The Cherry Point Aquatic Reserve

Understanding and Using the Management Plan

Prepared by the Washington Environmental Council for the Cherry Point Aquatic Reserve Citizen Stewardship Committee

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About the Washington Environmental Council

Washington Environmental Council (WEC) is a nonprofit, statewide advocacy organization that has been driving positive change to solve Washington’s most critical environmental challenges since 1967. The mission of WEC is to, “protect, restore, and sustain Washington’s environment.” See: http://wecprotects.org for more information.

Note:

This document contains visuals aids to provide supplemental information. Each type of aid has its unique color border and icon.

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<th><strong>DEFINITION</strong></th>
<th>Purple boxes provide definitions</th>
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<td><strong>MANAGEMENT ISSUE</strong></td>
<td>Orange boxes highlight important issues related to management</td>
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<td><strong>ACTION</strong></td>
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Cover picture: Cherry Point Aquatic Reserve. Photo by Maddie Foutch
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Puget Sound Aquatic Reserves and Their Management Plans

Introduction to Aquatic Reserves

Washington State holds ownership to much of the aquatic lands in Puget Sound, entrusted to manage the lands for the benefit of the public. These lands are managed by the Department of Natural Resources (DNR). DNR often leases sections of these areas for public or private use, such as placement of mooring buoys, building docks, and establishing shellfish aquaculture. According to State law (RCW 79.105.030),

The manager of state-owned aquatic lands shall strive to provide a balance of public benefits for all citizens of the state. The public benefits provided by state-owned aquatic lands are varied and include:

1. Encouraging direct public use and access;
2. Fostering water-dependent uses;
3. Ensuring environmental protection;
4. Utilizing renewable resources

There are state laws and rules that govern programs such as the Aquatic Reserve Program. **RCW** is the Revised Code of Washington and are the laws passed by the legislature and signed by the Governor. **WAC** is the Washington Administrative Code and are the rules that define how the laws are implemented.

However, the proper balance of use is often difficult to determine or obtain and conflicts often arise over specific uses in some areas. This was recognized by the legislature when it authorized the designation of areas of special importance for special management priorities and practices. This was the origin on the Aquatic Reserves Program.

According to the State rules regarding state-owned aquatic lands (WAC 332-30-151),

Aquatic lands of special educational or scientific interest or aquatic lands of special environmental importance threatened by degradation shall be considered for reserve status. Leases for activities in conflict with reserve status shall not be issued.

Designation of an area as an aquatic reserve is a long and arduous process and this process is different depending on the type of reserve. The criteria that must be met are detailed in the DNR publication *Aquatic Reserve Program Implementation and Designation Guidance* (Bloch and Palazzi, 2005). An aquatic reserve is formally designated through an order from the Commissioner of Public Lands.

Puget Sound currently has seven aquatic reserves, as shown in Figure 1.
Aquatic Reserves consist of state-owned tidelands and bedlands in places that have been identified as having special qualities, such as herring spawning areas and feeding and rearing areas for salmon and birds; intact or unusual oceanographic features; or features of special educational value. The purpose of the reserves is to promote the preservation, restoration, and enhancement of state-owned aquatic lands that are of special educational, scientific, or environmental interest.

There are three types of aquatic reserve: Educational, Environmental, and Scientific. A reserve has at least one of these designations and can have more than one.

Educational reserves are accessible areas of aquatic lands typical of selected habitat types which are suitable for educational projects.

Environmental reserves are areas of environmental importance, sites established for the continuance of environmental baseline monitoring, and/or areas of historical, geological or biological interest requiring special protective management.

Scientific reserves are sites set aside for scientific research projects and/or areas of unusually rich plant and animal communities suitable for continuing scientific observation.

The Need for Aquatic Reserves
Puget Sound is one of the most ecologically diverse ecosystems in North America and is the second-largest estuary in the United States. The health and productivity of Puget Sound is a cornerstone of the region’s quality of life and vibrant economy, from sport fishing to salmon and shellfish production to tourism (EPA, 2013a, USGS, 2013).

It’s Bigger than the Reserve
Aquatic reserves can play critical roles in the health of Puget Sound. They provide areas that are important to the health of the marine life and to the physical processes that define the very nature of the Sound. To understand how these areas influence the health of the Sound and how external factors affect the reserves, we need to look at the bigger picture, to look at the region in terms of the ecosystem.

Ecosystem is a term to describe an area and all the organisms and physical processes in that area that function together as a unit.
In an evaluation of marine species at risk, the Puget Sound Georgia Basin Ecosystem Indicator Report (EPA, 2006) identified three major factors that influence species decline:

1. **Habitat loss, degradation and fragmentation**
   Once native habitat is converted to other uses, the remaining habitat often becomes more isolated in a fragmented landscape of multiple uses. Wildlife populations associated with these fragmented habitats are often isolated from other breeding populations, are more susceptible to competition and predation from other species and can lack food resources.

2. **Pollution and chemical contaminants**
   Intensive industrial activities including industrial wastewater discharges, mining, pulp and paper mills, oil refineries, and smelting have all contributed to contamination of Puget Sound as has polluted surface
runoff (stormwater). Contaminants of concern include heavy metals, organic compounds such as polycyclic aromatic hydrocarbons (PAHs, carcinogens created through petroleum combustion), flame retardants, phthalate esters (used in plastics and cosmetics) and polychlorinated biphenyls (PCBs).

3. Over-harvesting
Obviously, if too many organisms are removed from the waters, the targeted species will not be able to maintain a health population. The pressures from both commercial and recreational harvests can cause substantial decline in the health of the marine waters.

The cost of ecosystem decline
The EPA report (2006) also pointed out ways that these losses may affect the public.

- Affects the legacy to our communities and our children
- Physical and emotional well-being
- Losing species habitat means loss of flood protection, pollinators that produce crops, potential medicines and biochemical compounds.
- Costly clean-up and restoration
- Imbalance in species causes other problems like opening niche space for aggressive, non-native species.
- Loss of recreational and wildlife viewing revenues: Washington is fifth in the U.S. for revenues associated with wildlife viewing. No species to look at means less local revenue.

There are also other costs associated with ecosystem degradation. The Puget Sound Partnership’s Action Agenda (PSP, 2013) has lengthy discussions on the related economic, cultural, and social costs.

Another way to look at the value of a healthy ecosystem and the cost of allowing the quality of the ecosystem to decline is through the innovative economics process of Ecosystem Functions, Goods, and Services (PSNERP, 2013).

<table>
<thead>
<tr>
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<tr>
<td><strong>Ecosystem Functions</strong>: A phenomena in an ecosystem that results from the interaction of the structures and processes of that ecosystem (for example, an animal acquiring food, flood stage changing slowly, a beach remains cool on a sunny day).</td>
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<tr>
<td><strong>Ecosystem Goods</strong>: Tangible products that are extracted from the ecosystem that have economic or cultural value to our societies (For example, fish, seaweeds, shellfish).</td>
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<tr>
<td><strong>Ecosystem Services</strong>: Ways that ecosystems provide amenities to our societies that are not in the form of an extractable product (for example, the provision of animal habitats, clean water, recreational settings, psychological or cultural well-being, storm protection).</td>
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In a study of valuing ecosystem services, researchers at EarthEconomics made an estimate of the minimum value of services in Puget Sound (Batker et al, 2008). Results are shown in Table 1.
Table 1: Evaluation of Ecosystem Services per year in Puget Sound. Source: Batker et al, 2008, Table 19 (edited)

<table>
<thead>
<tr>
<th>Cover Type</th>
<th>Acres</th>
<th>Total $/year Low</th>
<th>Total $/yr High</th>
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<tr>
<td>Beach</td>
<td>48,341</td>
<td>$1,080,582,000</td>
<td>$3,941,146,000</td>
</tr>
<tr>
<td>Salt Marsh</td>
<td>83,144</td>
<td>$29,827,000</td>
<td>$9,539,900,000</td>
</tr>
<tr>
<td>Eel grass beds</td>
<td>49,422</td>
<td>$272,167,000</td>
<td>$762,137,000</td>
</tr>
<tr>
<td>Estuary Waters</td>
<td>552,712</td>
<td>$10,291,000</td>
<td>$1,032,748,000</td>
</tr>
<tr>
<td>Marine Waters</td>
<td>1,127,891</td>
<td>$292,507,000</td>
<td>$871,499,000</td>
</tr>
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Despite the wide range of values between the low and high estimates, it is obvious that ecosystem services are very valuable. In addition to the actual acreage of the different cover types that exist in the reserves, the reserves also improve the ecosystem functions of areas outside the reserve through the enhancement of marine life, such as providing forage fish spawning areas, and through preservation of physical processes, such as refreshing eroding beaches with new sand and gravel.

**Power of Aquatic Reserve Status**

An area designated as an aquatic reserve is a recognition of the importance of the area as critical to the health of the Puget Sound ecosystem and that it is in danger of being further degraded. The designation also provides some additional protection by restricting the use of state-owned aquatic lands. However, the level of protection for the designated area is limited by DNR’s proprietary authority.

**Management Issue**

According to the state rules (WAC 332-30-151), the DNR reserves management program consists of the prevention of conflicting land-use activities in or near the reserve through tideland lease actions. DNR proprietary management authority extends only to the state owned aquatic lands.

These limitations can be reduced and protection of the area can be increased by DNR working with other entities, including local, state and federal agencies; tribes; and other stakeholder groups.

**Management Issue**

While each reserve has its own reasons for designation, a major theme exists for most of the reserves: the status of herring and other forage fish stocks. Puget Sound has seen dramatic declines in some herring stocks, as well as other fish stocks, since the 1970s.

**Purpose of Management Plans**

Each reserve has its own management plan, developed to describe the primary characteristics and purposes of the reserve. The plans identify the features of the reserve, including activities, habitats, and species. It states the goals and objectives for the reserve and the management actions that will be employed by the DNR, in consultation and partnership with additional agencies and reserve stakeholders, to conserve the identified resources, with environmental protection being the highest management priority.
**Definition**

*Forage fish* are small fish that are essential components of the food web, the intermediary between plankton and other fish, birds, and marine mammals. The primary forage fish in Puget Sound are Pacific Herring, Sand Lance, Surf Smelt and anchovy.

**Land Ownership Context**

The reserves are only on state-owned tidelands and bedlands. Private tidelands and bedlands are excluded from the reserve and are governed by different regulations. Local, state, and federal public lands are governed by their own rules and regulations, although these may be coordinated with DNR goals and activities. The reserves do not incorporate any lands above the mean high tide level.

**Definition**

*Tidelands* are the areas of the shoreline that are exposed at extreme low tide and are below mean high tide. It is also called the intertidal zone.  
*Bedlands* are areas that are submerged at extreme low tide.  
*Extreme low tide* is the lowest tide height derived from all tide records.  
*Mean high tide* is the mean (or average) of all the high tide heights derived from all tide records.

**Decision-Making Structure**

While DNR is designated to oversee the aquatic reserves, other agencies, local governments, and tribes have a role as resource managers on what is done in and around the reserves.

**DNR’s Role and its Ability to Manage the Activities in and near the Reserve**

DNR management primarily consists of critical reviews of all lease applications in the reserve area to insure proposed activities or structures will not conflict with the basis for reserve designation. The review applies to both new applications and applications to continue existing leases after their expiration. This review consists of at least the following:

- An environmental assessment.
- Request of agencies or institutions previously identified as having a special interest in the area for their concerns with regard to the project.

Proposed leases for structures or activities adjacent to any reserve area will be subjected to the same critical review if the structures and/or activities have the potential of:

- Degrading water quality,
- Altering local currents,
- Damaging marine life, or
- Increasing vessel traffic.
The authorization for aquatic reserves is based on multiple uses of state lands. This means that aquatic reserves do not necessarily eliminate activities that also occur in these areas, such as fishing, shipping, and recreational activities.

The exact types and conditions for future leasing activities that are authorized or prohibited within state aquatic reserves are in the final site-specific management plans. Leases that are not consistent with the conditions of that aquatic reserve’s management plan are not permitted.

Four principles will be applied by DNR for existing, pending, and future proposed use authorizations within the reserve.

1. Primarily serve the objective of the reserve,
2. Reduce site-specific impacts over time,
3. Monitor impacts, and
4. Apply adaptive management strategies

Use authorizations that were granted prior to the establishment of the reserve are honored throughout the duration of the current leasing period. Modifications or extensions to such leases are evaluated for compliance with reserve objectives and site management plan. DNR supports maintenance and facility upgrades that serve to implement the objectives of an aquatic reserve.

A DNR use authorization is a legal contract, different from regulatory permits obtained from other agencies. DNR contracts outline the terms and conditions of the use and convey certain property rights to the user in exchange for rent.

DNR has no authority over aquatic resources such as fish and most shellfish. DNR, tribes and local, state, and federal regulatory agencies share management authority of the state’s aquatic resources. DNR’s power is based on the proprietary nature of state-owned aquatic lands.

The Roles of State and Federal Agencies, Local Jurisdictions, Tribes, and Others

These following agencies and others have some regulatory or management authority related to activities in the Reserves. Details of the involvement of these authorities are included in a supplemental document.

- U.S. Coast Guard
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- National Oceanographic and Atmospheric Administration (NOAA) Fisheries
- Treaty Tribes
- Washington State Department of Health
Key Elements of the Management Plan

All the Puget Sound marine aquatic reserve management plans have the same basic structure, although there are variations due to when each plan was developed. This is a summary of some key sections that are common to all the plans.

Introduction

This section provides information that is useful in defining the area of the reserve, adjacent lands, why the reserve was created, and how the management plan will be updated to address changing conditions. These topics are:

- Boundaries. This is reserve specific and specifies the boundaries. This is a good source for determining if something is inside or outside the reserve.
- Purpose of Reserve. Defines the type of reserve and describes the information in following sections.
- Adaptive Management. This describes the 10-year cycle of updating the plan, based on new and updated scientific information. It also states that the plan can be modified more frequently.

Relationship to Federal, State, Local, and Tribal Management

This describes who has authorities and restrictions on authorities. This is an excellent source of understanding which entities are involved and the partnerships developed to support reserve management. It lists tribal, federal, state, county, and local government involvement.

Ownership

All tidelands and bedlands within the reserve are owned by the state and managed by DNR. This section lists the ownership of lands adjacent or in the immediate vicinity of the reserve. This section is useful for identifying sources of pressures that might be affecting the reserve, resources to protect the reserves, and stakeholders to involve in the reserve’s management.

Reserve Description (or Background)

This section provides context to the designation of the area as a reserve. It can provide insight into potential conflicts in use of the area.

Site (or Resource) Characterization

This section provides a wealth of information on what is known about the reserve. It is a technical evaluation of the reserve and is the baseline of current conditions. It is useful tool to become familiar with the processes and resources within the reserve.
As a baseline of conditions, this characterization is useful for comparison with future data and evaluations, such as the status and trends for forage fish, the dependence of endangered or threatened species using the reserve, and the presence of intact oceanographic processes.

Current Conditions
This section contains descriptions of all the things that affect the reserve, such as shoreline modification, pipelines, overwater structures, etc. It is a very good source of current and potential threats.

Potential Future Impacts (some plans)
This section identifies and discusses potential threats to aquatic resources within the reserve, including future land use scenarios, spill scenarios, energy projects, non-essential pipeline or transmission line rights of ways, increased recreational use and mooring buoys, invasive species, shoreline modification, and climate change.

While this section is very good to scope identified threats it serves only as a guide. Interpretation of the listed threats may not be inclusive of all factors, plus other threats are likely to emerge. Further development of this list of impacts should be a major component of the adaptive management process and the update of the management plan. Information in this section needs to be complemented from outside sources, especially recent information.

Management Goals and Objectives
This states the reasons the area was designated a reserve.

The Goals and corresponding Objectives can be used as tools for two main purposes:
1. To evaluate if the current activities are living up to expectations (a report card).
2. To evaluate if new activities and their impacts violate the intent of the reserve.

Management Actions
This section presents, usually in somewhat general terms, actions that DNR and others will take to meet the specific goals and objectives. Because there are no budgets attached to these items, no schedule, and often no entity identified to take the lead on the action, these items serve as guidelines instead of mandates. However, DNR works with stakeholder committees to prioritize management actions and identify resources, timelines and partners to aid in their implementation.
Management actions help to maintain sensitive aquatic resources, plan for existing and future uses of state-owned lands, direct public use, and facilitate stewardship, research, monitoring, and environmental education.

Protection maintains existing conditions by removing threats.

Restoration focuses on re-establishing the natural processes.

Enhancement is designed to address degradation.

Research and Monitoring
This shows what is, and by implication, what is not, being monitored. It also indicates what research is being conducted to answer key ecological questions. This can reveal gaps in what is necessary to monitor or investigate. Additionally, it should indicate sources of monitoring and research data that can be used to evaluate if management actions are effective. This section should be a key element in the adaptive management process as monitoring and research results indicate trends and possible causes.

Adaptive management is a scientific approach to management in complex systems that tests assumptions in order to learn and adapt.

Adaptation is about improving actions based on the results of monitoring and learning.

Testing assumptions involves developing and stating assumptions about a situation, designing and implementing an action, and monitoring to see how actual results compare to what was predicted.

Learning is about systematically documenting the processes used and the results achieved. (PSP, 1012)

The Puget Sound Partnership also emphasizes adaptive management in working toward the restoration of environmental health throughout the regional ecosystem. Chapter 3 of the 2012 State of the Sound report is dedicated to adaptive management.

Uses on State-Owned Aquatic Land
This section details the status of:

- Existing leases: can continue current activities until lease expires
- Renewal of leases: must meet goals of reserve, except for some special cases in some reserves, such as some pipelines, cable crossings, and outfalls

Other Uses
Describes how new and unanticipated uses may be authorized only if they meet the goals and objectives of the reserve. This section is useful if you want to see what standards a proposed use must meet.
Implementation Guidance (some reserves)
This section details how use authorization and management plan updates will be reviewed. Some plans detail the use of the Implementation Committee and its structure. Others discuss coordination of different resource managers and do not provide information on the Implementation Committee.

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<td>Implementation committees are key components to providing full review and evaluation of proposed changes to the reserve. However, Implementation Committees provide only guidance to DNR and their proposals can be modified or not implemented. Not all Aquatic Reserve Implementation Committees have been convened.</td>
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References
This is one of the most powerful resources—a go to list. Use the list of references as your starting point to investigate information that is not fully discussed in the Management Plan. It is also useful to review quoted references to make sure the information in the plan reflects what was really said and was the intent of the reference.

Appendices
These are usually extensive and often have specific information that is lacking in the main part of the document. These often have important details on topics such as bathymetry, the genetics of herring stocks, and the status of species. This information is good to enhance assessments once issues have been identified.
The Cherry Point Management Plan
The Cherry Point Aquatic Reserve Management Plan (DNR, 2010) was developed through a rigorous and sometimes contentious process involving numerous stakeholders as well as resource management agencies. While the reserve was designated in 2003, the management plan was not completed until 2010. Figure 1 shows the boundaries of the aquatic reserve in association to the geographic and manmade features and Figure 2 shows a regional view of the area.

Figure 2: Map of the Cherry Point Aquatic Reserve boundaries. Source: DNR, 2010.
Key Elements of the Cherry Point Aquatic Reserve

The reserve is an Environmental Reserve. The driving forces are the unique environment and the status of the Cherry Point herring stock. Other fish species are also dependent on the area: there are five species of salmon (including the endangered Nooksack Chinook stock), endangered bull trout, flatfish, and rockfish. It is an important area for birds and invertebrates, including Dungeness crab. It is also utilized by marine mammals, including killer, grey, and humpback whales; Dall and harbor porpoise; sea lions; and harbor seals.
The Cherry Point Pacific Herring stock, once the largest herring stock in Puget Sound, has declined by 90% since the 1970s (see Figure 4). Herring are a major prey item for the endangered Chinook salmon stocks and other salmon species, as well as other fish, marine mammals, and birds. The Southern Resident Killer Whale (SRKW) stock is highly dependent on Chinook salmon and the decline in the SRKW population has been attributed, at least in part, to the lack of adequate numbers of Chinook in the region. The submerged aquatic vegetation is important for herring-spawning substrates. The undisturbed intertidal areas are also important for spawning of other forage fish, particularly the sand lance and surf smelt. Forage fish, as their name implies, are small fish that are primary food sources for many fish, mammals, and birds.

Figure 4: Spawning biomass of Pacific herring stocks. From PSP (2012)

The hydrology of the area is important with three intact drift cells, high energy zones, and steep bathymetry. The high energy areas (surf, strong currents, and storm events) and the steep bathymetry are not common in Puget Sound and thus provide an environment fostering distinctive biodiversity. Geographically, the eroding bluffs (known as feeder bluffs) provide sand and gravel to help restore and maintain the beaches.
DEFINITION

Drift cells are aquatic environmental features that transport sediments along beaches and result in the deposition of sediments on shorelines to replenish areas eroded by surf and storms.

The shoreline area is mostly undeveloped except for large industry piers and some localized shoreline armoring; most of the tidelands are owned by the State. The three large commercial docks are excluded from the aquatic reserve (knockout areas as shown in Figure 2). A fourth pier (Pacific International Terminal) is under review; if built, that pier would also be excluded from the reserve.

The piers likely degrade the reserve by shading out vegetation, physically disrupting the drift cells and wave action, and adding light pollution. The industrial actions contribute substantially to the regional air pollution and possible particulate fallout in the reserve. Commercial shipping calling on these docks provide several possible threats to the reserve. This includes:

- Noise pollution
- Light pollution
- Air pollution
- Introduction of invasive species (ballast water discharges and hull fouling)
- Disruption of vegetation through anchoring
- Oil spills
- Illegal discharge of sewage, contaminated bilge water, and other substances

Other identified threats to the aquatic reserve include:

- Shore disruptions through shellfishing (not filling holes) and beach fires
- Derelict fishing gear
- Dogs and people on the beach
- Shoreline armoring
- Point and non-point pollution from upland areas
- Recreational boat introduction of invasive species
- Creosote piling and beached debris

Goals

The plan identifies five goals for the aquatic reserve:

Goal One: Identify, protect, restore, and enhance the functions and natural processes of aquatic nearshore and subtidal ecosystems that support endangered, threatened, and sensitive species and aquatic resources identified for conservation.
**Definition**

**Nearshore** is the narrow ribbon of land and shallow water that rings Puget Sound.  
**Aquatic nearshore** is the area of the nearshore from the intertidal area out to a depth where sunlight no longer supports marine vegetation.  
**Subtidal areas** are the aquatic areas below the intertidal area. These areas are also referred to as bedlands.

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**Goal Two:** Improve and protect water quality to protect public health, support fish and wildlife species and healthy functioning habitats.

**Goal Three:** Protect and help recover indicator fish and wildlife species and habitats, with primary focus on Cherry Point herring, Nooksack Chinook salmon, groundfish, marine mammals, seabirds/ducks and shorebird communities, Dungeness crab, and submerged aquatic vegetation.

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**Definition**

**Indicator Fish and Wildlife Species** are species that are used as representatives of all similar species and provide information on the overall health of the ecosystem. Indicators are used when monitoring the health of all species is impractical.  
**Habitat** is the area where plants or animals normally live and where their required environmental needs, such as food or light, can be met.

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**Goal Four:** Facilitate stewardship of habitats and species by working in cooperation with lessees, tribes, recreational users, and resource agencies to minimize and reduce identified impacts of human activities on the species and habitats of the Reserve.

**Goal Five:** Identify, respect, and protect archaeological, cultural, and historical resources on state-owned aquatic lands.

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**Management Actions**

These actions are identified as important to the success of the plan although not necessarily funded. As previously stated, DNR does not have regulatory authority on any privately-owned lands and does not regulate the harvest of natural resources. What DNR can do, other than control what is done in state-owned tidelands and bedlands, is limited; therefore DNR managers must work in cooperation with other entities that have existing regulatory authority.

**DNR actions**

- Use aquatic reserve guidelines on use, including outfalls
- Require that use authorizations (structures) don’t disrupt natural processes
- Prohibit hard shoreline armoring except for some replacement
- Prohibit cables, pipelines, saltwater intakes (except for firefighting)
- Ban any new residential docks
- May permit mooring buoys for both residential and commercial activities
A study on the effects of mooring buoy anchors on the bedlands of the Maury Island Aquatic Reserve was released in April, 2013. While this study includes a proposed mooring plan specific to Maury Island, the basic review of mooring methods as well as the effects of shading by moored structures, could be useful in developing a mooring plan for the Cherry Point Aquatic Reserve.

Request to other entities

- Request Washington Department of Fish and Wildlife to enforce shellfishing harvest rules (regarding unfilled holes) or ban activities.
- Request Whatcom County to ban dogs on beaches, prohibit beach fires, and educate users to stay on bare rock and sand. Also to increase public access to beach.
- Review and comment on vessel traffic risk assessment efforts.

The latest round of the vessel traffic risk assessment study includes scenarios with increased vessel traffic associated with the proposed coal terminal as well as increased vessel traffic from the Vancouver, BC area, including the transport of Alberta tar sands oil (DilBit). The preliminary results of this study were released in late September, 2013 and the final report will be issued in late December, 2013. Implications of the study will be widely discussed and provide resources for future comments on facilities expansions. The first phase of the study was released in 2011 and is available on the Cherry Point Aquatic Reserve webpage at the DNR website.

- Review open water mooring instead of anchoring
- Review and comment on Washington Department of Ecology (ECY) Geographic Response Plans to protect herring spawning areas
- Request that ECY implement the Treoil Site actions
- Monitor ballast water exchange, treatment, and discharges
- Have site-specific plans for upland protections, bluff stabilization, etc. and non-source pollution sources (stormwater)
- Ensure water quality discharges meet requirements and NPDES permits include sediment quality studies. Upgrade water quality treatment systems where needed
- Implement Birch Bay LID recommendations and support proposals from dischargers to re-use stormwater and treated water
**DEFINITION**

**LID** is Low Impact Development. It is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. (EPA, 2013b)

- Review oil spill contingency plans

**EXAMPLE**

Washington State enacted the final rules for ESHB1186, a bill that increases oil spill preparedness through new requirements in contingency plans. These new requirements are phased in over the next few years. Through that period, contingency plans must be updated and open for public review and comment. The comment period usually lasts for 30 days.

- Enforce sewage discharges from vessels

**EXAMPLE**

Ecology is evaluating whether to petition the Environmental Protection Agency to designate Puget Sound as a No Discharge Zone for all vessels. If the petition is submitted and EPA acts on this petition, the rules for implementation will be open for comment. Submission is expected in late 2014.

- Implement measures from the NW Ports Clean Air Strategy.
- Respect all tribal rights during restoration projects and develop a cultural resources protection act.
- Remove harmful debris, including creosote logs in the beach, and derelict fishing gear. Removal of the derelict gravel conveyor at Gulf Road.
- Restore beaches damaged by shellfishing.
- Restoration of native vegetation.
- Assist in removing hard beach armoring with soft banks.

**Monitoring, Data Collection, and Research**

The following items are identified for monitoring and research. However, being proposed does not mean that the work is being conducted.

**Data Gap Analysis**

- Identify protection, enhancement, and restoration opportunities, especially for submerged aquatic vegetation.
- Identify additional protections for forage fish spawning areas, marine and terrestrial bird habitat, and submerged vegetation.
- Monitor toxicity nearshore, in groundwater, and in the intertidal zone.
- Summarize vessel traffic, oil transfer operations, and items affecting changes in vessel traffic.
- Monitor air pollution sources for particle deposition.

**Management Issue**

The Puget Sound Ecosystem Monitoring Program (PSEMP) has compiled an inventory of current monitoring being done and is currently conducting gap analyses to identify important unmet monitoring needs. PSEMP has recently activated a work group on forage fish; many other work groups have been active for some time and have already reported their analyses.

**Action**

The list of data gaps, baseline and trend monitoring needs, and needed research, can be used to create a scorecard on how much of the needed work is being done.

**Proposed Baseline Monitoring**

- Herring larval survival
- Seafloor mapping and habitat classification
- Derelict vessels

**Example**

The 2013 Washington State Legislature passed ESHB 1245, a bill that improves the DNR derelict-vessel program through increasing ownership liabilities, increasing state authority, and provide additional funding. Implementation of the bill is currently being discussed by DNR and the bill sponsors. Once the process is refined, the proposals will be available to stakeholders and the general public for comment.

- Profile other (than herring) forage fish.
- Profile intertidal species and invasive species.
- Evaluate seasonal occurrence of larvae in relation to potential use of oil dispersants.
- Profile marine mammal presence.

**Proposed Trend Monitoring**

- Assess bird abundance, distribution and trends (both marine and riparian).
- Characterize the condition of riparian areas over time for effectiveness monitoring.
- Surveys of fish and wildlife and herring spawn in relationship to light and noise.
- Map submerged aquatic vegetation over time.
- Monitor herring population as a measure of effectiveness monitoring.
- Monitor effects of shading on species composition.
- Monitor air pollution and mitigating efforts.
- Monitor and assess effects of climate change.
Research
- Investigate the cause of herring low hatch and survivor rates.
- Assess ways to reduce effects of shading and artificial illumination.
- Assess effects of sound pollution.
- Assess recreational harvests.
- Assess vectors of introduction of non-native species and scope and effects of these species.
- Assess impacts of toxicity associated with outfalls.
- Assess groundwater, sediment, and surface waters as source of toxics.
- Assess impacts of shoreline armoring (particularly Point Whitehorn and Gulf Road).
- Assess the effects of natural environmental variability and climate change.

Implementation of the Plan
The actions of the plan are reviewed by the Implementation Committee and their recommendations are presented to DNR. However, actions are subject to DNR review and approval and to the availability of funds.

MANAGEMENT ISSUE
The Implementation Committee meets 3-4 times a year. Presentations to the Committee are posted at the Cherry Point Aquatic Reserve webpage at the DNR website. The Implementation Committee’s activities and reviews are critical to the adaptive management process for the reserve.

The Issues
The management plan addresses two main themes: the status and recovery of the Cherry Point herring stock and the need for protection of this unique environment.

The precipitous decline in the herring stock, and the effects on the entire food web, is of great concern. The plan looks at monitoring herring and its vegetative habitat, conducting research on mortality mechanisms, and possible habitat enhancements.

The threat issues come from several sources. Some are relatively small scale, such as beach fires and holes left after digging for shellfish. The bigger issues are associated with the industrial uses of nearshore and upland areas that affect the reserve. Much of this is associated with ship traffic in the area and the transport of crude oil and oil products. These vessels and the associated activities on the piers may contribute to water, air, light, and noise pollution, and introduce invasive species. The piers likely affect natural processes, such as drift cells and waves and other high energy components, as well as shade out some vegetation. Anchoring ships may scour the seafloor of important vegetation and underwater structures. Additionally there is the continuing threat of oil spills, either from vessels or from the facilities.
**MANAGEMENT ISSUE**

In Fall 2013, DNR is scheduled to release its draft Aquatic Habitat Conservation Plan (HCP) with an accompanying Environmental Impact Statement (EIS). According to the DNR HCP webpage, the draft HCP focuses on protecting the nearshore marine environment, lakes, and rivers, which are crucial for the health of the entire ecosystem. The plan addresses the impacts of shade, sediment compaction, disruption of the flow of water and sediment, contamination, and noise.

In addition to these primary themes, there are numerous components identified and discussed in the plan. These are mostly assessing the health of the ecosystem and taking actions to improve the habitat. Assessments of toxins in groundwater, sediments, surface water, stormwater and other outfalls are identified. As a measure of health and vulnerability, monitoring of seabirds, riparian and submerged vegetation, marine mammal presence, and other forage fish is suggested.

**DEFINITION**

**Riparian areas** are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. They include those portions of terrestrial ecosystems that influence exchanges of energy and matter with aquatic ecosystems (i.e., zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine—marine shorelines. (NRC, 2002)

Therefore, what is being looked at is the health of the ecosystem components and the effects on the food web. Tied directly to this issue are the interaction of three threatened and endangered species: the health and abundance of the Cherry Point herring stock, the abundance of Chinook salmon that depend on this herring stock, and the health and abundance of the Southern Resident Killer Whales that depend on the Chinook runs. Actions can be taken to directly address these specific issues, or actions can be taken to enhance components of the ecosystem or to reduce or eliminate threats.

**Supplemental Information**

The Management Plan is a great resource for characterizing the environment and the issues associated with the aquatic reserve designation. The plan emphasizes the need for adaptive management—identifying what has changed and what is and is not working since the plan was completed. Additionally, by the nature of the way the plan was developed, some statements made in the plan may be compromises in order to reach consensus among the different stakeholders. Therefore, it is important to seek information from other sources to both update the information in the plan and to get additional perspectives on issues.
Sources of Additional and Updated Information

DNR webpages are frequently updated with additional documents. The DNR Aquatic Reserves main page contains links to individual aquatic reserve webpages, links to additional resources, and background documents on the program.

http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr_rsve_aquatic_reserves_program.aspx

The Cherry Point Aquatic Reserve webpage on the DNR site contains numerous documents, with the documents and presentations used in the Implementation Committee meetings being very useful.

http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr_rsve_cherry_point.aspx

The DNR webpage on the proposed Aquatic Lands Aquatic Habitat Plan provides details on the review of the HCP along with a long list of documents that are descriptive of issues surrounding the aquatic habitat.

http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHCP/Pages/aqr_aquatics_hcp.aspx#species

The report on mooring issues and a proposed mooring plan in Maury Island Aquatic Reserve is available at:

http://www.dnr.wa.gov/Publications/aqr_quartermaster_harbor_mooring_buoy_plan.pdf

Ecology has a webpage with information and links concerning BP's final National Pollutant Discharge Elimination System (NPDES) permit. The permit, issued in 2012 has extensive documentation on environmental parameters, the extent of discharge, and the potential impacts of these discharges.

http://www.ecy.wa.gov/programs/swfa/industrial/oil_bp.html

Ecology has a webpage with a description of the process regarding the permitting of the Gateway Pacific Terminal. The page has extensive links to related documents.

http://www.ecy.wa.gov/geographic/gatewaypacific/

Ecology has a website for people and organizations to sign up as volunteers in the event of an oil spill. The page also provides information about additional training opportunities.

http://www.oilspills101.wa.gov

DNR has a report issued in late 2011 that is an assessment of environmental damage in the aquatic reserve caused by refinery equipment lost while being transported by barge. Besides discussing the effects of the sinking of a large piece of equipment, the report provides good details of the animals and plant life in part of the reserve.


Inventories and gap analyses of monitoring programs compiled by PSEMP are available at:

https://sites.google.com/a/psemp.org/psemp/
References


PSNERP, 2013, Puget Sound Ecosystem Restoration Project Ecosystem webpage. Available at: http://www.pugetsoundnearshore.org/ecosystems.html

