget Sound Initiative driven plans: the Green Vision Plan and similar Washington State Parks Puget Sound Initiative Projects Interpretive and Education Plan. I quantified this comparison by calculating what fraction of these plans specific environmental interpretation plans were implemented by the end of the observation period of 2013. Qualitative analysis using pattern matching and cross case comparison illustrated similarities and contrasts in the parks' interpretation efforts.

I analyzed qualitative and quantitative data on staffing levels and budget amounts to discern how interpretation services in these state parks are supported and implemented. This included a broadly scaled time-series analysis of quantitative data on parks interpretive staffing levels over the past 30 years and overall park funding over the last decade. I analyzed interview content to understand more about Washington State Parks

interpretation services goals, support and delivery; State Parks' role in Puget Sound natural resource management plans; and barriers to implementation.

4. CASE STUDY RESULTS

This chapter presents results from case study research regarding the current status of environmental interpretation in Washington State Parks on Puget Sound. Data is presented in sections based on three main data sets used in methodological triangulation analysis: review of state park documents, first-hand observations in parks, and interviews with parks staff.

4.1 Review of Washington State Parks Documents

In this section, I present data from my research reviewing documents particularly relevant to understanding the current status of environmental interpretation in Washington State Parks. This document review serves the purpose for later analysis in the comparison of policy versus evidence of implementation of that policy. Documents are organized under the general headings of *POLICY* and *SUPPORT*.

POLICY

After briefly summarizing the development of Washington State Parks guiding policy pertinent to environmental interpretation, I present data on specific policy documents and relevant excerpts that outline current guiding principles, goals, and strategy plans adopted by the Washington State Parks and Recreation Commission (WSPRC). I organized the policy data under the headings *Washington State Government Laws and Regulations*, *Washington State Parks and Recreation Commission Policies*, and *WSPRC Natural Resource Management and Interpretation Plans*, and first provide a few

summarizing remarks of their significance before listing each policy in chronological order of development.

The Washington State Parks and Recreation Commission (WSPRC) has a long history of managing the use of state park lands and resources for interpretive purposes. In 1953, agency initiatives officially established the Interpretive Program, charged with acquiring, preserving and interpreting several heritage sites and with developing interpretive centers in especially significant locations. Guiding policies adopted in 1984 (RCW 79A.05.305) emphasized the use of state park lands for interpretive purposes and expanded policy to encompass the development and delivery of interpretive services agency-wide (WSP, 2012). In the last few decades, the legislature further clarified the role of interpretation in natural resource management plans with the adoption of a series of policies both defining “environmental interpretation” and authorizing its expanded use in the state park system (WSP, 2010). More recently, with the anticipation of the one-hundredth birthday of the Washington State Parks system created in 1913, the Washington State Legislature produced the 2013 Centennial Plan. Since 2005, the Centennial Plan has served as State Parks’ strategic plan, informing budget requests and measuring the agency’s progress towards its goals. In 2006, the Legislature and Governor approved Centennial Plan Supplements and appropriated \$17.3 million to State Parks to improve septic and wastewater treatment systems and model “Sound Friendly Parks” in 24 Washington State Parks on Puget Sound. Out of this effort, specific interpretation plans were created to communicate the water quality enhancement projects in the 24 shoreline parks.

During this case study, in 2013, a draft “Beyond 2013 Vision” and Transformation Strategy plan was crafted by the WSPRC and adoption of the final Washington State Parks Strategic Plan 2014-2019 occurred in late 2014. As part of preparing for the next WSPRC Strategic Plan, the Washington State Legislature asked the WSPRC to issue various reports on the status of its functions and fiscal health. An analysis of these reports and the draft plan are included in the overall review of policy documents.

Washington State Government Laws and Regulations

The following list of state laws, both Washington Administrative Codes (WAC) and Revised Codes of Washington (RCWs), authorize the use of State Parks for interpretation and Centennial Plan’s vision to provide interpretation in all Washington State Parks by 2013. Statutes define environmental interpretation services specifically and summarize EI’s purpose for natural resource protection to increase citizen understanding, appreciation, and stewardship of natural resources. Of particular note is language that describes EI’s role in stewardship not only for the parks natural resources but also for ecosystems and natural resources throughout Washington State.

WAC 352-16-020 (1996)

Land classification system

State park areas are of statewide natural, cultural, and/or recreational significance and/or outstanding scenic beauty. They provide varied facilities serving low-intensity, medium intensity, and high intensity outdoor recreation activities, areas reserved for preservation,

scientific research, education, public assembly, and/or environmental interpretation, and support facilities.

RCW 79A.05.335 (1991 and recodified in 1999)

Environmental interpretation — Authority of commission.

The legislature finds that the lands owned and managed by the state parks and recreation commission are a significant collection of valuable natural, historical, and cultural resources for the citizens of Washington State. The legislature further finds that if citizens understand and appreciate the state park ecological resources, they will come to appreciate and understand the ecosystems and natural resources throughout the state. Therefore, the state parks and recreation commission may increase the use of its facilities and resources to provide environmental interpretation throughout the state parks system.

RCW 79A.05.340 (1991 and recodified in 1999)

Environmental interpretation — Scope of activities.

Interpretive activities authorized.

The commission may provide scenic, natural, cultural, or historical resource interpretive activities for visitors to state parks that:

- (1) Explain the functions, history, significance, and cultural aspects of ecosystems;
- (2) Explain the relationship between human needs, human behaviors and attitudes, and the environment;

(3) Explain the diverse human heritage and cultural changes over time in Washington State;

(4) Offer experiences and information to increase citizen understanding, appreciation, and stewardship of their natural, cultural, ethnic, and artistic heritage; and

(5) Explain the need for natural, cultural, and historical resource protection and preservation as well as the methods by which these goals can be achieved.

RCW 79A.05.345 (1991 and recodified in 1999)

Environmental interpretation— Commission's authority to consult, enter agreements, and solicit assistance from other organizations.

The commission may consult and enter into agreements with and solicit assistance from other public agencies, the state parks foundation, private entities, employee business units, and tribes that are interested in stewarding and interpreting state parks scenic, natural, cultural, and recreational resources.

WAC 352-32-010 (2003)

Definitions

Environmental Interpretation: The provision of services, materials, publications and/or facilities, including environmental learning centers (ELC), for other than basic access to parks and individual camping, picnicking, and boating in parks, that enhance public understanding, appreciation and enjoyment of the state's natural and cultural heritage through agency directed or self-learning activities

RCW 79A.75.005 (2004)

Washington State Parks Centennial 2013 Vision and Plan

In 2013, Washington's state parks will be premier destinations of uncommon quality, including state and regionally significant natural, cultural, historical and recreational resources that are outstanding for the experience, health, enjoyment and learning of all people.

Goal 2: Enjoyment, health and learning – All state parks will have community events and interpretive programs ...so that citizens understand that parks are places to enjoy healthy recreation and learn about Washington's history and cultural heritage.

Washington State Parks and Recreation Commission Policies

WSPRC Policies are agency rules that guide Washington State Parks operations and activities, including the following list of policies relevant to providing environmental interpretation. Both the WSPRC Natural Resource Management Policy and Environmental Interpretation Policy are policy titles used interchangeably in WSPRC communications and contain identical language, both speaking to the important role EI plays in resource management activities. In fact, these policies directly state that environmental interpretation is an “essential resource management tool” to foster public awareness and stewardship of natural resources and assist Washington State's protection of natural resources in its care. Here again, language refers to environmental interpretation's role in public stewardship of natural resources not only within the parks, but “in the surrounding landscape” as well. The policy explicitly directs staff to integrate information on natural resource management, natural resource issues, and the

composition and function of native habitats resource into interpretive and education programs, printed materials, and electronic media. In addition, these policies state the measurable goal to provide interpretive opportunities in all developed parks.

Washington State Parks and Recreation Commission Policy 65-95-1 (2004)

Referred to as both the Natural Resource Management Policy and the Environmental Interpretation Program Policy

Purpose:

State Parks recognizes that an informed public, knowledgeable of natural and cultural resource values and management issues, is well positioned to assist the agency in the management and protection of its natural resources. The agency will strive to provide interpretive opportunities in all developed parks. Agency staff will work to integrate information on resource management, natural resource issues, and the composition and function of native habitats into interpretive and education programs, printed materials, and electronic media. In addition to informing park visitors, staff will seek to engage and educate neighbors and local officials in issues and approaches to eliminate threats confronting the natural resources of the park and its surrounding landscape.

Policy:

1. The Commission utilizes interpretation as an essential resource management tool to foster public awareness and stewardship of state park lands and the inherent natural, cultural, scenic and recreational resources entrusted within its care.

2. Every state park serves a function within a statewide network of interpretive opportunities. All developed state parks provide appropriate self-guided and/or guided interpretive services to enhance visitor experience.
3. State park lands possess unique capacities to serve as outdoor classrooms for environmental interpretation. The Commission fosters educational opportunities statewide, including the facilitation of curriculum-based learning programs and activities.
4. The Commission is committed to preserving and interpreting Washington's diverse human and natural heritage to the public. The Commission coordinates with interested Native American tribes in the research and development of interpretation associated with topics of mutual interest to ensure that presented information is accurate and appropriate, including the display of collection objects.
5. The Commission collaborates externally with interested Native American tribes, government agencies, educational institutions, and private organizations and individuals to enhance interpretive services statewide, including the operation of designated Heritage Sites and Interpretive Centers.
6. The Commission strives to maintain relevant interpretive experiences. An Interpretive Program Strategy should be updated biennially to identify and prioritize interpretive programming and facility needs for consideration in agency budget development procedures.

The following WSPRC approved policy addresses implementation of State Governor Executive Orders 5-01 and 4-01 to establish sustainability and green practices in all state agency operations. Policy language describes the Washington State Parks

agency's "commitment to institute an agency-wide ethic of sustainability" with the goal to "become the national leader among state park agencies for environmentally sustainable practices." Notably, one of the policy goals also states stewardship success will need public support and thus emphasizes the importance of providing interpretation about sustainability in the parks to develop a "sustainability ethic in park visitors and Washington residents." The policy sets measurable goal to have interpretation about sustainability in all staffed parks and on the WSPRC website by 2020.

Washington State Parks and Recreation Commission Sustainability Policy 73-08-1

(2007)

Purpose:

To provide Commission approved policy direction required to implement the Commission's commitment to institute an agency-wide ethic of sustainability and the practice and actions of "being green" within Washington State Parks so that Washington State Parks can become the national leader among state park agencies for environmentally sustainable practices.

Definitions:

1. Sustainability: An ethic that guides individual and organizational decisions resulting in the conservation of environmental, economic and human resources for current and future generations.

2. Being green: Practices and actions that protect the environment and meet the needs of the present without compromising the ability of those who come after us to meet their needs.

Policy:

It is the policy of the Washington State Parks and Recreation Commission that the ethic of sustainability and the practice and actions of “being green” be integrated into every aspect of agency operation so that Washington State Parks will be the sustainability leader among state parks nationwide.

Goals:

8. Communication, Education, Interpretation

Without a way to communicate the purpose and aims of sustainability, we stand little chance of success. Achieving the agency’s sustainability goals will require that we effectively communicate with agency staff, policy makers, and the public. Interpreting sustainability to the public will become an increasingly central function in state parks.

The agency should work to develop interpretive methodology, programs, funding strategies, and partnerships to instill a sustainability ethic in park visitors and Washington residents.

Goal: By 2020, the agency will

- a) provide sustainability-related interpretation to the public at all staffed parks
- b) provide the public current sustainability information on the agency’s website and through other public information campaigns

c) include sustainability training at ranger in-service trainings and the Stewardship Certification Program

Found below is the most recent WSPRC Interpretive Policy, though it mostly contains essentially the same language as stated in earlier relevant policy. However, in this policy, various aspects of interpretation services are further categorized and defined; importantly providing a modern definition of interpretation that states it is “A mission-based communication process that creates opportunities for visitors to connect emotionally and intellectually with the world around them in meaningful ways.” The stated policy purpose was to reaffirm interpretation’s important role in resource management and a core function of the agency is to provide a statewide network of interpretive opportunities. In addition, the policy states measurable goal that all state parks provide appropriate self-guided and/or guided interpretive services.

Washington State Parks and Recreation Commission Interpretive Policy 50-10-1(2010)

Purpose:

Providing interpretive opportunities for the citizens of Washington and their guests is a long-standing activity of the Washington State Parks and Recreation Commission (Commission). The scope and function of interpretation has evolved substantially with the expansion of the state park system, exponential growth in visitation and technology advancements witnessed over the last 97 years. This policy aims to organize and redefine the statewide role of interpretation in the state park system as it prepares for a second century of service.

Furthermore, this policy will enable the Commission to better utilize interpretation as a resource management tool to support the ongoing stewardship of the outstanding, yet vulnerable natural, cultural, historical and scenic resources entrusted within its care. This policy applies to all agency employees, volunteers, and contractors engaged in the development, implementation, and evaluation of interpretive services.

Definitions:

Environmental Interpretation: The provision of services, materials, publications and/or facilities, including environmental learning centers (ELC), for other than basic access to parks and individual camping, picnicking, and boating in parks, that enhance public understanding, appreciation and enjoyment of the state's natural and cultural heritage through agency directed or self-learning activities [see WAC 352-32-010].

Heritage Site: A designated location, structure, or assemblage of resources within a state park area possessing significant natural, cultural, historical or scenic attributes that are preserved and interpreted for the education and enjoyment of the public.

Interpretation: A mission-based communication process that creates opportunities for visitors to connect emotionally and intellectually with the world around them in meaningful ways.

Interpretive Center: A designated site or structure administered by State Parks specifically to interpret a significant element of Washington's heritage to the public. The significance of historic properties, events and/or natural features, extant or vanished, within the general proximity of an Interpretive Center transcends local interest and is of statewide or national significance.

Interpretive Services: A range of program activities aimed to communicate messages to wide and varied audiences in order to enhance visitor experience and stewardship of state park resources using guided and self-guided methodologies and media technologies.

a. Guided: One person or persons providing interpretation to another person or group of people. Examples include informal visitor contacts (roving) and formal programming, such as campfire talks, guided hikes and tours, and curriculum-based learning programs and activities.

b. Self-Guided: Interpretive media that does not require a person to deliver messages. Examples include indoor and outdoor exhibits, brochures, audio/video programs and digital media (world wide web content).

Stewardship: The care of state park lands including conservation of natural features and systems, preservation of historical and cultural sites and resources, and thoughtful management that encourages their meaningful and sustainable recreational and educational use and enjoyment.

Policy:

1. The Commission utilizes interpretation as an essential resource management tool to foster public awareness and stewardship of state park lands and the inherent natural, cultural, scenic and recreational resources entrusted within its care.

2. Every state park serves a function within a statewide network of interpretive opportunities. All developed state parks provide appropriate self-guided and/or guided interpretive services to enhance visitor experience.

3. State park lands possess unique capacities to serve as outdoor classrooms for environmental interpretation. The Commission fosters educational opportunities statewide, including the facilitation of curriculum-based learning programs and activities.
4. The Commission is committed to preserving and interpreting Washington's diverse human and natural heritage to the public. The Commission coordinates with interested Native American tribes in the research and development of interpretation associated with topics of mutual interest to ensure that presented information is accurate and appropriate, including the display of collection objects.
5. The Commission collaborates externally with interested Native American tribes, government agencies, educational institutions, and private organizations and individuals to enhance interpretive services statewide, including the operation of designated Heritage Sites and Interpretive Centers.
6. The Commission strives to maintain relevant interpretive experiences. An Interpretive Program Strategy should be updated biennially to identify and prioritize interpretive programming and facility needs for consideration in agency budget development procedures.

In addition to statutory authorizations in law, WSPRC agency rules, administrative policies, and procedures, guidance for managing the state park system is included in statements of its mission and vision. At the start of this case study, the Washington State Parks' operating mission was the following, enacted in its Strategic Plan of 1993.

Mission:

The Washington State Parks and Recreation Commission acquires, operates, enhances and protects a diverse system of recreational, cultural, historical and natural sites. The Commission fosters outdoor recreation and education statewide to provide enjoyment and enrichment for all and a valued legacy to future generations.

In preparation for the Washington State Parks 100th anniversary, the WSPRC adopted the Centennial 2013 Plan (RCW 79A.75.005, above) in 2003, including a vision statement and 11 goals through which to achieve it (Figure 16). To carry out the 2013 Centennial Plan, the WSPRC adopted in 2006 an accompanying Strategic Plan and goal objectives with excerpts relevant to supporting interpretation services in the parks listed below. Of particular note is the quantifiable goal to provide interpretive events and programming in all 120 State Parks by 2013.

Centennial 2013 Plan Vision and Vision Goals (2003)


In 2013, Washington's state parks will be premier destinations of uncommon quality, including state and regionally significant natural, cultural, historical and recreational resources that are outstanding for the experience, health, enjoyment and learning of all people.

WSPRC Strategic Plans 2007-2013 (2006) and 2009-2015 (2008)

Centennial Plan's Enjoyment, Health and Learning Commitments

Goal and objective: All 120 state parks have community events and interpretive programs, so that citizens can connect with Washington's heritage and pursue personal health.

Figure 16. WSPRC 2013 Centennial Plan performance goals authorized under RCW 79A.75.005 in 2004

 CENTENNIAL 2013 PERFORMANCE GOALS	
Our Commitment	
Stewardship – So that citizens understand and support the care of their parks and environment	1. Goal: All 120 parks have land-use plans supported by the public and Commission <i>(which includes the direction of care of historic buildings and sites and natural resources)</i>
Enjoyment, health and learning – So that citizens can connect with Washington’s heritage and pursue personal health	2. Goal: All 120 state parks have community events and interpretive programs
Public service – So that citizens are confident their taxes are used wisely	3. Goal: On a scale of “A - E,” agency public services rate B+ or better on surveys
Facilities – So that citizens have safe and modern parks	4. Goal: Rebuild half of the old park system
Partnerships – So that citizens help improve their parks and recreation	5. Goal: Double volunteer help to 2,000 volunteers, 500,000 volunteer hours, 500 partners
Financial strategy – So that citizens know that innovation and accountability will sustain their parks	6. Goal: All 120 parks have business plans with four revenue sources (taxes, facility fees, product and service revenues and donations) and cost savings
Your Legacy	
Legacy - So that citizens prepare parks for a growing state	7. Goal: 1,000 new miles of winter/summer, land/water trails 8. Goal: Open three new parks, expand 10 parks 9. Goal: Four major historic sites renovated and open 10. Goal: Tell the Ice Age Floods story
100 Connections	
Connections - So that citizens contribute Centennial improvements to their favorite parks	11. Goal: 100 citizen gift projects in parks all over the state.

Listed in both WSPRC Strategic Plans above and under Stewardship Commitment objectives are additional stewardship activities that directly pertain to the 24 Washington State Parks in case study research. In 2006, the state legislature added in the following supplement to existing Washington State Parks and Recreation Commission statutes to accommodate the Puget Sound Initiative driven plans and thus was incorporated into WSPRC Centennial and Strategic Plans as documented below.

- Puget Sound and Hood Canal Cleanup:

Wastewater and storm water systems are old and have not been given high priority for the repairs and maintenance of our parks. The agency will focus on improving all waste water systems and adding or improving storm water systems in those parks that are adjacent to any lakes, streams, rivers or salt water. State Parks will request capital and maintenance funding each biennium until this objective is met. Additionally, sustainable water projects are extremely important. State Parks will propose projects and request capital funding to continue to be a model neighbor to the waters of the state. To this end, near shore developments will be carried out using Low Impact Development techniques where practical. Agency personnel will remove creosote piling, bulkheads, and random logs from Parks property and replace with more sustainable materials where necessary. Nearshore habitat and access to upland spawning habitat will be considered as stand alone projects as well as parts of major capital development and maintenance (WSPRC 2006; WSPRC, 2008).

WSPRC Strategic Plans (additional stewardship activities)

- Support the governor's commitment to restoration of the Puget Sound by creating "Sound-friendly" parks.

In addition, under "other stewardship activities", the Strategic Plans contain reference to modeling some of its sustainability activities in five "stewardship model parks", as described below.

In an effort to move toward a sustainable park system that guarantees resource protection, access and a multitude of opportunities to learn about resources, the Washington State Parks Commission has committed to a sustainability program.

The commission identified five model stewardship parks to demonstrate the state's ability to use sustainable technologies, preserve cultural assets, maintain healthy plant and wildlife communities, and offer interpretive opportunities. Model stewardship park activities include controlling all 14 noxious weeds identified by local county weed boards, reducing fire fuels to prevent catastrophic wildfires, providing learning opportunities about state cultural and natural resources, and preserving plants important to Native American people. The model stewardship parks are Flaming Geyser, Fort Casey, Lake Wenatchee, Leadbetter Point, and Rothschild House. The lessons learned at parks translate directly to the improved sensitivity and care of the environment when visitors return home.

Of note, is one of the "model stewardship parks" is Fort Casey State Park that was part of this thesis' embedded case study. I discuss this more in results section 4.4.

In its Centennial year of 2013, the Washington State Parks and Recreation Commission, as part of its "Beyond 2103" planning for its future, adopted the Washington State Parks Transformation Strategy in March 2013 that refined its mission and vision. The Transformation Strategy includes seven strategies and 47 initiatives intended to guide the agency into a second century. I document three initiatives significant to environmental interpretation policy in the following excerpts.

Washington State Parks Transformation Strategy (March, 2013)

Mission:

Washington's state parks will be premier destinations of uncommon quality, including state and regionally significant natural, cultural, historical and recreational resources that are outstanding for the experience, health, enjoyment and learning of all people.

Vision:

Washington's state parks will be cherished destinations with natural, cultural, recreational, artistic and interpretive experiences that all Washingtonians enjoy, appreciate and proudly support.

An initiative in the current strategic plan demonstrates WSRPC continued stated support and emphasis of interpretation's status as a core function in Washington State Parks. The initiative promotes various elements to enhance its relevancy and delivery effectiveness.

Interpretation Transformation Initiative:

This initiative transforms interpretation into a fundamental element of the state park experience. Modernized interpretive services also provide cost-effective management tools to promote new and repeat visitation, and stewardship of vulnerable state park resources. Key elements include:

- Diversifying programming and events to expand the demographic of visitors using state parks.
- Maintaining and developing relevant self-guided interpretive opportunities that connect visitors to Washington's diverse human and natural heritage in meaningful ways.
- Developing an integrated digital media strategy that leverages technology to deliver cost-effective interpretive services with capacity to transcend state park boundaries.

- Organizing a partnership network that nurtures growth of interdependent partnerships at the local, regional, statewide and national level.
- Promoting state parks as outdoor classrooms to promote life-long learning within all of Washington’s distinct ecosystems.

One of the seven core strategies in the current WSPRC Strategy Plan is about supporting stewardship for Washington State Parks’ natural resources. The supporting initiative documented below emphasizes the importance of engaging public participation in conserving natural resources as well as developing materials and methods to “convey their significance” and “threats” to the public. I interpret this conveyance as communication, which in a park would be through environmental interpretation and thus demonstrates the WSPRC continued commitment to using EI in natural resource conservation.

Strategy: Demonstrate the state park system’s contribution to conserving the state’s natural heritage and biodiversity.

Natural Heritage Initiative:

The overarching purpose of this initiative is to develop a systematic plan for protecting and restoring natural plant and animal communities in state parks, conveying their significance to the public, and enlisting the public’s participation and support in conserving them. Elements of this initiative include:

- Assembling field data and assessing the significance, integrity and risks to State Parks’ ecological resources

- Recommending priorities for treatment of plant and animal communities (e.g., protection, restoration, enhancement)
- Identify financial and in-kind resources to accomplish treatments
- Develop materials and methods to convey the significance of the state parks resource, the threats it faces, and enlist the public in supporting the agency's stewardship efforts

Another current initiative directly relates to the Puget Sound Initiative and environmental interpretation in the parks and instructs WSPRC activities to continue implementation of the Puget Sound Action Agenda. Language in this policy demonstrates Washington State Parks and Recreation Commission's continued support for Puget Sound's nearshore restoration and outlines accompanying environmental interpretation should contain Puget Sound ecology, threats, vital signs, and recovery actions. For the first time this policy directs the agency to seek funding specifically for these interpretation opportunities.

Puget Sound Action Agenda Implementation Initiative:

This initiative implements near-term actions outlined in the Puget Sound Partnership's Action Agenda. Elements for which State Parks is responsible include:

- Identifying opportunities for nearshore restoration and removal of shoreline hard armoring
- Review existing plans and seek funding for interpretive opportunities on Puget Sound ecology, threats, vital signs, and recovery actions in state parks

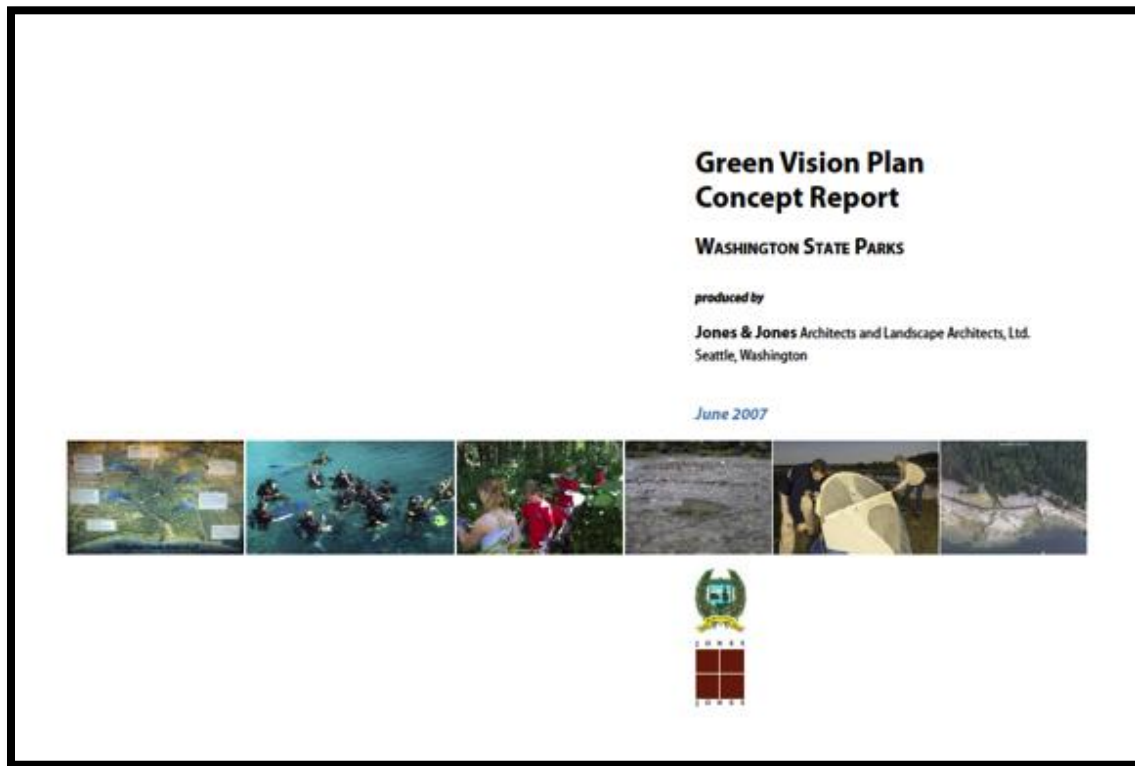
- Working with the Department of Ecology and the Environmental Protection Agency to establish no discharge zones in Puget Sound
- Administering federal Clean Vessel grant program that provides grants to local government and private marinas for vessel sewage

PSI natural resource management and WSPRC interpretation plans

When Governor Gregoire created the Puget Sound Initiative in 2005, Washington State Parks were identified as ideal places to model green strategies to Puget Sound residents for effective care of the Puget Sound ecosystem. The idea of showcasing effective best-management practices and renovations in public areas with a lot of visitors was also the inspiration for interpretation plans created specifically for the Washington State Parks and Recreation Commission. I describe these documents below, examined them in the embedded case study, and used them for data analysis of first-hand observations in PSI State Parks compared to stated environmental interpretation goals.

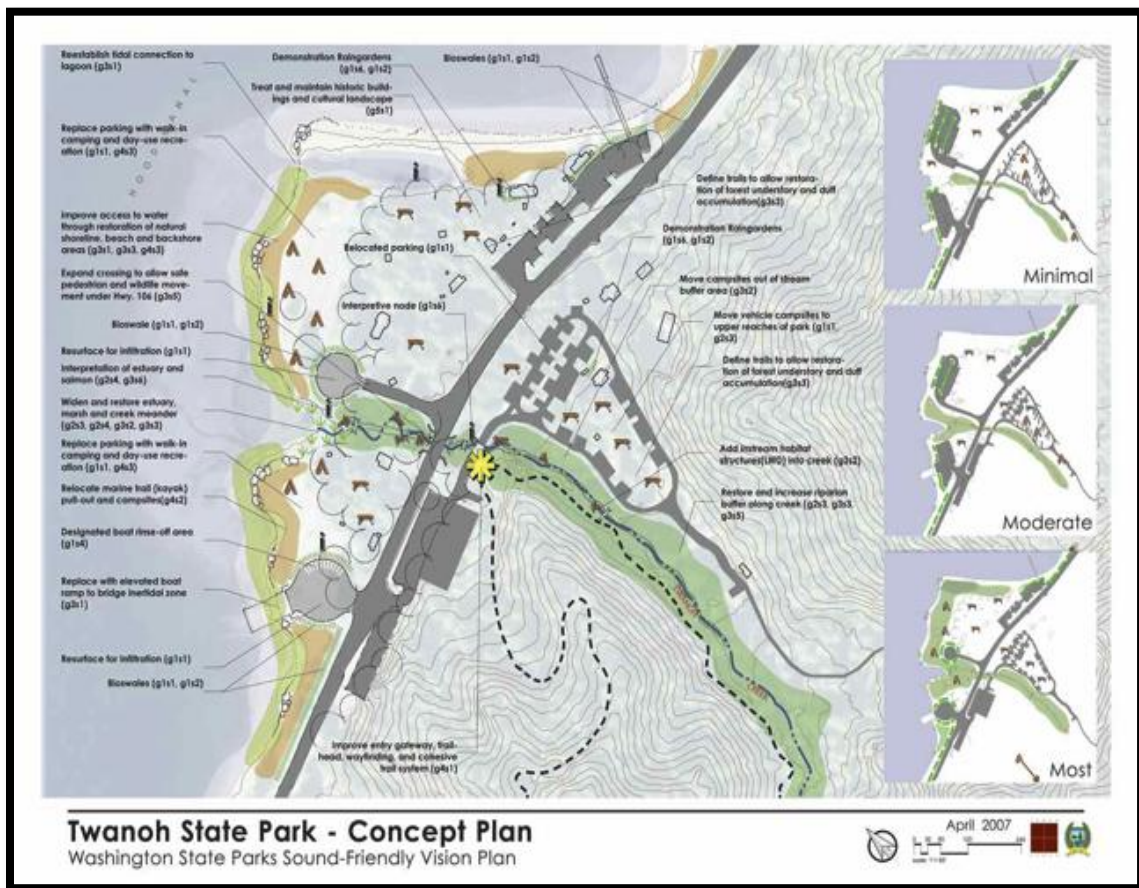
The first plan is called the Green Vision Plan Concept Report written by the consulting firm Jones and Jones with oversight by State Parks staff (Figure 17).

Figure 17. WSPRC Green Vision Plan for Washington State Parks for Puget Sound friendly parks (2007).



The report details capital project designs for the parks that conserve energy and/or water; remove pollutants from non-point or point source discharges; improve near-shore and aquatic habitats; and otherwise model “Sound-Friendly” development. Washington State Parks selected three parks, Fort Casey, Saltwater, and Twanoh State Parks, to model sustainable design and low-impact development practices (Figure 17a).

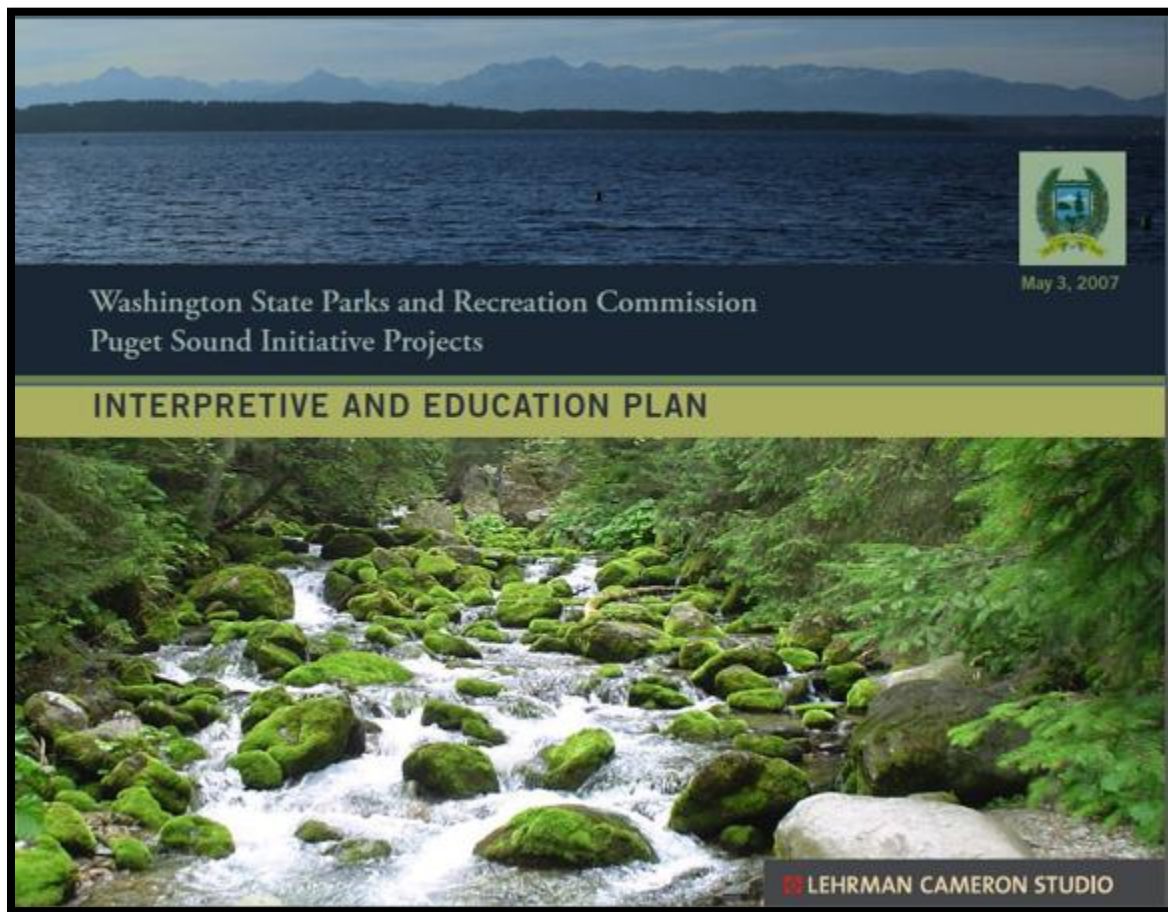
Figure 17a. Example of Concept Plan for Twanoh State Park



Although the Green Vision Report mostly details Sound-Friendly architectural designs for each park, it also describes goals for public education about the green development projects and the importance of water quality and restored nearshore environments in Puget Sound.

Around the same time that the Green Vision Report and Concept Plan was produced (in 2007) the Washington State Parks and Recreation Commission Puget Sound Initiative Projects Interpretation and Education Plan (Figure 18) was created with more specific environmental interpretation plans about Puget Sound water quality, the PSI, and Green Vision capital projects in 24 State Parks.

Figure 18. WSPRC PSI Projects Interpretation and Education Plan (2007).



The plan's Executive Summary describes the specific purpose and outlines the plan's goals.

Bringing interpretation to the PSI parks in the State Parks system, people will begin to understand the importance of Puget Sound, the status of its health, and how they can make a positive difference. They will not only love the Sound but understand it and know how to care for it .

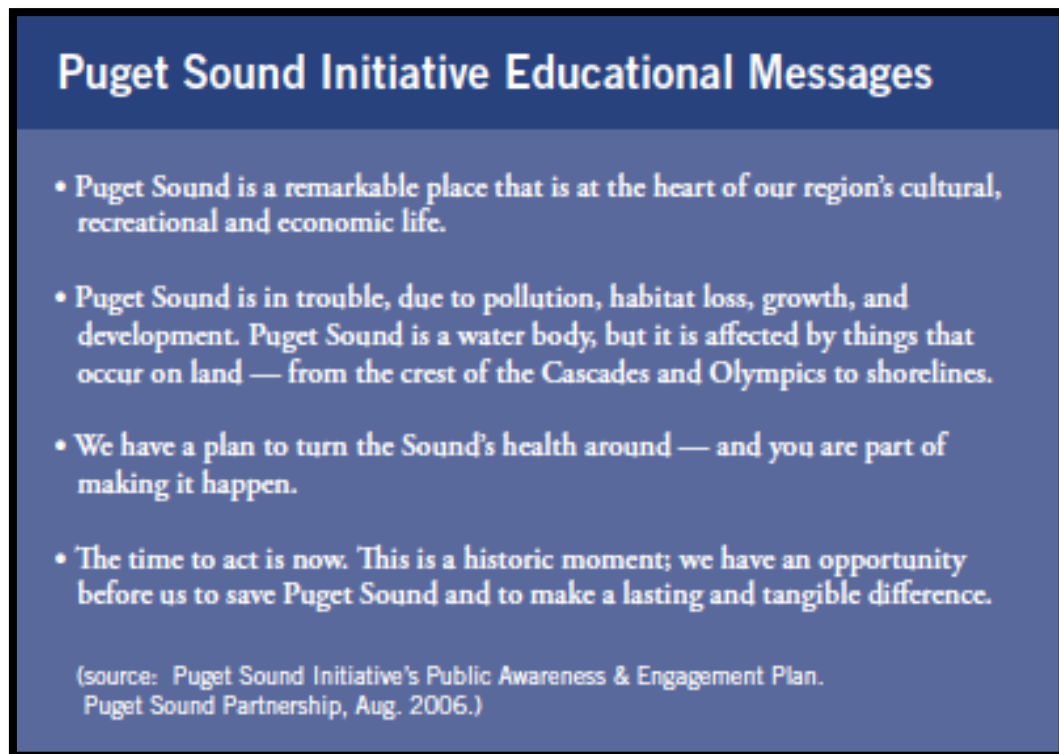
Goal 1. Show what State Parks is doing to help improve and protect the health of Puget Sound.

Goal 2. Convey the importance of water quality for the health of Puget Sound.

Goal 3. Inspire the public to participate in facility improvements in their own homes and communities.

The plan emphasizes the goals are in line with the Puget Sound Partnership's Public Engagement and Awareness Plan (PSP, 2006) as well as the Washington State Parks 2013 Centennial Plan.

Figure 19. WSPRC Interpretation and Education Plan incorporates PSI messages.



The WSPRC PSI projects Interpretive and Education Plan was produced by consulting firm Lehrman Cameron Studio and based on information supplied by several State Parks staff and Construction Project Managers and consultants working on the wastewater and stormwater treatment improvement projects. Criteria for selecting these showcase parks included the magnitude of the PSI project in the individual park, the geographic distribution of the parks, and annual visitation numbers. The plan includes detailed designs and budgets associated with construction and implementation in several showcase parks as well as for various environmental elements in all 24 PSI parks. The

strategy for environmental interpretation delivery methods and installation of interpretive features (Figure 20), based on “current funding”, includes:

- All PSI parks have restroom signs, small physical interpretive elements, programs, and brochures.
- Showcase parks: all of the above plus more elaborate, interpretive sculptural elements.

The plan offers the possibility for future EI development by stating, “Additional interpretive information, including websites and posters-as appropriate and fundable.”

Figure 20. WSPRC Interpretation and Education Plan environmental interpretive strategies for all 24 PSI parks and select showcase parks.

PROJECT METHODS (CURRENT FUNDING)

■ **ALL PARKS WITH PSI PROJECTS**

- Signs at restrooms introducing PSI projects (includes inserts)
- One three-dimensional element (bench, small sculpture, tiles, trails, or signs) with story relevant to that park
- Programs (guided walks, Jr. Ranger program, evening presentations, demonstration carts, volunteer group work projects, K-12 programs, and/or events)
- PSI Brochure (general PSI info — available at programs, from Rangers, on racks, and via partnerships)

★ **SHOWCASE PARKS**

- all PSI-park features (above)
- Additional physical elements specific to each park

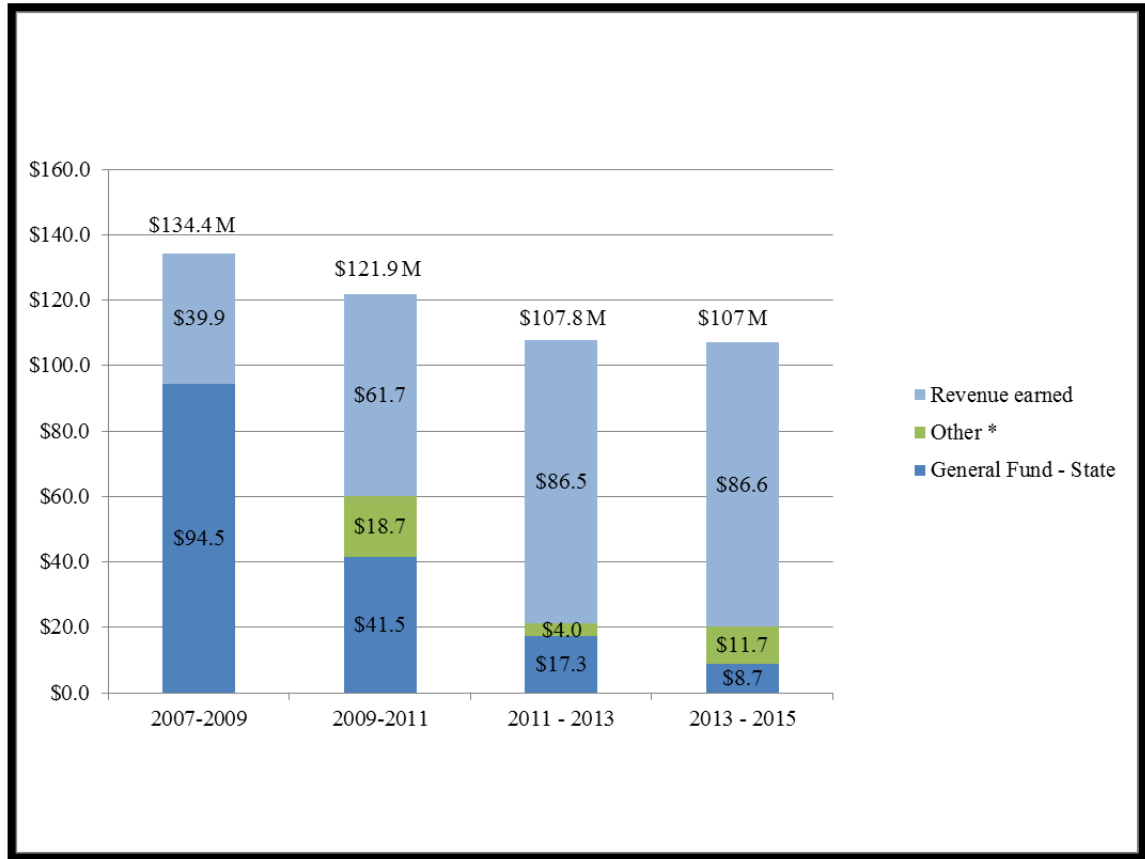
SUPPORT

My research into what kind of support is available to implement all the above environmental interpretation policy led me to examine the documents that illustrate support for Washington State Parks in general as well as specific budgets and progress reports about the natural resource management projects and environmental interpretation plans in the parks selected by the Puget Sound Initiative. First I summarize data taken from Washington State Parks documents that address financial resources for support of its operations and then documentation specific to implementing interpretation services.

Washington State's General Fund revenues from taxes historically supported parks with contributions amounting to around 100 million dollars for Washington State Parks' operating biennium budget (WSPRC, 2012, Figure 21) Washington boasts one of the largest and most visited state park systems in the United States. Even at these funding levels, State Parks received less than one quarter of one percent of the state's overall budget and put Washington's state spending on its state parks 44th in the nation among state parks systems nationwide (WSPRC, 2006).

Overall funding support for Washington State Parks radically changed in 2009 when, because of the severe downturn in the economy at the time, the legislature made large cuts to all state agency budgets. State Parks' budget support was abruptly cut down to 41 million dollars for the 2009-2011 biennium budget. In response, starting in 2009, Washington State Parks reduced staffing from 595 full-time permanent employees to 395 (WSPRC, 2012). Because of its budget constraints, Washington currently ranks 47th nationally in state dollars spent per park visitor — 78 cents in Washington compared to a nationwide average of \$1.96, which itself declined from a national average of \$4.94 a decade ago (WSPRC, 2006).

Figure 21. WSPRC operating budget totals in millions of dollars (M) from Washington State tax supported General Fund and earned revenue for biennium budget years 2007-2015.



In 2011, the legislature instituted a new model of support for State Parks, changing its majority of operating revenues coming from state taxes to an operation more reliant on revenues from user fees and donations. To help State Parks earn more revenue on their own, the legislature created the Discover Pass program so that park users have to pay \$10 fee for day-use or a \$30 fee for an annual pass. However, as of 2014, Discover Pass revenues were less than 50% of those originally projected (OFM, 2012). With staff and program reductions, staff spread thinly across the parks system, and the transfer of some parks to other managing entities, the agency has been able to keep its 124 parks open. General park maintenance projects, already backlogged as a result of chronic

historical underfunding, have grown by 2014 to a backlog estimate of 360 million dollars needed to address basic park maintenance issues (WSP, 2014).

During this time of reduced state tax funding, the Washington State Legislature established a special license plate program for revenue and expenditures that “may only be used to provide public educational opportunities and enhancement of Washington State Parks” (RCW 79A.05.059). As stated on the WSPRC website, some of the programs supported by license plate sales include: Junior Ranger, Environmental Education, The Folk and Traditional Arts in the Parks Program, Interpretive Centers, Interpretive Exhibits and Waysides. License plate revenues help staff purchase supplies like activity booklets and help fund the maintenance and replacement of existing exhibits as well as the development of new ones. Last year, this account generated \$103,000 (WSPRC, 2014).

Although the above represents research into dedicated financial resources for Washington State Parks that might influence support of interpretation services, there are other financial resources available through a variety of grant opportunities, mostly coordinated through the Washington State Recreation and Conservation Office (RCO) that administers a dozen state and federal grant programs totaling around \$70 million annually for a range of activities “from developing parks, creating trails, to saving salmon” (RCO, 2015). Several of these grant programs are highly relevant to restoration in Puget Sound State Parks and providing support for interpretive signage. For example, the RCO website lists its Aquatic Lands and Enhancement Account grant program,

ALEA grants may be used for acquiring, restoring, or improving aquatic lands for public purposes. They also may be used to provide or improve interpretation and public access to those lands and associated waters (RCO, 2015).

In describing eligible projects for its \$5.4 million average biennium grant budget it states, “Restoration or development projects with interpretive or educational elements are highly encouraged” (RCO, 2015). Interestingly, in 2012, the Legislature shifted \$4 million from the Aquatic Lands Enhancement Account (ALEA) to help State Parks get by to help the agency fill some pressing operations gaps with the loss of General Fund tax support, and including “small Centennial Plan projects” such as (WSPRC, 2012).

In response to continued underfunding of Washington State Parks operating budgets, Executive Order 14-01 formed a Washington Blue Ribbon Task Force on Parks and Outdoor Recreation in 2014 and with it, current Washington State Governor Jay Inslee formally recognized the importance of Washington’s parks and its “significant reductions in funding to operate, maintain, and make capital investments” (RCO, 2014). Highlighting the projected \$64 million gap between available funding at current Discover Pass and other revenue rates and General Fund levels and how much funding is needed to operate State Parks, the Task Force found,

As a result of declining revenues, funding necessary to operate and maintain existing parks and recreation sites is inadequate. Planned and deferred maintenance and adequate staffing to meet customer demands are just two of the largest deficiencies (RCO, 2014).

The Task Force was ordered to prioritize development of “long-term sustainable funding sources for Washington State Parks” and other natural resource management agencies.

Among other more modest revenue proposals such as smoother Discover Pass implementation, increased fees, and small excise taxes to earn revenue for immediate funding needs, the Task Force recommended restoring General Fund support.

The Legislature should provide stable, long-term funding for Washington's state parks and other state recreation lands, facilities and programs, recognizing that they provide essential public services and should be supported primarily by General Fund revenues, with user fees supporting services that are primarily of benefit to the user (RCO, 2014).

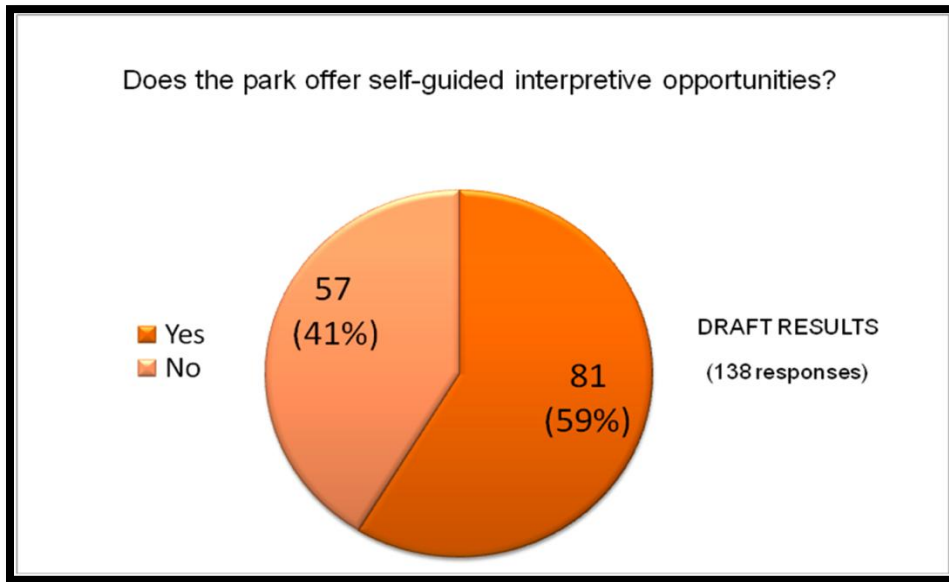
In addition to financial support, I gathered documentation about available staff resources and infrastructure in Washington State Parks for interpretation services delivery. Much of that information came from an internal document, “2013 WSPRC Report on Interpretation”, a statewide interpretive level of service survey supplied to me by Interpretive Program Manager Ryan Karlson and discussed more in Interview results section.

The 2013 WSPRC “Report on Interpretation” describes summary results from survey responses on how much and what kind of interpretive services are currently offered in Washington State Parks, and who is doing the interpretation. It is important to note that the survey did not distinguish between interpretation of the park’s cultural resources or natural resources, and therefore is just about interpretation in general, not environmental interpretation per se. I list some of the main findings below.

- A large percentage of developed state parks provide some form of on-site opportunities (105 state parks). The most common form of on-site opportunity surveyed was self-guided exhibit panels and kiosks.

- Self-Guided Interpretive Facilities: A park-level survey identified eighty-one (59%) of developed state parks providing self-guided outdoor interpretive opportunities (Figure 22).

Figure 22. Percentage of Washington State Parks that offer self-guided interpretive opportunities.

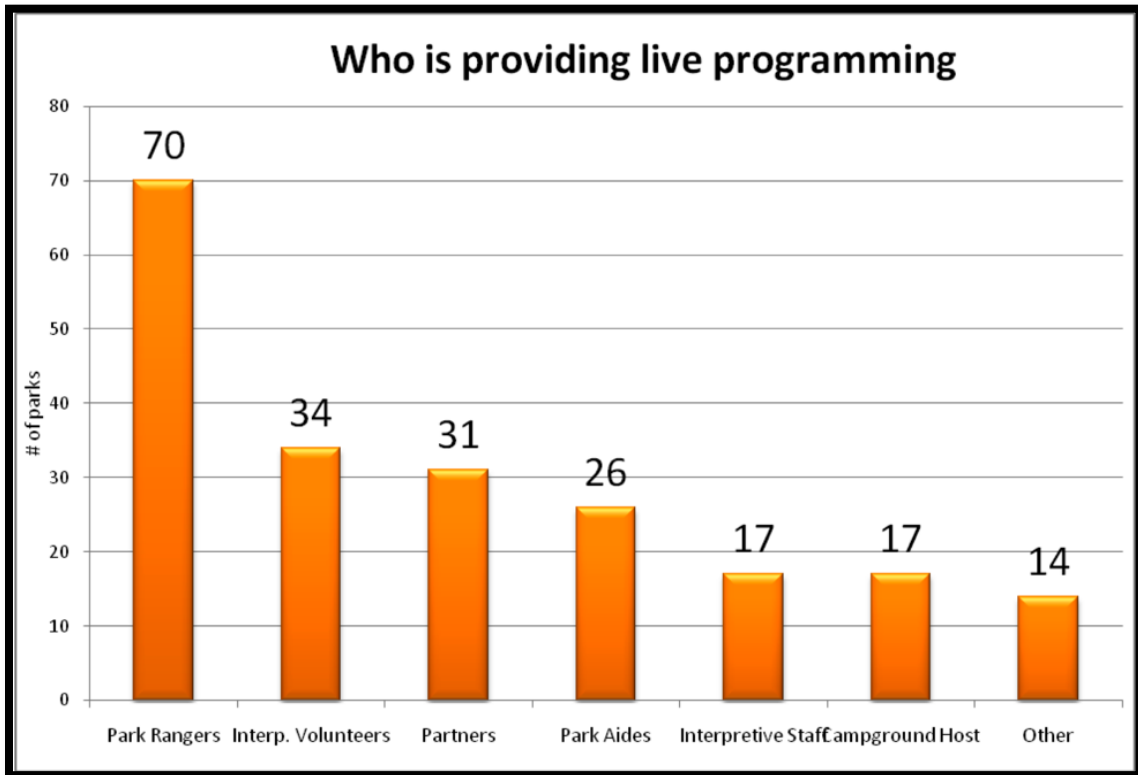


- The most common forms of self-guided media include outdoor exhibit panels and brochures located on kiosks and at trailheads. The majority of outdoor exhibits surveyed have reached or passed their designed life expectancy or they convey outdated information and are in need of replacement or removal.
- Interpretive media in State Parks: Static media, such as laminated exhibit panels, is the dominant form of interpretive media used in state parks.
- Interpretive programming in State Parks: The most common types of interpretive programming offered in state parks are guided tours and hikes, while the least common are youth-oriented Junior Ranger programs.

- Eight state parks with dedicated agency interpretive staff produced nearly 70% of the agency's interpretive contacts in fiscal year 2013 (approximately 80,000 of 114,000 contacts). Additional programming capacity was supported by formal partners and interpretive volunteers. The majority of programs occur in parks with advanced interpretive facilities, including formal interpretive trails, amphitheaters, and interpretive centers.
- Only 56 of 117 parks reported having any interpretive programs or community events.

Figure 23 represents who is providing the live programming in the parks and shows a vast majority of the parks rely on State Park rangers, volunteers, and partners. As mentioned above, only eight State Parks have interpretive staff.

Figure 23. Who is providing interpretive programming in Washington State Parks.



Although not directly related to interpretation, I also reviewed reports based on a biennial effort to determine satisfaction with State Parks and its facilities and services. The Washington State Parks and Recreation Commission hired an independent polling firm to conduct a scientific telephone survey of 1,200 Washington residents to determine Washington State residents' use of state parks and facilities, their opinions on state park management and funding, and other park-related issues. The most recent survey I could find was done in 2008 and I present here some findings relevant to support of Washington State Parks.

- Two-thirds of Washington State residents (66%) agree with the statement, "My family often incorporates a visit to a state park on weekends or during vacations."

- An overwhelming majority of Washington State residents (93%) have visited a Washington state park at some time in their lives.
- A majority of Washington State residents (71% in 2008) visited a Washington state park in the past 2 years.

Washington State Park visitors were asked about eight potential reasons for visiting State Parks. The top five reasons, based on a ranking of the percentages saying that the reasons were very or somewhat important were:

- Enjoying nature and the outdoors (99%)
- Getting away, stress reduction, or relaxation (97%)
- Spending time with family and friends (96%)
- Being active and healthy (95%)
- Participating in educational or interpretive programs (79%)

Similar to those findings that showed educational/interpretive programs were important reasons for visiting State Parks, of those Washington residents who had visited a State Park in the past two years, when asked, “How important are educational or interpretive programs, such as nature talks, campfire programs, or educational markers along trails?” 79% responded “very or somewhat important” (WSPRC, 2008).

In addition, the 2008 survey asked about Washington residents’ perceptions of the importance of various efforts of State Park rangers. Of the five efforts, providing “interpretation” is considered *very* or *somewhat* important by large majorities, as seen in Figure 24

Figure 24. Washington residents' perceptions of the importance of various efforts of State Park rangers.

Question: How important do you think the following efforts are?	Very Important	Somewhat Important	Total Important
Interpretation	58	35	93
Law enforcement	83	16	99
Maintenance	89	9	98
Resource protection	87	11	98
Park management	73	24	97

With the 2009 severe WSPRC budget cuts and staff reductions directly impacted staff resources associated with delivering interpretation services. These reductions included cutting 66 of Washington State Parks 189 full-time park rangers (WSPRC, 2014) and eliminating the three Interpretive Specialists working in Puget Sound State Parks (Figure 25).

Figure 25. Interpretive positions staffing in Puget Sound region (2009-2014)

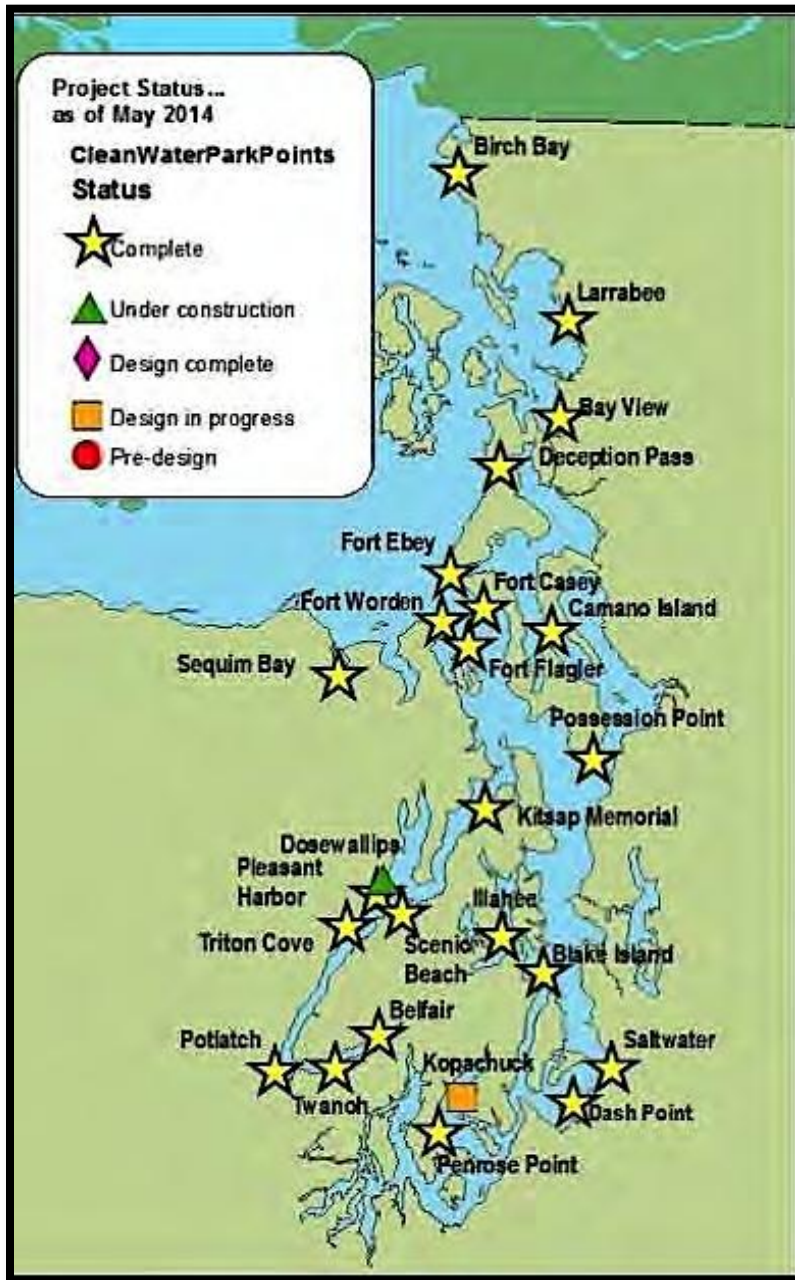
Park/Area EE Program	ESD	FY 2009 FTEs	FY2014 FTEs	Reduction in FTEs
Deception Pass	189	1.0	0.0	-1.0
Lime Kiln Point-San Juan Islands	189	1.0	0.0	-1.0
Moran ELC	189	1.0	0.0	-1.0
		3.0	0.0	-3.0

I also looked for documentation of support specifically for implementation of the Washington State Parks Puget Sound Initiative Projects Interpretation and Education Plan associated with the Sound Friendly restoration capital projects in 24 PSI parks. The U.S. Environmental Protection Agency (EPA) National Estuary Program (NEP) awarded the Department of Ecology two cooperative agreements with emphasis on Toxics and Nutrients Reduction and Prevention, and Watershed Protection and Restoration. This money was designated for the Governor's Puget Sound Initiative to protect and restore the Puget Sound shoreline habitat and ecosystem processes. By the end of the 2011-13

biennium, the Department of Ecology received a total of \$27.29 million of federal funding to carry out the Puget Sound Initiative's focus on restoration projects in the 24 Washington State Parks on Puget Sound.

Washington State Parks Environmental Planner Randy Kline and Capital Construction Project Coordinator Brian Yearout helped provide documents that detailed the particular infrastructure upgrades for each park and which renovations have been completed and which are still in the works (Figure 26 and Appendix A)

Figure 26. Map showing project status for PSI State Parks.



I mined Washington State Parks records on the agency's past and projected biennium budgets and found budgets and timelines for remaining PSI projects, including some information on budgets to support implementation of environmental interpretive plans in the PSI project parks. Reviewing These reports indicate that the majority of the

24 PSI parks’ clean water projects have been completed with the last two wastewater treatment projects currently under construction, with a few more stormwater enhancement and hard armoring removal projects still planned.

Of particular interest is the WSPRC Ten Year Capital Plan for budget years 2013-2023 excerpt shown in (Figure 27) that documents implementation information for the “Twanoah Interpretive Master Plan”. This current budget plan projects \$293,000 funding will be appropriated in the 2017-2019 biennium budget year. The original budget to implement the WSPRC environmental interpretation plan for the 24 PSI parks, outlined in 2007, was more than twice that amount not counting the planned hiring of three interpretive staff to coordinate programming (an addition of around \$400,000 a biennium).

Figure 27. Excerpt from WSPRC Ten Year Capital Plan for budget years 2013-2023?

Ten Year Capital Plan Project Listing by Legislative District, Agency								
	Estimate Total	Prior Expenditures	Reapprop. 2013-15	New Approp. 2013-15	Estimated New Approp. 2015-17	Estimated New Approp. 2017-19	Estimated New Approp. 2019-21	Estimated New Approp. 2021-23
465 State Parks and Recreation Commission								
30000068 Scenic Beach SP Stormwater Improvements	383,000						383,000	
30000069 Scenic Beach Shoreline Protection	675,000					225,000	450,000	
30000120 Belfair State Park - Park Facilities Renovation	5,946,000				583,000	2,707,000	2,656,000	
30000246 Twanoah - Interpretive Master Plan	293,000						293,000	
30000276 Hope Island Group Camp	139,000						139,000	
30000426 Polkatch Campground	2,955,000				864,000	2,091,000		
30000532 Schafer Relocate Campground	2,050,000				2,050,000			
30000646 Twanoah & Manchester Historic Preservation	2,841,000				1,241,000	1,600,000		
30000692 Scenic Beach Cabins and Comfort Station	760,000						760,000	
30000851 Twanoah State Park Stormwater Improvements	2,049,659				375,559	1,674,100		
State Parks and Recreation Commission Total	18,091,659				5,113,559	9,489,100	3,489,000	

4.2 First-hand Observation Data on Environmental Interpretation Available in Washington State Parks on Puget Sound

With the policies, mandates, and plans for environmental interpretation in Washington State Parks in mind, I conducted first-hand observations and assessments of environmental interpretation in 24 Washington State Parks on Puget Sound. Only eight state parks in the whole system's 120 parks have interpretive staff (Ryan Karlson, personal communication; WSP, 2013). At the time of data collection on environmental interpretation, none of the case study's 24 State Parks on Puget Sound had interpretive staff; live programming was offered only seasonally and infrequently by volunteers or outside organizations at a handful of the parks. The most common form of interpretive opportunity for a recreating park visitor is non-personal, self-guided written and digital media (WSP, 2013). Therefore, I chose to focus observations of this type of environmental interpretation for the case study of 24 State Parks.

Observations of park signs, kiosks, displays, trails, exhibit, and digital media resources (Figures 28-37) provided data for assessing the current status of environmental interpretation in these parks.

Figure 28. Example of WSP kiosk with posters, signs.



Figure 29. Example of WSP interpretive panel sign.



Figure 30. Example of an interpretive trail.



Figure 31. Example of an interpretive trail sign/marker

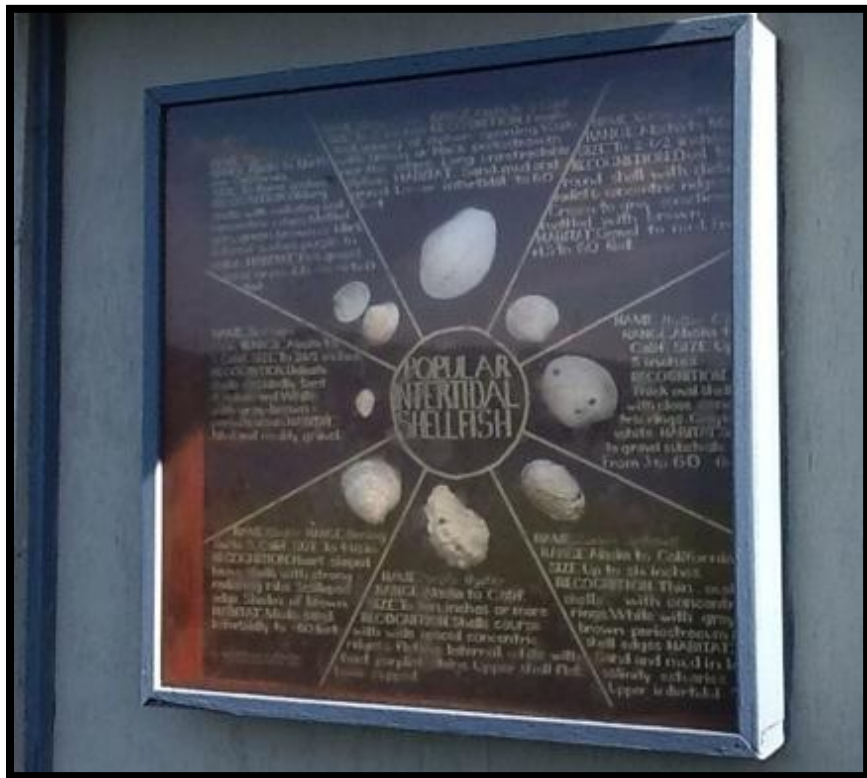


Figure 32. Example of interpretive display.

Figure 33. Example of interpretive center exhibits



Figure 34. Examples of park information brochures.



Figure 35. Example of digital media—WSP website and mobile phone application.



Typically, interpretation in parks helps orient the visitor to the park and highlights cultural and/or natural resources inherent in the park setting. Because these parks provide great access to the physical environment of Puget Sound and are part of large-scale natural resource management plans, I was looking specifically for any mention of environmental content and issues particular to Puget Sound’s natural resources. Results document the presence of natural resources/environmental content for self-guided interpretation available to the recreating park visitor. Results include assessments of whether interpretation highlighted Puget Sound’s natural resources and evidence of any mission-based interpretation aimed at building valuing, awareness, positive stewardship attitudes, and behaviors. These results are used in my analysis, comparing what policy states with what is being implemented in current practice.

Results of first-hand observations from visiting the 24 parks are presented in table form and observations of brochures and mobile digital media potentially available to park visitors are described in summary paragraphs. Table 1 lists each park, what kind of environmental interpretation (EI) was present in the park, a description of the topics covered in any park EI, and assessments of apparent age and physical condition of the EI materials.

Table 1: Data on type of self-guided EI, description of EI topics, and condition notes on EI materials, available in 24 PSI Washington State Parks in 2013
Described self-guided environmental interpretation currently available in 24 Washington State Parks on Puget Sound, surveyed from 2012-2013. NA =None available

PSI Washington State Park	Type of Self-Guided Environmental Interpretation (EI) present in park:	Description of EI topics	Condition notes on EI materials (Age/maintenance status)
Bayview	NA	NA	NA
Belfair	<ul style="list-style-type: none"> • Display • Panel signs 	<ul style="list-style-type: none"> • Shellfish identification • Hood Canal water quality • Salmon life cycle 	<ul style="list-style-type: none"> >10 years old/Poor >10 years old/Poor >10 years old/Fair
Birch Bay	<ul style="list-style-type: none"> • Interpretive trail panel signs 	<ul style="list-style-type: none"> • Marsh ecosystem 	<10 years old/Good
Blake Island	<ul style="list-style-type: none"> • Interpretive trail signs 	<ul style="list-style-type: none"> • Native plants 	>10 years old/Poor
Camano Island	<ul style="list-style-type: none"> • Interpretive trail markers w/brochure • Panel sign 	<ul style="list-style-type: none"> • Forest vegetation • Marine Life of Admiralty Inlet Stewardship Area 	<ul style="list-style-type: none"> >10 years old/Poor ~10 years old/Good
Dash Point	<ul style="list-style-type: none"> • Kiosk posters 	<ul style="list-style-type: none"> • Marine life 	>10 years old/Fair

Deception Pass	<ul style="list-style-type: none"> • Interpretive trail panel signs • Tidepool panel signs • Panel sign 	<ul style="list-style-type: none"> • Dunes vegetation/ ecosystem • Marine Life/beach etiquette • Marine Life of Admiralty Inlet Stewardship Area 	<p><10 years old/Good</p> <p>>10 years old/Poor</p> <p>~10 years old/Good</p>
Dosewallips	<ul style="list-style-type: none"> • Panel sign 	<ul style="list-style-type: none"> • Hood canal water quality 	>10 years old/Fair
Fort Casey	<ul style="list-style-type: none"> • Panel signs • Kiosk posters, signs 	<ul style="list-style-type: none"> • Composting demonstration • Forest nutrient cycling • Marine Life • Underwater Dive Park etiquette, Marine Life 	<p>>10 years old/Poor</p> <p>>10 years old/Fair</p> <p>>10 years old/Poor</p> <p>>10 years old/Fair</p>
Fort Ebey	<ul style="list-style-type: none"> • Panel signs • Kiosk posters, signs 	<ul style="list-style-type: none"> • Kettles formation • Marine Life of Admiralty Inlet Stewardship Area • PSI's "Puget Sound Starts Here" scoop • pet poop poster • Marine Life 	<p>>10 years old/ Fair</p> <p>~10 years old/Fair</p> <p><10 years old/Poor</p> <p>>10 years old/Fair</p>
Fort Flagler	<ul style="list-style-type: none"> • Interpretive trail markers w/ brochure • Panel sign • Kiosk posters 	<ul style="list-style-type: none"> • Forest vegetation • Marine Bird and human disturbance • Wildlife guidelines 	<p>>10 years old/ Poor (brochure out of stock)</p> <p><10 years old/Good</p> <p>>10 years old/Fair</p>
Fort Worden	<ul style="list-style-type: none"> • Interpretive centers (separate entrance fees) 	<ul style="list-style-type: none"> • Marine Science and Conservation • Natural History of Puget Sound 	
Illahee	<ul style="list-style-type: none"> • Panel signs • Interpretive trail markers w/brochure 	<ul style="list-style-type: none"> • Tree identification • Forest vegetation 	<p>>10 years old/Fair</p> <p>>10 years old/Fair (brochure out of stock)</p>
Kitsap Memorial	<ul style="list-style-type: none"> • Panel Sign 	<ul style="list-style-type: none"> • Hood Canal water quality 	>10 years old

Kopachuck	<ul style="list-style-type: none"> • Interpretive trail signs • Kiosk posters, signs • Panel Sign 	<ul style="list-style-type: none"> • Forest vegetation • Shellfish harvesting • Puget Sound 	>10 years old/Fair >10 years old/Fair <10 years old/good
Larrabee	<ul style="list-style-type: none"> • Trail sign 	<ul style="list-style-type: none"> • Beach etiquette 	>10 years old/Fair
Penrose Point	<ul style="list-style-type: none"> • Interpretive trail signs 	<ul style="list-style-type: none"> • Forest vegetation 	>10 years old/Poor
Pleasant Harbor	NA	NA	NA
Potlatch	<ul style="list-style-type: none"> • Panel Sign 	<ul style="list-style-type: none"> • Hood Canal water quality 	>10 years old
Saltwater	<ul style="list-style-type: none"> • Kiosk posters, signs • Panel Signs • Panel Signs • Interpretive trail signs • Interpretive center 	<ul style="list-style-type: none"> • Marine Life; Salmon Life Cycle; Seal Pups disturbance: Beach exploring etiquette • Marine Life of Artificial Dive Reef • Local watershed and salmon creek • Native vegetation and ethnobotany • Marine Life, Forest vegetation, Salmon watershed, Puget Sound Posters • Marine Life, Forest vegetation displays • Artificial Reef Diving video 	>10 years old/Fair <10 years old/Good >10 years old/Poor >10 years old/Poor >10 years old/Fair >10 years old/Fair <10 years old/Good
Scenic Beach	NA	NA	NA
Sequim Bay	NA	NA	NA
Triton Cove	<ul style="list-style-type: none"> • Panel Sign 	<ul style="list-style-type: none"> • Hood Canal water quality 	>10 years old

Twanoh	<ul style="list-style-type: none"> • Display • Panel signs • Kiosk posters 	<ul style="list-style-type: none"> • Shellfish identification • Hood Canal water quality • Salmon life cycle • Wildlife etiquette 	>10 years old/Poor >10 years old/Poor >10 years old/Fair >10 years old/Fair
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The second data table (Table 2.) lists each park and what kind of self-guided environmental interpretation media, if any, was in the park and if messaging connected park visitors specifically to Puget Sound’s natural resources and restoration efforts. This data allowed me analyze the current status of EI in these parks against the ideals outlined in Washington State Parks environmental interpretation policies and plans. The table categories were created from ideals and targets set by the Washington State Parks and Recreation Commission Puget Sound Initiative Projects Interpretive and Education Plan, the Washington State Parks Green Vision Plan, and the U.S Environmental Protection Agency and Washington State’s Puget Sound Partnership’s 2020 Action Agenda’s Public Awareness and Engagement Plan. Categories of data include whether the EI topics available in the park conveyed messages about the natural history or attributes of Puget Sound’s marine life and environment; messages with intention to build public awareness and understanding of issues facing Puget Sound; messages about stewardship, encouraging practices and behaviors that are detrimental to Puget Sound and promoting those that are beneficial; messages about the Puget Sound Initiative specifically, such as mention that the parks are part of the PSI’s plan; and if any of the PSI water quality enhancement projects in the 24 parks are identified in messaging to park visitors.

Table 2. Data on self-guided EI with elements of ideals described in WSPRC planning documents, available in 24 PSI Washington State Parks in 2013

*Described environmental interpretation with elements of ideals available in 24 Washington State Parks on Puget Sound, surveyed in 2013. Parks labeled with * are green vision/showcase parks as described in WSPRC planning documents.*

KS = Kiosk Signs

P = Interpretive Panel

IC = Interpretive Center exhibit

B = Brochure

D = Interpretive Display

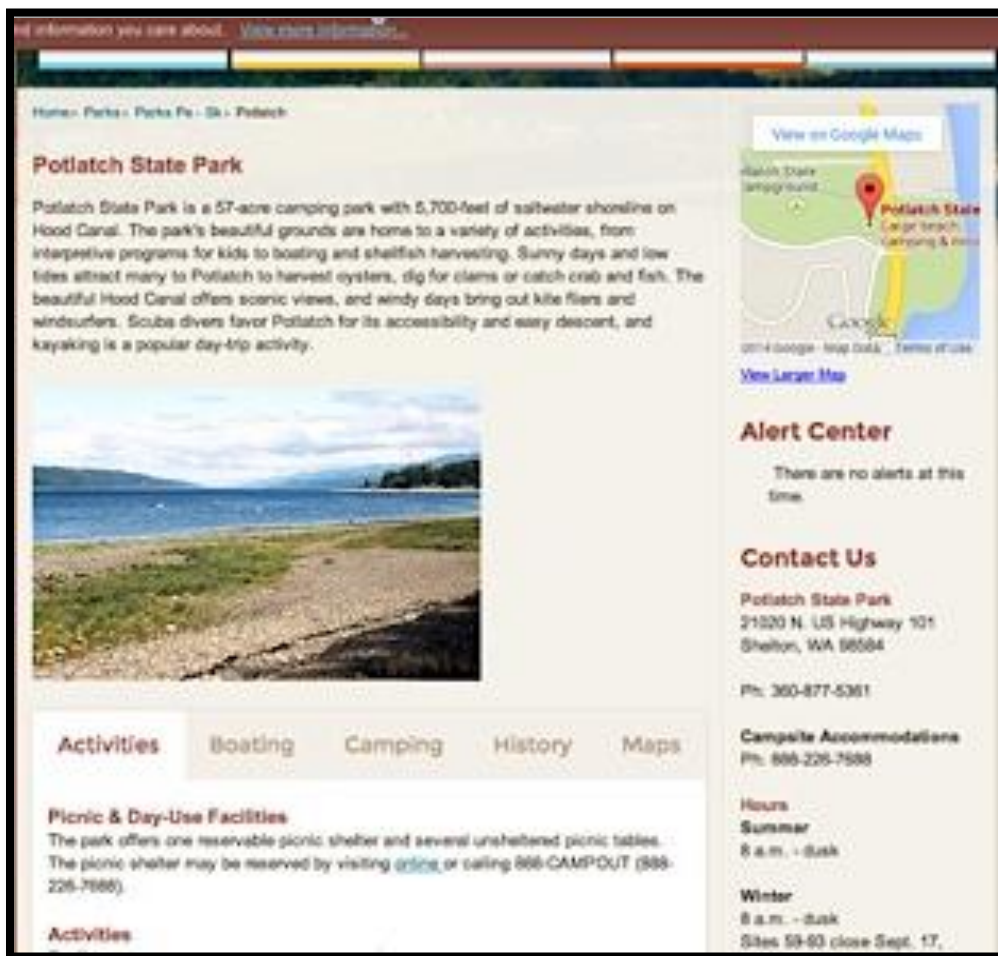
PSI Washington State Park	Highlights Puget Sound/ Marine Life	Aims to build public awareness and understanding of issues facing Puget Sound	Aims to change practices and behaviors detrimental to Puget Sound and promote those that are beneficial	Identifies State Park as part of the Puget Sound Initiative	Identifies Enhanced water quality projects in park
*Bayview					
*Belfair	P	P	P		
Birch Bay					
*Blake Island					
Camano Island	P	P	P		
Dash Point	KS				
Deception Pass	P	P	P		
*Dosewallips	P	P	P		
*Fort Casey	KS, P				
Fort Ebey	KS, P	KS, P	KS, P		
Fort Flagler	KS, P, B				
*Fort Worden	IC	IC	IC		
Illahee					
Kitsap	P	P	P		

Memorial					
Kopachuck	P				
*Larrabee	KS				
Penrose Point					
Pleasant Harbor					
Potlatch	P	P	P		
*Saltwater	KS, P, IC	KS, P			
Scenic Beach					
Sequim Bay					
Triton Cove	P	P	P		
*Twanoh	KS, P, D	KS, P	P		

A review of my collection of informational brochures available for park visitors indicated that, although several parks offered brochure-like take-away materials at locations such as park buildings or interpretive trail kiosks, the content was geared toward general orientation to the park, available recreational activities, and regulations. The few examples that contained any interpretation of the park's resources were brochures designed to describe the history and cultural significance of the park or accompany an interpretive trail. Natural resource content was strictly limited to a few interpretive trail brochures about forests, their nutrient cycles, and vegetation identification. In summary, I found no examples of brochures that had interpretation about Puget Sound specifically or about stewardship efforts to restore its natural resources.

A review of Washington State Parks online digital media delivered by the agency website and phone application yielded data on environmental interpretation potentially available to a park visitor using these mobile communication resources. The Washington State Parks website contains information pages for each park (Figure36). Currently there are no park website pages or sections dedicated specifically for interpretive purposes but the possibility for future development has been mentioned in recent State Parks planning documents, “as funding permits” (WSP 2013).

Figure 36. Example of a webpage for an individual Washington State Park (WSPRC, 2014).



A review of the Washington State Park’s website park-pages indicates that they primarily orient the visitor to the particular Puget Sound state park by giving information

about its size, its shoreline footage, and some historical content such as how the park got its name. Most of the communications fall into general information categories describing the available recreational activities and regulations. A few park-pages mentioned “environmental features” of the park under a tab heading called “History” and contained references to geological history, such as how the Hood Canal was formed by glaciers.

In 2013, Washington State Parks and Recreation Commission launched the Official Washington State Parks Mobile App in collaboration with ParksbyNature Network, a marketing and software company that produces several Pocket Ranger® Park Passport mobile apps for entities like state parks across the country (at no cost to the state). A review of the app and WSPRC launch documents indicate the information and content is taken directly from the State Parks website. I could find no *additional* interpretive content about Puget Sound or stewardship efforts. Overall, my review of the digital media resulted in finding no evidence of mission based environmental interpretation of Puget Sound’s natural resources and no mention whatsoever of the Puget Sound Initiative, other restoration efforts, or any stewardship based content.

Figure 37. Washington State Parks mobile application, Pocket Ranger.



4.3 Interviews with Parks Staff

To supplement the survey data and provide additional depth to my research, I conducted interviews with relevant Washington State Parks staff and volunteers. The State Parks interviewees were purposefully chosen to provide insight into the status of environmental interpretation in Washington State Parks. After briefly describing the Washington State Parks individuals whom I interviewed, I present data on pertinent excerpts from in-person, phone, and email interviews. Results are presented in descriptive

paragraph form where I summarize questions and conversations with staff and volunteers and broadly organize them under themes of *Policy, Support, and Implementation*. Table 3 lists the parks staff interviewed and their position.

Table 3. List of Washington State Parks interviewee names and positions.

Interviewee	Position
Steve Wang	Interpretive Program Manager (retired)
Ryan Karlson	Interpretive Program Manager
Randy Kline	Environmental Program Manager
Brian Yearout	Capital Program Construction Project Coordinator

Current and retired Interpretative Program Managers helped answer research questions about historical and current support for interpretation services and barriers to implementation; they also supplied some supporting internal documents. The Environmental Program Manager and Capital Program Coordinator provided insight into Washington State Parks Green Vision Plan and status updates with supporting documents on Puget Sound Initiative natural resource management plans and associated Puget Sound-Friendly capital projects in the 24 PSI parks. To gain additional perspective on the thesis topic, and for the embedded case study of the three Green Vision State Parks and Fort Flagler State Park, I interviewed staff and volunteers at these parks. Conversations with park rangers and volunteers who work on-site in the embedded case study parks

offered insight into interpretive services support and barriers to interpretation as well as insight into their profession. Results from the embedded case study interviews are presented in section 4.4c.

Washington State Parks Interpretive Program Manager, Steve Wang

In 2006, I met with Steve Wang before he retired after 30 years in interpretation for Washington State Parks. The National Association of State Park Directors soon after granted him its annual President's Award recognizing a lifetime of service and contribution.

One of his major achievements was to bring to the nation a greater awareness and appreciation of the Lewis and Clark Expedition. He spent a decade fully committed to unveiling the state of Washington's part in that historic experience, which resulted in a marvelous interpretive video and complimentary publication, two major interpretive center renovations, over 50 new highway interpretive markers, installation of artwork, monuments at trail heads in parks, a series of special youth oriented activities and programs during the bicentennial period, and a continuing array of interpretative programs along the route

(WWW.ServiceWearApparel.com/ranger/finalist).

Most of my interview with Steve centered on the organizational structure and the history of support for interpretive services in Washington State Parks.

Support:

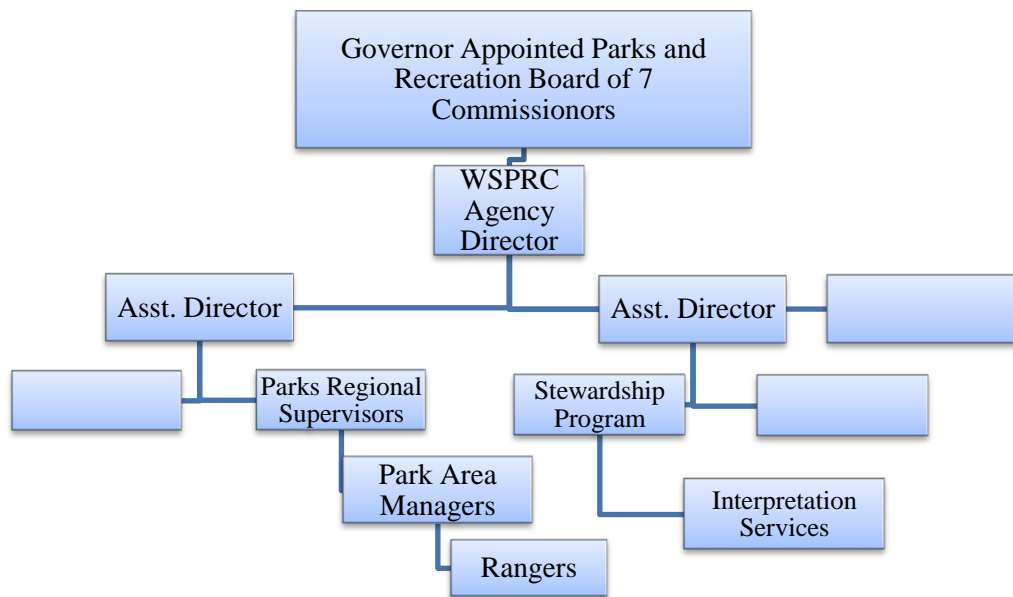
Steve stated that staffing levels had grown in the 1970s and 80s to include 20 paid interpretive staff positions. At that time, everything was done "in-house", including creation of interpretive content, the design and production of printed media, and the fabrication of exhibits, displays, panel signage, etc. However, he said after a tough budget year in 1991, cuts were made that left just 2 interpretive staff, including himself and one other interpretive position at the Goldendale Observatory. He said that is also when the

model shifted to contracting out non-personal interpretation services such as the production of interpretive signage.

With the transfer of the Mount Saint Helen's Visitor Center to Washington State Parks in 2000, and a new capital project of rebuilding the Lewis and Clark Visitor Center in 2004 to commemorate the bicentennial landing at Cape Disappointment State Park, interpretive staffing levels started growing again. He stated that large capital-project infrastructure such as the Lewis and Clark Visitor Center help him "fight for staff." He shared the most recent large-scale interpretive plan, which involves several Washington State Parks along the geologic path of the Ice Age Floods and will interpret that story as part of a multi-state National Geologic Ice Age Floods Trail. He said inspiration for that project came from surveys that showed only 19% of people living in the northeast part of our state had ever heard of the Ice Age Floods. He started getting some funds to support interpretation of the Ice Age Floods after he testified to the State Legislature that it would be great for State Parks to be part of the National Geologic Trail project. Then the WSPRC director agreed to put it into the 2013 Centennial Plan to "reveal its mystery" through interpretation in 21 Washington State Parks.

He went on to describe the organizational structure of Washington State Parks that I attempt to represent here in Figure 38. He stated that interpretation was organized under the stewardship services branch of one of many divisions and along with several other park related programs. He said interpretation competes with many other "opportunity costs" and that other dimensions of park management, such as health and safety, come first.

Figure 38. WSPRC organizational structure relevant to interpretation



Implementation:

I shared that my curiosity for this project came from research I began at Fort Flagler State Park on Puget Sound and that I thought there was a lot of great potential to interpret the incredible natural environment there. I had been shown some old interpretive plans for the park that included natural resource interpretation but that those plans were never implemented. When asked about how implementation of interpretation happens in individual state parks, he stated that there are, "mandates from up above for all parks to create interpretive plans." He said just because the plans become "adopted" doesn't mean they are "implemented." He said there is "no time and money is not available." He provided a hypothetical example regarding how interpretation support might happen at the individual state park level such as at Fort Flagler State Park. He said if park manager Mike Zimmerman wants an interpretive specialist position, he takes his idea to his

regional supervisor who then takes it to “headquarters.” He said park managers usually, “only ask for things they might get.” He said that park rangers are really “managing little cities” and although interpretation is part of that, it really is “a matter of time” and “the challenge is trying to fit that in with everything else.”

I mentioned the possibility of neighboring parks on Puget Sound working together to create coordinated interpretive opportunities and that parks along its shorelines share a lot of natural resource themes; thus, general interpretation could be created that would work efficiently for implementation in all of them. He said he liked my idea of doing Puget Sound shoreline parks together as a whole theme, “like what was done with Lewis and Clark and Ice Age Floods parks.” He said, “Consistency should be there and neighboring plans should work together, but due to [lack of] time, they aren’t.”

Ryan Karlson, Interpretative Program Manager

I met Ryan for the first time in 2011 for an in-person interview and then kept in contact through email to remain up to date on any relevant developments for my case study research. Before taking over as manager when Steve Wang retired in 2008, Ryan worked as an interpretive specialist at State Park’s Lewis and Clark Visitor Center and as State Parks Planner. Ryan’s graduate research at Central Washington University included field investigation and public interpretation of Ice Age Flood features within the Washington State Park system. One of Ryan’s recent achievements has been his work to obtain funding for interpretation in 21 of the State’s parks that highlight Ice Age Flood

geologic events and the remodel of a new Dry Falls State Park Visitor Center for the Ice Age Floods National Geologic Trail.

Much of our conversation was focused on environmental interpretation specifically because many new developments in WSPRC environmental interpretation policy and planning around the Puget Sound Initiative had occurred since I had met with Steve Wang in 2006. Ryan shared with me results from an internal survey that assessed current levels of interpretative services of State Parks as well as some park visitor use statistics. Relevant data from those sources are presented here. We also discussed interpretation support and implementation barriers.

Support:

Our interview started with an overview of the Interpretive Services Program and Ryan broke down the services into four areas he described as follows:

- Self-guided and Guided: He said the “bread and butter is development of self-guided media such as formal exhibits and panels.” “Guided programs” are programs like “guided walks and campfire evening programs.”
- Environmental Education: This was more “curriculum-based” and “facilitated activities” with the “work done by teachers” where “the park is the classroom” and more of “the setting.”
- Museum Services/Collections Management: This involves “archeology, coastal defense artifacts, Native American grave protection, etc.”

- Outreach Partnership: This is the “park’s role in different networks”. He said, “for example with Puget Sound, it is more urban and therefore more resources and therefore different strategies” for offering services.

He mentioned that for the 2013 Centennial, interpretation is “a number one category priority” and so understanding current levels of interpretation was important. He reviewed draft results of an “internal survey of 119 State Parks across the state with a 90% participation rate.” He said the survey showed that “self-guided and static panel type” was the “majority of interpretation” in parks. He also said, “guided” or “live” interpretation was mostly from “roving” experiences when a visitor directs a question to a park staff member or volunteer, and then interpretation ensues. He said this was, “the most successful” with “high visitor contacts” coming mostly from rangers and some from volunteers. He mentioned that the survey showed 73% of trails in the parks were not interpreted. Ryan supplied me the draft results of the internal survey and later a final draft by email in 2013 and I review relevant excerpts from these documents in section 4.1.

At the time of our initial interview, Ryan said “on-line” development (that is, online and digital interpretive media) had not been launched yet.” He expressed interest in a focus for on-line development “to reach user groups that are younger” and “more tech savvy” who may not relate to “old style media.” He mentioned a new idea of “virtual ranger” programming that he said the National Park Service was starting to use for orientation and content. In a follow-up email later in 2012, Ryan mentioned they had moved forward “in the development of online media to help draw visitors to our parks, especially in our metro areas.”

Ryan shared some of the same history of interpretive staffing levels that his predecessor Steve Wang had recounted. Ryan also supplied supporting documents excerpted here.

In 1991, the agency supported a statewide interpretive program with four full-time and 16 seasonal staff providing a range of interpretive services, including an interagency funded Environmental Education coordination position that was shared with the Department of Natural Resources. Interpretive programming was focused within agency-operated Environmental Learning Centers, Interpretive Centers, and Heritage Sites. In 1992, budget cutbacks reduced the interpretive program to a total of 2.0 FTEs statewide with all seasonal and interagency staff eliminated.

Since 1992, interpretive programming was slowly reestablished and had been on an upswing in the 2000s growing up to 14 full-time staff. However, in 2009, severe state budget cuts eliminated or reduced hours of many interpretive positions including cutting three interpretive positions in the Puget Sound region (Figure 25). These cuts included the elimination of the Moran Outdoor School, a residential environmental/outdoor education school for visiting schools and other groups. Ryan said the interpretive specialist position at Cama Beach State Park (a park on Puget Sound's Camano Island that opened in 2008) was "still there."

Policy:

Ryan stated that that the interpretation services program was under the "Stewardship" division in Parks. He recounted how, up until 2006, the push to interpret

natural resources was centered on highlighting biodiversity, and in Puget Sound, on recovery of salmon from an “old grant.” He then mentioned the 2007 WSPRC Sustainability Initiative that set goals for State Parks to become greener by reducing fuel use, etc.” He said there is interest to “model stewardship and sustainability in State Parks” since they are “like a small city.” He said, “modeling this relationship to the community is especially ripe in Puget Sound.”

We then started a discussion about the Puget Sound Initiative and its impacts on environmental interpretation in State Parks. This is when I learned of the specific interpretive plans created to educate visitors about capital projects improving infrastructure in “shoreline zone” parks. Ryan said he thought there was about “\$27 million” dedicated to PSI shoreline parks enhancements and “out of this came the Puget Sound Initiative Projects Interpretation and Education Plan” (Figure 18). He shared that this plan was created in consultation with an outside contractor and he gave me a copy. Our discussion about implementing the plan is covered in the *Implementation* section below.

Implementation:

Upon learning about the PSI Projects Education and Interpretation Plan, I asked about implementation. Ryan said ever since the budget cuts that began in 2009 and with the institution of a funding model based less on state support and more on self-reliance, “the focus has been on just trying to maintain what we have now.”

I checked in with Ryan periodically over the next few years for updates on developments related to Puget Sound environmental interpretation and the PSI projects to model Sound-Friendly parks. In 2012, Ryan stated,

“Unfortunately, we have not had much success in advancing many of our interpretive program initiatives, including our Puget Sound clean water initiative, due to substantial changes to our budget. Basically, [there is] nothing new on the implementation front.”

Ryan did share some optimism when he announced that, “we are working to respond to the Governor's Shellfish Initiative,” a newly created initiative, “that may lead to developing some interpretive programming and events specific to shellfish and the culinary aspects of clean water = clean food, etc.” He also mentioned development plans for on-line digital media.

Ryan continued to serve as a resource for information on WSPRC interpretive services beginning in 2011 and continuing up to the publishing of this thesis in 2014. He supplied many documents (reviewed in section 4.1.) as part of our exchange in conversations and my inquiries.

Randy Kline, Environmental Program Manager

In 2011, I reached out to Randy after learning of the Puget Sound Initiative driven plans for Washington State Parks. I wanted to understand more about the natural resource management plans in the Puget Sound shoreline parks as part of my research. We began our conversation through an exchange of emails that continued through 2013 and centered on my inquiries about the water quality enhancement construction projects in the

24 PSI parks, the associated Green Vision and Interpretive Elements Plans, and the three showcase parks chosen to model the Sound Friendly development strategies (Figures 39).

Policy:

When asked about the Green Vision and PSI projects, Randy gave me a copy of the Green Vision Plan (Figure 17) and the State Environmental Policy Act (SEPA) documents related to the PSI projects in the three Green Vision showcase parks. I shared that my thesis focus was on environmental interpretation in the parks and so I was interested in any plans to interpret the work done in the PSI parks. Randy responded that

There is large interpretation/education component to the Green Vision Plan - a separate "Interpretive Elements" document was prepared that includes specific educational and interpretive signs related to the Hood Canal and Puget Sound.

He gave me a copy of the "Interpretive Elements" document that turned out to be a 2009 follow-up document for implementing the 2007 WSPRC's PSI Projects Interpretation and Education Plan. This is also referred internally for WSPRC as the "Twanoah Interpretive Master Plan"; I review this document in data results section 4.1a. I used it for case study research to investigate implementation of the environmental interpretation components during direct observation surveys in the parks.

Implementation and Support:

Randy provided me with an updated project status list related to the multiple enhanced water quality projects completed as of 2010 (Appendix A) and alerted me to the few remaining low-impact development (LID) projects to address stormwater and

restoration of shorelines. Randy added, “As funding permits, we will continue to move forward with these types of projects consistent with the 2007 Green Vision Plan.”

In 2013, I checked in with Randy about the PSI projects and I told him that I had visited the parks, including the three Green Vision parks but had failed to see any implementation of the restoration or environmental interpretation. Randy responded,

“At Twanoh an existing asphalt parking lot located on the shoreline was replaced with a pervious pavement parking lot – the pervious pavement would not be immediately obvious unless you were looking for it. At Saltwater [State Park] we constructed a bioswale that replaced asphalt parking lot – again something that would be hard to notice unless you were looking for it. At Fort Casey, we upgraded the on-site septic and drainfield (much of the dollars allocated for this work went into septic and sewer upgrades) and connected the Lighthouse facility – again a project that you would not be able to see on the ground”.

Randy said that, “While the sign and interpretation plan has been completed, the funding to install the existing signs is not available at this time”. Randy said the State Parks budget was to blame and that, “It's a staff resource issue at this time. However, I'm hoping for some movement early next year.”

Later, I made more inquiries about the Green Vision Plan specifically. He thanked me for my interest and wanted to share, “ a caveat that the Green Vision Plan pre-dates my starting here at State Parks”. I include the questions and his responses here:

-Who wrote the plans specifically?

The plan was written by the consulting firm Jones and Jones with oversight by State Parks staff.

-Are the plans meant to represent real goals and benchmarks and work as a blueprint for design of these parks with a timeline or are the plans more of an ideal?

A plan like this would be best characterized as funding dependent – so more of an ideal. That said, we are currently implementing components of the plan through grant funded restoration efforts at Saltwater and Twanoh. That is one of the advantages of a plan like this, it provides a basis and starting point to pursue grant funds. Plans such as this often take many years to implement and the recession in 2008 provided a real setback for this type of funding.

-When these plans were formulated, was there a consideration of resources to implement the plans? I read that an initial 17.3 million dollars was allocated for the cleanup projects in the 24 parks on Puget Sound. Was any of that dedicated to these Green Vision plans for the three specific parks?

In reviewing the plan there was a real attempt to quantify the cost of implementation in the cost-benefit analysis section. In regard to the \$17.3 million, a portion of the funds were used to create this plan and the remainder used for on the ground cleanup projects in the 24 parks. I am not aware that any of funds were specifically reserved for future Green Vision Plan implementation.

-Why were these three parks picked specifically?

All three parks are within Puget Sound and have the potential for upgrading outdated infrastructure and restoration. Another factor was selecting parks from different regions of the Puget Sound.

-I was thrilled to discover the Green Vision report and its inclusion of environmental interpretation as a strategy to support the need to restore Puget Sound. However, on the ground, I have not found much implementation and assume a lack of financial resources is the issue. Can you comment more on this?

You are correct, lack of financial resources is the main issue. However, the plan provides a way forward and as funding opportunities become available we will continue to work towards implementation.

Randy provided me with updated information on additional capital projects moving forward in continued work towards implementing the plan. The last remaining stormwater/wastewater treatment projects in the 24 PSI parks involve “Sound Friendly” development plans for Dosewallips State Park on Puget Sound’s Hood Canal. The \$3.2 million capital project includes a new membrane bioreactor sewage treatment facility to replace the aging septic system at the park with an improved treatment process that decreases negative impacts to water quality. Randy said construction on that project is scheduled for the 2013-2015 biennium. In addition, although most of the 24 PSI projects addressing water quality have been completed, plans continue to address removal of hard armoring and restoration of shorelines to enhance habitat and ecosystem processes. Twanoh State Park is slated for more LID shoreline restoration work and Randy gave me a summary of that project slated for implementation in the 2013-2015 biennium.

Twano State Park Beach Restoration: (\$402,900; source federal EPA grant funds). Grant funds will be used to restore nearshore and delta processes in Twano State Park in southern Hood Canal. The first phase of the project will include the removal of fill, shoreline armoring, and a concrete bulkhead; installation of soft shore armoring; beach nourishment; culvert replacement; large wood placement; and marine riparian planting. This will result in the restoration of a historic barrier embayment on the eastern shoreline of the park, improved beach profile along 1,500 feet of marine shoreline, and improved habitat conditions in the lowest reach of Twano Creek (below the Highway 106 culvert).

With this information, I decided to contact the WSPRC Capital Construction Project Coordinator associated with these projects to find out if environmental interpretation is included in the implementation of these plans.

Brian Yearout, Capital Program Construction Project Coordinator

In 2014, I e-mailed Brian Yearout by email and told him about my MES thesis and research into the PSI driven projects in the 24 Washington State Parks on Puget Sound including the current project in Dosewallips State Park. Below are my questions and his responses.

-Do you know if any of the current plans include interpretation about septic and wastewater treatment improvements for the recreating visitor?

The current budget for Dosewallips does not include interpretation.

-Were any funds towards implementing the plans specifically associated with education, such as the construction of interpretive panels, displays, etc.?

Yes, last biennium we used some of the clean water funds to purchase interpretive materials. I will send you a separate e-mail on that.

-Did the money for the Dosewallips project come from Governor Gregoire's Puget Sound Initiative funds allocated for state parks' cleanup in 2005?

Initially, Yes. The first 3 phases of construction and the design of the MBR came from those funds. However, it was not enough to finish the project so we requested additional funds in our capital budget request and we were successful in obtaining those funds in our current biennium.

He also provided status updates for projects as of 2014 and sent me information documenting the interpretive signage proposed for installation. He said, "The signs have not been installed yet – but we're working on it." I include images of the interpretive signs he forwarded to me in my review of WSPRC documents in section 4.1.

4.4 Embedded Case Study Results

The embedded case study of four parks within the larger case study group of 24 Washington State Parks provided opportunities to deepen my understanding of the current status of environmental interpretation in parks targeted by the Puget Sound Initiative to model “Sound Friendly” development projects. I chose Fort Flagler State Park because I spend a lot of time there recreationally and this park was where I first made the observation of the potential of public environmental education about Puget Sound. I also examined Fort Casey, Saltwater, and Twanoh State Parks, picked by the Washington State Parks and Recreation Commission as “showcase parks” in the Green Vision and PSI Education and Interpretive Plans.

I present results from the embedded case study similarly as overall case study, in sections based on three main data sets used in methodological triangulation analysis: review of state park documents, first-hand observations in parks, and interviews with parks staff. I reviewed documents that describe plans for environmental upgrades and interpretation in each of the four parks. Results from the direct observation of environmental interpretation (EI) for recreating park visitors, summarized with other parks in Tables 1 and 2, are presented in narrative detail here for each individual park. I also summarize data from interviews with staff and volunteers working in these specific parks.

4.4a. Review of State Park Documents

Here I represent documents associated with the PSI projects and Green Vision plans. While examining general environmental interpretation about Puget Sound and the

PSI's natural resource management efforts in the parks, I specifically looked for implementation of the interpretive elements described in these documents for my first-hand observations in Fort Casey, Fort Flagler, Twanoh, Saltwater State Parks.

Washington State Parks Environmental Program Manager Randy Kline supplied the document that details the designs of the interpretive elements for PSI parks and the showcase parks like Twanoh State Park, and thus is internally referred to as the "Twanoh State Park Master Interpretation Plan" (Figure 39). This document is a follow up to the WSPRC PSI Projects Interpretation and Education Plan discussed in section 4.2. The "Twanoh Plan" provides environmental interpretive designs and content for communication materials that highlights the wealth of Puget Sound's natural resources, conservation issues facing the watershed, and the State Parks' "Sound-Friendly" on-site renovations to address the health of Puget Sound's ecosystem. It includes construction and mounting instructions for environmental interpretation signage and displays, as well as budgets for each element. This plan also serves as the strategy for the handful of "showcase parks" such as Twanoh State park.

Figure 39. WSPRC Puget Sound Initiative Projects Interpretation Elements Plan, also referred to as the Twanoh Master Interpretive Plan.

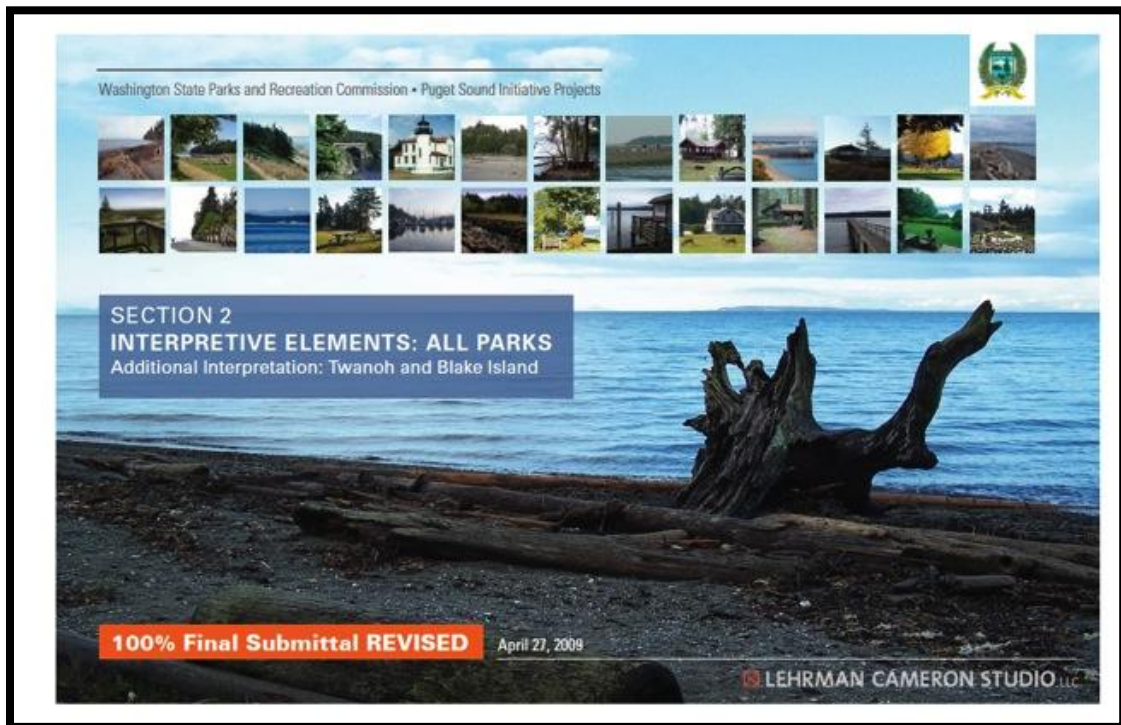


Figure 39 shows one of the environmental interpretative elements planned for all PSI parks-- an example of the several tile signs for installation in park restrooms. The bathroom tiles contain messages about Puget Sound's watershed and the variety of life it supports. Some tiles also emphasize how human caused changes to land in our watershed such as pollution from pet waste and urban development along its shorelines, impact the watershed's water quality and ability to provide healthy habitat for commercially important fish and other wildlife.

Figure 40. A sampling of restroom tiles for PSI Washington State Parks.

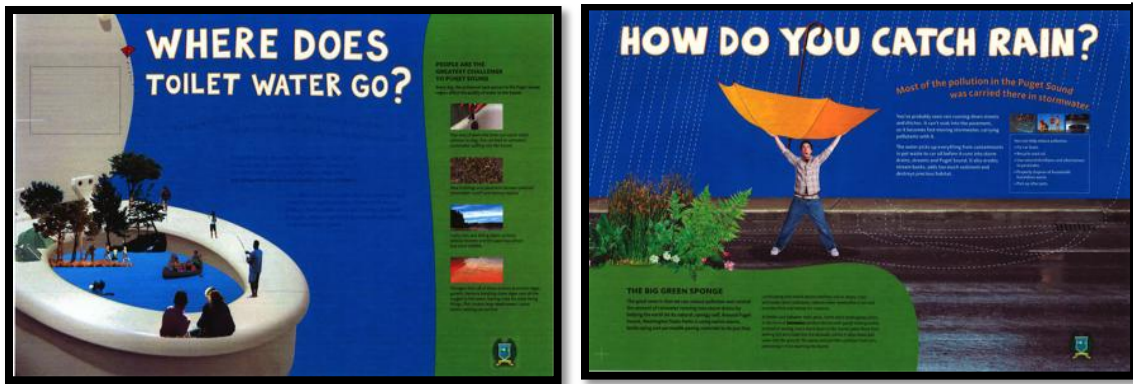


WSPRC Capital Program Construction Project Coordinator Brian Yearout supplied information and images of large panel signs for display in PSI parks. Figures 41-43 show the interpretive panels for Fort Casey, Fort Flagler, Saltwater, or Twanoh State Parks, the four parks examined in my embedded case study. Which panel sign is installed in which park is dependent on the park’s upgrades and relevant themes.

The panels seen in Figure 41 address wastewater and stormwater pollution and illustrate how our actions on land impact the water quality of Puget Sound. The signs describe the native planting bioswales and biomembrane reactors Washington State Parks have installed and how this green infrastructure cleans the water before it enters Puget Sound, and contributes to its restoration. The panels also explain the Puget Sound

Initiative and give specific actions we all need to do to provide a healthy Puget Sound “as a legacy to our children and grandchildren.”

Figure 41. Wastewater and stormwater interpretive panels.



The following “RV Dump” and “Boat Pump” interpretive panels are for placement at Washington State Parks wastewater dump stations and thus directed at park visitors flushing waste from recreational vehicles or boats. Messaging is focused on dissuading the use of toxic chemicals in septic waste collection systems so as not to disrupt natural bacteria waste processing.

Figure 42. “Boat Dump” and “RV Dump” interpretive panels.



The set of environmental interpretive panels pictured in Figure 43 are designed as stand-alone pieces that sit atop rock bases. Messages are intended to educate about environmental processes that impact the health of Puget Sound’s water and habitat quality. Topics include toxin bioaccumulation in food chains with messages to avoid pesticides and other chemicals; beach habitat processes and proper etiquette for beach exploration to minimize harm; fecal pollution from leaking septic tanks, agricultural runoff, and pet waste.

Figure 43. Bioaccumulation, Beach Stewardship, and Poop interpretive panels.



Overall, the environmental interpretive messaging in these and other public communications in the PSI parks education plans is purposeful in its aims to help visitors connect with the natural resources inherent in Puget Sound and understand why the PSI upgrades are necessary to improve water quality, habitat and restore the health of natural ecosystem processes. In addition to informing the public of the Puget Sound Initiative and the various Sound-Friendly upgrades developed to address stormwater-runoff, leaking septic tanks, and hard armored shorelines, the messaging invites individuals to

contribute to the health of Puget Sound by being aware of our cumulative impacts and how to make changes in our own lives while at the park and at home.

The Washington State Parks Environmental Planner and Capital Construction Project Coordinator helped provide documents that detailed the particular infrastructure upgrades for each park (Appendix A) and which renovations have been completed . All four parks received significant upgrades to wastewater treatment facilities as part of the PSI cleanup efforts. LID projects in the parks emphasized green “bio-retention” infrastructure such the use of soils and permeable pavements or “bioswale” planting strips adjacent to parking lots to remove pollutants from storm water runoff. I summarize details for each of the four embedded case study parks PSI driven upgrades in the following section.

4.4b. First-Hand Observation Data in Four State Parks

In this section, I detail direct observation results for the embedded case study of environmental interpretation available for recreating park visitors in each of the four Washington State Parks on Puget Sound from on-site surveys started in 2012 and updated from 2013-2014. As in the general case study, observations of park signs, kiosks, displays, trails, exhibits, and digital media resources provided data for assessing the current status of environmental interpretation in these parks. Results include assessments of whether interpretation highlighted Puget Sound’s natural resources and evidence of any mission-based interpretation aimed at building values, awareness, positive stewardship attitudes, and behaviors. These results are used in my analysis, comparing what policy states with what is being implemented in current practice.

I first summarize direct survey data in Tables 3 and 4 for quantifiable analysis on implementation of environmental interpretation against ideals outlined in the Washington State Parks interpretive planning documents described above. In Table 3, as I did earlier in the general case study results presented in Table 2, I summarize direct observation data on implementation of environmental interpretation against ideals outlined in the Washington State Parks and Recreation Commission Puget Sound Initiative Projects Interpretive and Education Plan, the Washington State Parks Green Vision Plan, and the U.S Environmental Protection Agency and Washington State's Puget Sound Partnership's 2020 Action Agenda's Public Awareness and Engagement Plan. Table 3 categories of data include whether the EI topics available in the park conveyed messages about the natural history or attributes of Puget Sound's marine life and environment; messages with intention to build public awareness and understanding of issues facing Puget Sound; messages about stewardship, practices and behaviors that are detrimental to Puget Sound and promoting those that are beneficial; messages about the Puget Sound Initiative specifically, such as mention that the parks are part of the PSI's plan; and if any of the PSI water quality enhancement projects in the park are identified in messaging to park visitors.

Table 4. Data on self-guided EI in 4 PSI Washington State Parks in 2014, description of type EI with elements of ideals

*Described environmental interpretation with elements of ideals available in 4 select Washington State Parks on Puget Sound, surveyed in 2013-2014. Parks labeled with * are PSI green vision/showcase parks as described in WSPRC planning documents.*

KS = Kiosk Signs

P = Interpretive Panel

IC = Interpretive Center exhibits

B = Brochure

D = Interpretive Display

PSI Washington State Park	Highlights	Aims to	Aims to	Identifies	Identifies
	Puget Sound/ Marine Life	Build public awareness and understanding of issues facing Puget Sound	Change practices and behaviors detrimental to Puget Sound and promote those that are beneficial	State Park as part of the Puget Sound Initiative	Enhanced water quality projects in park
Fort Flagler	KS, P, B				
*Fort Casey	KS, P				
*Saltwater	KS, P, IC, D	KS, P	KS, P		
*Twanoh	KS, P, D	KS, P	P		

I present in Table 4 results from direct observation in these Puget Sound Friendly model parks on implementation of specific environmental interpretation plans and designs from 2009’s Washington State Parks Puget Sound Initiative Projects Interpretive Elements document, also referred as the “*Twanoh Master Interpretive Plan*” . Table 4 categories were created from the four environmental interpretation elements and designs excerpted from the document and described in section 4.4a.

Table 5. Data on self-guided EI in 4 PSI Washington State Parks in 2014, description of EI topics with elements of PSI ideals described in WSPRC planning documents.

Described observation of specific environmental interpretation elements from Puget Sound Initiative Projects and Washington State Parks and Recreation Commission Interpretive Elements design document.

PSI Washington State Park	Signs at Restrooms Introducing PSI Projects	Three Dimensional Interpretive Element with Story Relevant to the Park	PSI Programs	PSI Brochure
Fort Casey	None	None	None	None
Saltwater	None	None	None	None
Twanoh	None	None	None	None
Fort Flagler	None	None	None	None

In the following sections, I describe in detail results from my direct observation research methodology of photographing interpretive elements observed in park surveys during the summer of 2013 to summer of 2014-time period. I present details under each park’s heading, with narrative descriptions and photographs of the park’s interpretive elements and PSI projects. In order to provide context for the reader, I first offer a brief summary about the park from data I sourced from Green Vision Plan documents, WSPRC website information, and documents supplied by the WSPRC Interpretive Manager. I describe the park’s landmass size, Puget Sound shoreline footage, current annual visitation numbers, environmental/ natural resource features, and general description on the kind of interpretive services available.

Fort Flagler

Fort Flagler State Park is a 784-acre marine camping park surrounded on three sides by 19,100-feet of saltwater shoreline (Figure 44). The park receives more than 500,000 visitors annually. Fort Flagler State Park features high bluff views of the Olympic and Cascade Mountains, beachfront access along Puget Sound's Kilisnoe Harbor and Admiralty Inlet, miles of island bluffs and heavily forested hiking and biking trails, boat launch ramps and moorage, a saltwater fishing dock, and a U.S. Fish and Wildlife Service marine lab.

Figure 44. Fort Flagler State Park, aerial view.



<http://adventureawaits.com/wpcontent/uploads/2012/08/FortFlaglerAerialCalendar>

Figure 45. Fort Flagler State Park's miles of shoreline beach access, here looking west.



PSI projects included replacement of fragmented septic systems into one park-wide wastewater treatment facility using new membrane bioreactor sewage treatment technology (Figure 46).

Figure 46. Fort Flagler State Park wastewater treatment enhancement project.



On-site facilities relevant to delivering interpretation services for recreating park visitors are the following: an interpretive trail, a museum (Figure 47) staffed by Friends of Fort Flagler volunteer group and open daily during summers and on weekends throughout the year (Figure 48), and a campground amphitheater. Self-guided interpretive media include interpretive displays, panels, and information kiosks for posters and brochures (Figure 49). Posted schedules indicated interpretive programs include weekly tours conducted by Friends of Fort Flagler volunteers during the summer (Figure 50). The Friends of Fort Flagler also stage cultural events at the park such as several musical concerts over the summer. Infrequent program activities directed towards young visitors

occur in the park's campground and amphitheater based on volunteer support and advertised by word of mouth from volunteer campground hosts (Figure 48)

Figure 47. Fort Flagler State Park military history museum.



Figure 48. Friends of Fort Flagler Volunteer Group communications.



Figure 49. Fort Flagler kiosk with posters, maps, etc.

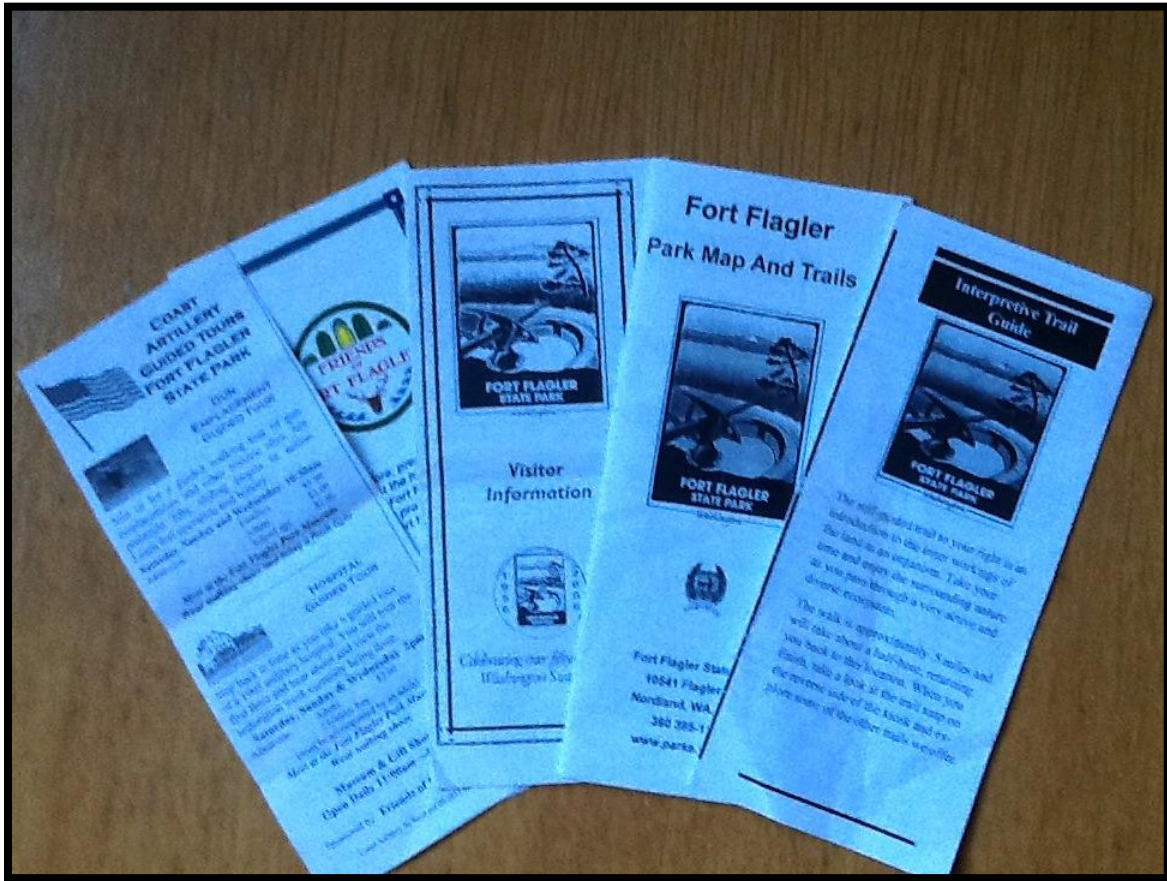


Figure 50. Fort Flagler State Park program for kids run by a park volunteer.



Figure 51 shows various brochures available to park visitors at information kiosks, the museum, and one for the interpretive trail.

Figure 51. Fort Flagler State Park brochure examples.



My review of available mobile digital media (Washington State Parks webpage for Fort Flagler and Virtual Ranger phone app), indicated mention of the park’s natural resources in terms of recreational activity opportunities such as hiking on trails and shellfish harvesting on its beaches. However, there was no environmental interpretation available about Puget Sound’s health or restoration efforts.

Although the park has an array of interpretive services available in park facilities, self-guided media, and volunteer supported programs, my direct observation results

indicated the park offers mostly cultural resources interpretation about the park's military history and very minimal interpretation about the park's natural resources or environmental interpretation about Puget Sound. I describe those limited findings next.

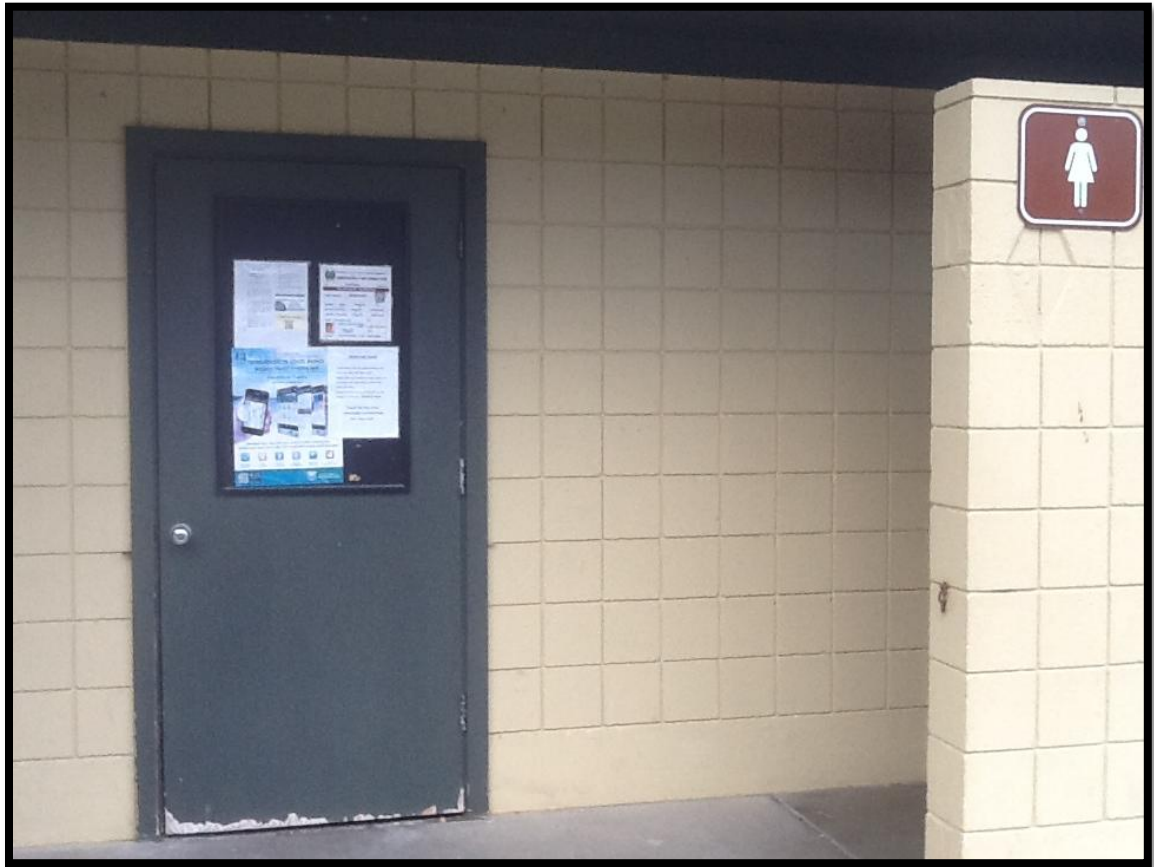
The interpretive trail's accompanying brochure (seen in Figure 51) provided natural history information of the park's forest through identification of vegetation and nutrient cycling. On the back of the trail guide is a one-page section titled, "Fun Facts About the Puget Sound!" This page highlighted the bounty of Puget Sound's natural resources and enumerates the abundance of marine organism inhabitants of "state-owned submerged saltwater lands." Although the section describes the region's surrounding human population of over 4 million and that "90 cities and towns border the Sound," there is no mention of resulting negative impacts of compromised water quality or habitat conditions of Puget Sound. Therefore, the brochure contained no evidence of environmental interpretation of natural resource management efforts for Puget Sound's restoration. The only other interpretive media on the park's natural resources was one trailhead panel sign and a few kiosk posters near the beach that contained messages about proper etiquette in regards to the park's wildlife such as not to feed them or not to let dogs chase birds (Figure 52).

Figure 52. Fort Flagler State Park kiosk sign examples.



No evidence was found in the park of implementation of the PSI and WSPRC Interpretive and Education Plan or installation of specific environmental interpretive elements designed to accompany the extensive wastewater treatment upgrades that occurred in the park five years earlier.

Figure 53. Fort Flagler restroom with information board.



Twanoh

Twanoh State Park is a 182-acre camping park with 3,167 feet of saltwater shoreline situated on Puget Sound's Hood Canal (Figure 54). The park receives more than 600,000 visitors annually.

Figure 54. Twanoh Creek State Park shorelines on Puget Sound's Hood Canal.



Twanoh Creek flows through the park's upland forest down to its saltwater beaches and supports federally listed salmon. The park's beachfront access features some of Puget Sound's warmest water for swimming and diving, docks for boat launch and fishing, and forested trails. PSI restoration projects completed to date include replacement of the entire wastewater collection and treatment system (Figure 55); added stormwater management of asphalt removal, vegetation restoration, and pervious pavement parking lot installation (Figure 56).

Figure 55. Twanoh State Park new wastewater treatment facility on site.



Figure 56. Twanoh State Park stormwater enhancement with replacement of impervious parking area with pervious pavement.



According to DOE and WSPRC capital budget documents, the next phase of PSI driven restoration for Twanoh State Park, slated to begin in the 2013-2015 biennium, has not been implemented yet (Figure 57).

Figure 57. Twanoh State Park's armored shoreline scheduled for restoration.



Twanoh State Park interpretation services offered for recreating park visitors include the following on-site, self-guided interpretive media: interpretive displays, interpretive panels, and information kiosks for posters and brochures (Figure 58).

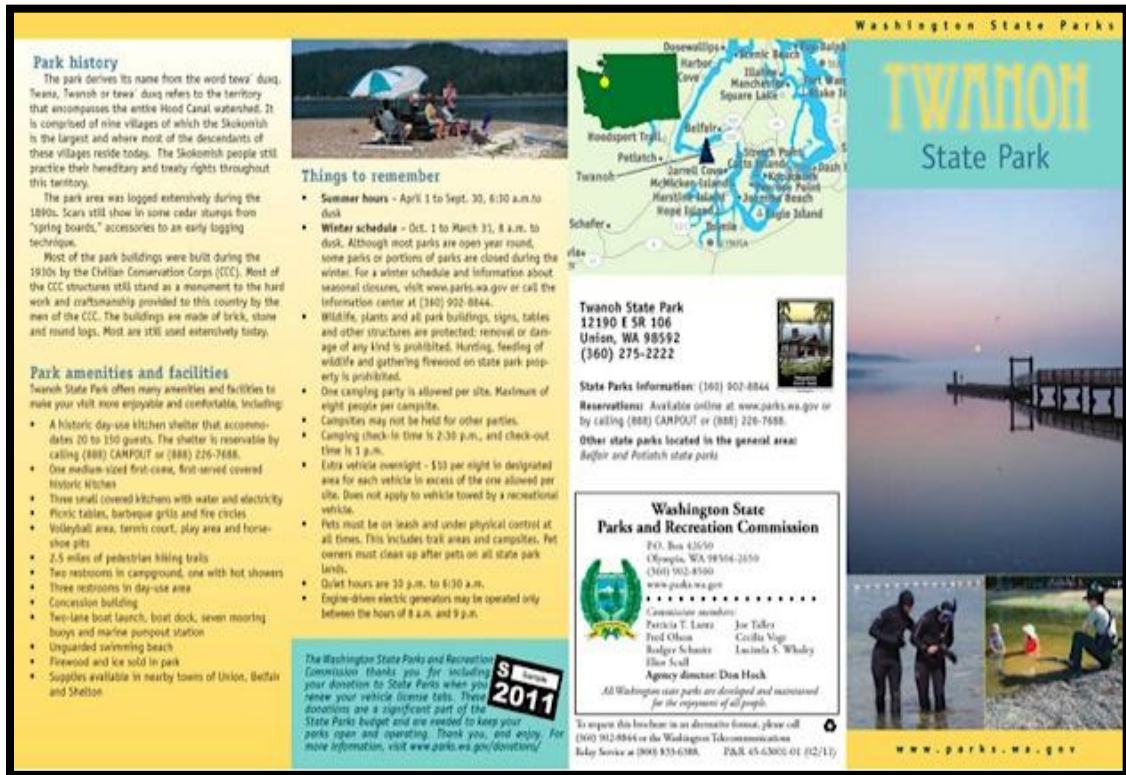
Figure 58. Twanoh State Park kiosk with signs.



My direct observation survey turned up no evidence for interpretive programs such as a posted schedule in the park or on the park's webpage.

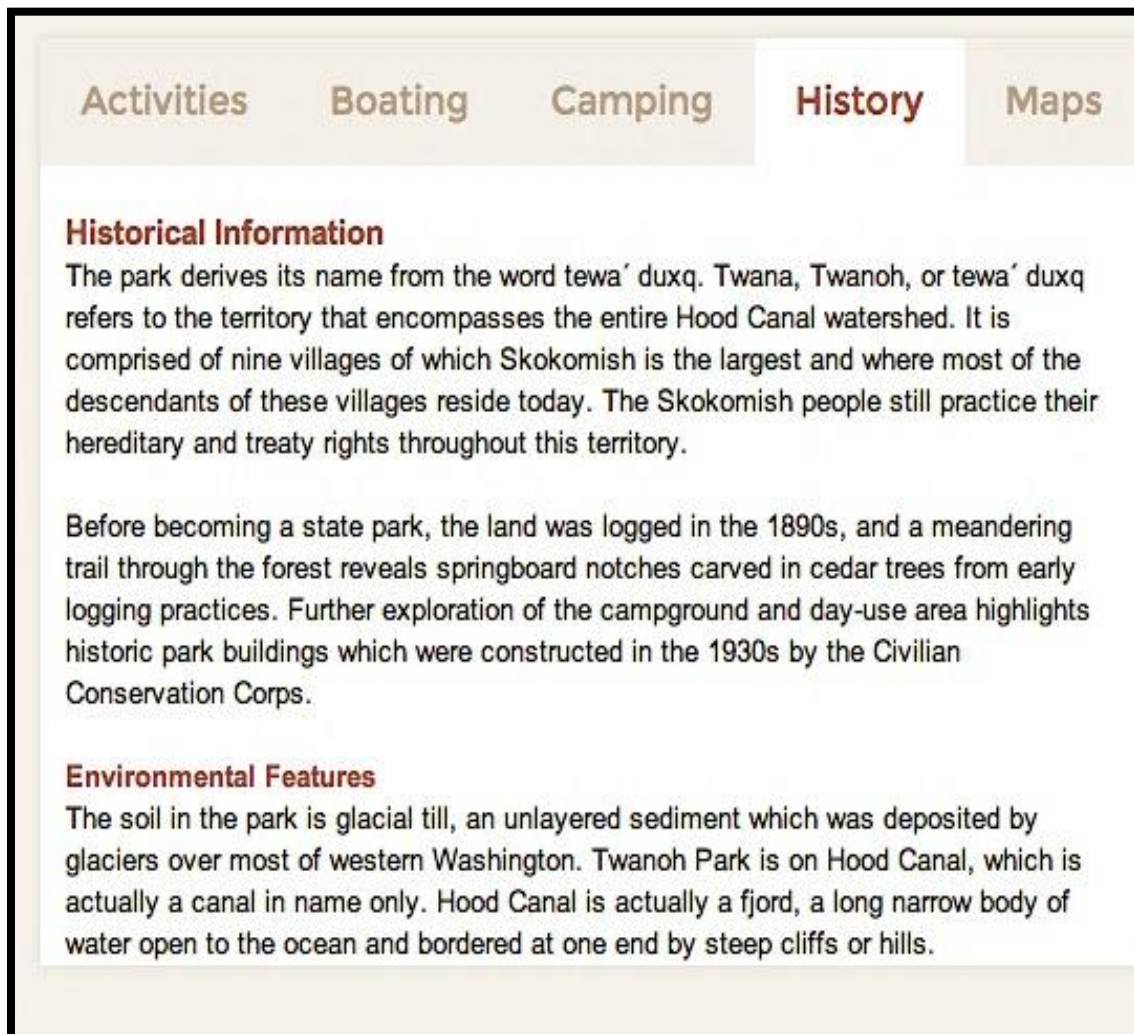
A review of the mobile digital media included a digital copy of Twanoh State Park's information brochure (Figure 59) and content of the park's webpage.

Figure 59. Twanoh State Park information brochure.



The brochure briefly describes cultural history of the park and only mentions natural resources in terms of recreational opportunities and protection regulations for the park’s plants and wildlife. Twanoh State Park’s webpage was one of the few out of the general case study’s 24 parks, that contains a section on “environmental features” under its history tab (Figure 60).

Figure 60. Excerpt from Washington State Parks webpage for Twanoh State Park.



The small amount of environmental content on the webpage describes historical tree logging in the area as well as the fact that the Hood Canal is actually a fjord and the park's soil is composed of glacial till. The digital media contained no environmental interpretation about Puget Sound, conservation issues affecting the watershed, or natural resource management efforts to restore its health.

As I describe in more detail below, the direct observation results indicate there is quite a bit of content highlighting Puget Sound natural resources and environmental

interpretation about Puget Sound's Hood Canal water quality in self-guided media available to the on-site park visitor. The most common type of interpretation on natural resources is in the form of natural history content displayed in kiosk signs (Figure 61), interpretive displays (Figure 62) and panel signs (Figure 63) and shows an interpretive focus on the park's Puget Sound salmon and shellfish.

Figure 61. Twanoh Park State Park kiosk sign about crab molts.

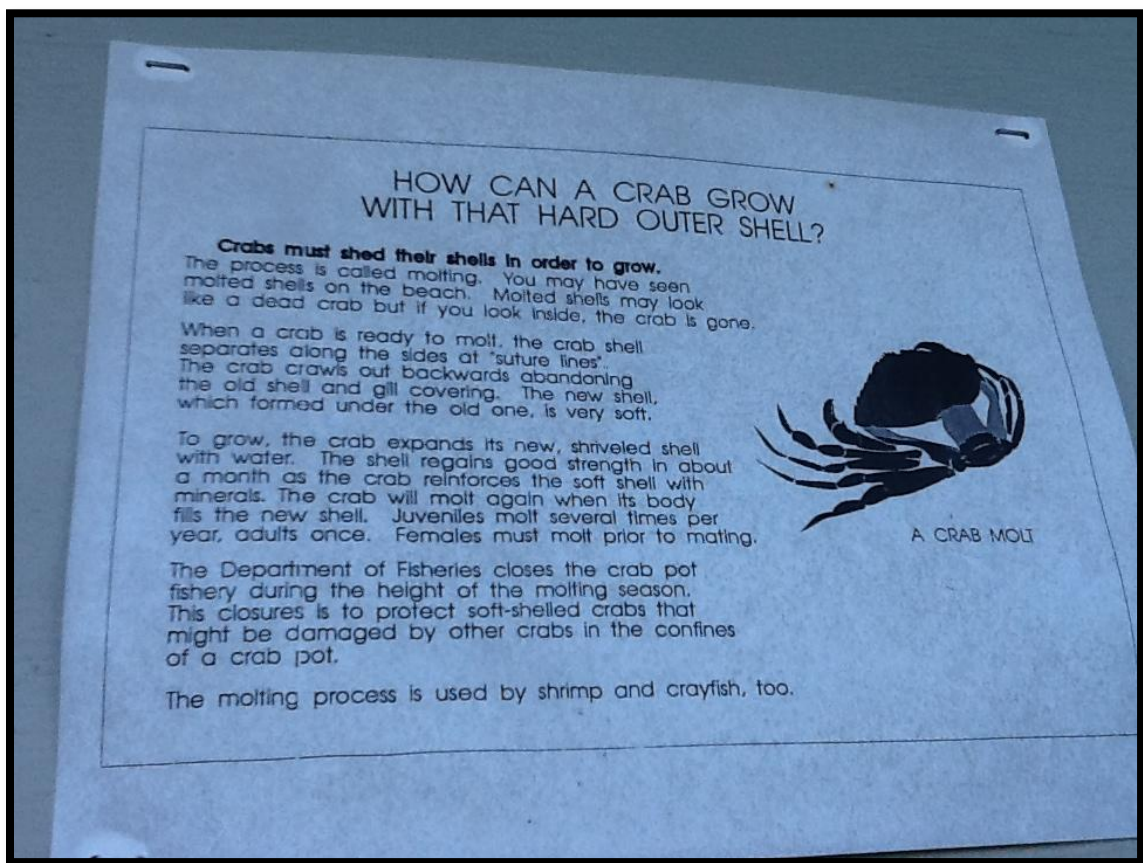


Figure 62. Twanoh State Park Interpretive display on local shellfish.

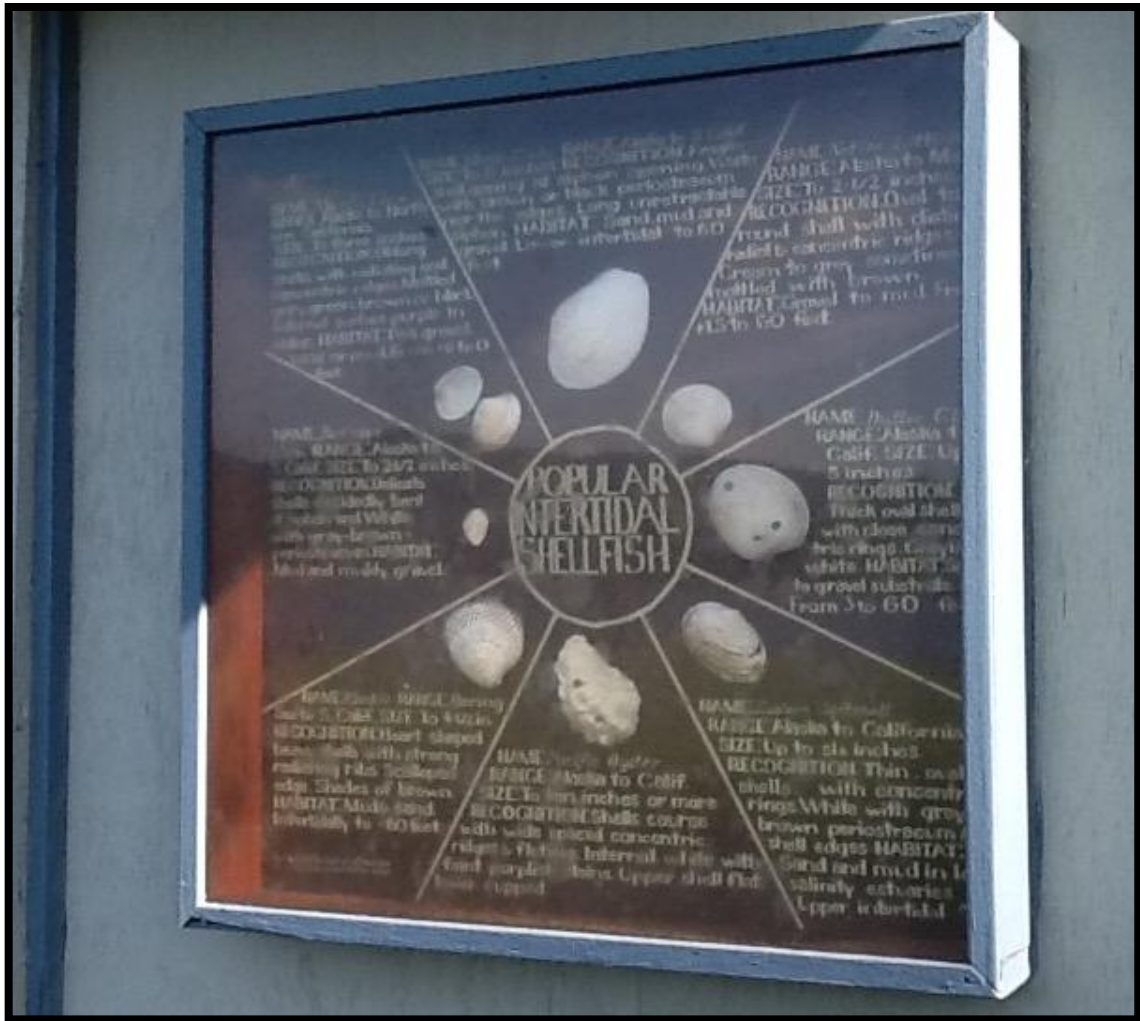


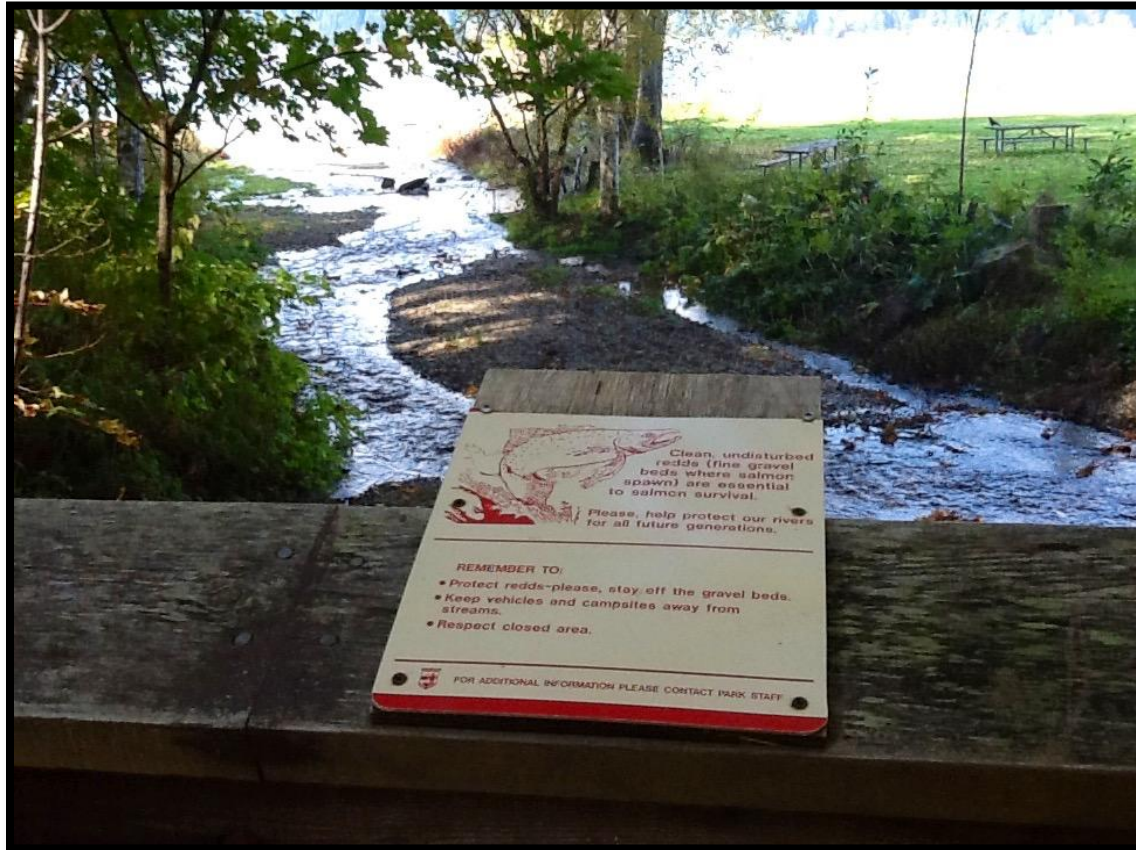
Figure 63. Twanoh State Park interpretive panel on chum salmon life cycle.



Although the examples shown highlight the natural history focus of available self-guided interpretive media, there are also examples of environmental interpretation of Puget Sound natural resources. For example, the panel sign on the pedestrian bridge over Twanoh Creek (Figure 64) contains messages that purposely aim to affect visitor behavior and encourage stewardship. The sign emphasizes the need for clean water and

undisturbed salmon nesting habitat and gives park visitors some behavior suggestions on how to support salmon and “protect our rivers for all future generations.”

Figure 64. Twanoh State Park interpretive panel sign on Twanoh Creek salmon.



Other environmental interpretation stewardship messages in interpretive media are related to water quality issues of Puget Sound’s Hood Canal. Examples include small panel signs (Figures 66-67) posted around the boat launch area and fishing dock and that spotlight human-caused pollution harmful to marine life. These communications encourage behaviors that limit pollution entering Hood Canal and ways to contribute to its health.

Figure 65. Twanoh State Park panel sign near boat launch.

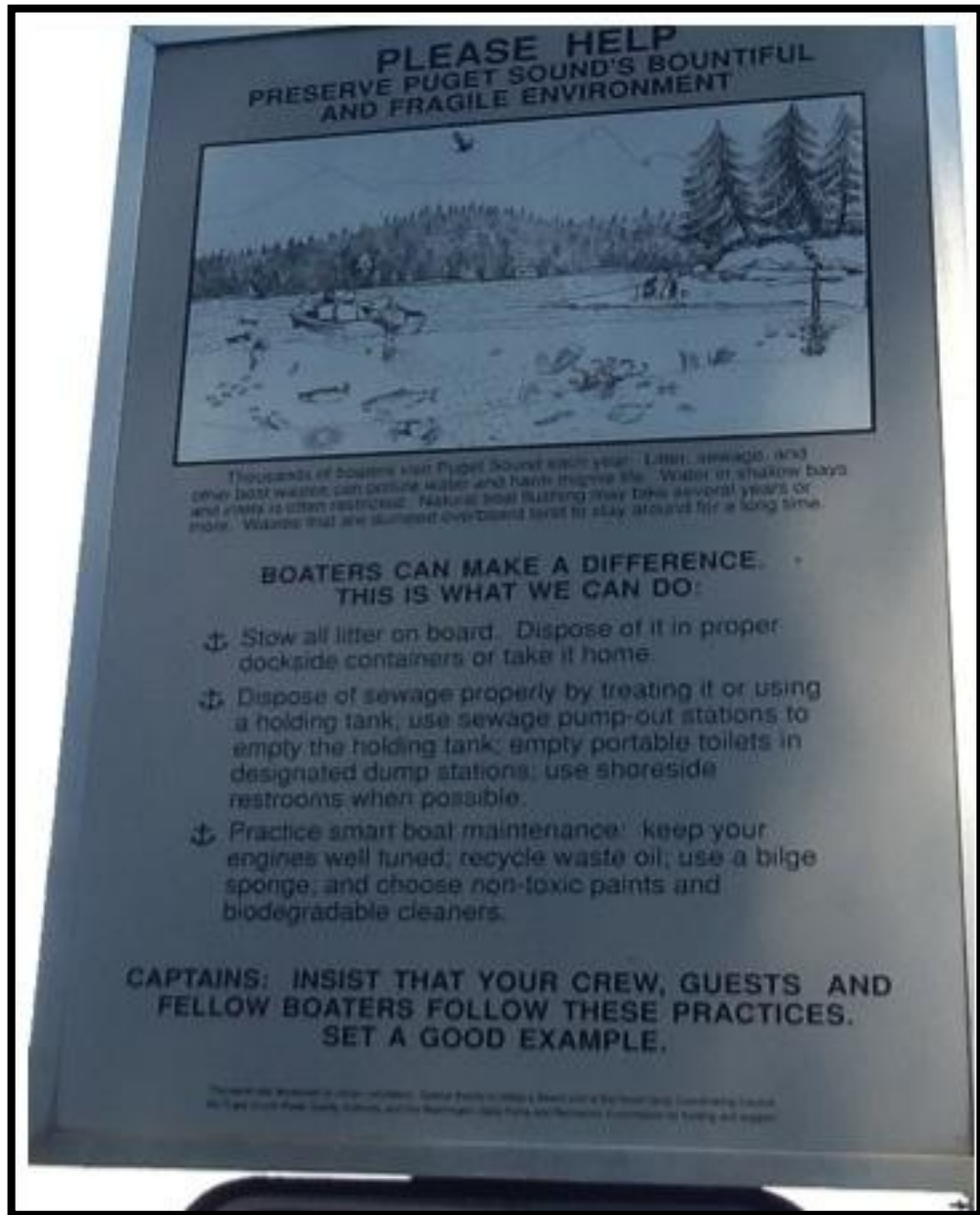
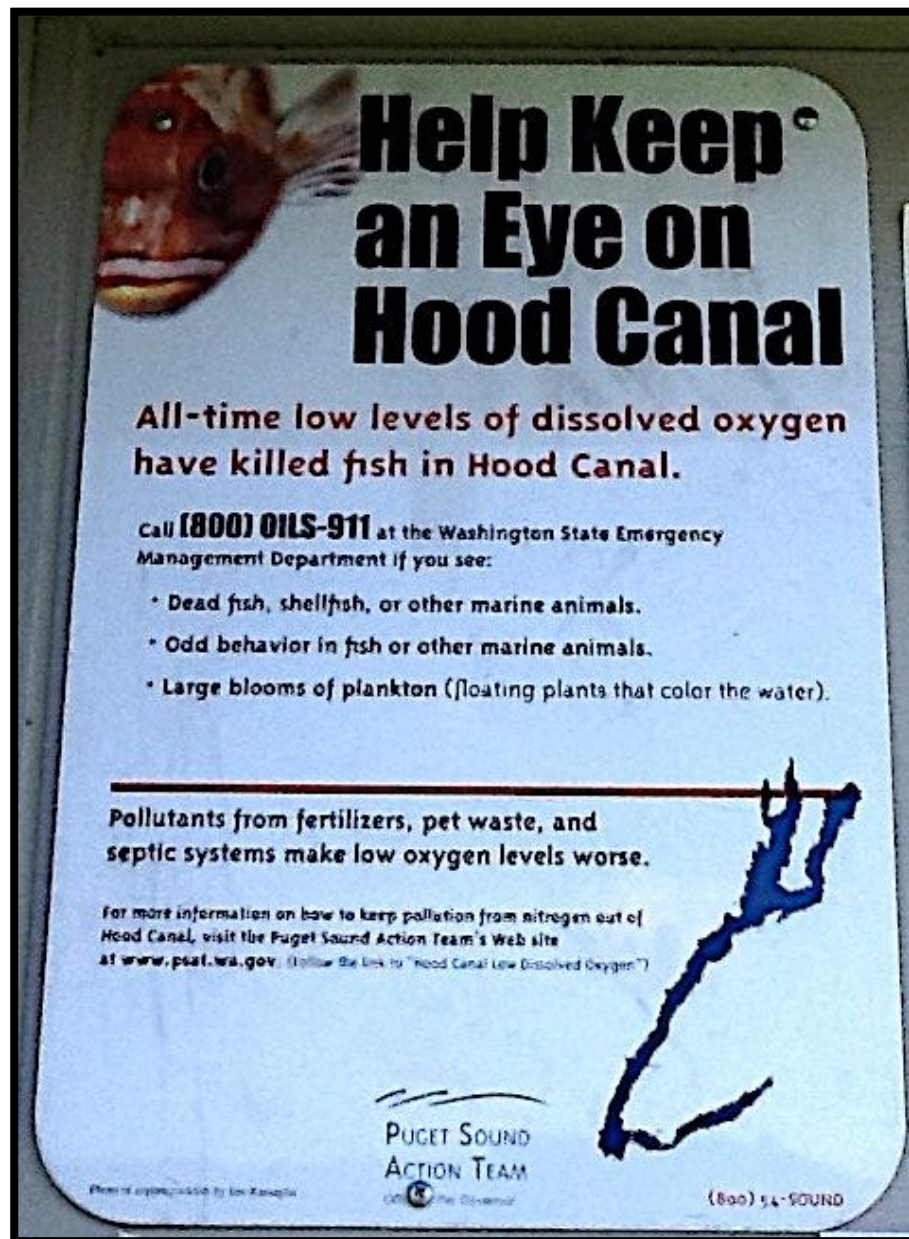


Figure 66. Twanoh State Park panel sign near beach.



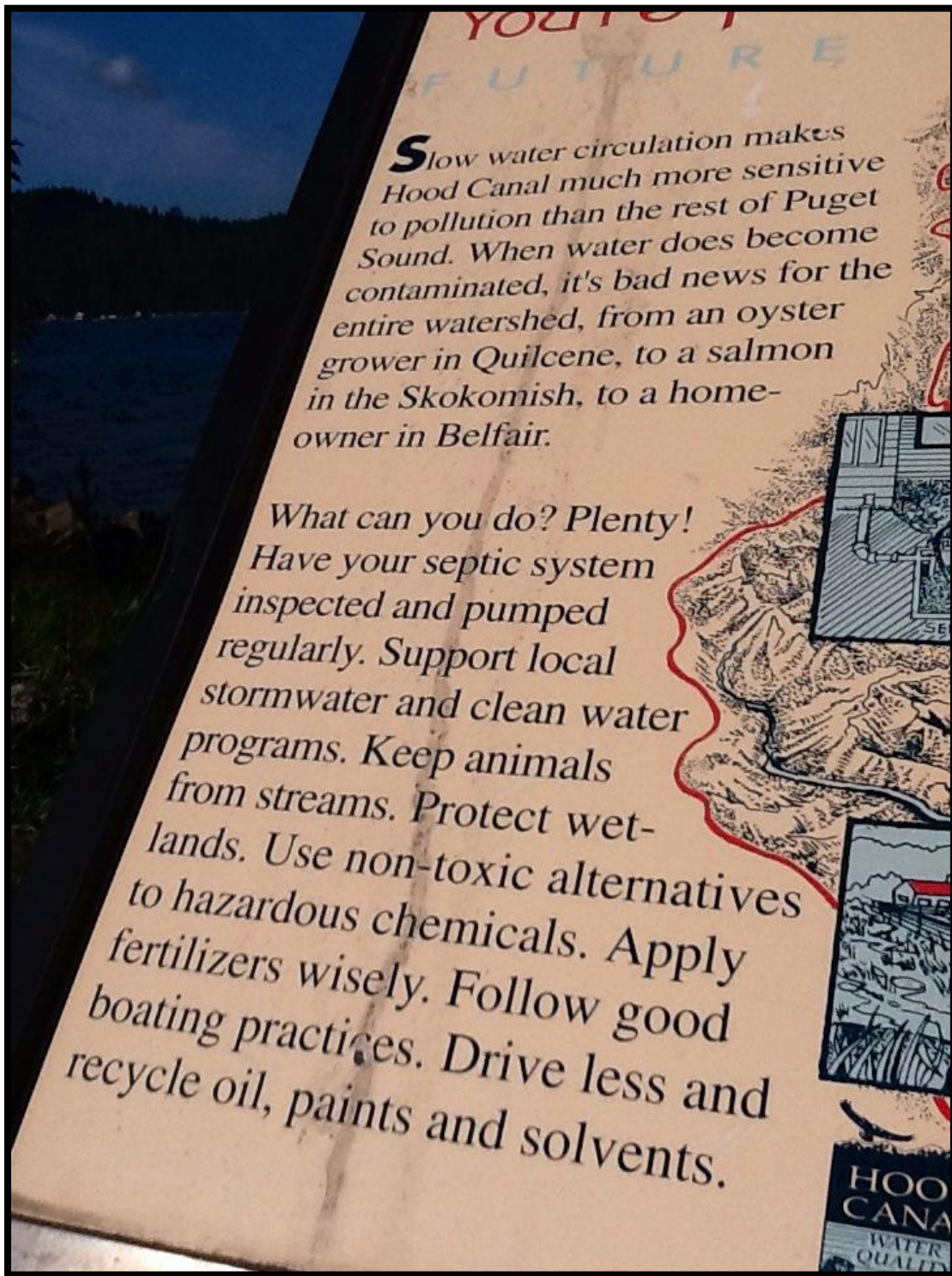
A large interpretive panel sign (Figure 67) found along the park's shoreline contained messages focused on raising awareness and understanding of how our daily actions negatively affect Hood Canal's water quality, impacts all life including ours, and gives specific examples of how we can be part of the solutions needed to restore its health

(Figure 68). I found this exact same panel in other Washington State Parks along Puget Sound's Hood Canal.

Figure 67. Twanoh State Park, interpretive panel along Hood Canal shore.



Figure 68 .Twanoh State Park, interpretive panel close up.



Although my direct observations in Twanoh State Park resulted in finding environmental interpretation around Puget Sound, the interpretive media appeared to have been produced decades ago, based on its physical condition as well the fact that the texts mentioned natural resource management entities that no longer exist. Along with the lack of current interpretive media, I found no evidence of reference to the current Puget Sound Initiative natural resource management efforts or its public awareness campaign. In addition, my results indicate no implementation of the PSI and WSPRC “Interpretive Elements” (Twanoh Master Interpretive Plan) to highlight the park’s extensive Puget Sound Friendly restoration that occurred in the park several years ago.

Saltwater

Saltwater State Park is a camping park with 1,445 feet of saltwater shoreline on Puget Sound, halfway between the cities of Tacoma and Seattle. The park receives more than 400,000 visitors annually. Saltwater State Park features beachfront access for swimming and fishing, tide pools, an underwater artificial reef dive park, a Marine Protected Area, seasonal spawning of salmon in McSorley Creek, and forested hiking trails. PSI projects included storm water management of large impervious asphalt parking lot with bio-retention and constructed bioswales of native plantings (Figure 71).

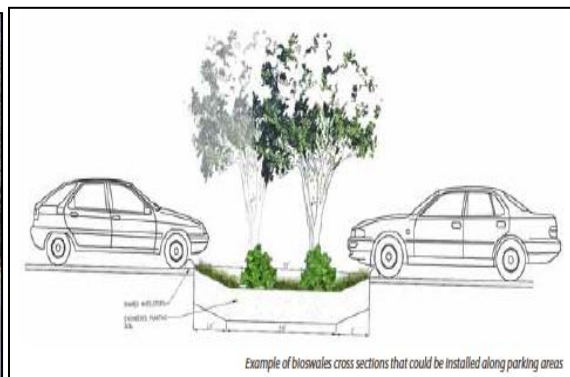
Figure 69. Saltwater State Park, aerial view. (Photo from http://wdfw.wa.gov/fishing/mpa/saltwater_statepark.html)



Figure 70. Saltwater State Park shoreline area looking north.



Figure 71. Saltwater State Park stormwater management with parking lot bioswales.



On-site interpretation services facilities for recreating park visitors are the following: a forested interpretive trail, an interpretive center (Figure 72) staffed by volunteer support and open on summer season weekends, an upland area amphitheater, and a “fire ring” large circular seating area near the beach.

Figure 72. Saltwater State Park Interpretive Center.

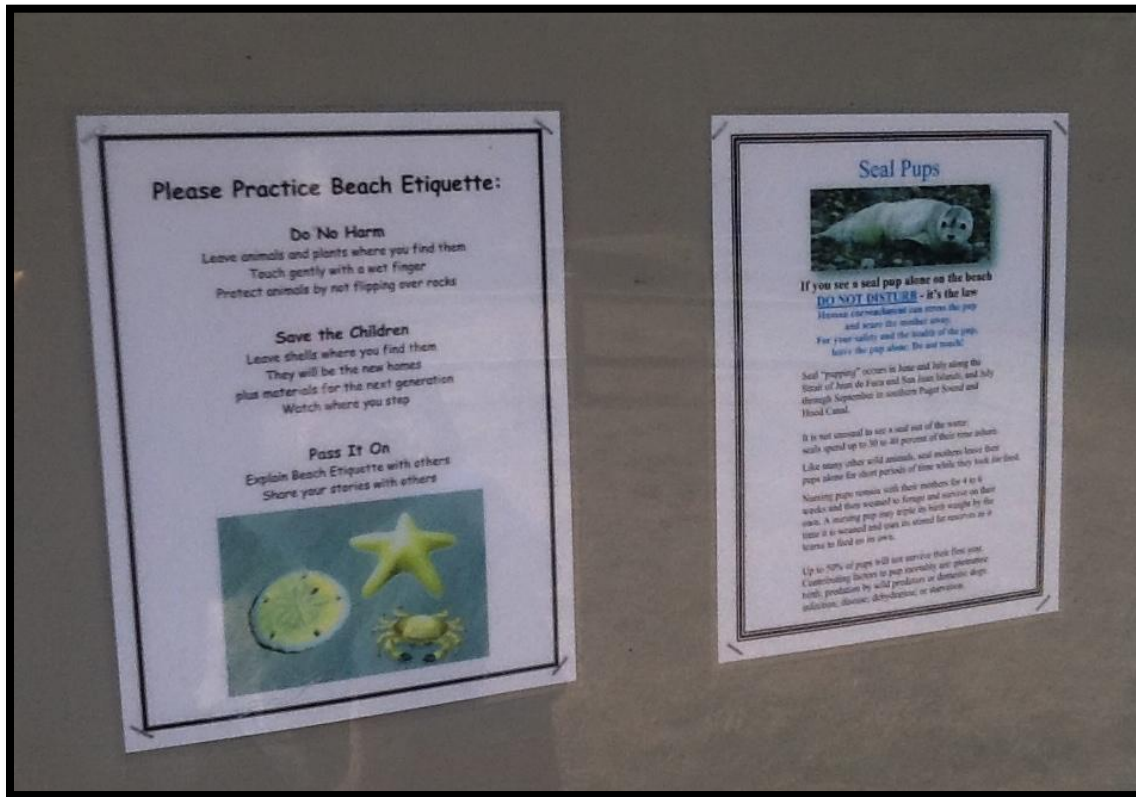


Self-guided interpretive media include interpretive displays, panels, and information kiosks for posters and brochures. This park offered comparatively a lot of self-guided interpretation on Puget Sound natural resources such as posting marine wildlife posters and flyers at several kiosks, such as seen in Figures 73-74.

Figure 73. Saltwater State Park kiosk with example of interpretive posters.



Figure 74. Saltwater State Park kiosk sign examples.



Saltwater State Park is home to an underwater artificial reef dive park, and Figure 75 shows interpretive panel about the park and some of the resident marine life found there. Background research on the park revealed WDFW manages part of Saltwater State Park as a fully protected reserve and regulations prohibit recreational and commercial fishing within the Marine Protected Area (MPA) for all non-tribal citizens, however, I did not see any signage about the MPA.

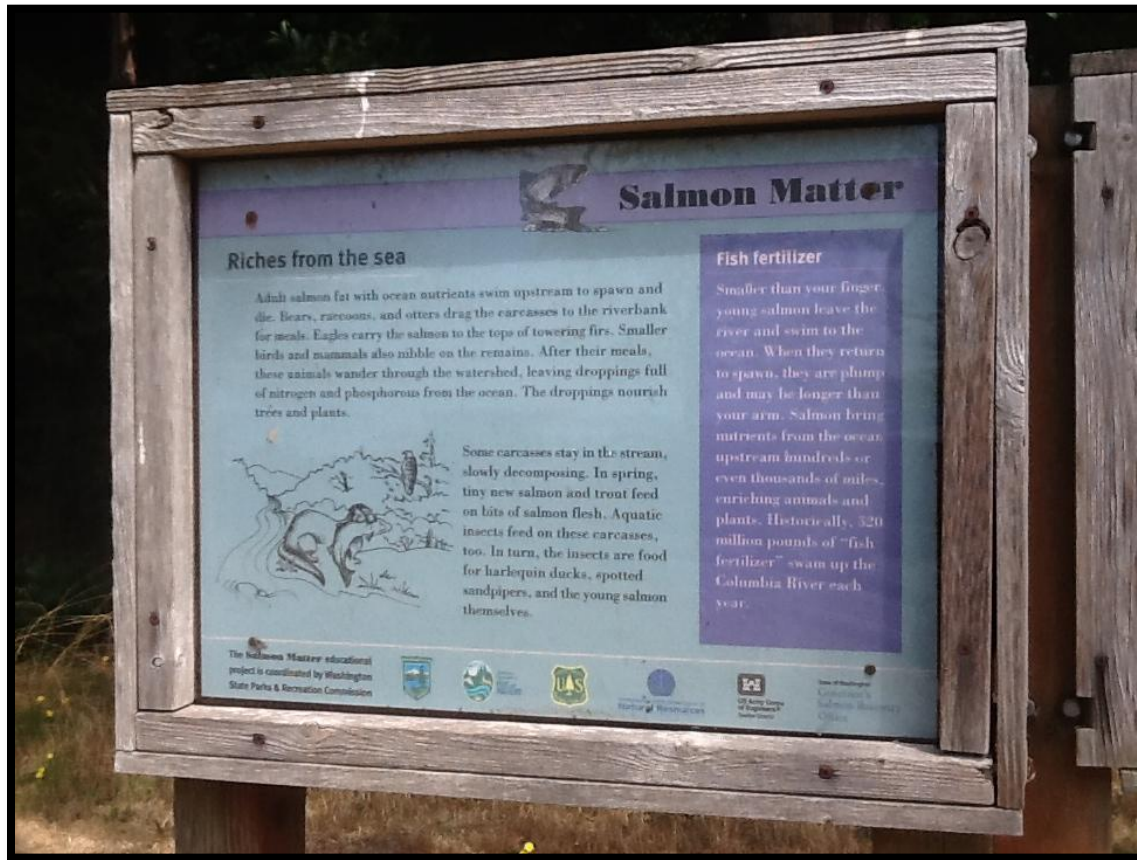
McSorley Creek that runs through the park supports a seasonal spawning run of salmon and this is also interpreted in interpretive panels along the creek (Figure 76). Examination of these “Salmon Matter” interpretive panels revealed they were sponsored

Figure 75. Saltwater State Park artificial reef interpretive panel.



by several state and federal natural resource agencies, with four Washington State Parks receiving similar interpretive self-guided media about Salmon in 2001-2003.

Figure 76. Saltwater State Park Interpretive display.



In addition to self-guided media about the marine and freshwater wildlife, there was an interpretive trail about native vegetation along the forested bluffs. The interpretive trail markers looked handmade but were in relatively good condition (Figure 77).

Figure 77. Saltwater State Park interpretive trail marker sign.



I found out much more about the park's interpretive efforts from my interview with the resident volunteer interpretive host who was responsible for the interpretive trail as well as all the exhibits in the interpretive center (Figure 79).

Interpretive programs include the volunteer camp host supported fireside talks Saturday evenings in summer and interpretive center tours spring through summer. Figure 78 shows the interpretive volunteer responsible for much of the interpretive programming provided during the spring and summer season in 2013 and interviewed for this case study.

Figure 78. Saltwater State Park Interpretive volunteer camp host, Margaret Osborne.



Figure 79. Saltwater State Park Interpretive Center media and exhibits.



Figure 80. Saltwater State Park Interpretive Center exhibit display.



In addition, the park invites outside partner organizations to do programming or stage the several cultural events at the park each year. The Seattle Aquarium’s Beach Naturalist program (Figure 81) comes on several low-tide days during spring and summer to help interpret marine organisms and model proper etiquette when exploring tidepools and beaches.

Figure 81. Saltwater State Park example of an outside partner providing interpretive programming.



Fort Casey

Fort Casey State Park is a 467-acre marine camping park 10,810-feet of saltwater shoreline on Puget Sound's Whidbey Island. The park is easily accessible by nearby ferry terminals and receives more than 800,000 visitors annually. The park's many features include sweeping views of Admiralty Inlet and the Strait of Juan de Fuca a Marine Protected Area, an underwater dive park, miles of beach and forest trails, and boat launch area. PSI projects included upgrading on-site septic and drain field; replacement of 80

year-old restroom; and connecting Admiralty Head Lighthouse (Figure 84) facilities into new wastewater treatment system.

Figure 82. Fort Casey State Park, aerial view. (Photo from http://www.fortflagler.net/WSPF/Fort_Casey_New/)



Figure 83. Fort Casey State Park views of Puget Sound and miles of beach access.



Figure 84. Fort Casey State Park's new restroom facility in lower part of park.



On-site interpretation services facilities for recreating park visitors are the following: an interpretive center (Figure 85) located within historic lighthouse with exhibits about the park's cultural history, and staffed/ interpreted by group volunteer support (coordinated by Washington State University Extension), and open to visitors every day during the summer season and weekends during spring and fall; an interpretive trail/compost demonstration site (Figure 87); and an underwater artificial dive park. Self-guided interpretive media include interpretive panels (Figure 88) and information kiosks for posters and brochures (Figure 88), including a brochure for an "interpretive walk" through Fort Casey's military batteries (Figure 89). Posted schedules indicated interpretive programs include weekly Fort tours during the summer conducted by that same "docents" from local volunteer association who provide tours of Admiralty Lighthouse Interpretive Center (Figure 86).

Figure 85. Fort Casey State Park Admiralty Head Lighthouse Interpretive Center staffed by volunteers.



Fort Casey State Park is similar to Fort Flagler State Park with historical beginnings in the late 19th and early 20th century as a coastal defense military post and lighthouse and much of the interpretive focus is this cultural history. As described in interview findings with one of the interpretive “docents” staffing Admiralty Lighthouse Interpretive Center the “Keepers of Admiralty Lighthouse” are a volunteer group that keep the center open and who also do fort tours through a cooperative agreement between Fort Casey State Park and the Washington State University Island County Extension Office. The compost demonstration site was also supported through a WSU Extension Office.

Figure 86. Fort Casey State Park Admiralty Lighthouse Interpretive Center volunteer docent, Don Garrett, talking with a visitor. <http://wsm.wsu.edu/s/we>.



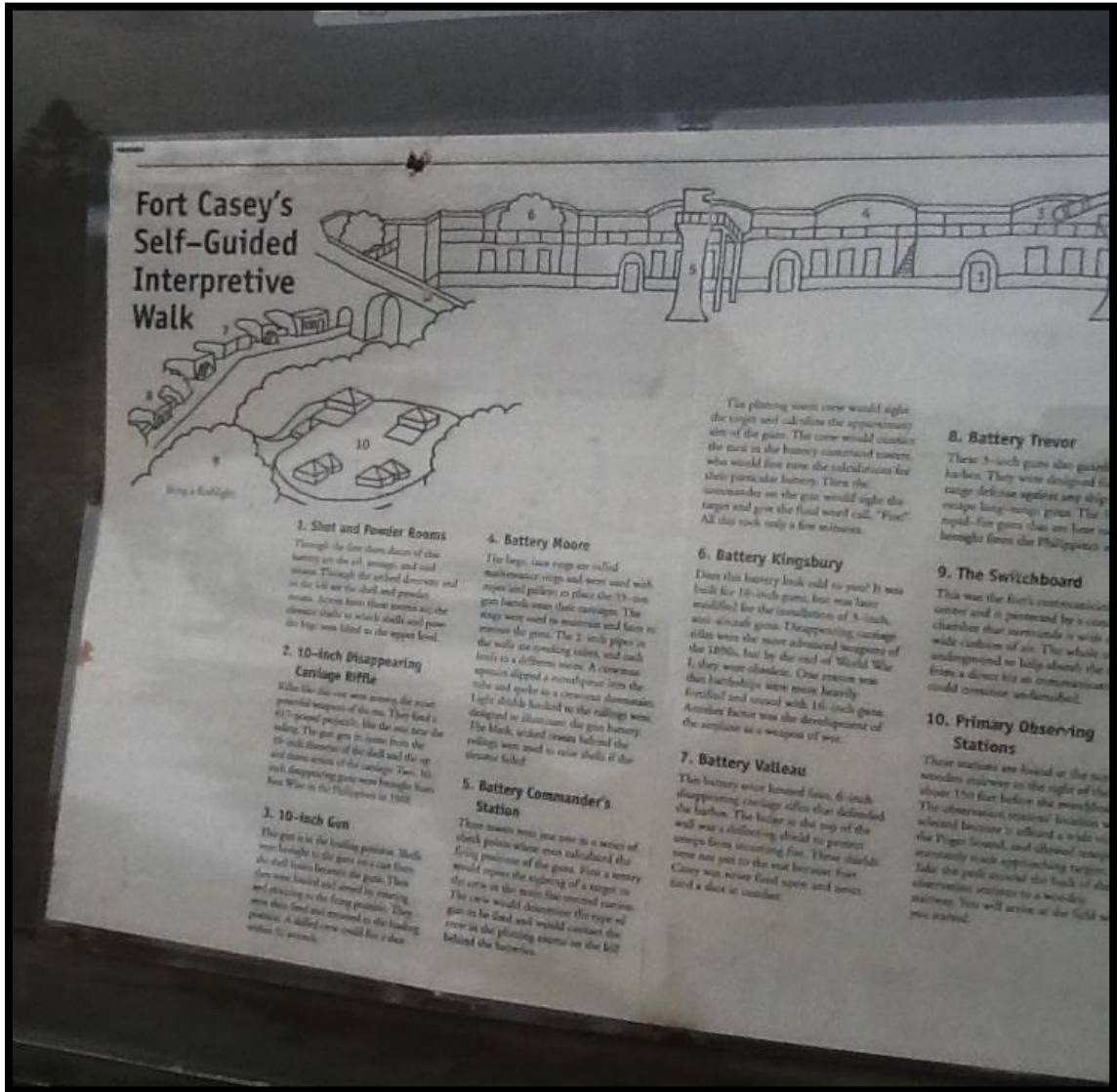
Figure 87. Fort Casey State Park interpretive trail, compost demonstration.



Figure 88. Fort Casey State Park brochures.



Figure 89. Fort Casey State Park self-guided Interpretive Walk brochure.



Puget Sound natural resource interpretation is very limited, with no exhibits or content on natural resources in the Interpretive Center. I found an interpretive panel about the artificial reef underwater dive park with information on dive regulations and some identification of native marine species (Figure 90). Located in the parking area near the dive park were a few very old and dilapidated interpretive panels with content on natural history content such as marine-based food webs (Figure 91).

Figure 90. Fort Casey State Park panel sign for underwater dive park.

THE UNDERWATER PARK

The Underwater Park

Construction of the Keystone Harbor breakwater and Fort Casey's quartermaster's dock, portions of which still remain, have provided ideal habitat for many species of marine life. The area has also attracted scuba divers and underwater photographers. In 1970, State Parks dedicated the area as an underwater marine park. The pictures here show the many varieties of underwater life found in the marine park.

Wave Climate

Keystone Harbor is exposed to wind-wave action from the east, south, west and ocean swells from the west. Waves can reach seven feet from a southerly direction.

Caution: Tidal Currents Below

Scuba divers use caution in this area. The direction of the currents is primarily westerly except between the breakwater and the old dock where they vary according to tidal stage. The currents reach speeds in excess of 1.2 meters per second (4 feet per second.) See map for hazardous areas.

Corps of Engineers Maintenance

Every four to six years, sand and gravel material accumulates in the harbor and channel entrance and must be removed to maintain navigation. Continued erosion of the beach between the breakwater and the old dock has made it necessary for the Corps of Engineers to place the dredged material on this beach. The Corps has made protection of the underwater park an integral part of its maintenance practices.

Underwater Park Rules:

- No collecting of any marine life
- No Fishing / Spear Fishing
- Park Hours 8 AM to Dusk
- Contact Park Office for use beyond these hours

GREENLING

CRAB

JELLYFISH

GOPY

STARFISH

WOLF EEL

OCTOPUS

ANEMONE

Photos by Henry Powers

Figure 91. Fort Casey State Park panels in lower parking area near beach.



As mentioned in WSPRC long-term strategic planning documents that I reviewed in section 3.1, Fort Casey State Park is one of five “Model Stewardship Parks”

(Figure.92). WSPRC picked these parks as models to demonstrate “sustainable activities” related to protecting the state natural and cultural resources (WSPRC, 2008).

Figure 92. Fort Casey Model Stewardship Park



Model Stewardship Parks appear to be about demonstrating WSPRC management, that the the Washington State resource management agency is a good steward of public resources that also supports public access but there does not seem much focus on conservation based public education. The compost demonstration site (Figure 87) was an exception but the site did not seem very connected to the rest of the park, tucked in the back woods behind the Lighthouse and it was created and supported by the WSU Waste Wise program. Fort Casey State Park did have an extensive recycling area (Figure 93) by the lower campground restrooms, more elaborate than any I saw in all the other 23 State

Parks. Signage labels above the recycling bins encouraged visitors to “do your part”, however a general information kiosk nearby contained no sustainability related content or any messages at all (Figure 94).

Figure 93. Fort Casey Recycling Area

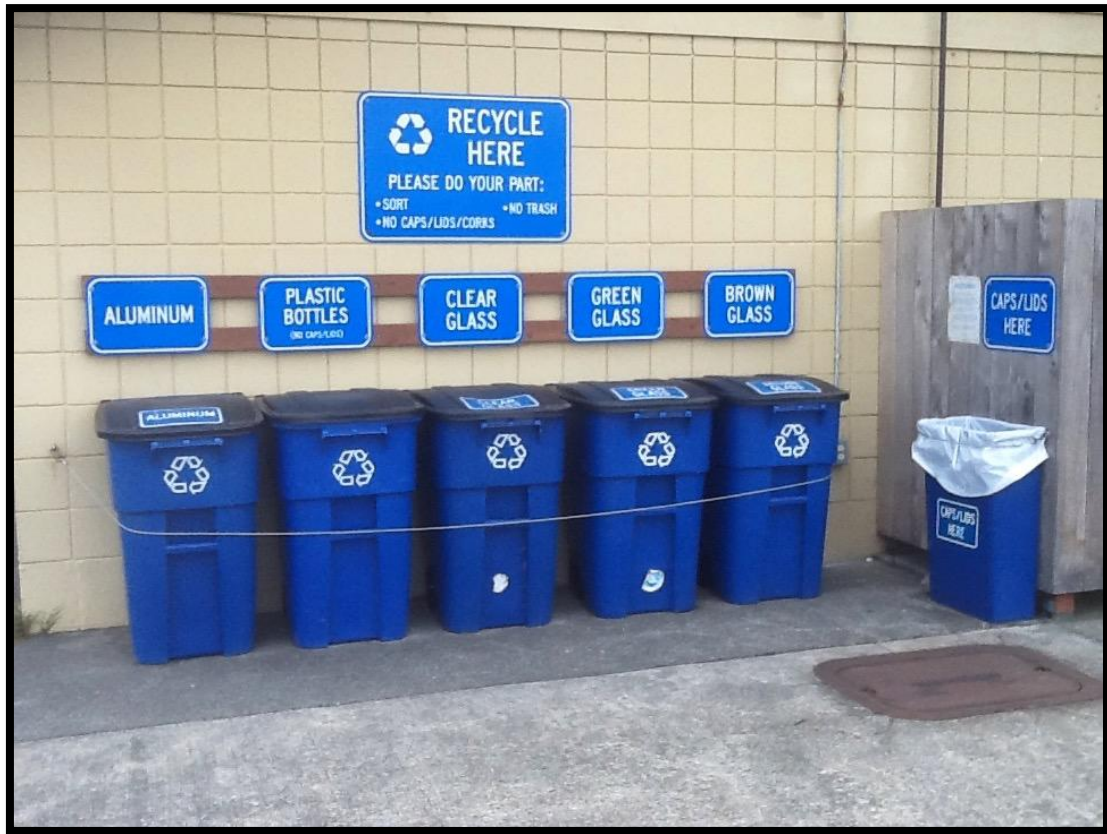


Figure 94. Fort Casey State Park kiosk near restrooms in campground area.



4.4.c. Interviews with Parks Staff and Volunteers

To gain additional perspectives with respect to how staff and volunteers see provision of environmental interpretation in Washington State Parks, I interviewed State Park rangers and on-site volunteers for the embedded case study of Fort Flagler State Park and the three Green Vision show case parks: Twanoh, Saltwater, and Fort Casey State Parks. Table 5 lists the individuals I interviewed either in person, through email, or over the phone to research questions related to support and delivery of interpretation in the parks. I present relevant results under topic headings for each park.

Table 5. *List of Washington State Parks interviewee names and positions.*

Interviewee	Position
Michael Zimmerman	Fort Flagler State Park Ranger and Area Manager
Brian Taylor	Fort Flagler State Park Ranger and Environmental Learning Center Coordinator
Johnny Johnson	Saltwater State Park Ranger and Asst. Area Manager
Charlie Korb	Twanoh State Park Ranger
Jim Spaulding	Fort Casey State Park Ranger
Margaret Osborne, Don Garrett	Interpretive Volunteers

Fort Flagler State Park Staff and Volunteers

In 2006, I began some preliminary research into environmental interpretation in Puget Sound State Parks by examining interpretation services in one of my favorite recreation destinations, Fort Flagler State Park. I conducted in-person interviews with long time Fort Flagler State Park Manager, Mike Zimmerman and then park ranger, Brian Taylor (Brian's ranger position was eliminated in the Washington State's 2009 biennium budget cuts). I also included the park for the case study direct observation data-collection in 2012-2013 surveys. I review relevant results from the 2006 interviews here. Data from the conversations were gathered before my thesis became focused on understanding the status of environmental interpretation (EI) through the lens of examining EI in shoreline parks involved in the Puget Sound Initiative (PSI) natural resource management projects. Therefore, I did not ask anything about Puget Sound or Green Vision planning specifically. Instead, the Fort Flagler State Park rangers helped me understand more generally about support and delivery of park interpretive programming.

Brian Taylor, Park Ranger and Environmental Learning Center Coordinator

In early 2006, I met ranger Brian while recreating at Fort Flagler State Park and explained that I was starting a MES thesis project centered on interpretation of natural resources in parks like Fort Flagler. At the time, I had wanted my thesis to include development of interpretive materials to use at the park. I said I would love to talk to ranger Brian more about how I could volunteer to help with the park's natural resource interpretation and we arranged to meet again soon.

Support

For our interview, ranger Brian reviewed the park's basic statistics on staffing and visitor attendance. He explained that Fort Flagler employed three full-time rangers, two full-time maintenance staff and seasonal park aides. He described how responsibilities were divided amongst the rangers and that he oversaw the environmental learning center (ELC), the vacation houses, museum, and helped with other areas of the park as well. I was particularly interested in the ELC thinking it was related to environmental education programming. However, Brian explained the ELC's role was "mostly for lodging large group-camps such as school and church groups or sports and music camps." Brian said the ELC, also referred to as a "retreat center," which "accommodated over 22,000 visitors annually and its facilities were open year round." He gave me a tour of the ELC retreat buildings, restored military group residence halls from the park's historical role as an early 20th century coastal defense post. When I asked about environmental education or interpretive programming, Brian stated, "There's a residential outdoor school at Moran State Park but if anything like that happens here, it's a teacher coming in and using our facilities but nothing that is run by us." He went on to explain the other areas under his supervision and briefly described the vacation house lodgings and that the museum was "open daily from June- September but only on weekends in the off-season."

Brian emphasized the park relies on "six to seven volunteer docent hosts" and added, "we couldn't do it without them." I asked how the volunteers came to work at Fort Flagler, and Brian said, "Recruitment for camp hosts is through the general park volunteer office." He added, "A lot has to do with the park manager's attitude to capitalize on volunteer skills." He gave an example of Fort Flagler's Jr. Ranger Program which was run by a volunteer named Mary. He then went on to describe the importance

of the “Friends of Fort Flagler” volunteer group. He said the group “was mostly island folks” and that the “corps volunteers at the park” were from this group. He gave example of “volunteer Bob Brown who clears trails and does historical tours and interpretation in the summer.” He said, “With the Friends Groups, any donations and membership fees can be kept for the park.” Brian also added “The Friends Group volunteers helped restore the old military hospital” for tours and event space and also “do lots of day to day stuff.”

I asked ranger Brian about the role rangers play in doing interpretation in the park. He commented that there was, “a ranger directing an outdoor school” and “Cape Disappointment [State Park] has an interpretive center about Lewis and Clark.” He then said, “There’s interpretive services at headquarters [central office for the WSPRC, in Olympia, WA.]. At the park level, rangers still try to do interpretation when they can” but the model is changing. National Parks and State Parks are now employing ‘interpretive specialists’. The current director wants a more generalist ranger.”

Implementation

During our discussion about rangers’ roles in interpretation, Brian told me, “There is a six-year-old Park Interpretive Plan” for Fort Flagler State Park and, “Parks are trying to get all the parks to do this but there’s no funding or resources for it.” He told me Fort Flagler State Park ranger Connie Boice wrote the plan. He said, “The plan separates out natural from historical resources and identifies and breaks down the park’s different ecosystems.” He said the park, “wants to keep the military museum the way it is but have something camps and day users can take with them, something they can do on their own” so less “demanding of staff time.” We talked a bit about the desire to further develop the

seasonal Jr. Ranger Program, the park's forest interpretive trail, and more interpretive signage throughout the park. When we made plans for me to return to review the interpretive plan and Jr. Ranger program materials, he said the Jr. Ranger Program "didn't happen last year because there was a lack of volunteers."

Michael Zimmerman, Park Ranger and Area Manager

I arranged to interview Mike in March 2006 and met with him at Fort Flagler's park office for an hour-long conversation about interpretive support and delivery. At that time, Mike had been working as a parks ranger for Washington State Parks and Recreation for 33 years, with 10 years at Fort Flagler State Park (and is still currently the Park Manager as of this writing in 2015).

Support

When I described my interest in understanding support and implementation of interpretation in state parks, Mike launched into a description of parks funding. He said, "The foundation comes from base taxes and park user fees go into the Parks Renewal and Stewardship Account for park enhancement." He said, "A certain percentage of the fees collected is returned to the parks but some parks don't have this." He talked a bit about the recent attempt to help fund the parks with a five-dollar parking fee that was instituted in 2003 during a recession but ended a few years later because it did not raise much money and park attendance declined. He said, "Washington State Parks was one of the last agencies to try to do parking fees. There's no solution to replace the money but people say they are working on it." He added, "Interpretation is always the last and, at most, there is just limited, seasonal hours for it."

I asked specifically about Mike's role in providing interpretation. He said, "When I started [at Fort Flagler] 10 years ago, the museum was never open. Now it's open seven days a week from May 1st until September 15th and three-day weekends the rest of the year because of volunteer docents." I asked him how the Friends of Fort Flagler Group got started and how did he have success getting volunteers to do so much at the park. He explained, "I do the recruitment and Brian oversees the volunteers and scheduling." In addition to keeping the museum open to the public, "Friends of Fort Flagler volunteers do 2-3 guided tours a week." He said, "It's by donation now but we may want to do a fee structure because sometimes even a minimal fee shows value." He commented, "Fort Casey and Fort Worden don't do tours." He said, "I look for personal interest driven volunteers and find ones that are good for visitor services, who have good teaching skills."

He explained that he does recruitment through "three sets of volunteers." He said, "Number one are community groups." He elaborated, "Usually to form a friends group, a ranger takes a key interest and works with local community and [Washington State] Park's Volunteer Services Division to make the arrangement." He added, "Volunteers need to feel wanted and sometimes work can be generated by self-interest but it's important to work in park needs and therefore volunteer recruitment and support needs park manager support." He emphasized, "It is extra work."

The second set of volunteers he said "comes directly through Volunteer Services Division that markets camp-host opportunities and hook-up sites in RV magazines, etc." He explained the park provides free campsites with full electricity and sewer to volunteers who work at least a 30-day commitment. "Now there are special sites to foster

this with an expectation of x amount of hours [28 hours per week] for a free site. There's an orientation, vests, hats, etc." He said the third set of volunteers he gets come from "other community volunteers that come to do individual projects." He gave examples, "A scouts group could come in or there is a Community Partnership Month in April around Earth Day that brings in groups for park cleanup projects." He said, "I go to Elks meetings, etc. to share volunteer opportunities." He also said, "I do recruitment through personal contacts while shopping" and added, "volunteers do recruitment too."

I asked Mike about park rangers' role in interpretation. He commented, "Ranger training involves mandatory law enforcement and taking care of criminals is the primary emphasis." Mike asked, "What about teaching not to be a criminal, what about education?" He said, "There's nothing mandatory for training in education and interpretation beyond limited voluntary options like a couple hours in a workshop." He commented, "Education is talked about as a priority but it's not supported." He shared, "For Fort Flagler's centennial celebration in 1999, I tried to get an interpretive specialist to be here for even just eight months and it was spoken about for a year." Instead, he said it was the impetus for the formation of the Friends of Fort Flagler volunteer group and, "The upcoming 50th birthday of Fort Flagler State Park will have to be in-house too." He said, "I have lots of creative ideas like roving interpretive persons to help but it's a matter of time and money to support."

Mike did say that the voluntary option for additional ranger training is called, "the stewardship certificate" that involves, "eastern and western Washington history and an interpretation workshop." He said as part of the voluntary certification, "A ranger has to produce a 'thesis' document that helps in resource management." He said Fort Flagler

State Park ranger Connie Boice did the stewardship certificate and, “created an interpretive plan for the park.” He added, “The hope was it would help get money for interpretive panels.” He said, “There is also a Coastal Artillery Interpretive Plan but the Commission put money to Fort Casey and Fort Worden as main hubs.” He said, “Fort Flagler has low budget signs by volunteer Bob Brown that didn’t go through the review process.” He said, “It’s bureaucratic. If someone like the park manager loses interest or takes a different focus, than all is lost.” He added, “There’s a lot to do in visitor services besides providing interpretation, like lawn mowing.”

Implementation

By the time of my interview with Mike, I had seen the interpretive plan ranger Connie had written and it had a large natural resource interpretation component that highlighted the park’s many ecosystems and goals included inspiring stewardship of those resources. I asked Mike about implementation for the plan that, in 2006, was already six years old. Mike said the Fort Flagler Interpretive Plan, “was the first in the NW Region before the mandate to create park plans in all parks.” He told me about the mandate for each park to participate in the “Classification and Management Planning (CAMP)” process to create a land-use plan for each park that includes interpretation. Mike stated, “The plans have not brought any money or support. CAMP plans are for development and decision making in the future, including interpretive services.” He said, “Volunteers can do a lot but not everything and stuff that involves archeologists and engineers”. He added, “A park manager can nominate a few projects. ‘Parks’ has no money though.”

Mike wrapped up our interview by stating he had been a ranger for 33 years. He said sometimes interpretation happens, “through the interest of the ranger, through grants for materials, but there’s not much support for follow through.” He said, “Rangers don’t have the time to do interpretation.” He added, “If they want to do interpretation they go national or make a case for more ‘interpretive specialists.’” He said, “A ranger has the desire, there’s just not a solid framework for funding support groups.” He said, “Steve [Wang, WSPRC Interpretive Manager] is just one guy.” He said, “Sustainability goes with personal and community interest.” He said, that he had been at “Birch Bay State Park for many years and put together an interpretive box.” He then commented, “In reality, interpretation is outside the corps business.”

Green Vision Parks

By 2012, my thesis research design focused on environmental interpretation in 24 Washington State Parks on Puget Sound and the Puget Sound Initiative’s natural resource management plans and restoration work in the parks. As part of an embedded case study to aid my research and understand more about support and implementation of interpretive services, I examined the three Green Vision State Parks and attempted correspondence with park rangers working in Saltwater, Twanoh, and Fort Casey State Parks. In 2013, I first contacted the Washington State Parks Information Center to get the head ranger contact information at each park and then sent an email with the following questions:

1. What resources do you have to support interpretation services?
2. Who does the interpretive programming?

3. How have your resources to support interpretation changed over the last eight years, since the creation of the Puget Sound Initiative and Green Vision plans?
4. Do you know of any environmental interpretation planned to educate the public about the low impact development projects that occurred at your State Park?
5. Lack of financial resources has been identified as the main barrier to supporting implementation of environmental interpretation in the 24 State Parks targeted as Sound Friendly models, including your "Green Vision Park". What is your understanding of the current status of implementation of the Green Vision plans in your park?

Thank you so much for taking the time to answer these questions or add additional comments about Green Vision planning and interpretation in your State Park.

Saltwater State Park

Johnny Johnson, Park Ranger and Area Manager-

Salt Water State Park Ranger and Area Manager Johnny Johnson has worked for 25 years in Washington State Parks. He responded to my emailed questions right away and offered more follow-up by phone. Below is his response to my emailed questions in 2013.

My name is Johnny Johnson and I am the asst. Area Manager for these two parks, Saltwater and Dash point. I was not involved in the designation or picking of which parks would be on the Green Vision Program. I would not have chosen Saltwater to participate in this program. Dash point would have been the better choice. That is here nor there it is done. I have been responsible for the interpretive center only because I feel it is important, it has nothing to do with the Green Vision Program. There have been no funds or activities I am involved with in the Green Vision Program. I made a partnership with the Seattle Aquarium for the Beach Naturalist Program to work with our beach. I did this because I have a

past history with this program it has nothing to do with the Green Vision. I have a need for interpretive programs and created a Volunteer interpretive position in my two parks, because I don't have any funds to get a professional position placed here.

I have heard some talk of the Green Vision over the years and am aware of its existence, however I have not seen any physical impacts to the park to date. I welcome any assistance in the interpretive programs here. I truly believe we have a story to tell and a history of significant to Washington State. Our beach is preserved for our future visitors through education and the beach activities here are overwhelming.

Margaret Osborne-Interpretive Volunteer Host

During my first-hand observation surveys, I had the fortune of meeting and conversing with staff and volunteers working in the park. I learned from 2013 summer season park volunteer camp host, Fred Osborne, that his wife, Margaret, staffed the park's "Interpretive Center" on weekends. I returned and met Margaret while visiting Saltwater State Park's Interpretive Center with my nine year-old son during the center's summer weekend open hours. The Interpretive Center's posted weekend hours are 1-6 pm and we arrived at 1:00 o'clock on an August Sunday to find the center wasn't open. The seasonal park aide at the park entrance booth explained that the volunteer, "sometimes gets back from church late," so we went for a hike. When we returned, the park aide informed us the volunteer had opened the center and said, "She would be happy to see you."

We entered the interpretive center and met Margaret Osborne who greeted us and offered us the opportunity to explore freely or receive a tour from her. We chose the tour and Margaret showed us around the front room as she described the history of the Civilian Conservation Corps (CCC) building and guided us through some exhibits and CCC artifacts on display. She gave us an accompanying brochure on the history of the

CCC and invited us to watch the video available in the room. She then led us to a back room of the building she called, “The Marine or Puget Sound Room” (Figure 79).

Although I started our interaction as a park visitor/participant observer while she led us on a tour of the building and exhibits, I soon recognized the opportunity I had in my encounter with Margaret and asked to interview her for my thesis research. We spent over an hour discussing her experience and knowledge about interpretation support and implementation in the park. I describe key findings from that conversation here.

Support:

When I asked Margaret how she came to do what she does for the park, she explained she had, “applied through Washington State Parks’ seasonal volunteer camp host program where one can indicate specialty areas such as maintenance and interpretation.” She shared that she, “had done visitor center work before” and “recently came from hosting in California State Parks system for five years.” She explained that the interpretive center at Saltwater State Park came into being after another ranger that had been residing in the building moved out. She added, “It was [Saltwater State Park] Manager Johnny Johnson who recruited me and wanted me so I could do interpretation.” She explained she volunteers as Saltwater State Park’s Interpretive Volunteer Host from March to October and then planned to spend the winter at Fort Worden State Park. I asked her if any general WSPRC volunteer entity supported her work such as a “Washington State Parks Volunteer Coordinator” and she replied, “No, just the manager here.”

Margaret added that she “helps procure grants” and explained donations and money she gets “can go directly to the interpretive center.” She commented that, “There used to be eight rangers and now there are only three” and that, “There are seasonal park aides for the summer season until September 15th.” Margaret said she sometimes helps at the entrance booth and collects Discover Pass fees. She remarked that when the fees started, “For every visitor entering the park, 50 turned away because they were pissed at the fee.” We then discussed the park fees designed to support the parks financially and she theorized, “People assume parks are still tax-supported.”

Implementation:

After the tour of the “Marine or Puget Sound Room” exhibits, framed posters, and video documentary that displayed natural history information on local marine life, I asked Margaret how all this effort was produced. She shared, “I put it together with the support of another volunteer who did all the fabrication.” She said, “I did all the displays and I recruited a volunteer to build the cases.” She also, “asked a MAST Center [local community college’s Marine Science and Technology Center] diver to film for me a video of the park’s underwater artificial reef.” She stated that she “gets more volunteers to support the interpretive center” and is “working on getting ‘Trout Unlimited’ [nonprofit organization dedicated to coldwater fisheries conservation] to do a Salmon Wall.” She also showed me another exhibit room under construction that she is designing to be about flora and fauna of local forests.

When asked about programming, Margaret shared that she does tours for “dozens of busses of school groups in the spring” and “summer evening talks on Saturday nights

at both Saltwater and Dashpoint [State Parks].” She added that she is “working on getting support” to restore the amphitheater. She added that, “There used to be Jr. Ranger programming, but now no one does it.” She said she “found [Washington State Parks] Centennial materials way back in storage” and brought out some to share with my son.

I asked Margaret specifically whether she had heard about the Green Vision Plan to use Saltwater State Park as a showcase park for environmental interpretation about Puget Sound and natural resource management efforts for its restoration. She said she had heard about it and added, “There is a ‘Perfect Plan’ but that was made eight years ago.” She said, “instead of waiting for that to happen, I am doing something now.”

Twanoh State Park

Charlie Korb, Park Ranger-

In 2013, I attempted to contact Charlie Korb, the head ranger at Twanoh State Park by sending my list of particular questions by email. After several emails and attempts at reaching him by phone, we finally connected in 2014 and arranged a phone interview. We had a long, open-ended conversation that centered around my submitted questions and my thesis topic in general. Charlie said he had worked in parks and recreation for 40 years, with 34 of those years in Washington State Parks. Before becoming a ranger at Twanoh State Park on Puget Sound three years ago, he had worked mostly in eastern Washington. Here I present significant findings from notes taken during our 30-minute phone interview.

Policy:

When I explained my thesis research and asked about his awareness of the PSI and Sound Friendly environmental upgrades in the parks, he described the projects that occurred in Twanoh, “five to six years ago for wastewater treatment that included a new drain field and downsized parking with bioswale collections.” He went on to say that restoration work is continuing “Puget Sound-wide, such as the removal of creosote pilings, to get toxics out of the water” and coming soon is more “restoration for Twanoh Creek and its hardening of shorelines.”

Support:

I asked Charlie about what kind of interpretation services were available in Twanoh State Park. He said, “Due to low current staffing levels, interpretation is mostly posted flyers, panels, but [there is] no personal interpretation.” He said, “Park funding is at the bottom of the food chain.” He explained that he “tries to do some campfire/fireside talks” when he can and “tries to accommodate school groups on environmental education [field trips] by request.” He then went on to describe that the park often gets “busloads in the spring for end-of-year field trips from Mason County Schools.” In talking with the school groups, Charlie attempts to address “first the geology of the area, water quality issues, the chum salmon in the creek, thermoclines in the spring and fall.” He commented, “Most people don’t know what goes on under the water or about Hood Canal oxygen levels” so he “tries but it’s really tough and I can’t be too long winded.”

When I asked about interpretation for regular daytime visitors, he said there “were some interpretive signs.” He said, “Most of the support for interpretive staffing and

published media goes to interpretive centers and what we do have are the same exhibits for more than 20 years.” I asked Charlie about interpretive volunteers in the park. He responded that, “There are no interpretive volunteers and if we have a park host it’s mostly retired seniors if they have an interest but they’re here maybe 1-2 months.”

Ranger Charlie added a lot of commentary on his own. He stated, “Puget Sound health has fallen off folks’ radar.” He said, “We put these projects in but there is no money left for interpretation.” He added that, “Since the Discover Pass in 2011, I wrote more tickets in the first few weeks, than the last 20 years.” He said he “joined the parks and recreation profession 40 years ago and I love it, the public is awesome.” He said, “Back then, we were a recreation society but since the 1970s the park system has not been healthy”. He commented, “We do the best we can with duck tape” but compared to other states, “what we spend per visitor is nothing.” He added, “We should be very proud of our parks.”

Some of Charlie’s concluding comments were dedicated to portraying the profession of park rangers. He said, “You’ll never meet a more dedicated group of individuals.” For rangers, “It’s a calling more than a career” and “a public service mindset drove interest in rangers.” He said, “People look at them in awe and it’s why we need to be getting out and making personal contacts.” He added, “We either pay now or pay later” with regard to the importance of connecting people with the outdoors as he feels “Westerners take their public spaces and land for granted.”

Implementation:

When asked about environmental interpretation plans to accompany the PSI restoration work in the parks, ranger Charlie commented that nothing had occurred yet since the projects went in six years ago, but that he thought there would be something coming soon. He thought there was talk of some interpretive signing coming for parks in Hood Canal and encouraged me to look into that further.

Fort Casey State Park

Jim Spaulding, Park Ranger-

Although I repeatedly sent messages to the contact email I had been given for Fort Casey State Park's area manager and called to leave messages at the park office to reach a park ranger, I was unable to get any response through these methods. In 2014, I returned to Fort Casey State Park to update direct observation data for the embedded case study and to see if I could encounter park staff in person for questioning. On an August weekend in Fort Casey State Park, I encountered a park ranger named Jim Spaulding. I learned he had been with Washington State Parks for 24 years, 15 of those at Fort Casey State Park. With recent State budget reductions, Fort Casey and 2 nearby State Parks had lost approximately 35% of their staff resources including the loss of four full-time park rangers. Jim's full-time ranger position was reduced to only seasonal work as of 2011 and he shares ranger responsibilities with one other seasonal park ranger to support Fort Casey, Fort Ebey, and South Whidbey State Parks during busy summer months.

I encountered ranger Jim in the busy parking area adjacent to Admiralty Lighthouse where he was monitoring cars to see if they had current Discover Passes. As

it so happened, my Discover Pass was due for renewal so I used this as an opportunity to engage in conversation with him as a participant observer. I had a short interaction and dialogue with him about the Discover Pass. I observed he was very busy with the task of enforcing fee collections and I shared this observation with him. He commented that he “spends 70% of his day doing this.” He seemed exhausted by the process but was courteous with me in our transaction.

I introduced myself as a MES graduate student and asked if I could ask him some brief questions about the park for my research thesis. I told him I was interested in the park’s low impact development projects that were designed to be “Puget Sound-Friendly.” He then proceeded to tell me about the wastewater treatment work that had occurred in the park. He said, “We replaced the whole drain field, redid the lower restroom, and hooked up the lighthouse.” I asked ranger Jim if he knew about the Green Vision Plan to model the restoration work for the visiting public but he did not seem to be familiar the name of the plan or with any environmental interpretation component. During this exchange, another parks ranger joined us (I did not get his name). Upon some discussion, the other ranger appeared to recall something about the Green Vision Plan and responded, “Oh, that was years ago, that Puget Sound Initiative thing.” I was not able to continue questioning ranger Jim, as the business of enforcing Discover Pass regulations required his attention.

Don Garrett -Admiralty Head Light House Interpretive Volunteer

I met Don Garrett during the summer of 2013 as I set out to explore Fort Casey’s Admiralty Head Light House Interpretive Center. As I entered the lighthouse, he greeted

me warmly in the front hall. After reading some of the interpretive panels and talking with Don about the lighthouse's history, I learned he was a retired naval airman and aeronautical sciences professor and we engaged in a discussion about his work as a "docent" and the interpretive programs offered at Fort Casey State Park.

Support

He explained the lighthouse is open to the public through a cooperative agreement between Fort Casey State Park and the Washington State University (WSU) Island County Extension Office. He shared that WSU extension runs the docent program for the park and, in addition to keeping the lighthouse open for tours, the docents also help out with historical tours of Fort Casey State Park's late 19th century coastal defense gun batteries. He said the lighthouse is open daily during the summer months, closed during the winter, and open weekends only during the spring and fall whereas the fort tours occur only during the summer. I asked Don how he came to volunteer at Fort Casey State Park and he said he's, "a member of lighthouse associations and spends summers here and winters in Florida." He added, "All the docents live on Whidbey Island." After exploring the exhibits and climbing to the top of the lighthouse, I commented to Don that the Puget Sound views were incredible from up there and wondered if he ever saw any killer whales. He said, "Oh yes, there's lots of marine life to see." I asked about any environmental interpretation at the Interpretive Center and he said the focus was on history of the fort and lighthouse.

5. DISCUSSION AND ANALYSIS

Here I present analysis of results from my literature review on the potential of environmental interpretation and original research on the current status of environmental interpretation in Puget Sound Washington State Parks. Analysis of results served to answer thesis research questions and a comparison between potential, policy and practice helped inform my assessment on the status of environmental interpretation in Washington State Parks and the recommendations that I will provide in my conclusion.

5.1. Findings on the Potential of EI in Washington State Parks on Puget Sound

A significant research component was in the form of a literature review to provide context and background for understanding environmental interpretation and to investigate the potential of environmental interpretation to raise public awareness and engagement in the Puget Sound Initiative's natural resource management efforts. With respect to each of my research questions, I present my analysis and judgments on those findings.

Findings indicated the leading cause of environmental degradation in Puget Sound stems from urban development and non-point sources of pollution from the humans living in the watershed. Potential already lies in the fact that humans are at the root of Puget Sound's poor health, because it means humans can also do something about it, but only if they are aware of the problem and then motivated to address it. Findings from analysis of environmental literacy statistics demonstrated that three quarters of the local population is not aware of the poor health of Puget Sound or how their actions impact its fragile ecosystems. The literature review showed Washington State and US Federal

natural resource management plans definitively state that lack of public awareness is a major barrier to gaining support for short and long-term restoration strategies. Current plans include legal mandates to prioritize public education to increase awareness and citizen engagement necessary to achieve the goals of the Puget Sound Initiative. If natural resource management efforts to restore Puget Sound by 2020 are to be successful, these management efforts need public support. Statistics also showed that residents value Puget Sound's natural resources, care about protecting water quality, and believe individuals can make a difference by adopting environmentally sustainable behaviors. These findings demonstrate the need, desire, and receptivity for an effective environmental education campaign in the region to influence public knowledge and support of the Puget Sound Initiative.

My research found the Puget Sound Initiative's natural resource plans do prioritize public education with specific goals to raise public awareness and understanding of issues facing Puget Sound, change behaviors that are detrimental to its health, and promote those behaviors that are beneficial. The governing body coordinating the Puget Sound Initiative, the Puget Sound Partnership, produced a Public Education and Awareness Plan that states the need to build social and institutional infrastructure to achieve these goals.

The primary focus of their public awareness efforts is through the "Puget Sound Starts Here" (PSSH) regional media/social media campaign to increase the visibility of and engagement in Puget Sound recovery to motivate residents to adopt new behaviors that will decrease the amount of pollution entering the Sound. The main communication strategies include television advertisements, a website, and public outreach tools for use

by PSSH partners. Success of the effectiveness of the Puget Sound Initiative's Public Awareness and Engagement plan in 2006 initially called for raising public awareness and concern statistics from around 25% to a majority by 2009, or an increase of 35 percentage points to close the gap between the public's perception of Puget Sound's health and reality. The Puget Sound Starts Here social marketing campaign aimed to increase the public's ability to recognize the PSSH marketing brand with a goal that the majority of the regions 4.5 million residents would do so by 2015.

Analysis of the most current results available at the end of 2014 indicated PSSH failed to grow its brand recognition with survey results indicating even fewer Puget Sound residents had heard of the phrase after five years of the social marketing campaign. Post campaign evaluation research showed that PSSH messages about behaviors to lessen Puget Sound pollution failed to be identified by Puget Sound residents. An overwhelming majority of the surrounding population still believes Puget Sound is in excellent or good condition and thus is still unaware of Puget Sound's poor health that continues to decline. Therefore, the Puget Sound Partnership's social marketing and communication strategies with its goals to raise public awareness of the plight of Puget Sound have failed. In fact, research analysis in the post evaluation of the PSSH campaign questioned the implementation of a social marketing strategy to engage residents in Puget Sound friendly behaviors when evidence showed the main barrier was that residents don't even know Puget Sound is unhealthy (PRR Inc., 2014). The analysis included statements questioning whether the failure of the campaign was a case of the "putting the horse before the cart" and "if residents don't clearly understand the why, it's

not likely they'll pay attention to requests to change their behaviors" (Environmental Social Marketing, 2012).

As described in the brief literature review on social marketing, there are multiple steps and best practices for community level social marketing to foster behavior change. Analysis of the Puget Sound Starts Here campaign seems it is more an "inspired by social marketing campaign" than a tactical community level intervention that targets segmented audiences, identifies barriers, pilots a communications strategy, and then evaluates behavior-change strategies. Social marketing research suggests the most important tool for campaigns is face-to-face outreach to the target audience and that "despite the high per-person cost of one-on-one outreach, it offsets its cost through driving significantly better behavior change results than mass media campaigns" (McKenzie-Mohr, et.al., 2014).

The PSI's current public communication strategies have failed to reach their goals in the more than eight years since the creation of the Puget Sound Initiative and the formation of the Puget Sound Partnership. These findings suggest that we should explore different efforts in social and institutional infrastructure than the current focus on social marketing media campaigns and employ communication strategies that are effective in increasing public awareness and engagement necessary for the success of Puget Sound recovery. The literature review on environmental interpretation showed that this field is a unique and distinct form of public environmental education aimed at the general public in recreational settings where studies indicate the majority of people learn about the environment through free-choice learning. Although the Puget Sound Starts Here social marketing campaign technically fits the definition of free-choice learning about the

environment, its media-based delivery is not situated in the physical environment of the natural resources with which it aims to connect people. My review on free-choice environmental learning studies indicated the audiences most likely to be motivated to learn and receptive to messages encouraging stewardship behaviors are people recreating in places where they are engaged making tangible connections with the natural environment. Puget Sound Initiative's public education and engagement efforts should be delivered where the public is most likely to be reached, and in a way that has the most potential to raise public awareness and influence behaviors needed for successful restoration and protection of Puget Sound's natural resources.

Parks are places where people spend their leisure time and parks provide unique opportunities for visitors to connect with and learn about natural resources as they enjoy the environment in protected areas. The literature review revealed that public parks often identify protection and stewardship of natural resources in their missions and incorporate environmental interpretation as a tool for communication with recreating visitors with the intention that informal learning and meaningful connections with the resources will support conservation management activities regarding the resources. In park-based environmental interpretation, the tradition already exists where natural resources are center stage in a conservation mission-based educational framework and that framework aligns well with the Puget Sound Initiative's focus on its mission to conserve and protect watershed natural resources by enhancing public education and engagement. Therefore, I found this form of public environmental education is unique, appropriate, and important for use in natural resource management efforts such as those in place for Puget Sound's large-scale environmental restoration.

Research on current behavioral change theory suggests environmental interpretation's promise lies in its outdoor recreational and social learning contexts and its cognitive psychology-based methodologies designed to create the meaningful, intellectual, and emotional connections considered necessary for people to develop conservation attitudes and behaviors. Research results on EI's effectiveness show that there are numerous examples where this communication strategy has succeeded in raising public awareness and environmental friendly attitudes that lay the groundwork for adopting sustainable behaviors towards natural resources. Several journal articles that examined the use of environmental interpretation as a natural resource management tool and support its use as an essential part of comprehensive natural resource management efforts for fostering environmentally responsible behavior (Falk et al., 2009; Kohl, 2005, Negra and Manning, 1997; Ham, 2012).

My findings suggest environmental interpretation can be an important and natural resources management tool and should be prioritized in places where people regularly recreate and access Puget Sound's natural resources. Findings that this style of educational methodology has proven to be effective coupled with the fact that the institutional infrastructure is already in place in public parks, means park-based environmental should be included in the PSI's goals for supporting social and institutional infrastructure that achieves public education and recovery targets.

My findings revealed that Puget Sound Initiative natural resource management plans have included the Washington State Parks and Recreation Commission since 2006, when the Washington Governor and state legislature identified state agencies should lead the way for good Puget Sound stewardship. Funding was provided for cleanup efforts in

24 Washington State Parks on Puget Sound that model “Puget Sound friendly” development, restored shorelines, and advanced storm water and wastewater treatment facilities. Most of the restoration work in the parks was completed in the first few years of the Puget Sound Initiative and involved green strategies that alleviate the main negative impacts from human development in the watershed. The literature review on Puget Sound’s health demonstrated that support for similar restoration from the region’s residents is what is needed to continue progress towards Puget Sound recovery.

Research showed that a large majority of Washington State residents have visited a state park in last two years, primarily come to parks to enjoy nature and the outdoors, and value interpretive services (WSPRC, 2008). With twelve million recreating visitors annually and the largest public ownership and access to Puget Sound shorelines, Washington State Parks system’s sixty-eight Puget Sound State Parks are well positioned to connect people with Puget Sound’s natural resources. As models, the 24 PSI Puget Sound Parks can help people become aware of PSI efforts, why these types of restorations are necessary, and how residents’ participation supports a healthy Puget Sound.

Analysis based on the above findings suggests environmental interpretation in the strategically located and heavily visited Washington State Parks on Puget Sound shorelines has great potential and capacity to support the Puget Sound Initiative’s goal of increased public awareness and engagement in regional citizens. Therefore, environmental interpretation in Washington State Parks should be well supported with appropriate resources for development and delivery to capitalize on its potential.

5.2. Reality of EI in State Parks on Puget Sound Compared to Ideals

I designed this case study to attempt to understand the current status of environmental interpretation in Washington State Parks as a whole and evaluate what was happening in a majority of the most easily accessible and heavily visited Washington State Parks on Puget Sound. Results on policy, support, and implementation were triangulated to strengthen and reveal consistency or inconsistencies in my findings. I summarize my findings in the following paragraphs and provide a comparative analysis of stated policy with actual practice of environmental interpretation in Washington State Parks on Puget Sound.

Examination of Washington State Parks documents, interviews, and direct observations demonstrated Washington State Parks has a long tradition of policy that, in principle, provides interpretive services and infrastructure for delivery as part of its core functions. My document review of Washington State law and Washington State Parks and Recreation Commission (WSPRC) agency guiding principles, goals, strategy plans and other adopted policies illustrated policy emphasis on interpretation's public educational role and capacity as a management tool for protection of Washington's resources. I found WSPRC interpretation policies support mission-based communication strategies to help recreating park visitors emotionally and intellectually connect with Washington's State's natural resources and encourage stewardship behaviors to care for them sustainably. Environmental interpretation plans created for the PSI Puget Sound Washington State Parks explicitly state objectives to help park visitors understand the importance of Puget Sound, the status of its health, and how they can make a positive

difference. My analysis indicates that environmental interpretation in Washington State Parks has been well supported in stated policy.

I examined WSPRC's definition of environmental interpretation, its goals, and how its mission-based communication strategies are employed in State Parks for natural resource management. I concluded that WSPRC's environmental interpretation practices are in line with current definitions and objectives drawn from professional field practitioners and leadership organizations, as described in the literature review on environmental interpretation. WSPRC goals for environmental interpretation share the overall goals and align well with the Puget Sound Initiative's public education and awareness agenda for engaging citizens in natural resources management efforts.

My analysis of the current status of environmental interpretation in Washington State Parks included policy implementation. That evidence was gathered from the case studies' WSPRC documents, staff interviews, and from my first-hand surveys of interpretation services available in Washington State Parks on Puget Sound. Some of the interpretation policies and plans I reviewed outlined specific interpretation services delivery targets and this offered me the opportunity to compare these objectives to evidence of implementation.

One of the targets for interpretation implementation comes from the 2013 Centennial Plan, produced by the Washington State Legislature to celebrate Washington State Parks 100th birthday and ready the park system for the next century of service. WSPRC Centennial Plans charged all 120 developed State Parks to have interpretation programs by 2013. In addition, WSPRC's Interpretation Policy states goals that direct,

“All developed state parks to provide appropriate self-guided and/or guided interpretive services” (WSP, 2010). However, as of 2013, WSPRC’s internal survey of level of interpretive service showed less than half of all parks reported having any interpretive programs or community events. The WSPRC survey and results from my interview with the WSPRC Interpretive Program Manager revealed the most common kind of interpretation in State Parks is self-guided media in forms that include outdoor exhibit panels and signage/brochures located on kiosks and at trailheads. The WSPRC survey indicated only 58% of Washington State Park properties had any self-guided interpretation available to park visitors. WSPRC’s own survey found, “The majority of outdoor exhibits surveyed have reached or passed their designed life expectancy or they convey outdated information and are in need of replacement or removal.” These surveys documented that only about half of Washington State Parks are currently offering interpretation. In order to understand implementation of environmental interpretation specifically in Washington State Parks on Puget Sound, I compared stated goals for environmental interpretation to results from my original research surveys. I discuss analysis of those findings below.

My direct observation surveys in the case study’s 24 PSI Puget Sound parks provided observations on self-guided environmental interpretation available to recreating visitors and documented the kind of EI media, the content of EI messages, and some idea of the quality of EI media materials. The results were used for analysis of implementation quantitatively by computing how many of the 24 parks had any environmental interpretation about Puget Sound and whether particular goals taken from WSPRC and PSI public education and awareness plans were implemented. Results showed that 15 of

the 24 parks had some limited form of self-guided interpretive media available about Puget Sound natural resources. I found the majority of self-guided EI media was in the form of signs and posters displayed at information kiosks located near parking areas. However, except for a few examples that I will discuss in later analysis, when compared to overall interpretation available to recreating park visitors and inherent natural resource assets, I found these parks have inadequate interpretation dedicated to Puget Sound. Many of the case study's 24 Puget Sound State Parks had a cultural resource interpretation focus and, if a park included dedicated interpretive infrastructure such as interpretive trails or installed interpretive panels about natural resources, the emphasis was often on terrestrial vegetation and not about Puget Sound. In the 15 parks that did contain any environmental interpretation about Puget Sound, it was minimal and the majority highlighted natural history type content, such as identification of local marine species. Raising public awareness about Puget Sound's natural resources assets is part of PSI and WSPRC overall environmental interpretation goals. However, I found that all self-guided interpretative media about Puget Sound's resident flora and fauna was produced long before the creation of the Puget Sound Initiative, with some materials more than 30 years old. The focus of the PSI and WSPRC environmental interpretation plans for the 24 parks aims to raise public awareness of Puget Sound conservation issues and natural resource management efforts and so I looked for evidence of this type of environmental interpretation specifically and, as discussed further below, I found the parks particularly deficient in this focus.

Only ten of the 24 parks contained any environmental interpretation that mentioned conservation issues threatening Puget Sound or management actions to restore

and protect it. Some of these examples were simple flyers posted at general information kiosks directing visitor behavior to minimize human impacts to resident marine wildlife through harvest regulations or warnings not to physically disturb protected species. The other instances of Puget Sound natural resources conservation-based EI were in the form of freestanding, interpretive panels. Analysis of message content in the panel signs demonstrated these were the only examples with any focus on public environmental education themes of Puget Sound watershed health and citizen engagement in stewardship behaviors. However, absolutely none of these panels or any other examples of self-guided environmental interpretation in the surveyed 24 Washington State Parks mentioned the Puget Sound Initiative or identified the parks' PSI driven "Sound Friendly" restoration projects.

For the embedded case study on current environmental interpretation offered in Green Vision showcase parks, I compared direct observation data on environmental interpretation gathered in Twanoh, Saltwater, and Fort Casey State Parks with stated goals outlined in Puget Sound Initiative driven plans: the Green Vision Plan and similar Washington State Parks Puget Sound Initiative Projects Interpretive and Education Plan. These plans called for enhanced self-guided environmental interpretation that, at a minimum, included the installation of restroom tiles and interpretive signs (as shown in Figures 40-43) designed to highlight each park's Puget Sound Friendly wastewater and stormwater treatment strategies. I found 0/3 of the Green Vision parks had PSI related environmental interpretation and no evidence of implementation of any of the specific PSI self-guided interpretive media or guided programming.

My quantitative analysis of the case studies' direct observation results helped me understand what environmental interpretation policy has been implemented in Washington State Parks on Puget Sound. My research found that almost all of the Puget Sound Initiative-driven wastewater and stormwater treatment efforts in the parks have been completed, with projects for the removal of shoreline hard armoring still scheduled for completion soon. In addition, specific plans for high levels of environmental interpretation services to accompany the projects in all 24 parks were developed with designs for self-guided interpretive media about each type of restoration project finalized and scheduled for installation in relevant parks. However, analysis of results from direct observations in the 24 PSI Puget Sound State Parks, including the "showcase" parks in WSPRC's original Green Vision planning, indicated there has been no implementation of any of the projects' planned environmental interpretation components intended to achieve PSI public awareness and engagement goals.

Qualitative analysis using pattern matching and cross-case comparison not only illustrated similarities and contrasts in the parks' interpretation efforts but also provided some information for research questions about support. Of particular interest were the examples I found in parks with some dedicated interpretive infrastructure specifically about Puget Sound's natural resources. In comparison to the other most prevalent forms of self-guided media in the parks, I consider the interpretive panels installed at scenic locations along Puget Sound shorelines and fabricated with durable materials and high quality graphics to represent a higher level of support for the provision of Puget Sound based environmental interpretation. The panels' message content focus was to draw attention to the need for human stewardship to protect Puget Sound's watershed health

and thus represented messages parallel to PSI's public awareness goals. What I found especially noteworthy about these interpretive panels was that they were instigated as part of past public education projects, similar to the current Puget Sound Initiative, though for smaller, more regional-scaled campaigns.

Figure 95 shows the "Admiralty Inlet Marine Stewardship Area" interpretive panel I found in three of the Washington State Parks I surveyed on Whidbey Island. These panels were created before the Puget Sound Initiative but in support of a Northern Puget Sound restoration effort called the Northwest Straights Initiative. As part of an integrated educational campaign, 18 panels were installed along Whidbey Island public shorelines to explain marine stewardship and shoreline processes and "To raise awareness of the assets of our nearshore and to instill an ethic of stewardship in residents and visitors" (<http://www.islandcountymrc.org>).

Figure 95. Interpretive panel graphic found in three surveyed Washington State Parks on Whidbey Island.



Figure 96 shows the interpretive panel I found in five of the State Parks that I surveyed on Puget Sound's Hood Canal. Out of all surveyed self-guided environmental interpretation in the parks, this panel was unique because it addressed the human-caused degradation of habitat and water quality from urban development; further, it highlighted specific ways the surrounding human population can contribute to watershed health. Of note is that this WSPRC interpretive panel and other smaller WSPRC panels about Puget Sound water quality (Figures 65-66) were sponsored either by the Puget Sound Water Quality Authority or Puget Sound Action Team. These were the two earlier state

government authorities responsible for coordinating Puget Sound cleanup efforts and that evolved to the current Puget Sound Partnership that oversees the Puget Sound Initiative.

Figure 96. Interpretive panel graphic found in five surveyed Washington State Parks on Hood Canal.



These examples of environmental interpretive panels found along Hood Canal and Whidbey Island shorelines were the best samples of self-guided environmental interpretation about Puget Sound I found in my survey of Washington State Parks on Puget Sound. I say this based on comparison to the other parks' limited examples of Puget Sound environmental interpretation, which were especially lacking in messages about the watershed's conservation issues and needed stewardship actions. These aesthetically attractive stand-alone panels were placed in scenic locations where people

can emotionally connect with the beauty of Puget Sound's inherent natural resources and can form intellectual understanding of conservation-based message content. The fact that these panels were installed in Washington State Parks as part of previous Puget Sound restoration natural resource management plans and associated public education campaigns demonstrates a precedent of support of the potential of environmental interpretation in public park settings to raise public awareness and concern for Puget Sound health.

Current Puget Sound Initiative natural resource management plans similarly called for installing environmental interpretive signs strategically in several Puget Sound Washington State Parks. With the PSI goal of restoring Puget Sound by 2020 and research that indicates an ill informed local community whose actions are mostly responsible for poor watershed health, environmental interpretive messaging in these signs takes an even more direct approach to engaging citizens to change detrimental behaviors. The choice of where to locate the signs is very strategic, using not just the setting of scenic public access to Puget Sound, but situated next to the parks' green development to demonstrate stewardship actions needed from the public.

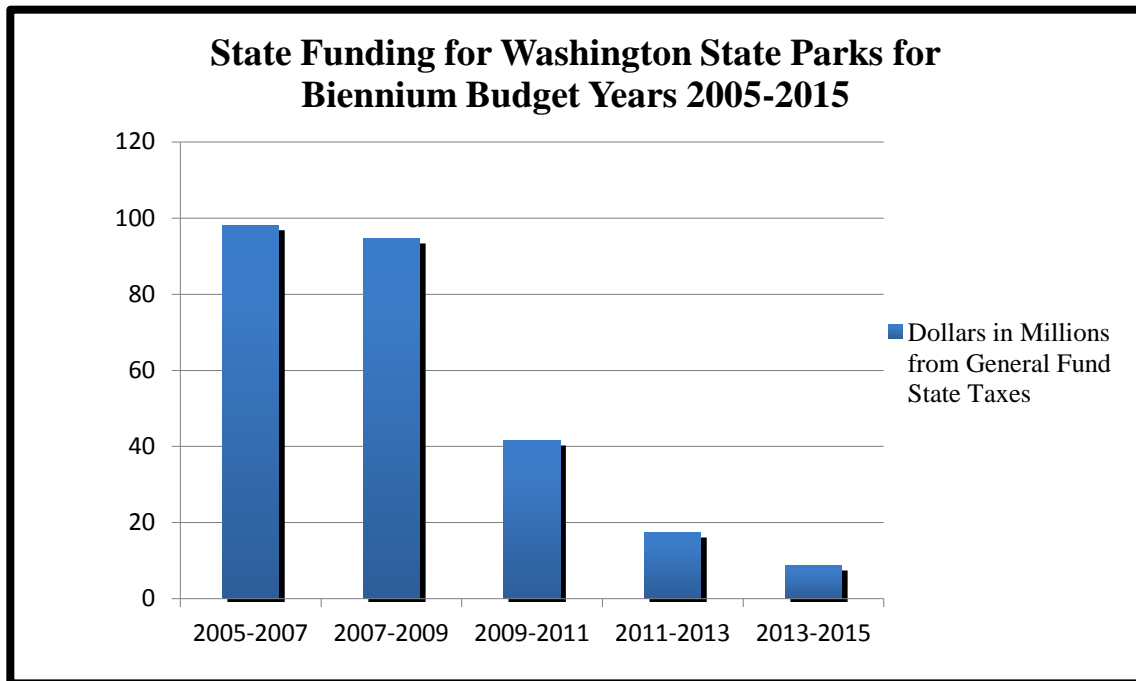
In comparing all these examples, I saw a trend in the development of self-guided environmental interpretation from older signs' natural history focus on individual flora and fauna in the parks, to later a focus on capitalizing on parks' shoreline access to raise public awareness of Puget Sound's natural resource assets, to more modern communication strategies to engage citizens to support natural resource management and restoration plans and adopt conservation behaviors beneficial to Puget Sound. This trajectory follows the development of the field of environmental interpretation into its

current mission based approach for helping people form a positive, sustainable relationship with their environment. Puget Sound natural resource management plans increased focus on using public education and awareness campaigns as important and necessary tactics for success influenced WSPRC policy to create complementary environmental interpretation. However, regardless of supportive policy and evidence of EI delivery realized in decades past, none of the current PSI and WSPRC environmental interpretation proposals has been implemented in the eight years since they were meant to be completed and in place in the parks.

My assessment of the current status of environmental interpretation in Puget Sound Washington State Parks also attempted to understand support and barriers for implementation of environmental interpretation policy. I analyzed quantitative and qualitative data from WSPRC documents, interviews, and from direct observations in the case study parks that yielded information on available financial and staff resources and current practices for interpretation delivery.

In looking at overall financial resources for Washington State Parks, I found the public tax supported Washington State General Fund had historically contributed to the majority of Washington State Parks' operating budget but this model changed in the 2009 biennium when economic recession and state budget cuts suddenly more than halved state financial support for the State Parks. Reductions in state support have continued with an overall 90% decrease from \$98 million in 2005 to only \$8.7 million for the current 2013-2015 biennium budget (Figure 97) In Figures 98-99, I first present time-series analysis of quantitative data on overall park funding and relevant staff resources since the creation of the Puget Sound Initiative.

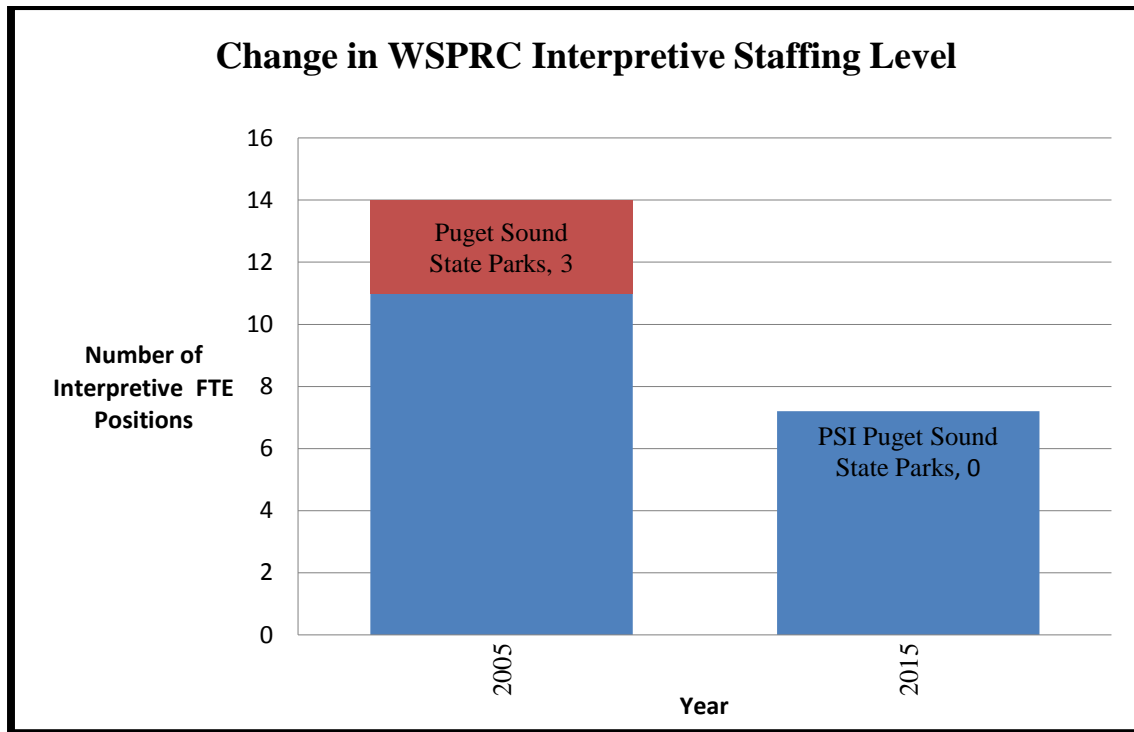
Figure 97. Washington State Funding for WSPRC operating budget in millions of dollars during biennium years 2005-2015.



In response to the state support, WSPRC’s greatly increased efforts in self-revenue generation through fees and permits but have not made up for the total loss of General Fund tax revenues, with analysis showing an overall 20% decrease in operations funding over the last decade. It is important to note that Washington State Parks’ operating budget provides funding for park resources such as staff to run park operations, including interpretive services. Review of WSPRC documents and media releases, indicated that in response to the abrupt decrease in state support for park operations in 2009, WSPRC cut a third of its overall staff, including those that case study results indicated were the most involved in interpretation contacts with park visitors; Interpretative Specialists and Park Rangers.

Analysis of WSPRC interpretive staffing levels since 2005, represented in Figure 98, shows a 50% reduction in overall interpretive positions in 2009 that led to elimination of the three interpretive staff positions in Puget Sound State Parks.

Figure 98. Change in WSPRC interpretive staffing levels since start of Puget Sound initiative



Around 2007, I became one of two candidates who interviewed for the full-time Interpretive Specialist at Deception Pass State Park, the largest State Park on Puget Sound. Built by the Civilian Conservation Corps in the 1930s and set in 4,134 acres of forests and 100,000 feet of shoreline, my impression was the interpretation focus of the position was the park’s natural and cultural history. There seemed to be no indication of interest to provide interpretive programming beyond the park’s borders and 2.7 million annual visitors or interpret the larger scale of Puget Sound’s watershed or Puget Sound Initiative’s conservation management efforts. I later ran into the individual who took the

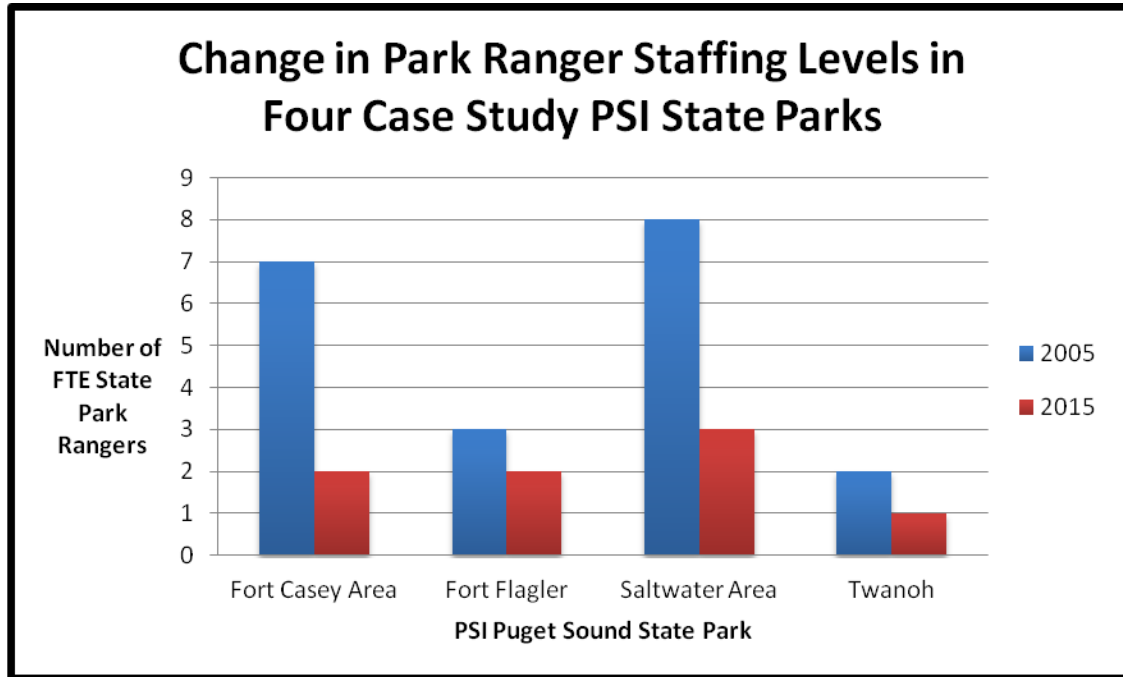
position, including at a meeting of members of the Education, Communication, and Outreach Network (ECO Net), the program loosely sponsored by the Puget Sound Partnership that attempts to build collaboration amongst the hundreds working to engage the public in restoring Puget Sound's health. I was inspired to see Washington State Parks had a representative there but soon after in 2009, I learned his WSPRC interpretive position had been eliminated.

Interviews with WSPRC staff and documents suggested resources for interpretive staffing and programming has mostly been supported in "significant heritage site" State Parks, with capital infrastructure like an interpretive or environment learning center (ELC). The three Puget Sound Interpretive Specialists eliminated in 2009 included the one at Deception Pass State Park on Whidbey Island, and at two State Parks in the San Juan Islands, one with an interpretive center and one with an outdoor learning school. Those parks with any interpretive staff number only three out of the 68 Puget Sound Washington State Parks. No interpretive positions were found in State Parks located near the more densely populated central and southern Puget Sound urban regions. In fact, WSPRC's own internal analysis of its overall Interpretation Program's level of service found "a notable gap in higher levels of services found in urban centers and shoreline parks" (WSPRC, 2102). With only 8 parks in the entire Washington State Parks system having dedicated interpretive staff, the 2012 WSPRC survey found that staff support for any interpretation in the 100 plus other parks comes from State Park rangers and volunteers working in the parks.

WSPRC staffing cuts in 2009 led to a loss of over a third of its Washington State park rangers. Analysis from WSPRC reports, media releases and interviews from my

embedded case study revealed that by 2015, all four parks experienced reductions of a third to more than half of their park rangers (Figure 99).

Figure 99. Change in number of WSPRC FTE park ranger staff in four case study PSI Puget Sound State Parks in the year 2005 compared to the year 2015.



Interviews with WSPRC staff suggested that park managers and rangers feel there is not enough staff resources to support interpretation given the myriad of other duties necessary for operating and maintaining parks, described by a few as “small cities.” In relation to the 2011 implementation of Discovery Pass revenue collections (Figure 100) to offset steep reductions in general tax support, a few park rangers also commented that the majority of their time was now spent on enforcing these parking permits.

Figure 100. Discovery Pass implementation in Washington State Parks.



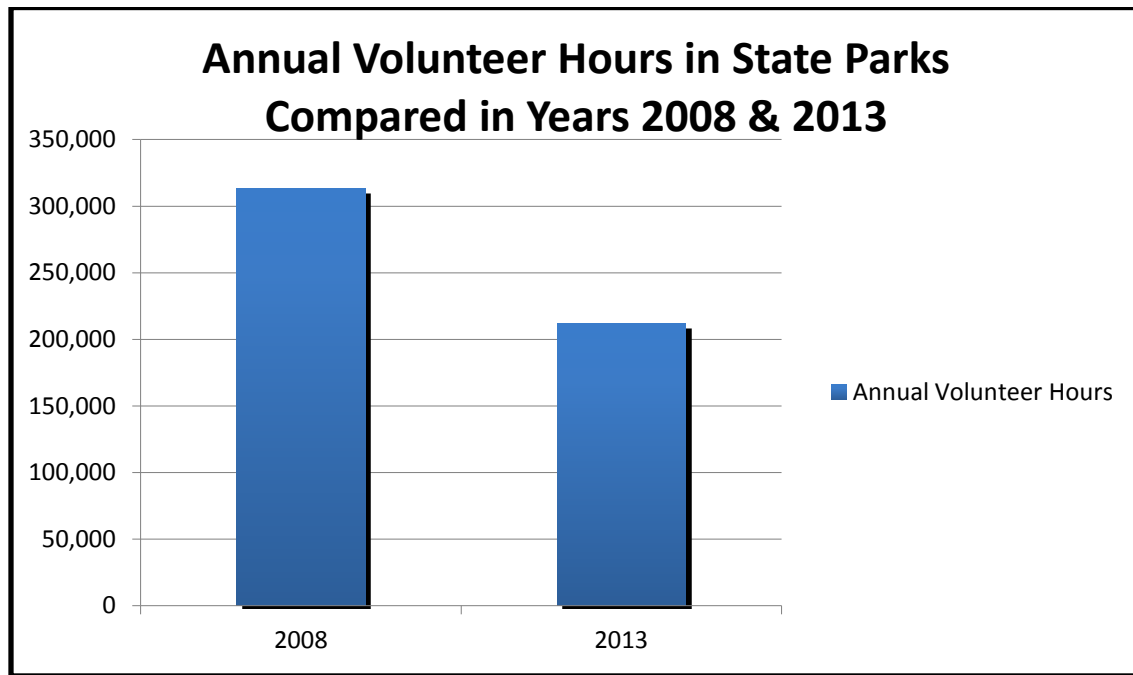
In addition, analysis in the WSPRC Interpretation Transformation Report stated,

Centennial Goal #2 calls for providing interpretive programs and community events in all developed state parks. With reduced staffing and emphasis on Discover Pass implementation, only 56 of 117 parks reported achieving this goal (WSPRC, 2012; R. Carlson, personal communication, 2014).

With reductions of available State Park rangers and interpretive specialists, much of interpretive programming, if any, falls on the efforts of individual volunteers and volunteer groups. However, since the budget cuts and WSPRC staff reductions, my research found that volunteer hours have declined.

Despite WSPRC goals of significantly growing overall volunteer hours and number of supporting “friends groups” by the park system’s 2013 Centennial anniversary, since the significant budget and staff cuts in 2009 (Figure 101), volunteer hours have decreased by 32% and over the last five years have remained at only half the target of 2000 volunteers contributing 500,000 hours annually by 2013. In addition, the small fraction of Parks with friends groups has remained flat at only 18/124 State Parks.

Figure 101. Number of annual Volunteer hours in Washington State Parks compared between the year 2008 and 2013.



From interviews and observations in the four embedded case study State Parks, I found that the majority of any interpretive programming happening was because of support from either individual volunteers or volunteer Friends Groups recruited through efforts of the State Park manager (head park ranger for an area). My evaluation suggested it was the resourceful nature of these individuals who capitalized on alternative assets and networked in their community for volunteer labor or engaged partnerships with outside

organizations that provided support for interpretive program delivery and sometimes even for fundraising.

In addition to the existing kind of infrastructure available for interpretation such as a park's historical buildings or an interpretive center, I found the personal passions of staff and volunteers seemed to play a key role in what resource subjects were supported and interpreted. The embedded case study's four Puget Sound State Parks exemplified these observations with varied interpretive offerings in each park. Fort Flagler State Park had incredible volunteer support for interpretive services about the park's cultural resources, about the park's history as a coastal defense military fort, and the Friends of Fort Flagler Group has won several awards for outstanding volunteer contributions. The Park Manager played a major role in recruiting the volunteers and was himself highly engaged in supporting maintenance of historical buildings and cultural programs such as musical performances that raised money for restorations. Any natural resource interpretation in the park, such as the interpretive trail about native vegetation, had historically been done by a ranger who retired years ago and since then, natural resource interpretation has not benefitted from any attention. Although budget and staff reductions impact what can be done, the fact that great cultural resource interpretation is happening suggests natural resource interpretation simply not the current focus of the current staff and volunteer individual's interests.

The Saltwater State Park head ranger seemed passionate that his shoreline park "had a story to tell" and he was motivated enough to make do with little resources to help tell the park's story with enhanced interpretation of the park's incredible natural resources. Almost every kiosk had a Puget Sound natural resources content focus, not

necessarily created by the park, but by taking the effort to find and display available natural resource agency posters and flyers. This ranger was the only State Park area manager who recruited a “volunteer interpretive host” for the busy spring and summer seasons to provide interpretation. By moving his personal residence to another building he freed up space for the creation of an interpretive center and enabled the volunteer interpretive host to produce the entire center’s exhibits and content, and also provide center tours and evening campfire talks. This interpretive volunteer’s statement that they couldn’t wait for the Green Vision’s “perfect plan” and that they, “had to do something now” in terms of offering Puget Sound interpretation, speaks to her and her manager’s determination and dedication, even in the face of no outside support. Saltwater State Park’s area manager also used his connections and interests to bring outside organizations to provide both cultural and natural resource programming, including engaging on a regular annual basis a beach naturalist program to provide interpretation about Puget Sound marine life for spring school field trip students and summer park visitors.

In addition, although passion is an important part of delivering interpretation, and park rangers or volunteers supporting interpretation is better than nothing, without support for access to modern interpretive training and high quality interpretive materials, the quality of the interpretation suffers. This was evident in my direct observations of decades-old interpretive media in poor condition, hand-made signage, and few examples of interpretive messages that addressed current natural resource conservation issues. Although volunteers are doing some interpretation programming in Puget Sound State Parks, rarely did any of it address Puget Sound natural resources, and if it did, I found the focus was on giving natural history information and nothing on conservation or

stewardship of natural resources. When asked, the interpretive volunteer host at Saltwater State Park said she received no support from the WSPRC Volunteer Programs office, and her presence and activities in the Park were all due to the park ranger. With less rangers available, and less WSPRC staff overall, this may be why there has been a decrease in the number of volunteers and no new Friends Groups organized in recent years. As stated in the WSPRC Centennial Plan analysis, managing and recruiting volunteers takes staff support and “due to staffing cuts, there is less capacity to manage volunteers” (WSPRC, 2013).

Looking at other evidence of support or barriers for implementation of the PSI environmental interpretation component in the parks led me to also examine WSPRC capital budget support. The Washington State Parks capital budget is separate from its operating budget and funds primarily infrastructure projects, such as construction of the “Sound Friendly” buildings and environmental enhancements in 24 of the State Parks that border Puget Sound. Those capital projects received significant funding with the passage of Governor Gregoire’s Puget Sound Initiative in 2005, and most were completed by the end of the 2007-2009 biennium. In interviews with WSPRC staff associated with the PSI State Park projects, deficiency of financial and staff resources was mentioned consistently in response to my inquiries as to why the environmental interpretation components of the PSI projects have not materialized more than five years after a majority of the projects were completed. Apparently, the millions of state and federal dollars have only gone to construction of the Sound Friendly projects and although funds paid for the creation of accompanying environmental interpretation plans and designs, none of the EI plans have been implemented. When asked about the most recent State

Park wastewater treatment project, the 3.2 million dollar membrane bioreactor (MBR) installation in Dosewallips State Park scheduled for completion in 2015, staff said the project did not involve implementation of any self-guided environmental interpretation. Although the WSPRC Environmental Planner expressed optimism that funding might come in the 2013-2015 biennium for installation of interpretive signs in at least some of the PSI Puget Sound State Parks, that would be only a fraction of the 24 PSI parks and, with just a few signs, this would be implementing the PSI Public Education and Interpretation Plan at the most minimal level.

I did find listed in WSPRC capital project budget planning documents, the “Twano Master Plan”, also known as the PSI Puget Sound Parks Interpretive Plan, which is presently scheduled to be funded in the 2017-2019 biennium at around \$293,000. This projected funding support is less than half of the original implementation costs of the plan and an even smaller fraction of the estimated budget needed to maintain environmental interpretation in the PSI parks over time. Analysis of the amount of \$293,000 shows that this might pay for installation of just the interpretive panels and restroom tiles. That type of environmental interpretation is important, but does not create the same level of engagement, meaning making, and skill building opportunities compared to the rest of the other elements, namely live programming. Not only is the funding inadequate to implement the plan, especially to support staff resources for the environmental interpretation plan’s programming elements, the fact that the funding to implement the plan is being projected well into the future, is no guarantee that it will happen. Even if this funding came through in the future, an important note is that the whole goal of the Puget Sound Initiative is to restore Puget Sound by 2020, which means,

according to current budget plans, the PSI Puget Sound Parks interpretation plan would be only partially implemented right at the end target date. Thus, given the current funding apparatus for WSPRC to support implementation, the PSI Parks EI plan and its objectives to reach millions of State Park visitors to raise awareness about Puget Sound health and help inspire Puget Sound residents to support restoration and incorporate Sound Friendly behaviors will not have had any chance to reach its potential by 2020.

I found little evidence of support for implementing the PSI State Parks public education and interpretation plans from the lead agencies coordinating the Puget Sound Initiative, namely the EPA, the Puget Sound Partnership, and the Washington State Department of Ecology. Although the EPA awarded six million dollars over the past five years to the Puget Sound Partnership for implementing the Puget Sound Action Agenda's Public Awareness and Engagement plans, I found no evidence of monetary support that trickled down to support education or interpretation plans in the PSI parks. The only evidence of any connection between the Puget Sound Partnership's public education efforts and Washington State Parks was my finding one tattered Puget Sound Starts Here "scoop pet poop" flyer posted at a Fort Ebey State Park information kiosk (Figure. 102)

Figure 102. Puget Sound Starts Here flyer found in Fort Ebey State Park information kiosk.



Recently, EPA Puget Sound recovery grants funded WDFW's Estuary and Salmon Restoration Program for the removal of unnecessary bulkheads and the restoration of tidal functions altered by land-use practices in public shoreline properties. According to Patricia Jateczak, the WDFW manager for the EPA grant program, "One goal of these projects is to give the public a chance to learn about beach processes and the

role shorelines play in salmon survival” (WDFW, 2013). The EPA grants included dedicated money toward interpretive signs and outreach as in the example of the city of Burien’s Seahurst Park Shoreline Restoration project. There, an interpretive brochure on the restoration project and how these low impact development strategies model best practices needed in Puget Sound communities has already been produced (Figure.102) and interpretive panels will be installed (Maria Hunter, WDFW Grants Specialist, personal communication, 2014).

Figure 103. Seahurst Park Shoreline Restoration project brochure.

What is a bulkhead?

Bulkheads or specifically seawalls — a physical barrier between two places intended to create more land space and to preserve the surrounding area from erosion.



One section of bulkhead along Seahurst Beach before the park restoration.

Gabion bulkheads — rock-filled wire cages used to create perched or “dry” beaches above the naturally occurring level of seawater.



Sand in the man-made perched beaches were contained by these gabion bulkheads, which were large rocks within wire netting.

Seahurst has high sea bluffs, mixed sand-gravel beaches, small creeks, and deep water offshore. All play a vital role in the region’s dynamic coastal geology!

The bulkheads cut off the supply of sediment from the bluffs, and increased the lowering of the beach by 3-4 feet.

Landslide-prone sea bluffs as well as rivers, creeks and streams contribute large amounts of sediment to beaches.

Waves and currents in deeper water carry that sediment, depositing it along the shoreline.

Seawalls can disrupt this natural process, which is important for a healthy habitat.



Alki

Seahurst

Sediment from Seahurst supplies sand to beaches 10 miles north, extending as far as Alki (see red line).

The largest beach restoration project in Puget Sound!



Replacing these bulkheads with natural rocks and woody debris restores and fosters a thriving diversity of habitats. A more natural or “soft shoreline armoring” requires less maintenance and provides an enhanced beach experience for visitors.



Soft shoreline armoring

While intended to protect the beach from erosion, these bulkheads actually contributed to it.



Protect sediment sources

Bluff erosion is natural. Bulkheads starve beaches of sediment and damage beach ecology. Salmon and other marine creatures suffer.

Bulkheads cut off sediment

Eroding beach

Salmon habitat

Although I didn’t find any similar state or federal agency financial support for providing similar public outreach in the grant funded restoration projects in Puget Sound State Parks, I did find language in the most current Puget Sound Action Agenda and

earlier versions that supports the idea of providing increased public access and “interpretive experiences” in Puget Sound State Parks for “maximizing opportunities to connect Park visitors with the regional recovery effort” (PSP, 2014). However, the expected performance measures for WSPRC to implement, “interpretive programs (including signage or other interpretive experiences) at up to two parks” by December 2015, are hardly any kind of significant support. Aiming for interpretation in two Washington State Parks out of a total of 68 State owned Puget Sound shoreline parks displays an expectation of minimal effort on WSPRC to implement and no money is associated with this stated expectation. In fact, reviews of previous action Agendas stated the same performance measure goal but the date for expected implementation kept getting moved up into the future.

Figure 104. Excerpt from Puget Sound Action Agenda 2014/2015 specific to Washington State Parks “interpretive experiences”.

<p>4.2 Increase access to and knowledge of publically owned Puget Sound shorelines and the marine ecosystem.</p>	<p>1 Washington State Parks interpretive experiences. Increase passive, active and virtual interpretive experiences on Puget Sound ecology, threats, vital signs, and recovery actions at Washington State Parks and other publically owned lands that provide access to Puget Sound. Maximize opportunities to connect Park visitors with the regional ecosystem recovery effort.</p>	<ul style="list-style-type: none"> • By December 2014, pull elements from existing interpretative plans that address specific ecosystem services needs for Puget Sound. • By December 2015, implement interpretive programs (including signage or other interpretive experiences) at up to two parks. • By December 2017, implement interpretive programs at up to two additional parks.
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Although there is continued policy support from WSPRC and even a limited amount stated in the Puget Sound Partnership’s current Action Agenda, clearly the Puget Sound Initiative’s goal to use the parks as models with enhanced environmental

interpretation is not happening on a time scale or service level as originally planned. It is true that work and resources have gone into supporting the Puget Sound Initiative's goal of creating 24 model Washington State Parks with Puget Sound Friendly natural resource restoration management. However, there has been no apparent financial or staff support to implement the public education plans to make them visible models. Without environmental interpretation of the PSI Sound Friendly projects, as the WSPRC Environmental Planner stated, "none of the enhancements would be visible to anyone visiting the PSI Park. (R.Kline, personal communication, 2013)

Before I conclude this discussion and analysis section with some recommendations, I summarize here my main findings on the potential, policy, and practice of environmental interpretation in Washington State Parks on Puget Sound. I found a demonstrated need and desire for an effective environmental education/interpretation campaign to influence public knowledge and support of the Puget Sound Initiative but that current education efforts are failing. My review of environmental interpretation studies indicated that recreating park visitors are the type of audience most likely to be receptive to stewardship messages and that there are numerous examples where this communication strategy has succeeded as a park management tool in raising and reinforcing public awareness, environmental friendly attitudes, and behaviors towards natural resources. Examination of WSPRC documents shows mission-based environmental interpretation focused on natural resources conservation is well supported in stated policy, aligns well with the Puget Sound Initiative's public education goals, and in fact Puget Sound Initiative environmental interpretation plans for 24 State Parks have already been created. Analysis of these findings suggests implementation of the

environmental interpretation plans in the strategically located and heavily visited Washington State Parks on Puget Sound shorelines has great potential and capacity to support the Puget Sound Initiative's goal of increased public awareness and engagement in regional citizens.

However, regardless of supportive policy and evidence of EI delivery realized in decades past, my observation results demonstrated currently none of the 24 Puget Sound Washington State Parks has any Puget Sound Initiative environmental interpretation in the eight years since it was supposed to be executed in all the parks. My assessment of support and barriers for implementation of environmental interpretation policy revealed that although WSPRC prioritized construction completion of the 24 State Parks' restoration projects and WSPRC continues to maintain goals to implement EI policy eventually, severe underfunding of its operating budget and resulting lack of staff resources are the main barriers to explain the absence of the projects' environmental interpretation components. I also found that even when there were more staff and resources to support interpretive services before dramatic cuts to the WSPRC's operating budget, there did not appear to be much effort to interpret the natural resources of Puget Sound, at least in a majority of its most heavily visited shoreline parks. Other areas of the Washington State Parks system have benefitted from large-scale efforts to interpret natural or cultural resources in regionally connected parks, and even the small efforts I saw in a few Puget Sound State Parks, made me wonder if it is also a matter of the passion of individuals that inspires the vision and fuels the determination and resourcefulness to make the vision a reality.

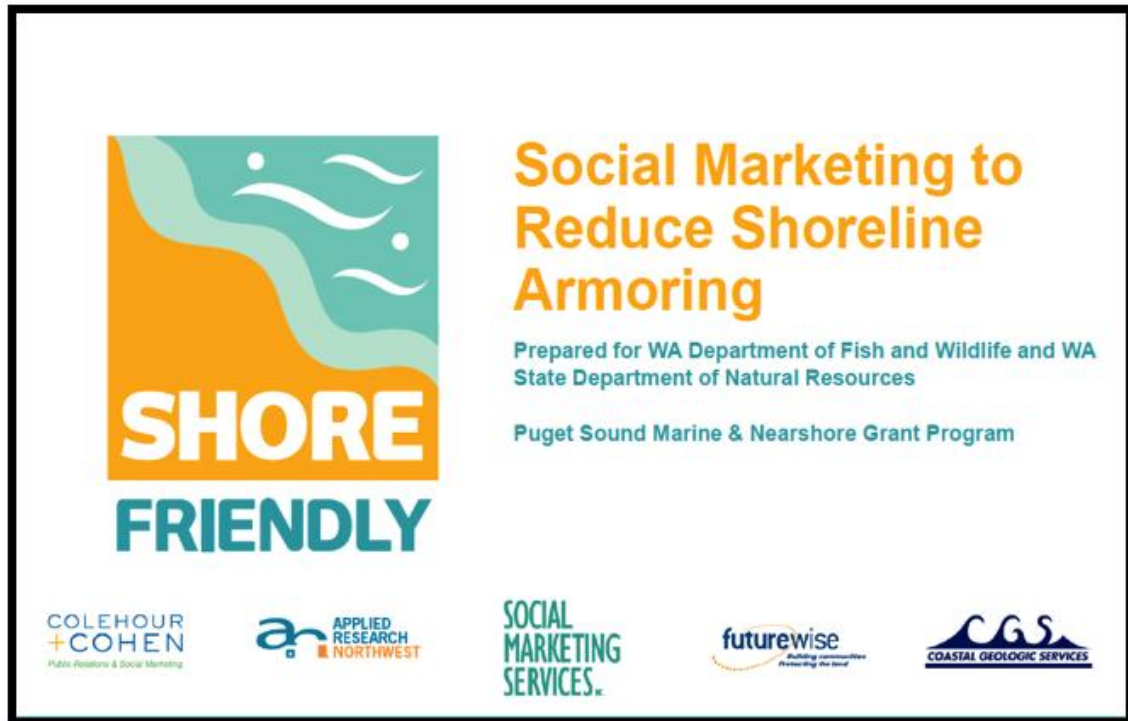
The Puget Sound Initiative involves literally hundreds of organizations working on the goal of Puget Sound natural resource management and it was only the Washington State Parks and Recreation Commission, itself a large state agency with many aspects, that I attempted to examine in its relation to environmental interpretation policy and support. I also visited just 24 of the 68 State Parks in the Puget Sound region and, although my observations were targeted on these 24 for specific reasons, I am making assumptions that the lack of environmental interpretation about the Puget Sound Initiative, if not found in the 24 PSI parks, would not be found in the smaller, less accessible parks or those not directly involved in state agency cleanup efforts.

Given these limitations of my study, my findings suggest that by not supporting environmental interpretation in Puget Sound State Parks, we are wasting a potentially incredible opportunity to educate millions of regional residents and help them become aware of and supportive of the ongoing natural management efforts to restore Puget Sound by 2020. An analysis of the current status of environmental interpretation in Puget Sound State Parks should also suggest where to focus development and resources; thus, before my closing remarks in the conclusion, I offer some recommendations based on my findings and observations of positive models. My recommendations speak to how the Puget Sound Action Agenda should include environmental interpretation in Puget Sound State Parks and some suggestions of how to address financial and staff support in State Parks that my research found were the main barriers to implementation of environmental interpretation in Puget Sound State Parks.

6. RECOMMENDATIONS

- 1) As the lead agency coordinating the state and federal Puget Sound recovery plan, the Puget Sound Partnership should redesign its social marketing strategies and expand its education and outreach efforts by capitalizing on the multiple public engagement opportunities offered by environmental interpretation in Puget Sound Washington State Parks. To restore Puget Sound by 2020, the Puget Sound Action Agenda prioritizes the need “to raise issue awareness and understanding to increase public support and engagement in resource management actions” (PSP, 2014) and the Puget Sound Partnership (PSP) has invested the majority of its efforts and resources in the large-scale Puget Sound Starts Here (PSSH) public media campaign. So far, the media campaign has had little success and suggests the PSP should redesign its outreach campaign and invest in other public education approaches. Analysis of the PSSH media campaign emphasized the need to build public awareness of environmental issues facing Puget Sound first before any behavior change can be expected. Even though the Puget Sound Partnership refers to the PSSH strategies as a social marketing campaign, my research into current best practices for social marketing shows that the PSSH could do more work on targeting segmented audiences, more evaluation to determine barriers, and more experimentation to discover what tactics work best. Possibly the WDFW’s Shore Friendly social marketing campaign aimed at Puget Sound shoreline homeowners could serve as an example with its smaller targeted audience and attempts to evaluate barriers needed for engagement (Figure 105).

Figure 105. WDFW and DNR report on Social Marketing campaign to reduce shoreline armoring in Puget Sound (2014)



Among the Puget Sound Action Agenda’s 105 action strategies, one states, “Incorporate and expand Puget Sound related content in diverse delivery settings” (PSP, 2014), and include other action strategies that promote the kind of setting and methods involved in park environmental interpretation:

- Foster a long-term sense of place among Puget Sound residents; encourage direct experiences with Puget Sound’s aquatic and terrestrial resources through recreation, informal learning, and public access sites;
- Increase passive, active and virtual interpretive experiences on Puget Sound ecology, threats, vital signs, and recovery actions at Washington State Parks and other publically owned lands that provide access to Puget Sound... to maximize

opportunities to connect Park visitors with the regional ecosystem recovery effort (PSP, 2014).

However, as my thesis research indicated, the current Action Agenda's performance measures for these strategies show minimal implementation expectations and no implementation of the original Green Vision environmental interpretation plans created eight years for Puget Sound State Parks. The thesis findings also demonstrate the potential of environmental interpretation's communication methodology in informal recreational settings and its capacity to environmentally educate and engage millions of State Parks visitors interested in connecting with Puget Sound natural resources. Therefore environmental interpretation in Washington State Parks on Puget Sound should be prioritized as an important part of PSP's regional communications to support and enhance the effectiveness of public engagement and stewardship strategies. The completed and future Puget Sound friendly restoration projects in the 24 State Parks can serve as models, inspiration, and training for regional citizens to undertake similar projects. Existing research suggests that citizens who think they understand environmental management strategies and that they have an effect on results are more likely to engage in responsible environmental behavior. Because supportive WSPRC environmental interpretation policy and planning have already been established, it is mostly a matter of supplying the necessary financial resources and political will to provide that support in a timely manner.

- 2) Washington State agencies that receive EPA and other grant funding as lead organizations to implement the Puget Sound Action Agenda should provide financial support for environmental interpretation in Washington State Parks on Puget Sound and

implement the existing EI designs for the 24 parks. EPA and State recovery capital construction funds paid for the PSI restoration projects in the parks and EI plans, but so far not the implementation of the EI components. EPA and state funds for Puget Sound recovery sponsored self-guided interpretive media in shoreline parks in the past and current models exist where capital construction restoration projects in public shoreline parks include dedicated funds for interpretive signage. I found multiple multi-million dollar EPA Puget Sound recovery grant programs administered by the State's Recreation and Conservation Office, including several that encourage applications for interpretive programming in public access sites; therefore, these same grant programs could be used for implementing environmental interpretation in Puget Sound State Parks.

- 3) The Washington State Legislature should restore General Fund public taxes to help adequately fund Washington State Parks. When the Governor created the Parks and Outdoor Recreation Task Force, he directed them to prioritize development of "long-term sustainable funding sources for Washington State Parks" (RCO, 2014). The Task Force recognized the revenue generation recommendations they proposed in their final report would not adequately support the parks system and therefore proposed increased state support as a more long-term funding strategy to fill the estimated \$54-64 million gap each biennium. In its Status Update on the Fiscal Health of the State Park System Report to the Office of Financial Management and Legislature, the WSPRC also concluded unanimously that increased reliance on earned revenues and temporary infusions of public money are not a long-term solution and perpetuate an environment of instability and uncertainty for State Parks (OFM, 2013). Generating tax revenue can be challenging in hard economic times and there are other essential government functions and competing interests vying for support. However, as stated in the Task Force's final report, "Just as

we invest in education and transportation, we must recognize that Washington’s outdoors—and our enjoyment of it—represents one of the state’s most significant assets” (RCO, 2014). Publicly funding Washington State Parks to protect and manage our state’s valuable cultural and natural resources, and the outdoor recreation and learning opportunities they provide to 35-40 million people annually, has many immediate and long-term benefits for all Washington citizens. Therefore, while continuing to develop self-generating revenue opportunities, a stable funding base for State Parks from public taxes is justified.

- 4) Washington State Parks and Recreation Commission should increase information outreach efforts to the public and legislators to build support for reliable state funding. In conversations with park staff and volunteers, several shared with me that many visitors they encounter do not seem to be aware that public taxes no longer provide the majority of support for our Washington State Parks system and also that visitors are disgruntled about the Discover Pass parking fee system. The Task Force determined from extensive public input that residents view, “providing outdoor recreation opportunities as an essential government service” (RCO, 2014). Therefore, lobbying to legislators could focus on reminding them they should feel confident that citizens would support them in their effort to restore public funding to the WSPRC. If necessary, WSPRC could threaten to close State Parks so that media about possible closures from inadequate public support might help people become more aware of chronic underfunding issues and concerned enough to pressure legislators to support the State Parks system.
- 5) WSPRC should propose increased budget allocations for more Washington State Parks staff to work in the parks and to manage volunteer support. Reductions in field staff such as the loss of a third of park rangers and half of all interpretive specialist positions greatly

impacted the ability of parks to provide interpretation. Although volunteers provide a lot of support for park activities, including interpretation, this work can be enhanced and improved to provide quality interpretation but only with proper staff support and management. My observations and interviews in Fort Flagler State Park show the value of volunteer friend groups such as the Friends of Fort Flagler, an organization that contributes thousands of hours of labor annually. Under the guidance of park rangers, passionate volunteers like “Friends Groups” and individuals like the volunteer interpretive specialist at Saltwater State Park, keep the park’s interpretive centers staffed year-round, provide guided tours of the park’s resources, and even fundraise, with proceeds directly benefiting the park for interpretation’s infrastructure and enhanced programming. From my experience supervising interpretive programs and volunteers for a decade at the Pacific Science Center and another decade at the Seattle Aquarium, I know there are hundreds of passionate and dedicated volunteers willing to help build public and awareness and support for Puget Sound through engaging informal interpretive experiences. I also know it takes a lot of staff and resources to recruit, train, coordinate, and reward volunteers but if done right, the return for this investment produces large quantities of quality interpretive programming that can provide engaging and rewarding public education experiences to the millions who recreate in Puget Sound’s natural resource and cultural institutions. As part of field staff development, there used to be stewardship certification opportunities that provided training in natural resource management and interpretation. WSPRC should also work to implement this training again to bring park ranger and interpretive specialist staff up on modern methodologies and philosophy of current best practices in the practice of mission-based interpretation.

- 6) WSPRC should re-instate the majority of eliminated full-time Washington State Park rangers so they can properly perform all their duties, including providing interpretive contacts with park guests. WSPRC's internal surveys demonstrated park rangers provide the majority of interpretive programming and that park visitors highly value their role in doing so. In my interviews and conversations with park rangers, they entered the profession because of their dedication to public service for the WSPRC's mission and their desire to help park visitors connect with Washington's cultural and natural resources to inspire continued support for protection into the future. However, budget and staff reductions have made their work's focus on basic law enforcement duties and implementation of parking fees to generate needed revenue. In my research interviews, I sensed that staff morale seemed pretty low; however, their continued dedication and belief in the mission was still present. As discussed in my other recommendations, WSPRC can do more to advocate and secure the necessary funding to capitalize of these dedicated field staff and public servants so they can perform the duties they were meant to do and provide the services park visitors value. As mentioned above, enhanced training and staff development can boost staff skills and morale to retain quality staff.
- 7) WSPRC should re-instate at least the three full-time Puget Sound interpretive specialists that were eliminated as part of the 2009 budget cuts and create a new work model with a more region-wide focus on Puget Sound natural resources environmental interpretation. Although there used to be interpretive specialists in a few select Puget Sound State Parks, their work seemed just focused on their relatively rural site park locations. To support WSPRC policy and address their own internal survey's findings that there is a dearth of higher levels of interpretive service in Puget Sound shoreline parks located near urban population centers, I recommend that these new interpretive specialists be based at highly

accessible Puget Sound State Parks but work in concert with each other and provide Puget Sound region-wide interpretive materials that all shoreline parks can use. The WSPRC interpretive service level survey and my own surveys found interpretive infrastructure such as an interpretive center or environmental learning center already exists in some Puget Sound locations so possibly minimal investment would be necessary and could go mostly towards delivery of Puget Sound interpretation live programming and self-guided materials. Since WSPRC has already created Puget Sound environmental interpretation plans and designs for self-guided materials, the new interpretive specialists could use these as guidelines to address the current lack of modern environmental interpretation of Puget Sound natural resources. Like other examples of dedicated and resourceful staff and volunteers I met in my thesis research and work with in my career, WSPRC should hire highly passionate and resourceful interpretive specialists. Their work can contribute to advocating for and securing grant funding to be able to implement the existing environmental interpretation plans designed to accompany the completed wastewater and stormwater treatment upgrades and future shoreline habitat restorations. These new interpretive staff also should be creative to capitalize on volunteer resources and all the existing Puget Sound environmental interpretive programming and materials that exist among the hundreds of the Puget Sound Partnership EcoNet partners and other organizations dedicated to the stewardship of Puget Sound.

- 8) WSPRC should encourage the employment of AmeriCorps interpretive staff in many more of its busy Puget Sound State Parks. I found an example of this kind of support coordinated by the Deception Pass Park Foundation. The Americorps position seemed to draw talented young people with passion for the park's environment and willing to take on any number of interpretive tasks including the recruiting and training of volunteers.

9) WSPRC and the Washington State Parks Foundation (WSPF) should work to create partnerships with outside science and environmental stewardship based organizations to enhance environmental interpretation in the parks. A partnership between Washington State Parks and the Washington State Arts Commission has resulted in a program called “Folk and Traditional Arts in the Parks” that provides funding for several cultural resource based events in the parks. On a much smaller scale, WSPRC and WSPF have also helped sponsor and gather partnerships for a new program called “Shellfest Event” in a two Puget Sound Parks annually (Figure 106). However, less than five thousand people a year attend a Shellfest event (WSPF, 2015). Similar efforts could do the same to connect more regional citizens with WSP’s natural resources in fun and engaging events and but even more focused on awareness on the Puget Sound Initiative’s recovery work for entire watershed ecosystem health. Directing fundraising and partnership efforts to support more widely distributed and permanent environmental interpretation in Puget Sound Parks would also potentially reach millions of visitors.

Figure 106. Shellfest Event in a Puget Sound State Park



10) WSPRC and WSPF should invest more staff time and resources to support virtual environmental interpretation learning opportunities. Although there has been some effort to enhance parks websites and the Virtual Ranger mobile app, they contain very little environmental interpretation about Puget Sound natural resources and nothing about related conservation efforts. Therefore, as WSPRC acknowledges, much more can be done with that type of web-based platform but tight resources make that challenging. For a possible suggested model, there is a great example of a park video available on the Penrose State Park website that has great environmental interpretation about that park's natural resources (Figure.107)

Figure 107. Grant funding park video available on the Penrose State Park website



This on-line video was produced by a marine and environmental education organization called Harbor WildWatch whose mission is dedicated to inspiring stewardship for the Puget Sound. The video was produced by a small grant from WSPF and is the kind of web-based environmental interpretation that could be developed with minimal resources but with potential wide delivery opportunities.

7. CONCLUSION

As the second largest estuary in the United States, Puget Sound is an ecologically and biologically diverse ecosystem whose environmental health and productivity is vital to the region's quality of life. However, decades of urban development from its rapidly growing population has damaged important shoreline habitats, polluted its marine and fresh waters, and made Puget Sound the target of several large-scale federal and state natural resource management recovery efforts. The creation of the Puget Sound Initiative in 2005 renewed focus and financial resources from federal, state, local and tribal governments to implement the Puget Sound Action Agenda and its strategies for cleaning up, restoring, and protecting Puget Sound by 2020. Survey research demonstrates the region's citizens greatly value Puget Sound's beauty and natural resources but mistakenly think Puget Sound is in good to excellent condition. Residents are also unaware the cumulative impacts from their individual actions are responsible for its ill health and continued decline. Lead agencies overseeing the recovery effort acknowledge this lack of public awareness is a major barrier to success and therefore the Action Agenda prioritized and legally mandated public education and engagement as essential to garnering needed Puget Sound Initiative support.

With the demonstrated failure of the Puget Sound Action Agenda media-based campaign to raise public awareness among Puget Sound residents, there is an opportunity to redesign and invest in other outreach efforts and venues. My thesis analysis focused on the potential and capacity of environmental interpretation in Washington State Parks to

educate millions of citizens about Puget Sound's environmental problems and build support for immediate and long-term natural resource management solutions.

My literature review research questions centered on understanding environmental interpretation in parks as a natural resource management strategy and how this unique communication approach may contribute to raising public awareness of natural resource issues for building supportive conservation attitudes and behaviors. My review of environmental interpretation research showed that park visitors are the type of audience most likely to be receptive to stewardship messages, that time spent recreating in natural settings provides motivation for environmental learning, and develops the positive emotions and attitudes important for promoting environmentally responsible behaviors. Negra and Manning (1997) summarized the components that indicate parks should be an important component of a comprehensive strategy for fostering environmentally responsible behavior because they (a) provide unique opportunities for environmental learning as locations where people spend their leisure time and seek out new experiences (b) are some of the few remaining relatively undisturbed natural places that enable people to experience an alternative to degraded environments; (c) are places where people may develop increased concern for nature through contact with natural environments; and (d) provide opportunities for learning about natural systems, which may increase awareness of how nature is threatened by human actions; (p.10).

The idea of enhancing public environmental interpretation in the largest park system on Puget Sound that receives twelve million visitors annually is promising also because studies show park visitors come with their outdoor interests and values already inherently supportive of the park's mission to protect public natural resources. My

literature review on the effectiveness of environmental interpretation in parks revealed many examples where this communication strategy has succeeded as a park management tool in raising and reinforcing public awareness, environmental friendly attitudes, and conservation behaviors towards natural resources.

Curious about what environmental interpretation about Puget Sound is currently available for visitors to Washington State Parks on Puget Sound, I designed a case study that investigated not only policy and support for implementing environmental interpretation, but also examined the practice of environmental interpretation in shoreline parks along Puget Sound. For case study in-person surveys, I chose the 24 Puget Sound Washington State Parks targeted by the Puget Sound Initiative cleanup efforts meant to serve as models of low impact development and “Puget Sound friendly” practices to protect water quality, sensitive habitat, and vital ecosystem processes. I also designed an embedded case study in four of these “Green Vision” parks to provide depth on results about environmental interpretation support and barriers to implementation. Triangulation analysis of qualitative and quantitative data from first-hand observations of EI in the 24 PSI Puget Sound State Parks, review of Washington State Park documents, and interviews with Washington State Parks staff and volunteers helped me provide an assessment on the current status of environmental interpretation.

Case study findings showed mission-based environmental interpretation focused on natural resources conservation is well supported in stated policy, and in fact, Washington State Parks Puget Sound Initiative/Green Vision interpretive plans and designs have already been created to accompany the park restoration projects. However, regardless of supportive policy, my observation results demonstrated currently none of

the 24 Puget Sound Washington State Parks has any Puget Sound Initiative environmental interpretation and minimal interpretation about Puget Sound overall. My assessment of support for implementation of environmental interpretation policy suggested that, although WSPRC prioritized construction completion of the restoration projects in all the parks, and the Washington State Parks agency continues to maintain goals to implement EI policy eventually, severe cuts in its operating budget and resulting lack of staff resources explain the absence of the projects' environmental interpretation components eight years after the creation of the Green Vision plans.

My findings imply that by not supporting environmental interpretation in Puget Sound State Parks, we are wasting a potentially incredible opportunity to educate millions of regional residents and help them become aware of and supportive of the ongoing natural management efforts to restore Puget Sound by 2020. Therefore I believe environmental interpretation in Washington State Parks on Puget Sound should be prioritized as an important part of Puget Sound Partnership's regional communications to support and enhance the effectiveness of public engagement and stewardship strategies. The completed and future Puget Sound friendly restoration projects in shoreline parks can serve as models, inspiration, and training for regional citizens to undertake similar green practices in their own lives and garner needed support for the Puget Sound Initiative. Existing research suggests that citizens who think they understand environmental management strategies and that they have an effect on results are more likely to engage in responsible environmental behavior. Because supportive WSPRC environmental interpretation policy and planning have already been established, it is mostly a matter of

supplying the necessary financial resources and political will to provide that support in a timely manner.

My recommendations suggest the Puget Sound Action Agenda should therefore prioritize implementation of environmental interpretation in Puget Sound State Parks and also redesign its current social marketing strategies to make better use of proven best practices. I also attempted to address the lack of financial and staff support in Washington State Parks with some suggestions on taking better advantage of current available resources of dedicated field staff and volunteers, supportive outside partners, and capitalizing on the myriad of available EPA grant funding opportunities designed to enhance public engagement with Puget Sound restoration. I also strongly advocated for the reinstatement of the long tradition of public tax funded State support for our 102-year-old public park system (that pre-dates our nationally publicly supported National Parks) and benefits all Washington citizens.

With limited resources, it is especially important that any future implementation of environmental interpretation communication strategies in Puget Sound State Parks be continually evaluated and modified based on research results to enhance effectiveness. Based on the minimal amount of Puget Sound interpretation currently available in Washington State Parks, there is also an opportunity to contribute to the growing field of environmental interpretation research to measure the impact implementing new environmental interpretation programs can have and possibly help justify its expense. Although years of chronic underfunding for Washington State Parks is currently a major barrier to implementing environmental interpretation on the scale necessary to engage and influence citizen behavior, there is hope that the tide may be turning. With the

creation of the Blue Ribbon Task Force on Parks and Outdoor Recreation, Washington State Governor Jay Inslee stated, “We want our children to experience, enjoy, learn about, and become lifetime stewards of Washington’s magnificent natural resources” and ordered the Task Force to recommend adequate and long-term financial support that includes restoring substantial public funding (RCO, 2104). This renewed interest in prioritizing support for Washington State Parks at the State level and the recent email update I received from the State Parks Interpretive Manager who told me WSPRC plans to propose funding for a new Interpretive Specialist the Puget Sound region in the upcoming 2015-2017 biennium, are hopeful messages. If we value the natural and cultural heritage that define and support health and quality of life for all Washington’s residents, and want to protect these resources into the future, we’ll support public education to help remind us of their value and inspire us to provide for their care.

References

- Ady, J., & Potter, G. (2009). The Federal Government and Free-Choice Learning. *Free-choice Learning and the Environment*, 171.
- Ballantyne, R. (1998). Interpreting 'visions': addressing environmental education goals through interpretation, in: D. Uzzell & R. Ballantyne (Eds) *Contemporary issues in heritage and environmental interpretation* (London, The Stationery Office).
- Ballantyne, R., Packer, J., & Sutherland, L. A. (2011). Visitors' memories of wildlife tourism: Implications for the design of powerful interpretive experiences. *Tourism Management*, 32(4), 770-779.
- Ballantyne, R., & Packer, J. (2005). Promoting environmentally sustainable attitudes and behaviour through free-choice learning experiences: What is the state of the game? *Environmental Education Research*, 11(3), 281-295.
- Brochu, L., & Merriman, T. (2002). *Personal interpretation: Connecting your audience to heritage resources* (Vol. 100). InterpPress.
- Brown, N. A., & Gaydos, J. K. (2007). Species of concern within the Georgia Basin Puget Sound marine ecosystem: changes from 2002 to 2006. In Proceedings of the 2007 Georgia Basin Puget Sound Research Conference. Vancouver, BC: Environment Canada and the Puget Sound Action Team.
- Byers, B. A. (2003). Education, Communication and Outreach (ECO) success stories: Solving conservation problems by changing behavior. A report prepared for the U.S Fish and Wildlife Service National Conservation Training Center Division, Shepherdstown, W.V.
- Cocker Fennessy, (2006). Public forums and online survey—Summary report (prepared for Puget Sound Partnership): Seattle, Wash., Cocker Fennessy, 30 p. From http://www.pugetsoundpartnership.org/our_work/charge_2/Forums_report.pdf.

Elway Research Inc (2009) Puget Sound Starts Here Communication Campaign Recall & Impact Survey results. Retrieved from [www. mypugetsound.net](http://www.mypugetsound.net)

Environmental Social Marketing. (2012) Puget Sound Starts Here Campaign Research Review and Analysis Report. Retrieved from: <http://www.mypugetsound.net>

Encyclopedia of Puget Sound (2014). Puget Sound Voices: Toxics research that changed Puget Sound history. Narrative by Richard Strickland.
<http://www.eopugetsound.org/articles/puget-sound-voices-toxics-research-changed-puget-sound-history>

Falk, J. H., & Dierking, L. D. (2002). *Lessons without limit: How free-choice learning is transforming education*. Walnut Creek, CA: AltaMira Press.

Falk, J. H., Heimlich, J. E., & Foutz, S. (2009). *Free-choice learning and the environment*. Lanham: AltaMira Press.

Ham, S. H. (1992). *Environmental Interpretation: A practical guide for people with big ideas and small budgets*. Golden, Colo.: North American Press.

Ham, S. H., & Krumpe, E. E. (1996). Identifying audiences and messages for nonformal environmental education: A theoretical framework for interpreters. *Journal of Interpretation Research*, 1(1), 11-23

Ham, S. H. (2009). From Interpretation to Protection: Is There a Theoretical Basis? *Journal of Interpretation Research*, 14(2), 49-57.

Ham, S.H (2013). *Interpretation: Making a Difference on Purpose*. Golden, CO: Fulcrum Publishing

Ham, S. H., & Sandberg, E. K. (2012). Interpretation as strategic communication in protected area management. *Management of Visitors in Recreational and Protected Areas*, Stockholm, Sweden, 132–133(2012)

International Union for Conservation of Nature (IUCN). (2014) <http://www.iucn.org>

- Island County Marine Resources Committee. Retrieved from:
<http://www.islandcountymrc.org/Projects/Education-Outreach/Shoreline-Signage.aspx>
- Jones & Jones Architects and Landscape Architects, L. (2007). Green Vision Plan Concept Report. Washington State Parks.
- Jurin, R.R, Roush, D.E. Jr & Danter, K.J. (2010). *Environmental Communications: Principles and Skills for Natural Resource Professionals, Scientists, and Engineers*, 2nd edition. Springer Publications.
- Kil, N., Holland, S. M., & Stein, T. V. (2014). Structural relationships between environmental attitudes, recreation motivations, and environmentally responsible behaviors. *Journal of Outdoor Recreation and Tourism*, 7, 16-25.
- Knapp, D., Volk, T. L., & Hungerford, H. R. (1997). The identification of empirically derived goals for program development in environmental interpretation. *The Journal of Environmental Education*, 28(3), 24-34.
- Kohl, J. (2005). Putting Environmental Interpretation to Work for Conservation in a Park Setting: Conceptualizing Principal Conservation Strategies. *Applied Journal of Environmental Education and Communication*. 4: 31-42
- Knudson, D. M., Cable, T. T., & Beck, L. (1995). *Interpretation of cultural and natural resources*. Venture Publishing, Inc., 1999 Cato Ave., State College, PA 16801.
- Larsen, D. L. (Ed.). (2003). *Meaningful interpretation: How to connect hearts and minds to places, objects, and other resources*. Fort Washington, PA: Eastern National.
- Louv, R. (2005). *Last child in the woods : Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.

- McClelland, S. J. (2002). *Beyond theory: Applying environmental interpretation in the U.S. national parks* (Masters Thesis). Available from <http://worldcat.org/z-wcorg/> database.
- McKenzie-Mohr, D., Lee, N. R., Schultz, P. W., & Kotler, P. (2012). *Social marketing to protect the environment*. Thousand Oaks, CA: Sage.
- Merriman, T., & Brochu, L. (2009). From mission to practice. Free-choice learning and the environment, Altmira Press, Palo Alto, CA, 77-86.
- Myers Jr, O. E., Saunders, C. D., & Bexell, S. M. (2009). Fostering empathy with wildlife: Factors affecting free-choice learning for conservation concern and behavior. *Free-choice learning and the environment*, 39-55.
- National Association for Interpretation. (n.d.). Available from <http://www.interpnet.com/>
- National Research Council . Committee on Learning Science in Informal, E., & Bell, P. (2009). *Learning science in informal environments: people, places, and pursuits*. Washington, D.C.: National Academies Press.
- Negra, C., & Manning, R. E. (1997). Incorporating environmental behavior, ethics, and values into nonformal environmental education programs. *The Journal of Environmental Education*, 28(2), 10-21.
- North American Association for Environmental Education (NAAEE). (2009). *Nonformal Environmental Education Programs: Guidelines for Excellence*. Retrieved from: <http://resources.spaces3.com/b85e2c0a-f321-40c2-9857-19a5f29d750b.pdf>
- Puget Sound Partnership. (n.d.) Available from <http://www.http://www.psp.wa.gov>
- Puget Sound Partnership, (2006). *Public Awareness & Engagement Plan*.

Puget Sound Partnership. (2008) 2008 Puget Sound Action Agenda. Retrieved from http://www.psp.wa.gov/downloads/ACTION_AGENDA_2008/Action_Agenda.pdf

Puget Sound Partnership. (2013). 2013 State of the Sound Report. Puget Sound Partnership. Olympia (WA). Retrieved from <https://app.box.com/s/vr2e2349jqsvhvruq9w1>

Puget Sound Partnership (2014) Puget Sound Action Agenda 2014/15. Retrieved from http://www.psp.wa.gov/downloads/2014_action_agenda/Final%202014%20action%20agenda%20update/2014-2015_Action_Agenda_for_Puget_Sound.pdf

PSP (2010). 2009 State of the Sound: A report on Puget Sound ecosystem status and a performance management system to track Action Agenda implementation.

PSP, (2009). Puget Sound action agenda: Protecting and restoring the Puget Sound ecosystem by 2020. Olympia, WA: Puget Sound Partnership.

PRR Inc., (2014). General Public Opinion Poll. Report prepared for the Puget Sound Partnership. Retrieved from <http://www.psp.wa.gov>

Recreation and Conservation Office. (2014) Governor's Blue Ribbon Task Force on Parks and Outdoor Recreation Final Report and Recommendations. Retrieved from <http://www.rco.wa.gov/>

Schubel, J. R., Monroe, C., Schubel, K. A., & Bronnenkant, K. (2009). Environmental literacy through the lens of aquarium ocean literacy efforts. *Free-choice Learning and the Environment*, 123.

Service, N. P. (2003). Fulfilling the NPS Mission: The Process of Interpretation Retrieved April, 2014, from <http://www.nps.gov/idp/interp/101/101mod.pdf>

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks: Sage Publications.

Stapp, W. B., D. Bennett, W. Bryan, J. Fulton, J. MacGregor, P. Nowak, and others. (1969). The Concept of Environmental Education. *Journal of Environmental Education* 1 (1): 30–31.

Stinchfield, H., Koontz, L., Sexton, N. R., & Geological, S. (2009). Social and economic considerations for coastal and watershed restoration in the Puget Sound, Washington a literature review, from <http://purl.access.gpo.gov/GPO/LPS113370>

Tilden, F. (1977). *Interpreting our heritage*. Chapel Hill: University of North Carolina Press.

United Nations Educational, S., & Cultural Organization, P. (1978). Intergovernmental Conference on Environmental Education Organized by UNESCO in Co-operation with UNEP (Tbilisi, USSR, 14-26 October 1977). Final Report: UNIPUB, Box 433, Murray Hill Station, New York, New York 10016

United State Environmental Protection Agency. (2009). Puget Sound Outreach, Education, and Stewardship Program, 2010, from <http://yosemite.epa.gov/R10/ECOCOMM.NSF/Puget+Sound/ps10fsouted>

United States Environmental Protection Agency (EPA). www.epa.gov

Washington Department of Ecology, (2011). Preventing toxic pollution key for protecting Puget Sound, new scientific assessment shows. Retrieved from <http://www.ecy.wa.gov/news/2011/304.html>

Washington Department of Ecology. (2006). Reducing toxic threats, cleaning up Puget Sound and managing our water. Retrieved from <https://fortress.wa.gov/ecy/publications/publications/0601001.pdf>

Washington Department of Fish and Wildlife. (2014) Shore Friendly Final Report. http://wdfw.wa.gov/grants/ps_marine_nearshore/files/final_report.pdf

Washington State Parks, (2008) Washington State Parks 2008 Survey of Washington Residents.

Washington State Parks, (2012) Level of Interpretive Service Report. Retrieved from <http://www.parks.wa.gov>

Washington State Parks, (2014). Interpretation Annual Report. Retrieved from <http://www.parks.wa.gov>

Washington State Parks and Recreation Commission. <http://www.parks.wa.gov>

Washington State Parks and Recreation Commission (WSPRC). (2013) Report to the Office of Financial Management and Legislatureas Required by ESSB5034 (2013 2nd Special Legislative Session).

Yin, R. K. (2003). *Case study research, design and methods*, 3rd ed. Newbury Park: Sage Publications.

Yocco, V. S. (2010). *Exploring the Effects of Communication Framed by Environmental Concern in Informal Science Education Contexts* (Doctoral dissertation), The Ohio State University.

Appendices

Appendix A

Washington State Parks and Recreation Commission

- Clean Water Program Progress Report -

... as of December 1, 2010

Park	Design	Construction	Description
Bay View State Park	In progress		Park-wide wastewater treatment upgrade.
Belfair State Park	Complete	Complete	Added a pre-treatment system to existing wastewater treatment system and upgrade utility hookup sites in campground.
Belfair State Park	Complete	Complete	Storm water management using Low Impact Development techniques.
Birch Bay State Park	Complete	Complete	This project replaced beach area sewer lift station pumps and improved connection to the municipal sewer by replacing valves and manholes.
Blake Island State Park	Complete	Complete	This project will bring the sewage collection and treatment system into compliance. The domestic water system will be upgraded in the process.
Camano Island State Park	Complete	Complete	This project replaced outdated sewage collection and treatment system at park office, shop and residence. Repairs to the campground drainfield occurred as well.
Dash Point State Park	Complete	Currently Under Construction	This project replaced the park-wide wastewater collection system and connects the entire park wastewater system to the Lakehaven treatment facility.
Deception Pass State Park	Complete	Complete	This project replaced outdated sewage collection and treatment system in the Cornet Bay area of the park with a connection to the sewage treatment system at the Naval Base.
Dosewallips State Park	In progress	Ph 1 Under Construction	Replace wastewater collection and treatment system. Upgrade existing comfort stations. (to be constructed on recently acquired property in the Brinnon area)
Fay Bainbridge State Park	Complete		Replace outdated and fragmented sewage collection and treatment systems with a new MBR system along with repair/replacement of the day use restroom. (If funded, system will have increased capability to allow additional flows from neighboring community)
Ft Casey State Park	Complete	Complete	This project replaced collection system and drainfield and supplement replacement of 80 year old restroom. It also connected Lighthouse facilities into new treatment system.
Ft Ebey State Park	Complete	Complete	The project will replace a failing pressurized dome drainfield as well as the upgrade of the collection system.
Ft Flagler State Park	Complete	Complete	Using MBR technology, replaced fragmented systems into one park-wide wastewater treatment facility.
Fort Worden State Park	Complete	Currently Under Construction	Replace sewage pumps in two sewage lift stations in the beach area. Construct a permeable pavement parking area for Bldg 246.
Illahee State Park	Complete	Currently Under Construction	Replace outdated and fragmented sewage collection and treatment systems with a new MBR system.
Kitsap Memorial State Park	Complete	Pilot Program Complete	Renovate RV dump station and drainfield with pilot MBR system for 2008 summer use season and assess current park-wide systems.
Kopachuck State Park	On hold pending additional funding to support partner system		Replace outdated and fragmented sewage collection and treatment systems with a new treatment system. (looking at possibly an MBR and having Peninsula School District tie into the park system)
Larrabee State Park	Complete	Complete	This project replaced the 30 year old park wide wastewater collection and treatment system with an MBR.
Penrose State Park	Complete		This project will replace outdated sewage collection and treatment systems with a single consolidated system along with upgrade of restroom facilities.
Pleasant Harbor State Park	Complete	Complete	Added a new vault toilet and improved parking lot stormwater management.
Possession Point State Park	Complete	In progress	This project replaced an outdated sewage collection and treatment systems with a single consolidated system along with upgrade of restroom facilities and parking lot. A storm water diverter system will be added above the drainfield to limit flooding.
Potlatch State Park	Complete	Currently Under Construction	Connect parkwide sewer system with Minerva Beach treatment system or add an MBR plant. Improve storm water management system. If possible, move park housing away from salmon bearing stream.
Saltwater State Park	Complete	Complete	Storm water management using Low Impact Development techniques.
Sequim Bay State Park	Complete	Complete	This project replaced the park-wide wastewater collection system and connected the entire park wastewater system to the City of Sequim municipal sewer and treatment facility.
Scenic Beach State Park	Complete	Complete	Assessed the 30+ year old wastewater collection and treatment system and constructed a small on-site system for the Emel House.
Shine Tidelands/Wolfe Property	In progress		Add new comfort station, parking lot and stormwater management.
Triton Cove State Park	Complete	Complete	Improved parking lot stormwater management.
Twanoh State Park	Complete	Complete	Replaced entire wastewater collection & treatment system.
Twanoh State Park	In progress		Stormwater management.