Appendix E
Aquatic Reserve Program Implementation and Designation Guidance

NATURAL RESOURCES

Aquatic Reserve Program
Implementation and Designation
Guidance

September 2005


Photo by Carol Cloen

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

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November 4, 2005

Dear Reader,

Washington's aquatic environment is an invaluable public resource that is treasured by the people of the state. The 2.4 million acres of state-owned aquatic lands is managed by the Washington State Department of Natural Resources to foster water-dependent use, public access, renewable resources, and environmental protection.

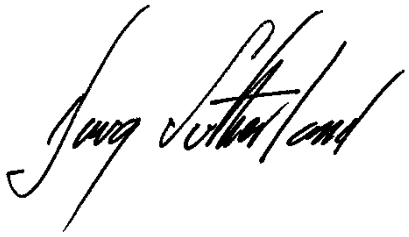
Established in September 2002, the Aquatic Reserves Program is part of the Department's efforts to conserve significant state-owned aquatic lands through preservation, restoration, and enhancement. In order to protect these aquatic systems and functions above other uses, the program provides an ongoing process to evaluate and designate reserves on those state aquatic lands that have unique ecological features and habitats.

State Aquatic Reserves also can help support the connectivity of healthy aquatic systems throughout the state — so important to our salmon and other aquatic life.

We are publishing this *Aquatic Reserves Program Implementation and Designation Guidance* to ensure consistent implementation of the Aquatic Reserves Program and to give people interested in nominating aquatic reserves the necessary information to do so.

I greatly appreciate the time and work of those technical reviewers outside of the Department, as well as DNR staff who devoted their time to develop this guidance. This will be a valuable tool to help identify and protect significant habitats into the future.

Sincerely,



Doug Sutherland
Commissioner of Public Lands

NATURAL RESOURCES

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Implementation and Designation
Guidance

September 2005

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Aquatic Reserves Program
Aquatic Resources

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

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Section 1

Preface

The purpose of the Aquatic Reserves Program implementation and designation guidance document is to assist the Washington State Department of Natural Resources (DNR) in the implementation of the Aquatic Reserves Program and to provide guidance and the application material for interested parties to nominate state-owned aquatic lands as aquatic reserves.

DNR's Aquatic Resources Program adopted the Final Environmental Impact Statement for Aquatic Reserves Program Guidance (Final EIS) on September 6, 2002. The Final EIS gives a programmatic description of how DNR will designate aquatic reserves on state-owned aquatic lands that have unique, native ecological features, habitats, and species in order to protect and support those elements.

The preferred alternative of the Final EIS describes how DNR will determine what areas and resources need the special protection provided by the aquatic reserves program, and how those areas are to be managed, once designated. This document provides details and interpretation for the aquatic reserves designation criteria as described in the preferred alternative of the Final EIS.

The criteria set out in the Final EIS, along with the implementation guidance provided by this document, set up the methods and time frames for establishing aquatic reserves on state-owned aquatic lands. The components of this implementation guidance include the Aquatic Reserves Program implementation elements presented in Sections 3, 4, and 5 and the ecological framework criteria presented in Sections 6.0. Appendix A includes the site proposal application. Appendices B – H provide technical information and guidance to assist in the development of aquatic reserve proposals. Appendix I includes the site evaluation forms and recruitment qualifications for the Aquatic Reserve Technical Advisory Committee.

Citizens, stakeholder groups, Tribes, and government agencies that would like to nominate state-owned aquatic lands for aquatic reserve designation for the dedicated purpose of environmental protection, scientific research, or education should use the guidance and application material provided in this document. For additional information about the Aquatic Reserves Program, copies of this implementation guidance, letter of intent form, and the proposal application, contact the DNR Aquatic Reserves Program staff or view the Aquatic Reserves Program web page.

Section 2

Overview

The Washington State Department of Natural Resources (DNR) manages about 2.4 million acres of state-owned aquatic lands. This includes about 1,300 miles of tidelands, 6,700 acres of harbor areas established in the state constitution, and all of the submerged land below extreme low tide. The total area of aquatic lands under management amounts to some 2,000 square miles of marine beds of navigable waters and an undetermined amount of freshwater shorelands and bedlands. Figure 1 (navigable waters in Washington) roughly depicts the distribution of aquatic land ownership in the state. More detailed maps of the navigability assessment of Washington lakes and rivers can be found on the DNR webpage: www.dnr.wa.gov/.

State aquatic lands are managed as a rich land base that offers a variety of recreational, commercial, and natural resource benefits. Management of state-owned aquatic lands is to be consistent with DNR's public trust responsibility, for the benefit of the people of Washington. These lands are "a finite natural resource of great value and an irreplaceable public heritage" and are managed to "provide a balance of public benefits for all citizens of the state" (RCW 79.90.450 and 79.90.455). Within this balance, DNR has recognized the increasing need for site-based conservation management of state-owned aquatic lands. The Aquatic Reserves Program is established to address that need.

Protecting Aquatic Resources

Washington's DNR has the proprietary authority to identify and withdraw lands from leasing when there are potentially conflicting uses (RCW 79.10.210). This could include instances such as choosing to withdraw a site from leasing and manage it for the conservation of important native habitat and species. DNR has direction to protect such sites through designation as state aquatic reserves.

Many other natural resource managers and citizens play important roles in the stewardship of aquatic resources in Washington State. The Aquatic Reserves Program is to work with landowners, citizens, stakeholder groups, Tribes, and regulatory agencies to develop management plans for individual sites that maximize the benefits for individual reserves and the ecosystem.

Although most of the state's aquatic lands are managed by DNR, Washington's Department of Fish and Wildlife (WDFW) and Washington's Treaty Tribes co-manage the fisheries that utilize the state's aquatic lands. Therefore, fisheries management is outside of the scope of the Aquatic Reserves Program. However, the program will, where appropriate, work cooperatively with these fishery managers to conserve aquatic habitats supporting Washington's ecosystems.

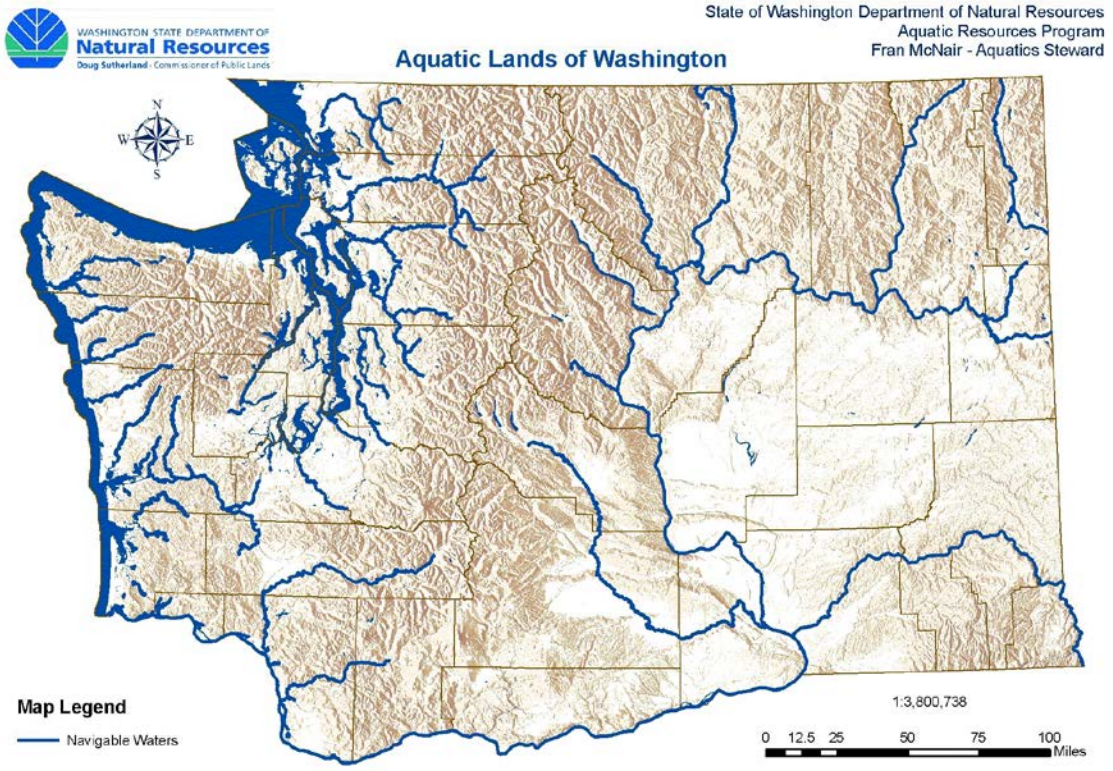

Figure 1: Navigable Waters in Washington (Washington State Department of Natural Resources 2005)

2.1 Aquatic Reserves Program

The Aquatic Reserves Program is set up to help DNR promote conservation (preservation, restoration, and enhancement) of state-owned aquatic lands that will provide direct and indirect benefits to the health of native aquatic habitats and species and other resources of Washington.

The program was created to establish aquatic reserves on selected state-owned aquatic lands to protect important native aquatic ecosystems. Aquatic reserves are lands of special educational or scientific interest, or of special environmental importance (WAC 332-30-151).

The process of evaluating a site for aquatic reserve status includes the development of an initial proposal by the proponent, varying levels of review by DNR, management plan development, review under the State Environmental Policy Act (SEPA), and ultimately final approval for designation of the site by the

Commissioner of Public Lands. Each aquatic reserve proposal is evaluated on a case-by-case basis during a (approximate) two and one/half-year cycle (Figure 2). While sites are evaluated on an individual basis, the intent of this program is to develop an ecologically sound network of reserves that function to achieve the statewide program goals and objectives.

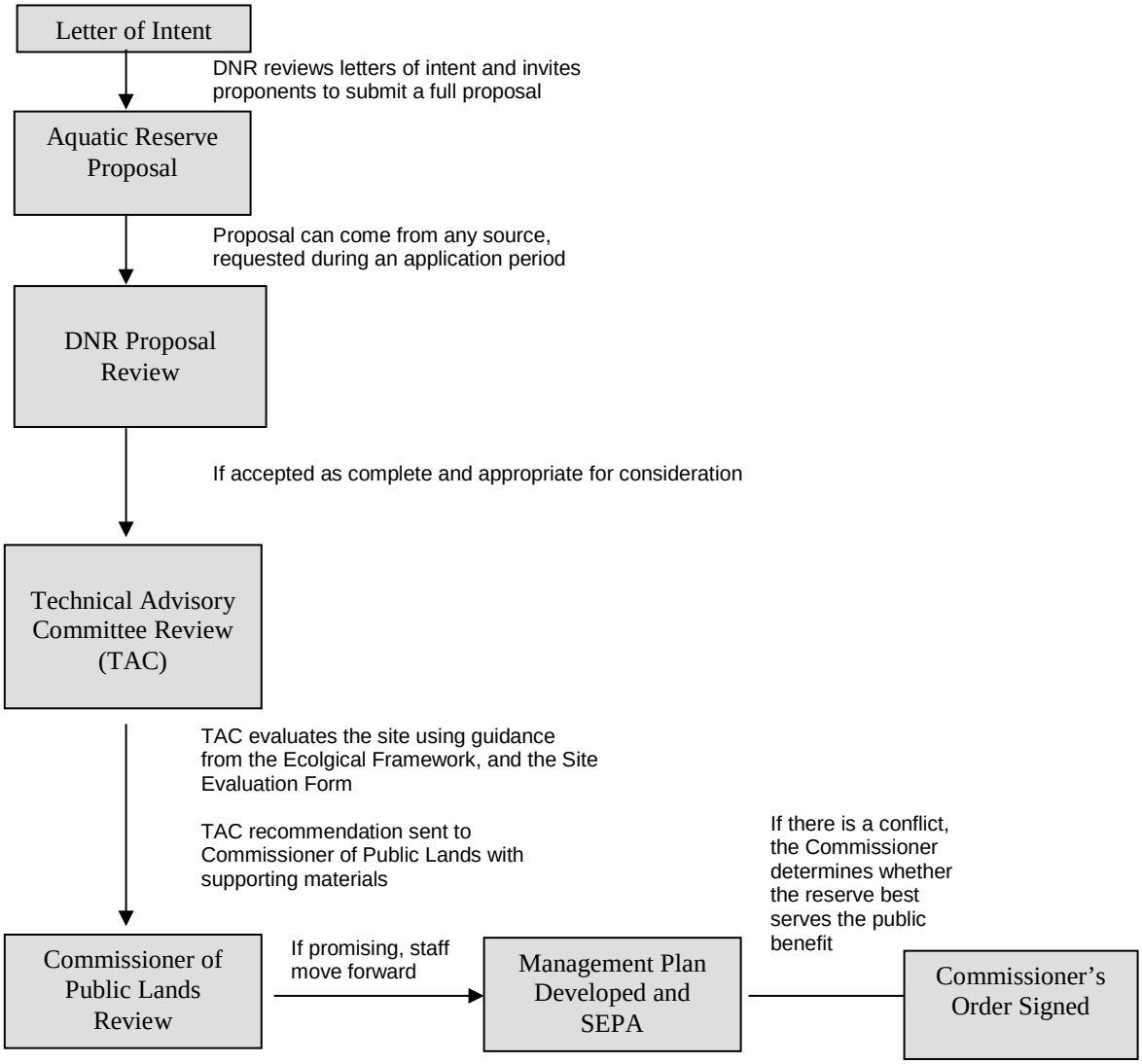

Figure 2: Overview of site evaluation procedure as outlined in the program's Final Environmental Impact Statement (EIS).

2.1.1 Goals and Objectives

The Aquatic Reserves Program partly fulfills DNR's stewardship responsibilities for state-owned aquatic lands. During 2002, DNR developed a Final EIS outlining program goals and objectives. As stated in the Final EIS (3.2.1.1), the overall goal of the Aquatic Reserves Program is to ensure environmental protection and preserve and enhance state-owned aquatic lands in order to provide direct and indirect benefits to aquatic resources in Washington State. Because DNR, Tribes and local, state, and federal regulatory agencies share management authority of the state's aquatic resources (DNR has no regulatory authority over aquatic

resources), achieving this goal will require partnerships among natural resource managers and landowners.

The overall goal is achieved through the designation of three classes of reserves: environmental reserves, scientific reserves, and education reserves (WAC 332-30-151). The objectives for each aquatic reserve category are discussed in Section 2.2.

2.2 Aquatic Reserve Types and Objectives

Environmental Reserves

Environmental aquatic reserves must be areas of regional or statewide environmental importance; sites established for the continuance of environmental baseline monitoring; or areas of historical, geological, or biological interest that require special protective management.

Objectives

- Establish aquatic habitats for conservation of ecological function and services or historical significance.
- Restore important degraded habitats to better functioning conditions.

Scientific Reserves

Scientific aquatic reserves are sites set aside for scientific research projects. These areas may contain unusually rich plant and animal communities suitable for continued scientific observation.

Objectives

- Provide sites that may be manipulated for the benefit of scientific research.
- Provide reference sites to measure the effectiveness of environmental protection.
- Manage sites with unusually rich plant and animal communities.

Educational Reserves

Educational aquatic reserves are accessible areas of aquatic lands typical of specific native habitat types that are protected as sites suitable for education projects.

Objectives

- Keep sites available for environmental education opportunities.
- Educate people on the value of aquatic habitats to help ensure environmental protection.

2.3 Program Administration

Aquatic Reserve Designation

DNR's Aquatic Reserves Program Administrator is responsible for statewide program implementation. This includes:

- Running a biennial application cycle,
- Screening new proposals,

- Reviewing aquatic reserve applications and sites to determine if they fit into the overall goals of the reserves program,
- Working with site proponents in developing proposals,
- Conducting public meetings for proposed sites,
- Establishing and chairing the Aquatic Reserves Program Technical Advisory Committee (Technical Committee),
- Leading the Technical Committee through the evaluation of proposed sites,
- Providing briefings on the Technical Committee's recommendations to executive management,
- Leading the development of management plans for proposed aquatic reserves, and
- Coordinating the transition from plan development to implementation of established aquatic reserves.

The Program Administrator also continues to develop and promote the Aquatic Reserves Program throughout the state.

Existing state aquatic reserves, and areas proposed for consideration as aquatic reserves, are evaluated according to the process in Section 5 and the criteria in Section 6.2. This evaluation process helps determine whether they are suitable aquatic reserve sites.

The Aquatic Reserves Program uses information gathered from scientific literature, new scientific research, and information described by nominating parties to evaluate sites as aquatic reserves. The Technical Advisory Committee consists of people external to DNR with expert knowledge of topics pertinent to establishing and managing aquatic reserves that assist in analyzing the proposed reserves.

The program relies on a two-year designation cycle. DNR receives and evaluates applications according to the time frame in Table 1 in Section 3. Once a reserve site has been identified, a management plan written, and SEPA review of the plan is completed, a Commissioner's Order designates the site as an aquatic reserve. The ability to establish new aquatic reserves is contingent upon funding allocation for the program and Program Administrator, and upon receiving at least one reserve nomination that meets the designation criteria described in Section 6.2.

The development of a successful aquatic reserve proposal relies on coordination and consultation with government entities, Tribal governments, the local community, interest groups, and natural resource users who have an interest in the site.

Creating Changes to a State Aquatic Reserve

Proposals to change boundaries and reserve classifications are to be reviewed by the Technical Advisory Committee. Changes to reserve boundaries and classifications are proposed, evaluated, and determined through the same process for designating reserves. Changes to an existing state aquatic reserve are formalized through a Commissioner's Order.

De-listing Aquatic Reserves

A proposal to de-list an existing state aquatic reserve is to be reviewed by the Technical Advisory Committee. De-listing of a reserve is proposed, evaluated, and determined through the same process as that used for designating reserves. De-listing of an existing aquatic reserve is formalized through a Commissioner's Order.

Section 3

Aquatic Reserve Application Process

DNR uses the following application process to evaluate a proposed aquatic reserve site, to make changes to an existing reserve's boundaries, or to de-list an existing aquatic reserve. Members of the public, non-governmental organizations, Tribes, and local, state, and federal government entities are eligible to submit proposals to DNR to establish an aquatic reserve. DNR staff also may submit proposals for aquatic reserve designation.

Table 1 identifies the steps and timeframes in the application process. The application process will be initiated every two years (subject to change). The important dates are subject to change based on the time it takes to complete each step.

Table 1. Aquatic Reserve Application Steps

STEPS	IMPORTANT DATES*
1. Call for proposals issued by DNR.	*June 1, (year 1)*
2. Letters of intent due.	*July 30*
3. DNR sends request to proponent to submit a complete proposal. DNR decides on the number of reserves to be reviewed for the biennium.	*September 1*
4. Deadline for submitting detailed proposals. Internal review begins.	*November 30*
5. Internal review completed.	*January 15*
6. Open house review of site proposal	*March 1-May 31*
7. Technical Advisory Committee review begins.	*July 1 (year 2)*
8. Technical Advisory Committee review completed.	*September15*
9. DNR staff submits recommendations for further action: Commissioner of Public Lands reviews and selects sites for continued planning and SEPA process.	*October 15*
10. Begin development of draft aquatic reserve management plans. Site- specific SEPA and management planning initiated.	*November 1*
11. SEPA review completed.	*November (year 3)*
12. Commissioner's Order(s) signed.	*January*

* These dates are tentative and may change.

3.1 Call for Proposals

The formal cycle for considering letters of intent for establishing new aquatic reserves, changing an existing aquatic reserve, or de-listing an existing aquatic reserve, is proposed to begin in June of every other year. To issue a call for letters of intent to make any of these proposals, DNR will use a press release or other form of public notice, as well as targeted solicitation from staff. Specific regional and habitat protection priorities also may be established by DNR for an application cycle. These priorities will be identified in the request for proposals.

3.2 Letter of Intent

The first step in proposing a site as an aquatic reserve is for the proponent to submit a letter of intent to DNR. Interested parties, including members of the public, non-government organizations, Tribes, local agencies, state agencies (including DNR), and federal entities wishing to submit applications, must submit a letter of intent to the (DNR) Aquatic Reserves Program Administrator. It is recommended that interested applicants with limited organizational or funding resources work with DNR and other government agencies, private organizations, universities, educational facilities, and others to ensure adequate information is gathered to support their proposal. The letter of intent needs to contain at a minimum the following information about the site:

- Specify whether you are proposing to designate, de-list, or modify a reserve.
- A description of the location and approximate acreage of the proposed area.
- A map of the site and its surrounding area.
- To propose a new aquatic reserve:
    1. Identify the project proponent(s).
    2. Identify what type of reserve is being proposed (environmental, scientific, educational).
    3. Explain why the area should be protected as an aquatic reserve.
    4. Describe the special features of the site and the aquatic resources that are being emphasized for conservation.
    5. Describe who the managers (if other than DNR) would be.
    6. Indicate the level of local, public, governmental, and tribal support for reserve status (include letters of support if possible).
    7. Confirm that the site is in state ownership (DNR can assist).
- To propose to de-list an existing aquatic reserve:
    1. Identify the type of reserve, when it was established, and features identified for protection.
    2. Explain why the site should be removed from the Aquatic Reserves Program.
    3. Indicate the level of local, public, governmental, and tribal support (as appropriate) for removal of the site from the Aquatic Reserves Program (include letters of support if possible).
- To propose to change the features or boundary of an existing aquatic reserve site:

1. Identify the project proponent(s).
2. Identify the type of reserve, when it was established, and the features identified for protection.
3. Describe the features and or boundary changes you are proposing and why.
4. Describe who the managers would be (if other than DNR).
5. Indicate the level of local public, governmental, and tribal support for changes to the existing reserve (include letters of support if possible).
6. Identify ownership (if changing boundaries).

(NOTE: The letter of intent form can be found at www.dnr.wa.gov/htdocs/aqr/reserves/home).

This introductory letter initiates an exchange of information between DNR and the proponent and helps determine the potential of the proposed site as a state aquatic reserve.

DNR works with a proponent to make sure that the letter of intent contains the necessary information. Upon review of all completed letters of intent, DNR staff determine which proponent(s) are invited to submit a full proposal for consideration.

The invitation to submit full proposals includes clarification of the limit of aquatic reserve applications DNR will review during the cycle.

Notification to Interested Parties

When DNR determines which proponent(s) are to be invited to develop and submit a full proposal, DNR staff will notify the following parties:

- Tribal governments with legal treaty rights or cultural interests within the area.
- Local government jurisdictions.
- Appropriate state and federal agencies with management or jurisdictional authority.
- Any other government or non-government agency, interest groups, or the general public.

Re-submitting Proposals

To re-submit a site to DNR for consideration as a new reserve, or to change boundaries of a recently established reserve, or re-establish a site recently de-listed, a proponent must demonstrate to DNR that additional information is available that warrants reconsideration of the site.

The only exception to this requirement would be re-submission of a proposal that had been rated highly by the Technical Advisory Committee in a previous evaluation cycle but was not designated due to limited DNR resources.

3.3 Proposal and Project Evaluation Information

In order to be considered, a full proposal needs to include the site-specific information outlined in the application form in Appendix A. The application questions in Section 1 of Appendix A, direct the applicant to provide the information on the site in the order and context of the evaluation criteria that is used by the Technical Advisory Committee to evaluate the site as discussed in Section 6. In addition, a proposal for scientific or educational reserves also needs to include answers to the questions in Section 2 or Section 3 of Appendix A respectively. A proponent needs to include references to support the information presented in the application.

Section 4

Aquatic Reserve Proposal Evaluation Process

DNR conducts a preliminary review of the proposals for completeness, taking the questions below into consideration. If the proposal is incomplete, staff informs the proponent about what information is still needed and works with the proponent to complete the application information. Staff may conduct site visits and consult with the appropriate governments, Tribes, and others regarding the feasibility of the proposal. If DNR determines that aquatic reserve status may not be the appropriate designation, the applicant is informed that the proposal will not be considered, and, when possible, is provided with recommendations for other alternatives.

4.1 Proposal Evaluation and Ranking

A complete aquatic reserve proposal includes written answers to the questions on the Site Proposal Application (Appendix A). Those questions, which parallel the reserve criteria in Section 6.2 and the site evaluation questions used by the Technical Advisory Committee (Appendix I), are derived from the preferred alternative (Alternative 1) in the Final EIS.

4.1.1 DNR Staff Preliminary Review

DNR staff review the completed applications for the following information:

- Is the application complete based on the requirements of the Site Proposal Application (Appendix A)?
- Has the proponent coordinated and consulted with local jurisdictions, Tribes, government entities, local landowners and other pertinent organizations or people?
- Is the proposed site on state-owned aquatic land? Does the proposal require land transfers, acquisitions, and/or cooperation from adjacent landowners?
- Has the area been adequately characterized, including a description of the condition and presence or absence of special features? What type of information was used to characterize the site (scientific, anecdotal)?
- Are there local issues or conflicts occurring at the site? Does the area or adjacent areas include current or proposed uses that conflict with the goal of the reserve program or the proposed reserve's objectives?
- What are the anticipated impacts of the proposed site being placed in reserve status?
- Has all relevant data for the site been included in the proposal?

After the preliminary review is completed, DNR staff present the list of proposed reserve sites to the Aquatics Program management team, and inform the Commissioner of Public Lands of the nature of the application pool. At that time, DNR will make a final determination as to the number of reserves that can be evaluated during the cycle, based on available funds, resources, and general quality of the proposals.

4.1.2 Open House Public Meeting

After the Commissioner of Public Lands directs the Aquatic Reserve Program Administrator to proceed with review of site proposals, DNR staff in cooperation with the site proponent conduct an open house public meeting to present an overview of the Aquatic Reserves Program and share the site-specific information collected to date to support the proposal. The meeting provides the public an opportunity to offer additional information to be included in the evaluation of the site. The public also has a chance to ask questions and discuss the Aquatic Reserves Program with DNR staff and the reserve proponent.

4.1.3 Aquatic Reserve Technical Advisory Committee

An aquatic reserve Technical Advisory Committee is established for each evaluation cycle. The qualifications for committee members include the following (and are described in Appendix I):

- Advanced degree and professional experience in a related field.
- Limited professional affiliations with DNR.
- Time commitment to complete the duties of the Committee.

Committee members review, evaluate, and rank nominated sites for the Aquatic Reserves Program and make recommendations to the Commissioner of Public Lands for further consideration and action.

The committee evaluates each proposal using the site evaluation forms in Appendix I and the criteria in Section 6 as guidance.

Technical Advisory Committee Site Visits

In coordination with DNR staff, each proponent of a site under consideration is required to organize a site visit for the Technical Advisory Committee. The site visit offers the committee an opportunity to see the site with the proponent and review the features of their proposal in context.

Evaluation Criteria

Each site proposal (Environmental, Scientific, and Educational) is evaluated based on the general reserve criteria discussed in Section 6.2. Each question addressed by the proponent in their proposal is related to specific evaluation criteria that will

guide the committee in evaluating how well each reserve proposal meets the Aquatic Reserves Program's goals and objectives. In addition to reviewing, evaluating, and ranking the proposals, the Technical Advisory Committee discusses the merits of different proposals, including, if appropriate, a statement of why a proposed area should not be considered for reserve status.

In addition, proposals for scientific reserves are evaluated based on the scientific reserve criteria discussed in Section 6.3, while proposals for educational reserves are evaluated using the educational reserve criteria discussed in Section 6.4.

4.1.4 DNR Staff Recommendation and Commissioner of Public Lands Review

Following evaluation by DNR staff and the Technical Advisory Committee, DNR provides a final list of reserve nominations to the Commissioner of Public Lands that includes the following information:

- DNR staff review summary
- Review of Aquatic Reserves Program goals and objectives
- Evaluation of available DNR resources (staff and budget) to plan and implement new reserves
- Summary of the committee rating, evaluation, ranking, and recommendations.
- Identification of potential conflicts with other current or projected uses of the nominated reserve site.

The Commissioner evaluates the nominations based on the above information. If the Commissioner accepts one or more nominations, staff is directed to develop management plans as appropriate, and to perform site-specific SEPA review of the selected proposals.


Photo by Sunny Walter

Section 5

Aquatic Reserve Designation Process

Proposal evaluations are the primary information collected to determine whether a site should be designated as a state aquatic reserve. The site designation triggers some limited protection for the site by withdrawing it from any potentially harmful leasing activity for a period of 90 years. It is important to note that designating a site as an aquatic reserve does not imply that commercial or other human activities are prohibited. Rather, its status is intended to ensure that human use is held at levels that are ecologically sustainable by restricting activities to those that are compatible with the reserve goals (Final EIS 3.2.1.4.2). DNR also works with educational and research institutions to encourage the use of aquatic reserve sites for educational experiences and research projects. Additionally, the agency may develop educational and outreach materials regarding individual aquatic reserves, the ecological functions they support, and the best management practices associated with those reserves.

The effectiveness of the Aquatic Reserves Program depends, in part, on the successful partnership with state, Tribal, and local resource managers and stakeholders in developing management plans for each individual site. Therefore, while the boundaries of state aquatic reserves are limited to areas under state ownership, DNR works with adjacent landowners and regulators on issues and ecological concerns that extend beyond reserve boundaries, but affect reserve resources.

5.1 Site Specific Management Plans

DNR, with the assistance of the proponent, develops a draft management plan for the selected proposal. Specific elements of a reserve management plan depends on the type of reserve, recommendations from DNR staff, the reserve proposal, pertinent jurisdictions and user groups, and the input from the Technical Advisory Committee. A management plan, at a minimum, addresses how management decisions and other activities are to be administered at the site.

5.1.1 Management Plans for Environmental Reserves

Management plans for environmental reserves should:

- Be based on habitat and species considerations, restoration and recovery efforts, and cultural resources.
- Have adequate protection to preserve and improve biodiversity and ecosystem function.

- Include coordination with other entities with jurisdiction, treaty rights, adjacent landowners, and others with legal rights to use the area.
- Include adequate protection of cultural resources, where applicable.
- Limit activities to those that will not negatively impact the habitats and species identified for conservation.
- Ensure that lease activities implement measures to primarily serve the objectives of an environmental reserve.

5.1.2 Management Plans for Scientific Reserves

Management plans for scientific reserves should:

- Be based upon the potential to conduct biological research and the need to protect these areas in a relatively undisturbed state.
- Have adequate protection mechanisms to ensure continuity of the site's features by reducing external ecological concerns and disturbances and allowing for natural disturbance regimes.
- Allow for some manipulation in areas stable enough to withstand alteration, for the benefit of scientific research. Other scientific reserves should be managed as un-altered sites to measure their natural variability or to compare as a control site to altered or impacted sites.
- Include coordination with other entities with jurisdiction, treaty rights, adjacent landowners, and others interested people and organizations.
- Limit access to scientific reserves to those individuals conducting approved research. Mechanisms should be established to ensure limited access.
- Establish guidelines for approved research activities, the length of research, mitigation, and the sharing of data.

5.1.3 Management Plans for Educational Reserves

Management plans for educational reserves should:

- Be based upon the unique physical features of the site that enhance environmental protection through public awareness and provide environmental education opportunities.
- Have adequate protection to ensure the longevity of the site, and its features, to provide ongoing opportunities for education into the future.
- Allow for some manipulation of a site in areas stable enough to withstand alterations, for the benefit of education or public access.
- Include coordination with other entities with jurisdiction, treaty rights, adjacent landowners, and others interested people and organizations.
- Include access and information on site to reach a wide audience. The facilities and staffing necessary to support the reserve must be managed and maintained.

- Ensure that lease activities are consistent with the objectives of the education reserves and that lessees implement measures to primarily serve the objectives of the education reserves.

5.1.4 Monitoring Considerations

Monitoring for state aquatic reserves is to be based on the site-specific reserve objectives and performance measures. A monitoring plan must be developed to observe and record the conditions of the resources and the natural and human-induced changes. Monitoring activities are typically sorted into the following three categories:

- **Implementation Monitoring** – Measures the extent to which activities are carried out as planned.
- **Effectiveness Monitoring** – Measures the effectiveness of the planned management actions in meeting the explicit conservation objectives for the site.
- **Validation Monitoring** – On the ground evaluation of the site's habitat, populations or other features of interest, and examines the appropriateness of the assumptions used to develop the management strategy for a specific site.

It may not be appropriate for all aquatic reserves to implement a monitoring strategy. The decision to implement a monitoring plan and the monitoring actions and strategy is to be made jointly by the management partners. The decision is to be based upon the features and objectives of the reserve, available funding and resources, and feasibility of monitoring actions at the site.

5.1.5 Other DNR Management Actions

General Lease Management Considerations

When considering a lease within or adjacent to an area that is under consideration as an aquatic reserve, DNR land managers are to follow the ***Interim Management Guidance*** in Appendix H.

The exact types and conditions for future leasing activities that are authorized or prohibited within state aquatic reserves will be established 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.

In addition to the site-specific management plan, DNR land managers are to use the following general management considerations when reviewing new or renewed authorizations within and adjacent to a reserve:

Use Authorizations

To meet the purpose of the aquatic reserve program and achieve the specific goals and objective for the reserve, the basic principles below will be applied by DNR for existing, pending, and future proposed use authorizations within the reserve. The activities must:

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.

Guidelines for Establishing Aquatic Reserves in Harbor Areas and State-owned Waterways

Establishing state aquatic reserves in harbor areas could be inconsistent with the specific uses for which harbor areas are established. Article XV, Harbors and Tide Waters of the Constitution of the State of Washington, states that harbor areas "*shall be forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce.*"

In addition, establishing aquatic reserves in state-owned waterways could be inconsistent with the specific uses and priorities for which state waterways are established, as described in RCW 79.93.010.

Appendix G provides alternatives for establishing aquatic reserves in existing harbor areas and state-owned waterways. Any changes to a harbor line boundary or status of a state-owned waterway could be viewed as part of the site-specific SEPA process for a proposed reserve site.

5.2 SEPA and Site-Specific Public Review

Once a draft management plan for proposed reserve has been developed, it goes through public review under the State Environmental Policy Act (SEPA).

DNR staff and the project proponents develop a SEPA checklist for each proposed reserve, or for a change to an existing reserve, consistent with the programmatic EIS developed for aquatic reserves. In accordance with SEPA, if it is determined from review of the environmental checklist that the reserve proposal could result in significant adverse environmental impacts, DNR prepares a site-specific supplement to the Final EIS; the public has an opportunity to review and comment on all proposals. As part of the site-specific SEPA process, a review is conducted for any changes proposed for harbor areas or state-owned waterway boundaries.

5.3 Commissioner's Order

Upon completion of SEPA review, the Commissioner of Public Lands formally establishes a reserve through the issuance of a "Commissioner's Order" withdrawing the lands from general leasing and designating them as an aquatic reserve. The language in the Commissioner's Order includes references to the management plan and other specific lease limitations that have been established for the reserve. The Commissioner's Order establishes aquatic reserve status for

90 years, at which time the site is re-evaluated to determine if its reserve status should be continued for an additional 90 years.

5.4 Program Implementation

Once an aquatic reserve is established, DNR land managers apply management guidance described in the site-specific management plan in order to evaluate what uses are appropriate within and adjacent to the reserve. DNR manages the site and prevents unauthorized uses. DNR staff will coordinate with the partners identified in the aquatic reserve's management plan for the implementation of the management actions identified in the plan.

5.4.1 Cooperate with Managers and Stakeholders

The ability of DNR to fully realize its goals and objectives is influenced by many factors outside of DNR's direct control. Therefore, DNR works with partners, including government agencies, Tribes, academic institutions, non-governmental organizations, individuals and stakeholders, to select and manage aquatic reserves.

5.4.2 Adaptive Management

Protecting the best available sites during each application cycle may fail to adequately achieve the Aquatic Reserves Program goals and objectives. Therefore, calls for aquatic reserve proposals are guided, in part, by the success of the Aquatic Reserves Program in achieving the program goals and objectives (Section 2.1.1) and specific objectives (Section 2.2). The progress of the program in meeting its goals and objectives will be determined as reserves are established, and 10-year reviews and updates of specific aquatic reserve management plans are conducted.


Photo by Tom Stilz

Section 6

Aquatic Reserves Ecological Framework and Criteria

The ecological framework is the scientific foundation of the Technical Advisory Committee criteria form (Appendix I) used to review candidate aquatic reserve sites. The framework provides the criteria for educational, environmental, and scientific reserves, and detailed scientific discussion about those criteria that are discussed in Section 3.2.1.3.5 of the Final Programmatic EIS.

Prospective applicants should reference the ecologic framework when developing an aquatic reserve site proposal application (Appendix A) in order to meet the Aquatic Reserves Program goals and objectives.

6.1 Ecological Framework

The ecological framework supports the criteria used for evaluating aquatic reserve proposals and, in the long-term, building a system of aquatic reserves. The ecologic framework helps ensure that reserve selection and management are based on sound science.

In designing reserves, the scale and size of sites need to be appropriate to the goals and objectives for the sites. Since different regional conservation targets are at distinctly different scales, DNR incorporates a hierarchical approach into the site selection process and in building a reserve system. DNR considers hierarchical at the following five scales:

1. **Individual** – A specific animal or plant residing at a site, such as Dungeness crab or bull trout.
2. **Population** – A group of individual organisms belonging to a single species that is endemic to an area, such as Pacific herring.
3. **Community** – Trophic interactions of species assemblages with regular joint occurrence and subject to common environmental influences. For example, an eelgrass community including plants, epiphytes, zooplankton, and fish known to be frequently associated with eelgrass beds.
4. **Ecosystem** – A community of organisms and their physical environment interacting as an ecological unit.
5. **Landscape** – Large-scale biogeographic regions that define watersheds or hydrologic units (Figures 3 and 4).

6.1.1 Landscape level structure

The Aquatic Reserves Program seeks to conserve aquatic resources across both marine and freshwater regions. The larger landscape scale provides an underlying structure for conservation planning. This scale can be effectively defined through

the development and application of aquatic biogeographic regions across the statewide aquatic landscape. A regional breakout is based upon the extent of fresh and marine water mixing and/or the locations of sediment source material and sediment deposition. Figures 3 and 4 depict biogeographic regions of Washington State. Due to differences in the function and characteristics of freshwater and marine aquatic systems, different methods are used to identify biogeographic regions in freshwater compared to marine waters.

The main ecological unit of large-scale freshwater systems is the major watershed or drainage basin.

The main ecological units of large-scale marine systems are defined by oceanographic conditions, such as energy, salinity, temperature, upwelling, currents and the mixing of fresh and marine waters and the regional biological diversity supported by these conditions.

Freshwater regions

For freshwater systems, classification is by watershed (hydraulic) sub-region or unit (USGS 1979). These sub-regions are created by river systems but may include a river reach and its tributaries, a closed basin or basins, or a group of streams forming a coastal drainage area (Seaber et al. 1987). A sub-region may include one or several individual watersheds, depending upon local or regional topography.

A total of eight sub-regions are found in Washington State (Figure 3). Because hydraulic sub-regions are based on watershed characteristics, they are appropriate units for the conservation planning of aquatic systems. Currently, many local and regional conservation and restoration efforts are organized around watershed planning units, based upon the (watershed) hydraulic sub-regions described in this guidance document.

Figure 3: Freshwater Biogeographic Regions of Washington State **(USGS 1979)**

Marine regions

At the landscape scale, Washington's marine ecosystems are defined primarily by the influences and mixing of specific freshwater systems with marine waters. Three primary marine regions in Washington are identified by oceanographic and species observations.

- **Columbia River Littoral Cell—**defined by the movement of sediments in the Columbia River from their source to their point of deposition, this is a region extends from the Columbia River estuary northward to North Beach. This region encompassing approximately half of the outer Washington State coastline (Peterson et al. 1991), and includes the Columbia River Estuary, Willapa Bay and Grays Harbor. Each receives important sandy sediments from the Columbia River.
- **Olympic Coast**—North Beach northward to the entrance of Neah Bay. This region is distinct, as it is influenced by the Pacific Ocean with no large freshwater discharges to the region.
- **Puget Sound** "inland sea" of Washington— extending from Neah Bay eastward and into Puget Sound. In order to have a common reporting template for monitoring results at a sub-basin scale (PSWQAT 2002), this inland sea is divided into nine sub-basins which are defined primarily by oceanographic zones and sills (Ebbesmeyer et al.1984). These nine sub-regions are: West Strait of Juan de Fuca, East Strait of Juan de Fuca, San Juan Archipelago, Strait of Georgia, Whidbey Basin, Admiralty Inlet, Hood Canal, Central Puget Sound, and South Puget Sound (Figure 4).

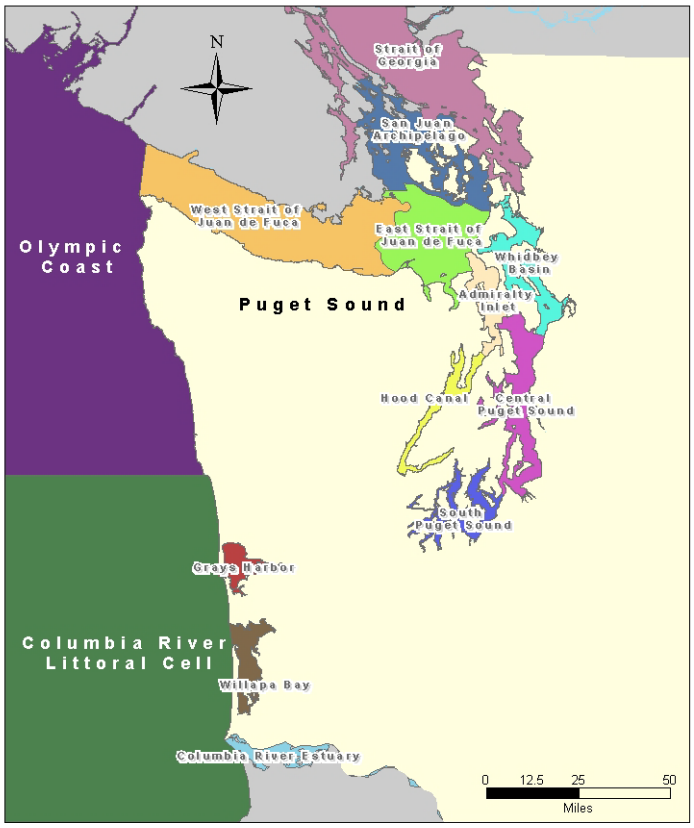

Figure 4: Marine biogeographic regions of Washington State (Ebbesmeyer 1984)

6.2 General Reserve Criteria

6.2.1 Ecological Criteria

The overall intent of the following series of criteria is to capture sites that exhibit high ecological quality and can enhance the management of aquatic resources in a manner consistent with Aquatic Reserves Program goals. Whether a site is proposed as an environmental, scientific, or educational reserve, it must meet this basic set of criteria to qualify as a state aquatic reserve. The evaluation of an environmental reserve relies entirely on the application of the general reserve criteria described in this section, while 'educational' or 'scientific reserve' proposals are evaluated using additional criteria described in sections 6.3 and 6.4 respectively.

Site Condition

- **Among equivalent proposed sites, DNR is to select the more pristine site.**
- **Less pristine sites may be selected if they aid in the restoration of strategically important aquatic habitats within the overall ecosystem.**

Discussion: Since very few ecosystems have avoided direct human influence and degradation (Vitousek et al. 1997), we lack a fundamental understanding of the historic natural condition. Therefore, it is important to act upon conservation opportunities using the precautionary approach until our understanding of these areas develops further (Sloan 2002). Applying this principle to aquatic reserve design suggests that sites that are fully functional and in relatively good condition have a higher conservation value. They are more predictable in their behavior and more resilient to minor insults than heavily degraded sites.

Among equivalent sites, DNR selects the more pristine site. However, this program has been developed in part to aid in the restoration of important aquatic habitats. It is recognized that the program likely will be applicable to sites that are undergoing intensive restoration. Where proposed reserves include a substantial restoration plan, the restoration plan should be included as an addendum to the proposal.

Biogeographic Representation

- **Sites are selected to distribute conservation efforts and ensure protection of aquatic habitats across aquatic biogeographic regions.**

Discussion: Representation of all biogeographic regions is a prerequisite for protection of biodiversity because assemblages of species will vary by region (Ballantine 1997). The Aquatic Reserves Program uses aquatic biogeographic regions to help make decisions that distribute conservation efforts and help ensure the protection of aquatic habitats across the diversity of habitats found in Washington State. However, it is important that reserve sites within a bioregion are sited in close proximity to each other (Rebelo and Sigfried 1992;Turpie and Crowe 1994).

Habitat Representation

- **Sites are to protect the majority of habitats at a level proportional to their abundance in a given biogeographic region.**
- **Sensitive, important or diminished habitats are targets for protection and may be over-represented in the reserve network when compared to the current distribution and abundance of habitats.**
- **Man-made, artificial, or altered habitats are not direct targets of conservation efforts, but may be included in reserves as restoration areas or as areas that conserve relict portions of the ecosystem.**

Discussion: Marine and estuarine habitats are classified according to Dethier (1990) or a similar habitat classification system. Many marine shoreline resources have been inventoried using the ShoreZone classification method (Berry et al. 2001), which is compatible with Dethier (1990).

Until such efforts are undertaken for freshwater habitats, DNR relies on the Cowardin et al. (1979) classification system. This classification system distinguishes major systems by a variety of hydrologic, geomorphologic, chemical, and biological characteristics. An overview of the habitat classes for riverine and lake (lacustrine) systems is provided in Figures 5 and 6.

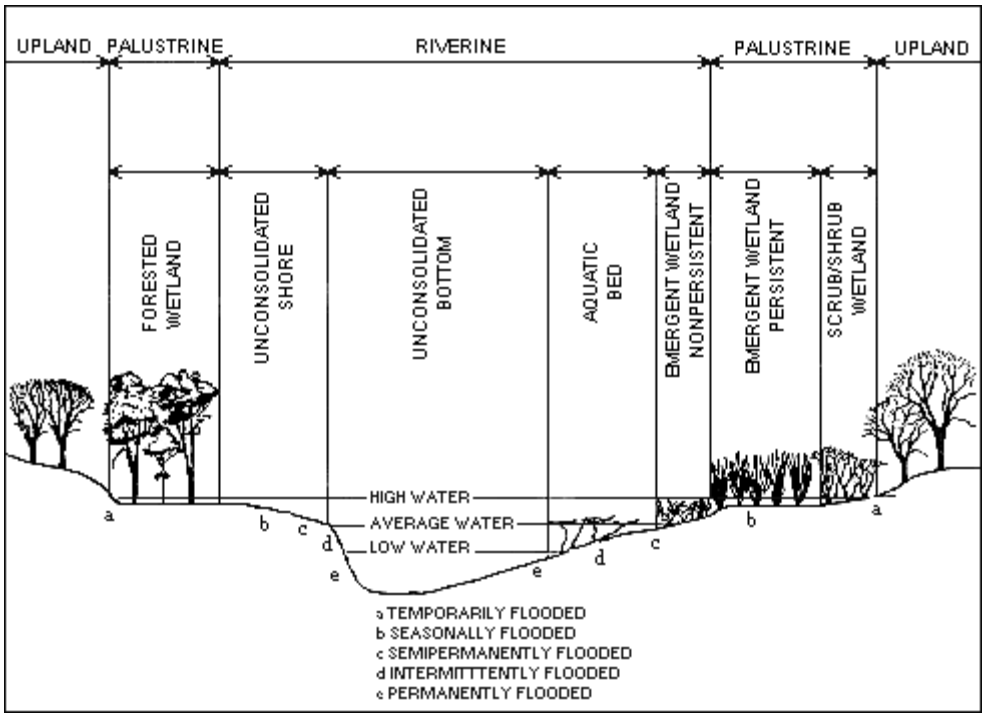

Figure 5: Distinguishing features and examples of habitats in Riverine Systems (Cowardin et al. 1979)

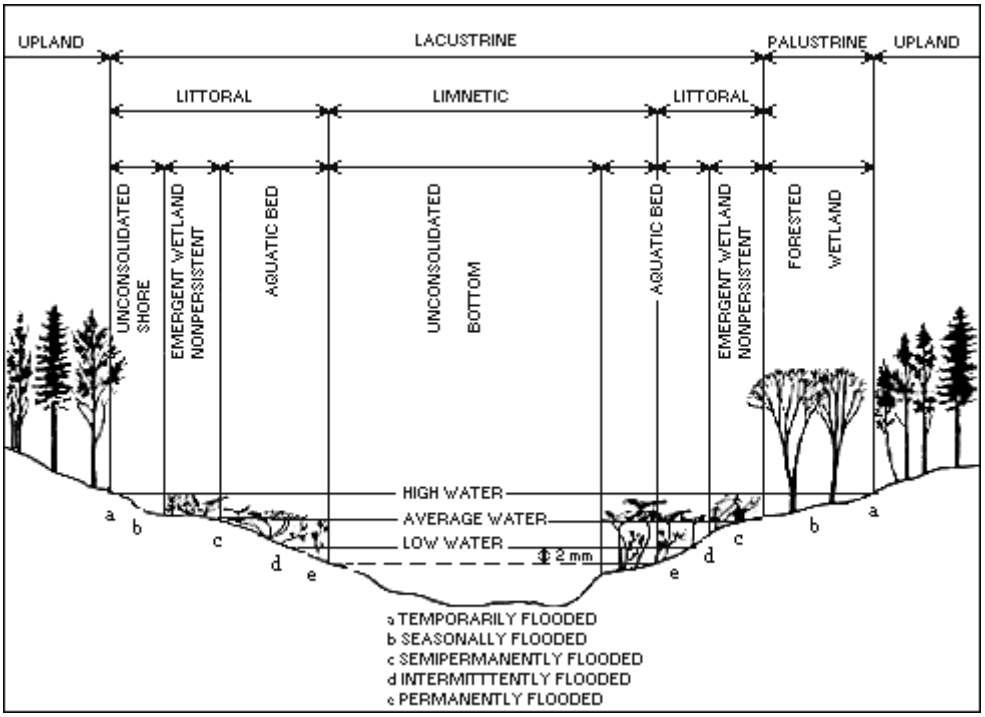

Figure 6: Distinguishing features and examples of habitats in lake (lacustrine) systems (Cowardin et al. 1979)

In the long term, the Aquatic Reserves Program would benefit from the collection of data following the hierarchical classification framework for freshwater ecosystems developed by The Nature Conservancy (Figure 7). This framework describes and predicts biological community diversity and distribution (Lammert et al. 1997). It characterizes aquatic ecosystems in abiotic (i.e., geologic, climatic, spatial) and biotic (i.e., biological) terms. Biological communities are nested within the following four spatially hierarchical levels. These levels, described in Table 2, range from the coarsest to the finest in scale:

- Ecoregional province
- Ecoregional section
- Macrohabitat type
- Habitat unit type

This classification system provides a standard way to describe the range of physical characteristics associated with each biological community type and to distinguish between ecological units that contain potentially distinct community types (Angermeier and Schlosser 1995).

The quantities of each type of habitat are to be assessed for their historic relative abundance within each biogeographic region, and a running tally of habitats in protected status are to be established. As the number of sustainable habitats found within a single reserve site increases, so does the value of the site as a reserve. Increased habitat diversity improves the ability of reserves to meet the overall reserves program objectives of protecting representative amounts of natural habitat. Furthermore, reserves that protect many types of habitat are more likely to support multiple life stages of target species (Appeldoorn et al. 1997).

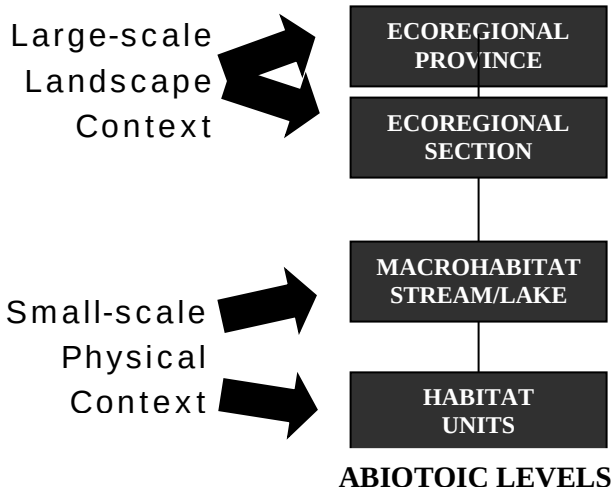

Figure 7: The Nature Conservancy's aquatic community classification framework.

Level	Description	Key Variables
Ecoregional Province	Large areas of similar climate corresponding to a broad vegetation region.	Climate General physical characteristics of the vegetation
Ecoregional Section	Areas of similar physiography within Ecoregional Provinces.	Landform Geology
Macrohabital Type	Types of small to medium-sized lakes or lake basins, and valley segment types of streams. Note: lake, riverine, and nearshore ecosystems are treated separately.	Surficial geology Local physiography Size, shape, and network position
Habitat Unit Type	Distinct subunits of macrohabitats that capture the physical variability.	Depth and light penetration Velocity (riverine) Substrate

Table 2. Definitions and key variables for each classification framework level

Biodiversity within a site

- **Habitat biodiversity should be factored when promoting a site as part of a reserve network.**

Discussion: Sites with the highest biodiversity per unit area provide a mechanism for conserving a maximal amount of our aquatic natural heritage. A danger in focusing protection efforts on areas with high "observed" biodiversity is that areas with intermediate habitat quality are known to frequently harbor high species richness, even though they may be dominated by cosmopolitan or invasive species (Rapoport et al. 1986). In identifying areas of high biodiversity we must also account for:

- Natural increases in biodiversity associated with larger areas due to species-area effects, and
- Natural differences in biodiversity between biogeographic regions.

In marine ecosystems, representative examples of most species can be captured in a relatively small number of larger reserves. Freshwater habitats exhibit considerably high diversity due to large differences in species composition between the various river and lake systems. Therefore, in freshwater systems, DNR may expect to develop a reserve system consisting of a relatively larger number of smaller reserves in order to capture viable examples of most species and habitat types.

Site Size

- **Sites are to be of sufficient size to provide for internal recolonization of species in response to natural disturbances.**
- **Proposed reserve sites should be large enough to capture entire habitats of interest, including eelgrass beds, kelp beds, stream reach, riparian area, or other aquatic habitats.**
- **When possible, reserve sites should include buffers surrounding species populations and habitats of interest.**

Discussion: Providing clear guidance on aquatic reserve size is difficult, due to the trade-offs associated with increasing size. There is no single size, scheme of management, or means of protection that is universally applicable to all aquatic reserves. The appropriate size, management scheme, and means of protection depend upon the purpose for which a reserve is to be established.

Since reserves often act like habitat islands in a sea of habitat degradation, larger and more numerous connected reserves tend to be particularly beneficial for preserving species diversity (Diamond 1975, Simberloff and Abele 1976). Research in marine habitats suggests that the preservation of discrete fragments of habitat within larger areas of degraded habitat could provide significant conservation benefits (McNeill and Fairweather 1993). However, social, political, and economic forces tend to create smaller, less numerous and highly dispersed reserves. An important goal for all reserves is to be of sufficient size to provide for internal recolonization of species in response to natural disturbances (Pickett and Thompson 1978).

Models suggest that highly mobile species decrease the effective size of reserves (Boersma and Parrish 1999). Reserves targeting species that are more mobile should be larger than those focused on protection of sedentary or sessile organisms. Thus, setting the minimum reserve size will vary depending upon the specific species or habitats the reserve is designed to conserve. Sites should be large enough for plant and animal populations to be self-supporting. Larval studies suggest that sites less than one square kilometer in size are likely to export most larval production (Figure 8), and therefore are unlikely to receive recruitment benefits from habitat protection (Kinlan and Gaines 2003). Whenever possible, sites should capture the full range of habitats used by animals throughout various life-history stages.

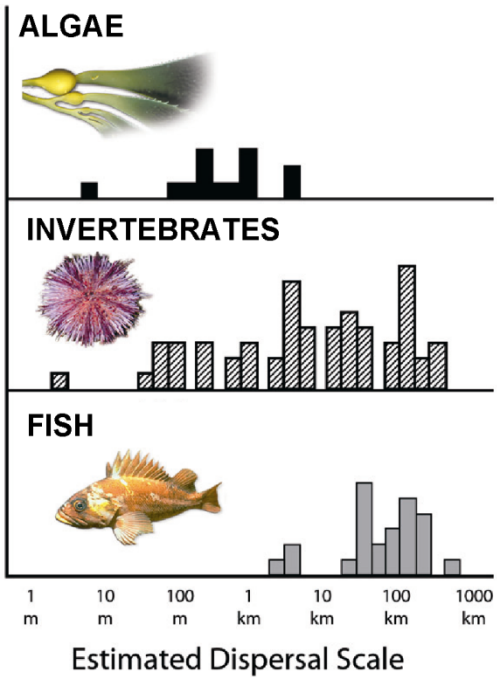

Figure 8: Estimated dispersal of algae, invertebrate and fish (adapted from Kinlan and Gaines 2003)

It is likely that the state Aquatic Reserves Program is best suited for sites that are hundreds to thousands of acres in size. Sites smaller than this range will likely require intensive management to maintain features of interest. This intensive management would raise costs while generating uncertain outcomes. Increasing reserve size increases the likelihood that the reserve network can capture and sustain entire ecosystem components.

Viability

- **Focal species and habitats are to be protected in multiple, spatially disjunct, but ecologically connected reserves.**

Discussion: Populations of large animals found within aquatic reserves are unlikely to be viable in isolation. However, wherever possible the reserves are to contain viable populations that are large enough to maintain populations despite random effects. When protecting sufficient habitat for larger animals in a single reserve is not possible, protecting many habitat patches may enhance the viability of populations (Roberts 2000). Therefore, the Aquatic Reserves Program is to seek proportionately more representations of habitats used by larger, more mobile target species.

A basic tenet of reserve design is that targets should be protected in different reserves (Ballantine 1997). In developing the Aquatic Reserves Program, DNR recognizes the important role of regulation and protection for aquatic resources. Multiple representation is particularly important in aquatic systems because such systems are naturally dynamic and prone to pulses of rapid change. Severe storms, floods, species invasions, and disease are among the natural catastrophes that can be expected to impact many aquatic reserves. Natural catastrophes tend to be unpredictable, and occur at temporal and spatial scales that are beyond the scope of this program's management. Reserves may be adversely affected by natural disturbances that are prolonged, extreme, rapid, or infrequent (Roberts et al.

2003). To mitigate for these potential impacts, sites should be large enough for internal replenishment. However, to avoid unintended consequences of natural catastrophes, it is also important to protect focal species and habitats in multiple, spatially separated, but ecologically connected reserves.

Ecological Connectivity

- **Ecological connectivity among reserves is important to support biodiversity within and beyond aquatic reserves.**

Discussion: An important consideration of reserve selection is the need to link between terrestrial and aquatic realms, as well as the links between aquatic realms. Conserving aquatic resources requires consideration of shorelines and upland areas (Salm and Clark 2000). In addition, since many aquatic species are highly mobile, and have different habitat requirements at different life stages, habitat connectivity is instrumental to successful reserve network design. Types of connectivity may include:

- Exchange of offspring, such as mating of individual members of a species, which improves gene pools for countering impacts of various kinds.
- Movement of juveniles and adults in breeding ground activities to sustain population viability.
- Transfer of materials, such as organic carbon (Roberts et al. 2003), and transfer of species to areas outside the reserve supports expansion of species' ranges and provides an advantage for resource gathering that could improve the health of sensitive species populations.

Individual sites managed through the state Aquatic Reserves Program are unlikely to protect sufficient territory to fully capture the range of habitats used by most species throughout their lifetimes. Cetaceans, salmonids, and pinnipeds are likely to spend a small portion of their lifetimes in any one reserve. However, the reserve network should support the ecological processes, habitats, and species that ultimately provide for the long-term survival of these species. Additionally, aquatic reserves can directly support the long-term survival of species by protecting areas used during sensitive life stages, such as haul-out areas and spawning beaches.

Variability in ocean currents, spawning seasons, larval life histories, and dispersal distances (from meters to hundreds of kilometers) makes it virtually impossible to obtain a single value to measure connectivity between sites for all taxonomic groups (Sala et al. 2002). Studies examining marine larval dispersal have identified at least two scales— distances of less than one and greater than 20 kilometers—in which reserves should be positioned relative to each other to support dispersal of aquatic larvae among reserves (Grantham et al. 2003). While recent studies have suggested that larvae may be traveling shorter distances than initially thought (Kinlan and Gaines 2003), reserves less than one square km in size are likely to support internal colonization for a limited portion of the ecosystem—primarily algae and some invertebrates. Most fishes and many invertebrates are believed to disperse more than 10 kilometers with a mean dispersal distance for fish species of approximately 100 kilometers (Figure 8; Kinlan and Gaines 2003). These taxonomic differences in dispersal emphasize the need to examine connectivity at multiple scales to adequately support metapopulation dynamics of aquatic species.

Species of Special Concern

- **DNR considers a species or subspecies "of special concern" if it is identified through population viability analysis to have a moderate to high probability of extirpation from Washington State over a 100-year planning horizon. A species found to have declined in abundance by 90 percent or more from historic levels within their (Washington) range are considered a species of special concern.**
- **Specific types of habitat receive special attention, including those that are rare, support high primary productivity, are known to support large numbers of animals, or support species of special concern.**

Discussion: Species of special concern include threatened, endangered, and sensitive species, as recognized by the state or federal governments. Species receiving similar designations by the provincial government in British Columbia or the federal government in Canada will also be considered. However, these lists are known to have taxonomic bias (Tear et al. 1995), as the listing or lack of listing of any one species may be limited by the understanding of a given species' needs. Therefore, this document provides additional guidance for the inclusion of species that may not yet be officially listed as conservation targets. DNR will consider any species or subspecies identified through population viability analysis, such as those found in Lande (1988), to have a 90 percent or greater probability of extirpation from Washington State over a 100-year planning horizon to be a species of special concern, regardless of its formal listing status. Additionally, any species found to have declined in abundance by 90 percent or more from historic levels within their Washington range are to be considered a species of special concern.

Unfortunately, population and distribution information is rarely kept for species that are not the targets of harvest fisheries. The Aquatic Reserves Program will work with other partners to further develop the capacity to collect and store species observations of abundance and distribution for both commercially important species and those that are not the target of harvest.

The Aquatic Reserves Program seeks to protect representations of all major aquatic habitats found in Washington. However, a few types of habitat will receive special attention in this program, including habitats that are rare, support high primary productivity, are known to support large numbers of animals, or support species of special concern – particularly during predictable aggregations. In addition, the Aquatic Reserves Program recognizes that habitats often occur in a range of successional stages and it will attempt to support that range of successional stages.

Vulnerable Habitats, Life Stages, or Populations

- **Sites protect those habitats that are used by species during vulnerable life stages.**

Discussion: A central role of the Aquatic Reserves Program is to protect habitats used by species during vulnerable life stages. Vulnerable life stages include periods of natural aggregation, such as during spawning, breeding, or migration as well as haul-out areas. River and stream mouths are especially sensitive areas for a number of reasons. First, species often 'hold' in the vicinity of stream and river mouths both before they enter the freshwater from the marine environment and before they leave the freshwater for marine waters. This

'holding' is often essential to the physiological adjustment necessary to transition from fresh to saltwater or vice versa. River and stream mouths also deliver nutrients to the marine environment leading to the development of relatively rare habitats that thrive in this high nutrient environment.

Ecosystem Processes

- **A reserve network supports important biological processes including spawning areas, migratory pathways, feeding areas, settlement, and concentrated feeding areas.**
- **The Aquatic Reserves Program maintains physiochemical processes and other ecosystem functions to sustain aquatic ecosystems.**

Discussion: Important biological processes to be captured within the aquatic reserves network include spawning areas, migratory pathways, feeding areas, holding areas, and concentrated feeding areas. Natural disturbance regimes, such as seasonal flooding and tidal action, sustain the structure and functions of regional aquatic ecosystems. Dynamic and sometimes destructive forces play an important role in structuring biological communities and habitats (Paine 1969). The natural organization of aquatic ecosystems, and particularly wetlands, is strongly influenced by dynamic disturbance regimes (White and Pickett 1985).

Unlike terrestrial ecosystems where ecological structure is strongly dominated by trophic interactions, the organization of aquatic ecosystems is strongly mediated by physiochemical and other environmental factors. Factors, such as river flow, sediment re-suspension, and circulation features, alter the scope and intensity of responses to either bottom-up (Boynton and Kemp 2000) or top-down (Alpine and Cloern 1992) controls on community and food web structure and production. Therefore, the Aquatic Reserves Program is to target the maintenance of physiochemical processes because of their essential role in sustaining aquatic ecosystems.

6.2.2 Socioeconomic Criteria

When balancing the environmental, educational, or scientific benefits of an aquatic reserve designation against the actual or perceived economic costs, "we are often left trying to balance the 'good' of ethics with the 'goods' of economics" (Morowitz 1991). Beyond the difficulties in assigning economic values to environmental features and services, it is often necessary to contrast what is financially beneficial to private individuals against what is broadly beneficial to society as a whole. Protected areas have a valuable economic characteristic—most of the benefits of a protected area can be "consumed" by one person without affecting the ability of another person to also benefit from the protected area (Munasinghe and McNeely 1992).

Cultural Resources

- **Aquatic reserves will support valuable cultural and archeological resources where appropriate.**

Discussion: Washington has a rich cultural history, a history that has been degraded and damaged by time, changes in climate and human disturbance. Cultural resources include a range of different resource types. These resources include archaeological remains and locations of continued traditional use of primary significance to Native Americans. While reserves are examined primarily

for their environmental attributes, reserve designation may be influenced by the presence of sensitive cultural artifacts or current uses.

As part of the protection and management of reserves, DNR promotes a greater knowledge base and understanding of cultural resources, tribal cultural practices, and significance of archaeological sites and place names.

By preserving and managing cultural resources in a sustainable manner, future generations may share in the understanding of regional archaeological and cultural sites. Furthermore, protection may provide opportunities for individuals and groups to continue to engage in culturally important practices.

Historic artifacts such as historic fishing villages or clam middens are potential indicators of the long-term importance of a site for environmental and cultural purposes. By identifying and protecting cultural artifacts, we also may provide opportunities for study and exploration of historical interactions between society and the environment.

Public Benefits

- **DNR is to provide a balance of public benefits.**

Discussion: Living marine resources provide essential economic, environmental, aesthetic, and other benefits. Management of aquatic lands is intended to "provide a balance of public benefits for all citizens of the state" (RCW 79.90.450). This balance requires DNR to consider all relevant values associated with a site. In some cases, the Aquatic Reserves Program will arbitrate or synchronize alternative uses for a site.

The values associated with a site include: direct use values, indirect use values, future option values, and non-use values.

- Direct use values would include consumptive (e.g., marina development or shellfish aquaculture) as well as non-consumptive (e.g., tourism or SCUBA diving) uses.
- Indirect use values are derived from the economic benefits associated with ecosystem services, such as wetlands purifying surface water, sediment transport (that has costs and benefits associated with it), oceanographic mixing (for instance, diluting and disbursing sewage), tidal action, etc.
- Future option values relate to potential future use of resources, such as components of the ecosystem that might be useful sources of food or medical products in the future but are not currently utilized. Option values could also apply to situations such as reserving an area for a future port for ships.
- Non-use values relate primarily to spiritual, cultural, and aesthetic values that individuals and cultures hold for the natural environment.

If aquatic reserve designation conflicts with current or projected uses of an area, analysis of the site's values are to be provided to the Commissioner of Public Lands to assist in a decision as to what use best serves the long-term public benefit.

6.2.3 Manageability Criteria

The effectiveness of reserves as a mechanism for conservation is highly dependent upon the quality of protection and management of the reserves (McNeely et al. 1994). To maximize the effectiveness of the state Aquatic Reserves Program, sites must be manageable and have clear boundaries that are transparent to potential users. Ecologically sound biological boundaries are difficult to identify in many cases due to the dynamic and transient nature of many aquatic habitats and species. Therefore, boundaries should tend to be ecologically conservative, capturing the target resources in addition to a buffer zone to account for unintentional encroachment on reserve boundaries as well as uncertainty regarding biological behaviors.

Ecological concerns

- **Management strategies are developed to address environmental impacts.**

Discussion: The Aquatic Reserves Program is designed to protect specific ecological features from degradation. Each aquatic reserve management plan must implement actions to preserve the viability of aquatic reserve and attain site specific and programmatic goals and objectives.

Management plans should identify sources, intensity, and manageability of environmental impacts to the site-specific ecological features that originate from within the reserve. However, reserve planning also must identify potential sources, intensity, and manageability of potential impacts that originate from outside of the reserve boundary.

Social/Political Acceptability

- **There is to be stakeholder participation in the proposal process, development of the management plan, and implementation of an aquatic reserve.**

Discussion: A lesson from other protected areas is that the active participation of stakeholders in planning and management can improve success of the protected area. Forcing local user groups to accept a protected area may create resentment and diminish the likelihood of compliance with voluntary, proprietary, or regulatory practices. The degree of local recognition for natural resource value at a site is an important barometer for reserve implementation success. The Aquatic Reserves Program must promote public participation to aid in determining the public perception of natural resource values at the site, identify their interests, and to ultimately foster acceptance and support for reserve designation.

6.3 Scientific Reserve Criteria

In addition to the general reserve criteria in Section 6.2, the following criteria are desirable for proposed scientific aquatic reserves. Scientific aquatic reserves are primarily developed as controls for scientific inquiry, with occasional opportunities for manipulation. However, it is important to have flexibility in the application of scientific reserves. Research on scientific reserves may assist in the development of baseline population densities and assemblages. Such research can be undertaken to improve understanding of the natural system. By enhancing our

understanding of the functioning of the natural system, we may improve aquatic resource management.

Interest to the scientific community

- **The site has expressed support from the scientific community.**

Discussion: Proponents of scientific aquatic reserves should have adequate financial support, technical capabilities, staffing, and resources to establish and maintain a long-term research program. Project proponents should have established ties to public or private research facilities, recognized statewide or regional research programs such as the Puget Sound Ambient Monitoring Program (PSAMP), public and private education facilities, or association with government entities.

Presence of current research projects

- **DNR favors sites with a history of ongoing monitoring.**

Discussion: For many locations, reserve designation provides a change in management from unprotected status to protected status. A failure of many monitoring efforts is to adequately capture and describe the pre-protection baseline conditions that allow for the evaluation of the impacts of management on biological communities and habitats. Therefore, sites with a long or detailed history of scientific research projects that might benefit from reserve status are favored during reserve selection.

Low degree of alteration

- **Scientific aquatic reserves are selected for and are maintained to have a low degree of alteration from their natural state.**

Discussion: Since there are very few ecosystems that have avoided human influence (Vitousek et al. 1997), there is a lack a fundamental understanding of natural conditions at a site. Fully functional scientific aquatic reserves in good condition have a higher research value than those sites that have been altered from their natural state.

Research without irreparable harm

- **The site has the capacity to support research without causing irreparable harm**

Discussion: Scientific manipulation at a site can significantly disrupt ecosystem process or the physical structure of a site. Therefore, research proposed for a reserve, in most cases, should not permanently or dramatically alter the natural conditions of the aquatic reserve or neighboring systems or habitats in order to advance knowledge.

6.4 Educational Reserve Criteria

In addition to the general reserve criteria in Section 6.2, the following criteria are desirable for proposed educational aquatic reserve proposals. The education of an ‘environmentally literate citizenry’ and the acquisition of responsible environmental behavior has long been recognized to be the primary and ultimate goals of environmental education (Stapp 1969, Roth 1970, UNESCO 1980, Roth 1992). The active participation of the general public is a key factor in preventing

and solving the environmental problems of contemporary society (UNESCO 1978, 1980).

Through the designation of educational reserves, the Aquatic Reserves Program will support the requirement for "instruction about conservation, natural resources, and the environment" to be provided at all grade levels, as required by state law (RCW 28A.230.020). A recent survey of 709 K-12 schools in Washington identified access to field-based learning as one of the most important resources needed to improve student learning (Angell 2003). Many studies have indicated that experiences in the outdoors (and in particular experiences in natural areas) is the number one factor influencing people towards development of environmental sensitivity (James 1993, Palmer 1993, Tanner 1980) and commitment to environmental protection (Chawla 1999). Outdoor experiences at an early age have positive long-term effects.

Educational Value

- **Sites that have a history of use for education are given priority.**

Aquatic reserves provide a natural laboratory for exploration by students of all ages. There are several lessons that can be taught using such areas as natural laboratories for observational inquiry. Lessons may include exploration of the relationships between species and their habitats as well as the impacts of other disturbances and development of resources. Sites that have a history of use for educational purposes are to be given priority over sites of similar ecological value. To maximize the value of these reserve sites, proponents should establish repositories for observational and natural history information for the site.

Distribution of Sites

- **Areas with habitat that is underrepresented in the region have higher priority.**

One function of aquatic reserves is to provide educational opportunities for adults and children. This requires that sites be accessible to people where they live. An emphasis is placed on distributing sites throughout Washington. Therefore, the Aquatic Reserves Program prioritizes proposals for sites that are under-represented in the existing educational network.

In addition to the location of other reserves, it is important to consider the types of habitat that are available for students of all ages to experience. Habitats that are under-represented in the educational reserve network are given higher priority.

Ease of Access

- **Proposed sites must have safe and ready public access.**

A vital consideration for all reserves is the amount and quality of access to the site. Access can be from the water or the adjacent uplands. Appropriate management measures such as the development of entry paths or boardwalks, establishing a right-of-way or arrangements for established access to the site, mooring buoys, or other measures that concentrate and direct use during site visits should be established.

6.5 Application of Criteria

The selection of areas for conservation often involves the prioritization of potential reserve sites based on selection criteria (Wright 1977). However, few researchers agree on the relative importance of different criteria, complicating efforts to develop universally accepted methods (Margules and Usher 1981). Evaluating sites using criteria scores is an artificial construct that can be misleading when evaluated in isolation. Therefore, drawing conclusions from site-specific scores is most valuable when placed in context and compared to a range of well-documented sites. Therefore, over time, DNR will develop site evaluations for several reference sites using the described criteria to provide appropriate context for site evaluations (Alder et al. 2002). The Aquatic Reserves Program will take advantage of such iterative approaches by developing the reserve network over time.

All goals and criteria are unlikely to be satisfied for any individual site. It is important that the program be flexible in the application of reserve criteria. Over time, the program will adapt to prioritize criteria and goals that are being underachieved by the reserve network.

Site proposals are evaluated using ecological criteria first. The program places the most emphasis on selecting those sites that have the highest ecological value. However, where two sites are of comparable value ecologically, then socio-economic criteria dominate the choice of which ones should be protected (Roberts et al. 2003).

The Technical Advisory Committee, an independent panel of scientists and professionals, evaluates individual site proposals for aquatic reserve status. The criteria and specific indicators used to address each criterion are delineated on the Site Evaluation Form (Appendix I). Several of the criteria identified in the program's Final EIS require use of multiple indicators and questions pertaining to them. To avoid overvaluing one criterion over another, the committee members apply the criteria as they relate to each site and ecoregional priorities.

Environmental reserve evaluations rely entirely on the application of the general reserve criteria (Section 6.2), while scientific (Section 6.3) or educational reserve (Section 6.4) proposals are evaluated using additional criteria.

Best Practices for Aquatic Reserve Evaluation

Use All Available Data

DNR staff make a concerted effort to work with site proponents to find all available relevant data for aquatic reserve proposals prior to convening the Technical Advisory Committee to evaluate those proposals. Additionally, the Department must attempt to collect adequate information to determine the potential for success in achieving the Aquatic Reserves Program's goals and objectives.

Criteria Update and Review

Criteria used to evaluate reserve proposals is reviewed and updated as scientific information becomes available. All available scientific information will be made available to the committee for their site evaluation.

Section 7

Glossary

Benthic – living at, in, or associated with structures on the bottom of a body of water.

Biodiversity – variety of organisms considered at all levels, from genetic variants belonging to the same species through arrays of species to the arrays of genera, families and still higher taxonomic levels; includes the variety of ecosystems, which comprise both communities of organisms within particular habitats and the physical conditions where they live. Structural, functional, and compositional diversity of organisms and their environments.

Biogeography – spatial distribution of plants and animals, both past and present.

Degradation - loss of native species and processes resulting from human activities such that only certain components of the original biodiversity still persist, often including significantly altered natural communities.

Distribution – occurrence, frequency of occurrence, position, or arrangement of animals and plants within an area.

Indicator physical, chemical, biological or socioeconomic measures of particular attributes used to indicate state or condition.

Ecosystem – community of organisms and their physical environment interacting as an ecological unit.

Ecosystem functions – biophysical processes that take place within an ecosystem. Examples include nutrient cycling and water purification.

Ecological process – processes that govern material, energy, or information transfer (e.g. nearshore drift).

Ecosystem integrity – capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having species composition, diversity, and functional organization comparable to that of the natural habitat of a region (Karr 1987).

Habitat – an environment of a particular kind, often used to describe the environmental requirements of a certain species or community.

Marine – saltwater or living in saltwater.

Manageable – a human-induced or natural event, action, structure, or characteristic that can be affected by regulation or proprietary actions.

Nearshore – estuarine delta and marine shoreline and areas of shallow water from the top of the coastal bank or bluffs water-ward to a depth of about 10 meters relative to Mean Lower Low Water (average depth limit of photic zone).

Plankton – small plants and animals, generally smaller than 2 mm and without strong locomotive ability, that are suspended in the water column and carried by currents or waves and that may make daily or seasonal movements in the water column.

Resilience – the speed at which a habitat, population, or community is able to return to equilibrium following a perturbation.

Shoreline – the zone where the ocean is in contact with dry land.

Species richness – a simple measure of species diversity calculated as the total number of species in a habitat or community.

Terrestrial – living or occurring on land.

Threat – A human-induced or natural event, action, structure, or characteristic that is likely or documented to cause harm to a species, population, or ecosystem.

Trophic – related to the processes of energy and nutrient transfer (i.e., productivity) from one level of organisms to another in an ecosystem.

Viable – when referring to a species, capable of living through reproductive age; when referring to a population or ecosystem, able to survive into the foreseeable future at current abundances without external support or immigration.

Section 8

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Appendix A - Site Proposal Application

Section 1 – New proposal, Boundary change, or De-Listing an Aquatic Reserve

Please fill out the form as completely as possible. Answer those items that you know apply to the proposed site. Leave blank any questions to which you do not know the answer.

(The site proposal application can be found at www.dnr.wa.gov/htdocs/aqr/reserves/home.html).

Site Proponent

Name:
Address:
Phone:
E-mail:
Primary contact:
Who have you cooperated with to develop the proposal?

General site information

A. Site location:

B. Site Overview:

1. General site description (including acreage)
2. Boundaries description (include section, range and township, county)
3. Current ownership of privately and publicly owned (other than DNR) aquatic lands adjacent to the proposed site (include detailed ownership map).
4. Current county shoreline designation and description

C. Justification for proposal: (Briefly summarize the reasons for proposing the site as an aquatic reserve based on the criteria discussed in Section 6 and Appendices C, D, E, and F).

Environmental Reserve Information

To be provided for each reserve proposal (environmental, scientific, or educational).

Ecological and cultural quality of the site

1. **Current condition of the site**

a. Is the site degraded?
b. Are there signs of habitat loss within the site?
c. Are there signs of habitat loss within the biogeographic region?
d. Are ecosystem processes (e.g., freshwater flow, littoral drift, nutrient cycling, etc.) intact?

2. **Risks to the ecosystem or feature of interest (if applicable) –** Can ecological concerns contributing directly to the area's decline be prevented through reserve establishment?

3. **Restoration potential**
   a. Is there pending restoration or identified restoration needs at the site?
   b. Would restoration benefits extend beyond site boundaries?

4. **Special value for biodiversity or species diversity**
   a. Does the proposed site capture habitat used regularly by species of special conservation interest?
   b. Does the proposed site capture vulnerable habitats, life stages or populations? (Vulnerable habitats, life stages or populations include: seal haul-outs, breeding bird aggregations or rookeries, seasonal bird aggregations, seasonal fish aggregations (e.g. feeding, spawning) or fish and wildlife migration routes.

5. **Ecological processes that sustain the aquatic landscape –** Would protection of the site protect/maintain ecological processes that sustain the aquatic landscape (e.g., freshwater flow, littoral drift, nutrient cycling)?

6. **The cultural quality of the site–** Does the site contain or protect significant cultural resources? (Does the site contain heritage, historical, or cultural resources that are eligible for the Washington Register of Historic Places, (RCW27.34.220) or the National Register of Historic Places?

Habitats and features represented within the site

7. Is the site a good example (relatively undisturbed) of representative native habitat?
8. Does the site contain representative habitats not otherwise protected in the network of protected areas or aquatic reserves?
9. Does the proposed site capture species or habitats that are currently much less common than they were historically within the site's "biogeographic region" (See Section 6, Figures 3 and 4)?

Viability of the occurrences of interest

10. **Site features meet the intent of the reserve**
    Are species, habitat, or ecosystem processes consistently associated with the reserve site?
11. **Number of conservation targets** *(As it relates to information in "Special value for biodiversity or species diversity," question #9 above).* Identify the habitat(s) and associated species you are proposing for conservation.

Summarize the conservation goals.

12. **Number of ecological processes**
    Does the site contain unique or distinctive physical habitat features (e.g., oceanographic gyre, oceanographic sill, natural beach spit, side channels, ox bow, estuary, etc.)?

Defensibility of the site

13. **Complementary protection within a reserve or protected area network**
    Does the site include habitat types that are under-represented on a bioregional basis, in the Aquatic Reserves Program, or other marine protected area or network?
14. **Connectivity to a reserve or protected area network and/or for species and/or habitats**
    a. Is site adjacent to existing marine or freshwater protected areas administered for preservation or restoration purposes?
    b. Does the site provide regional habitat connectivity through any of the following functions? Refuge (predator, physiological, high energy), food production, migratory, corridors, spawning, nursery or rearing, riparian vegetation, adult habitat, other functions. Please provide references to support this information.
15. **Appropriate size to be sustainable**
    Is the area large enough to be self-sustaining? Is the entire feature identified for conservation included in the proposed site? Does the site include the adjacent areas necessary to support and buffer the conservation features of the site?
16. **Ability to persist over time**
    a. Can site be successfully managed to maintain the features of interest?
    b. Are there known human-caused, or natural ecological concerns, to continued viability of the site?
17. **Known or anticipated activities that endanger the site or habitat**
    Are proposed land uses or modifications compatible with reserve designation (Modifications of interest are described in Appendix B)?
18. **Potential for factors contributing directly to the area's decline to be prevented**
    Would reserve status provide protection for habitats, species, or processes of interest from encroachment?

Manageability of the site

19. **Coordination with other entities, including local jurisdictions and current leaseholders**

a. Does the proposal include coordination of reserve actions with other entities, including local jurisdictions and current leaseholders?[1]

b. Has another entity previously identified this site or areas within the site as a priority for protection? *[Examples include Important Bird Areas (Cullinan 2001), priority areas for Research Natural Area Designation (Dyrness et al. 1975), or priority areas for conservation (e.g., through ecoregional planning, Natural Heritage Program research (Kunze 1984), or similar process (Dethier 1989)]*

c. Have potential cooperative management partners been identified for management, monitoring, and enforcement? [2]

d. Is the site adjacent to terrestrial protected areas managed for conservation or restoration purposes?

20. **Provide a description of how to measure success (i.e., monitoring). Describe what, if any, monitoring needs**

    Does the reserve proposal include a monitoring plan that measures reserve progress toward goals and provide for adaptive management?

21. **Kinds of enforcement needed to make sure incompatible uses and impacts do not encroach on the reserve**

    What kind of enforcement is needed to prevent incompatible uses and impacts from encroaching on the reserve?

22. **Does the site serve or conflict with the greatest public benefit?**
    a. Does reserve status represent the greatest public benefit?
    b. Is reserve status compatible with existing or proposed adjacent uses?

Section 2 - Additional information to be provided for SCIENTIFIC RESERVE Proposals

Coordinate your responses to the following questions with answers provided under site-specific Environmental Reserve site information, above.

1. **Rare site including a wide variety of habitat types and ecological processes** *(See: "Special value for biodiversity")*
2. **Relatively undisturbed example of habitat that was common historically** *(See: "What is the current condition of the site?")*

3. **Is the site of interest to the scientific community?**
    a. Does site represent a unique research opportunity?
    b. Do proponents have a history of successful scientific research?
4. **Species richness**

    Does site exceed expected species richness for areas of similar size? *(i.e., does site contain plant and animal communities suitable for continuing*

[1] This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent best management principles that the Aquatic Reserve Program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

[2] This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent the best management principles that the Aquatic Reserve program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

scientific observations (WAC 332.30.106).

5. **Viability and manageability of the site, able to support rare, special, and unique features?**
6. **Site contains a high degree of biodiversity for habitat type**

   Does site exceed expected biodiversity as measured using Shannon's diversity index (an index that measures diversity and evenness of species) for similar habitats?
7. **Site should be manipulated without doing irreparable harm to neighboring systems or habitats in order to advance knowledge (where applicable)**

   a. Do proposed manipulations affect the physical (e.g., habitat structure or ecosystem processes) or biological composition of the site?

   b.Are impacts of manipulation restricted to the site?
8. **History of monitoring or an opportunity for long term monitoring at the site**

   Does site have a historical monitoring record?

Section 3 - Additional information to be provided for EDUCATIONAL RESERVE Proposals

1. **Network of sites that provides an accessible distribution of sites throughout the state**

   Are education reserves available within a biogeographic region? (Education reserves may include areas operated by U.S. Fish and Wildlife Service, National Park Service, Washington State Parks and Recreation, or The Nature Conservancy that offer educational curricula.)
2. **Network of sites that provides an adequate distribution among habitat types –** Is the proposed site a unique example of habitat available for educational opportunities regionally or statewide?
3. **Sites that attract a range of target audiences –** Is the curriculum integrated into an applied educational program (e.g., school, public education program, etc.) and tailored to the unique features of the site.
4. **Sites that are compatible with educational use activities** – Are activities and conditions in the areas adjacent to the proposed reserve compatible with the uses proposed for the reserve?
5. **Current site conditions or activities adjacent to the site are compatible with the educational reserve** – Are activities and conditions in the areas adjacent to the proposed reserve compatible to the uses proposed for the reserve?
6. **Site whose ecological integrity can be preserved while providing public access –** How will the proponent maintain the unique ecological features of the site while providing public access for an education program?
7. **Site has a history of monitoring and an opportunity for long-term monitoring.** (Criterion applicable in cases described by Final EIS 3.2.1.4.3) – Does site have a historical monitoring record?

Appendix B - Potential Causes of Habitat Modification and Ecological Concerns

1. Adjacent residential upland development *
2. Adjacent industrial upland development *
3. Adjacent agricultural upland development *
4. Over water structures *
5. Shoreline armoring
6. Slope/bank stabilization
7. Development (marinas, port facilities, boat ramps, marine repair facilities, etc.) *
8. Sewer outfalls *
9. Stormwater outfalls
10. Mooring buoys
11. Derelict vessels
12. Submerged vessels
13. Fill
14. Underwater disposal sites
15. Contaminated sediment
16. Dredged areas
17. Revetments *
18. Piles
19. Nuisance species
20. Water Quality
21. Hydraulic modifications
22. Other

* Source: Final Report - Northwest Straits Nearshore Habitat Evaluation, prepared for the Northwest Straits Commission, prepared by Anchor Environmental, L.L.C. and People for Puget Sound. January 2002.

Appendix C – Priority Marine Habitat

The Washington State Deparment of Natural Resources' (DNR) responsibility is to manage aquatic habitat on state-owned aquatic lands. Priorities are driven by the use of this habitat by aquatic species that are not managed by DNR.

DNR-designated sensitive marine habitat

Source: Washington State Department of Natural Resources, Aquatic Resources Management Reference Manual, Section 20.1 (rev. date 9/94)

Vegetated marine estuarine

Includes eelgrass meadows, kelp beds, and turf algae in intertidal and subtidal areas to a depth of approximately 30.5 meters below mean lower, low water. Priority is also given to maintaining the following physical parameters necessary for kelp and eelgrass survival and growth: substrate, wave exposure/energy, salinity, light level, and nutrients.

- Kelp *(Macrocystis* and/or *Nereocystis*): Patches of sedentary floating aquatic vegetation.
- Eelgrass *(Zostera):* Habitat consisting of intertidal and shallow subtidal shores that are colonized by rooted vascular angiosperms of the genus *Zostera*.
- Commonly used forage fish spawning structural habitat for fish stocks identified by Washington State Department of Fish and Wildlife (WDFW) in the 1996 Forage Fish Stock Status Report (or updated edition).
- Habitat documented for use during critical life stages of priority aquatic species (e.g., refuge, forage areas, concentrated migratory corridor use versus lower value for passage, spawning, rearing, riparian habitat, adult habitat).
- Turf algae: Habitats consisting of non-emergent green, red, and/or brown algae plants growing on solid substrates rocks, shell, hardpan).
- Native (unaltered) estuarine mudflats.
- Gravel beaches - low energy, high energy.
- Sand beaches - low energy, high energy.

Marine priority habitat

Source: Washington Department of Fish and Wildlife, Priority Habitat and Species (www.wa.gov/wdfw/hab/phshabs/htm)

Estuary, estuary-like

- Deepwater tidal habitats and adjacent tidal wetlands usually semi-enclosed by land but with open, partly obstructed, or sporadic access to the open marine waters, where marine water is at least occasionally diluted by terrestrial freshwater runoff (not including non-point sources, such as stormwater runoff or sewer outfalls).

Marine/estuary shorelines

- Shorelines include the intertidal and subtidal zones of beaches. Backshore and adjacent components of the terrestrial landscape (such as cliffs, snags, mature trees, dunes, meadows) are important associated habitat for fish and contribute to marine/estuary shoreline function (such as sand/rock/log recruitment, nutrient contribution, erosion control). Though these areas may not be state-owned aquatic lands, and therefore, not included in the aquatic reserves, they may be significant adjacent habitat that are critical to the function of the reserve.
- Consolidated substrate: Rocky outcroppings in the intertidal and subtidal marine/estuarine environment consisting of rocks greater than 25 cm (10 inches) diameter, hardpan, and/or bedrock. Unconsolidated Substrate: Substrata in the

intertidal and subtidal marine environment consisting of rocks less than 25 cm diameter, gravel, shell, sand, and/or mud.

Riparian

- Area adjacent to marine shorelines that contain elements of both the aquatic and terrestrial ecosystems that mutually influence each other. Riparian habitat encompasses the area beginning at the ordinary high water mark and extends to the portion of the terrestrial landscape that is influenced by the aquatic system.


Photo by Phil Bloch

Appendix D - Priority Freshwater Habitat

Source: Washington Department of Fish and Wildlife, Priority Habitat and Species (www.wa.gov/wdfw/hab/phshabs/htm)

Note: These areas may not be on state-owned aquatic lands, and therefore, not included in the aquatic reserves. If not, they should be considered significant adjacent habitat that are critical to the function of the reserve.

Freshwater wetlands and fresh deepwater

- Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following attributes: the land supports, at least periodically, predominantly hydrophytic plants; substrate is predominantly undrained hydric soils; and/or the substrate is saturated with water or covered by shallow water at some time during the growing season of each year.
- Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. The dominant plants are hydrophytes; however, the substrates are not considered soil because the water is too deep to support emergent vegetation. These habitats include all underwater structures and features (e.g., woody debris, rock piles, caverns).

Instream

- The combination of physical, biological, and chemical processes and conditions that provide important functional life history requirements for fish and invertebrates.

Riparian

- The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. In riparian systems, the vegetation, water tables, soils, microclimate, and wildlife inhabitants of terrestrial ecosystems are influenced by perennial or intermittent water. Simultaneously, the biological and physical properties of the aquatic ecosystems are influenced by adjacent vegetation, nutrient and sediment loading, terrestrial wildlife and organic and inorganic debris. Riparian habitat encompasses the area beginning at the ordinary high water mark and extends to that portion of the terrestrial landscape that is influenced by, or that directly influences, the aquatic ecosystem. Riparian habitat includes the entire extent of the floodplain and riparian areas of wetlands that are directly connected to stream courses.

Appendix E – Priority Marine Species

Priority habitat and species lists are dynamic and because the Department of Natural Resources does not administer any lists of priority species, reference is made to three sources that DNR will use as the sources for its Priority Marine Species lists. Priority marine species are identified from the following three sources: Washington Department of Fish and Wildlife - Species of Concern in Washington State; Washington Department of Fish and Wildlife Fish Stock Status Reports, Species with critical stock status.

Source: Washington Department of Fish and Wildlife, Species of Concern in Washington State (June 2002) (http://www.wa.gov/wdfw/wlm/diversity/soc/soc/htm)

More habitat value if documented use for critical life stages of these species (e.g., spawning, rearing, concentrated use versus lower value for passage)

Fish (any documented occurrence)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
BLACK ROCKFISH	*SEBASTES MELANOPS*	SC	none
BOCACCIO ROCKFISH	*SEBASTES PAUCISPINIS*	SC	none
BROWN ROCKFISH	*SEBASTES AURICULATUS*	SC	none
BULL TROUT (COASTAL/PUGET SOUND)	*SALVELINUS CONFLUENTUS*	SC	FT
CANARY ROCKFISH	*SEBASTES PINNIGER*	SC	none
CHINA ROCKFISH	*SEBASTES NEBULOSUS*	SC	none
CHINOOK SALMON (PUGET SOUND ESU)	*ONCORHYNCHUS TSHAWYTSCHA*	SC	FT
CHUM SALMON (HOOD CANAL ESU)	*ONCORHYNCHUS KETA*	SC	FT
COPPER ROCKFISH	*SEBASTES CAURINUS*	SC	none
EULACHON	*THALEICHTHYS PACIFICUS*	SC	none
GREENSTRIPED ROCKFISH	*SEBASTES ELONGATUS*	SC	none
PACIFIC COD (S&C PUGET SOUND)	*GADUS MACROCEPHALUS*	SC	none
PACIFIC HAKE (C. PUGET SOUND)	*MERLUCCIUS PRODUCTUS*	SC	none
PACIFIC HERRING (CHERRY POINT)	*CLUPEA PALLASI*	SC	none
PACIFIC HERRING (DISCOVERY BAY)	*CLUPEA PALLASI*	SC	none
QUILLBACK ROCKFISH	*SEBASTES MALIGER*	SC	none
REDSTRIPE ROCKFISH	*SEBASTES PRORIGER*	SC	none
TIGER ROCKFISH	*SEBASTES NIGROCINCTUS*	SC	none
UMATILLA DACE	*RHINICHTHYS UMATILLA*	SC	none
WALLEYE POLLOCK (SO. PUGET SOUND)	*THERAGRA CHALCOGRAMMA*	SC	none
WIDOW ROCKFISH	*SEBASTES ENTOMELAS*	SC	none
YELLOWEYE ROCKFISH	*SEBASTES RUBERRIMUS*	SC	none
YELLOWTAIL ROCKFISH	*SEBASTES FLAVIDUS*	SC	none

Fish (breeding areas, documented regular large concentrations)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
PACIFIC HERRING	*CLUPEA PALLASI*	none	none
LONGFIN SMELT	*SPIRINCHUS THALEICHTHYS*	None	none
SURFSMELT	*HYPOMESUS PRETIOSUS*	None	none
PACIFIC SAND LANCE	*AMMODYTES HEXAPTERUS*	None	none

Mammals (documented regular occurrence)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
BLACK RIGHT WHALE	*BALAENA GLACIALIS*	SE	FE
FIN WHALE	*BALAENOPTERA PHYSALUS*	SE	FE
HUMPBACK WHALE	*MEGAPTERA NOVAEANGLIAE*	SE	FE
KEEN'S MYOTIS	*MYOTIS KEENII*	SC	none
KILLER WHALE	*ORCINUS ORCA*	SC	threatened
PACIFIC HARBOR PORPOISE	*PHOCOENA PHOCOENA*	SC	none
SEA OTTER	*ENHYDRA LUTRIS*	SE	none
SEA OTTER	*ENHYDRA LUTRIS LUTRIS*	SE	none
SEI WHALE	*BALAENOPTERA BOREALIS*	SE	FE

Mollusk (documented natural occurrence)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
NORTHERN ABALONE	*HALIOTIS KAMTSCHATKANA*	SC	none
OLYMPIA OYSTER	*OSTREA LURIDA*	SC	none

Marine Birds (Breeding areas, areas of documented regular large concentrations)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
AMERICAN WHITE PELICAN	*PELECANUS ERYTHRORHYNCHOS*	SE	none
BRANDT'S CORMORANT	*PHALACROCORAX PENICILLATUS*	SC	none
BROWN PELICAN	*PELECANUS OCCIDENTALIS*	SE	FE
CASSIN'S AUKLET	*PTYCHORAMPHUS ALEUTICUS*	SC	FC
COMMON LOON	*GAVIA IMMER*	SS	none
COMMON MURRE	*URIA AALGE*	SC	none
ALEUTIAN CANADA GOOSE	*BRANTA CANADENSIS LEUCOPAREIA*	ST	none
MARBLED MURRELET	*BRACHYRAMPHUS MARMORATUS*	ST	FT
SNOWY PLOVER	*CHARADRIUS ALEXANDRINUS*	SE	FT
TUFTED PUFFIN	*FRATERCULA CIRRHATA*	SC	FC
UPLAND SANDPIPER	*BARTRAMIA LONGICAUDA*	SE	none
WESTERN GREBE	*AECHMOPHORUS OCCIDENTALIS*	SC	none

FE: Federal Endangered FC: Federal Candidate
FT: Federal Threatened SC: State Candidate
SE: State Endangered ST: State Threatened None: No listing status

Appendix F–Priority Freshwater Species

Lists of priority habitat and species are dynamic and because DNR does not administer such lists, reference is made to three sources it uses as the sources for its Priority Marine Species lists; priority species are identified from the following three sources: Washington Department of Fish and Wildlife - Species of Concern in Washington State; Washington Department of Fish and Wildlife Fish Stock Status Reports, Species with critical stock status.

Source: Washington Department of Fish and Wildlife, Species of Concern in Washington State (June 2002) (www.wa.gov/wdfw/wlm/diversity/soc/soc/htm)

More habitat value if documented use for critical life stages of these species (e.g. spawning, rearing, concentrated use versus lower value for passage).

COMMON NAME	SCIENTIFIC NAME	ANIMAL TYPE	STATE STATUS	FEDERAL STATUS
CASCADE TORRENT SALAMANDER	*RHYACOTRITON CASCADAE*	Amphibian	SC	none
COLUMBIA SPOTTED FROG	*RANA LUTEIVENTRIS*	Amphibian	SC	FC
DUNN'S SALAMANDER	*PLETHODON DUNNI*	Amphibian	SC	none
LARCH MOUNTAIN SALAMANDER	*PLETHODON LARSELLI*	Amphibian	SS	FC
NORTHERN LEOPARD FROG	*RANA PIPIENS*	Amphibian	SE	none
OREGON SPOTTED FROG	*RANA PRETIOSA*	Amphibian	SE	FC
BULL TROUT	*SALVELINUS CONFLUENTUS*	Fish	SC	FT
BULL TROUT (COLUMBIA BASIN)	*SALVELINUS CONFLUENTUS*	Fish	SC	FT
CHINOOK SALMON (LOWER COLUMBIA)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (SNAKE R. FALL)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (SNAKE R. SP/SU)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (UPPER COLUMBIA SP)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FE
CHUM SALMON (LOWER COLUMBIA)	*ONCORHYNCHUS KETA*	Fish	SC	FT
KOKANEE (LANDLOCKED SOCKEYE)	*ONCORHYNCHUS NERKA*	Fish	SC	FT
LAKE CHUB	*COUESIUS PLUMBEUS*	Fish	SC	none
LEOPARD DACE	*RHINICHTHYS FALCATUS*	Fish	SC	none
MARGINED SCULPIN	*COTTUS MARGINATUS*	Fish	SS	FC
MOUNTAIN SUCKER	*CATOSTOMUS PLATYRHYNCHUS*	Fish	SC	none
RIVER LAMPREY	*LAMPETRA AYRESI*	Fish	SC	FC
SOCKEYE SALMON (SNAKE R.)	*ONCORHYNCHUS NERKA*	Fish	SC	FE
STEELHEAD (LOWER COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (MIDDLE COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (SNAKE RIVER)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (UPPER COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FE
CALIFORNIA FLOATER	*ANODONTA CALIFORNIENSIS*	Mollusk	SC	FC
GIANT COLUMBIA RIVER LIMPET	*FISHEROLA NUTTALLI*	Mollusk	SC	none
GIANT COLUMBIA SPIRE SNAIL	*FLUMINICOLA COLUMBIANA*	Mollusk	SC	FC
NEWCOMB'S LITTORINE SNAIL	*ALGAMORDA SUBROTUNDATA*	Mollusk	SC	FC
WESTERN POND TURTLE	*CLEMMYS MARMORATA*	Reptile	SE	FC

1. FE: Federal Endangered
2. FT: Federal Threatened
3. SE: State Endangered
4. ST: State Threatened
5. FC: Federal Candidate
6. SC: State Candidate
7. None: No listing status

Appendix G - Establishing Aquatic Reserves in Harbor Areas and State-Owned Waterways

Harbor Areas

Establishing aquatic reserves in harbor areas could be inconsistent with the specific uses for which harbor areas are established. Article XV, Harbors and Tide Waters of the Constitution of the State of Washington, Article XV states that harbor areas "*shall be forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce.*"

To establish aquatic reserves in an existing harbor area the department can take one of the following steps:

1. Build into the specific aquatic reserve management plan allowances for uses that will not conflict with uses for which the harbor area was established.
2. Adjust the harbor area line to exclude the reserve area as described in RCW 79.92.020.

Under alternative number 2, the commitment by the Washington State Department of Natural Resources (DNR) and the cooperation required by other management entities necessary to adjust the harbor line should be established, documented, and included in the nomination of the site to the Commissioner of Public Lands for review. In addition, SEPA review for the harbor area adjustment will occur simultaneously with SEPA review for establishing the reserve and management plan. The harbor line adjustment should be made before the Commissioner's order is signed for the reserve.

Under alternative 3, DNR is given the authority under RCW 79.90.460(3) to consider *"…the natural values of state-owned aquatic lands as wildlife habitat, natural area preserve, representative ecosystem or spawning area prior to issuing any initial lease…The department may withhold from leasing lands which it finds to have significant natural values …"*
RCW 79.90.010 defines aquatic lands as "…all state-owned tidelands, shorelands, harbor areas, and the beds of navigable waters*."*
RCW 79.990.465(12) defines state-owned aquatic lands as "…*those aquatic lands and waterways administered by the department of natural resources or managed under RCW 79.90.475 by a port district*."

State-owned Waterways

Establishing aquatic reserves in state-owned waterways could be inconsistent with the specific uses and priorities for which state waterways are established, as described in RCW 79.93.010. In order to establish aquatic reserves in an existing state-owned waterway the department could vacate the waterway according to

RCW 79.93.060 in order to eliminate risks that an aquatic reserve could be utilized for other uses in the future. Refer to DNR Procedure PR09-000-01 (May 6, 2003 or current update) for the details of the procedure for vacating state waterways. The commitment by DNR and the cooperation required by other management entities necessary to vacate a state-owned waterway should be established, documented, and included in the nomination of the site for review.

Appendix H–Interim Management Guidance

This interim guidance is modeled on the Approved Interim Management Guidance for Aquatic Reserves and Withdrawn Areas from Fran McNair, Aquatics Steward to Aquatic Resources Program Staff, June 27, 2001.

The exact types of future leasing activities that are authorized and prohibited within aquatic reserves will be established after the area is formally designated as an aquatic reserve and the site-specific management plan has been adopted.

1. The aquatic reserve interim management guidelines apply to aquatic lands that have been identified by the Commissioner of Public Lands for formal SEPA review and planning for reserve candidacy.
2. The guidelines will continue to be in effect until the area is designated by a Commissioner's Order as an aquatic reserve (at which time a management plan is adopted by DNR) or the area is no longer being considered for reserve status.
3. There will be no attempt to curtail legal activities conducted under existing DNR use authorizations within candidate reserve sites.
   3.1. DNR staff will work with lessees to address environmental concerns and operational improvements related to authorized activities.
4. All legal activities conducted under existing use authorizations in areas adjacent to candidate reserve sites will be managed using the best available knowledge to approve re-authorizations, assignments, maintenance, and construction activities.
   4.1. DNR staff will use the best available knowledge to approve such activities under conditions that afford the greatest amount of environmental protection and improvement of the general area and that minimize the disturbance to the adjacent candidate reserve site relative to its intent.
5. All use authorizations existing within a candidate reserve site at the time of reserve designations, whether in normal or holdover status:
   5.1. Will be honored throughout their current terms.
   5.2. May conduct maintenance and construction activities as per the existing terms and conditions of the original agreement.
      5.2.1 DNR staff will use the best available knowledge to approve maintenance and construction activities that afford the greatest amount of environmental protection and improvement to meet the intent of the candidate reserve.
   5.3. May be re-assigned to another entity under the existing terms and conditions of the original agreement.

5.4. That expire during the candidate reserve site's SEPA review and planning process, will be held in holdover status until completion of the process.

5.4.1. DNR staff will work with lessees to address environmental concerns and operational improvements related to authorized activities.

5.5. That are in holdover status or expire after the area has been formally designated as an aquatic reserve, will be evaluated based on the adopted site management plan to assess their compatibility with the reserve and reserve goals.

5.5.1. Activities determined to be compatible may be authorized.

5.5.2. Activities determined not to be compatible will not be authorized.

6. Applications for use authorizations within candidate reserve sites which occurred before, during, or after the SEPA review and planning process, but were not finalized and signed by DNR (except as described below in 6.1 and 6.2), will be placed on hold pending completion of the SEPA review and planning process. No new uses will be authorized within candidate reserve sites until the SEPA review and planning process for the site is completed (except as described below in 6.1 and 6.2).

   6.1 Applications for use authorizations that will restore, enhance, and/or preserve the environmental features of the site and will serve to improve the ecological conditions of the site relative to its intent as described in the applicable reserve application, will be processed under the terms and conditions as set forth by DNR under its Conservation Leasing and Licensing Program.

   6.2 Applications for short-term (less than one year) use authorizations that will have no functional, physical, or aesthetic impacts to the environmental features or ecological functions of the site may be authorized after a thorough review by region staff in consultation with Aquatic Resources Division staff.

7. Unauthorized and trespass activities (whether historical or new) located within candidate reserve sites shall be managed as follows:

   7.1 Those activities determined to pose no or minimal environmental concerns relative to the intent of the reserve, as described in the applicable reserve application, and that would be authorized under normal (non-reserve) conditions, will be identified, documented as existing by region staff, and allowed to continue until the SEPA review and planning process is completed.

   7.2 Those activities determined to pose significant environmental concerns relative to the intent of the reserve, as described in the applicable reserve application, and/or that would not be authorized under normal (non-reserve) conditions, will be prohibited and pursued as a trespass against the state in the same manner as would any trespass in a non-reserve area.

   7.3 Those activities that are subject to public, political, and/or regulatory pressures will be evaluated based on the best available knowledge to determine their compatibility with the intent of the reserve, as described in the applicable reserve application.

Appendix I – Site Evaluation

Site Evaluation Forms

General Evaluation Criteria

The following form is used to evaluate all proposed reserve sites. Educational reserves and scientific reserves require additional evaluation. (See additional forms, following).

In the evaluation, most site conditions and characteristics are assigned a score of Poor, Fair, Good, or Excellent. Criteria for assigning the scores are shown for each condition or characteristic evaluated. The scores assist the Technical Advisory Committee in making recommendations for aquatic reserve status.

The evaluation is drawn directly from the Washington State Department of Natural Resources Aquatic Resources Program's "Non-Project Final Environmental Impact Statement Aquatic Reserves Program Guidance" (Final EIS), (September 6, 2002). The italicized items below can be found in Section 3.2.1.3.4, Designation Criteria, on pages 21 and 22 of that document.

The ecological and cultural quality of the site

What is the current condition of the site?

1. Is the site degraded?

Site is heavily degraded with more than 50% of the shoreline hardened or otherwise altered.	Site is moderately degraded with 25%- 50% of the shoreline hardened or otherwise altered.	Site is minimally degraded with 10 - 25% of the shoreline hardened or otherwise altered, and 75% - 90% of habitat intact.	No noticeable signs of human-caused impacts on or near site. Site is considered 'pristine.' Site is not degraded or otherwise altered (0-10% shoreline hardened, 90-100% of habitat intact).
Poor	**Fair**	**Good**	**Excellent**

2. Are non-native species found at the site?

Site is heavily degraded by multiple non-native species. Habitats are being altered as a result of invasion.	Non-native species are abundant at the site and at least one species is considered invasive.	Non-native species are identified at the site; however, they are uncommon and none are considered to be invasive.	No non-native species are identified at the site.
Poor	**Fair**	**Good**	**Excellent**

3. Are there water quality concerns associated with the site? (Water quality concerns may include low dissolved oxygen concentrations in the water column, toxic pollutants in the water column, or elevated risks of algal blooms as a result of human-caused inputs).

There are current water quality concerns. The source has not been identified or remediation/ correction or water quality is not improving.	There are current water quality concerns. The source has been identified and remediation/correction have begun and water quality is improving.	Water quality is not a current concern at the site; however, water pollution or dissolved oxygen concerns have been noted in the area in the past.	No signs of water pollution exist at the site, nor have any been documented in the past.
Poor	**Fair**	**Good**	**Excellent**

4. Are there signs of habitat loss within the site?

Evidence of dramatic habitat loss (less than 25% of historic habitat is intact).	Evidence of habitat loss is noticeable (25%-75% of historic habitat is intact).	Little evidence of habitat loss as a result of human caused development (75-90% of historic habitat is intact).	No evidence of habitat loss as a result of human-induced development (more than 90% of historic habitat is intact).
Poor	**Fair**	**Good**	**Excellent**

5. Are ecosystem processes intact (e.g., freshwater flow, littoral drift, nutrient cycling, etc.)?

Many ecosystem processes are not functional. Habitat and ecosystem relies on frequent management inter-ventions to be sustained.	Some ecosystem processes are degraded or disrupted. Habitat and ecosystem benefits from occasional management interventions.	Some ecosystem processes are degraded or disrupted. Ecosystem appears to be recovering without management interventions.	No ecosystem processes are noticeably degraded or disrupted. Management interventions would not benefit habitat or ecosystem.
Poor	**Fair**	**Good**	**Excellent**

Risks to the ecosystem or feature of interest (If applicable)

6. Can ecological concerns contributing directly to the area's decline be prevented through reserve establishment?

All ecological concerns cannot be mitigated through establishment of reserve. Ecological concerns are external to authorization of reserve and must be managed using other tools.	Reserve establishment would prevent some, but not all, ecosystem ecological concerns occurring within the site. Ecological concerns contributing to decline beyond site boundaries would not be directly affected.	Reserve establishment would prevent most ecosystem ecological concerns occurring within the reserve, and minimize some ecological concerns extending beyond site boundaries.	Reserve establishment would prevent all ecological concerns occurring within the site and provide benefits beyond site boundaries.
Poor	**Fair**	**Good**	**Excellent**

Restoration potential (If applicable)

7. Is there pending restoration at the site?

No restoration plans exist. Transportation or other government infrastructure is highly dependent upon the continued use of the site.	Draft restoration plan exists, but no final plans, nor implementation plan exists. Site includes many landowners and stakeholders with divergent interests in restoration.	Restoration planning is at advanced stages. Restoration process has identified partial funding for restoration.	Restoration process is prepared to proceed. Implementation plan exists, partners are in place and permitting is taking place.
Poor	**Fair**	**Good**	**Excellent**

8. Would restoration benefits extend beyond site boundaries?

Restoration benefits are not described with a conceptual model. Restoration benefits uncertain.	Restoration benefits are described with a conceptual model. Restoration benefits primarily occur within the site.	Restoration benefits are described with a conceptual model. Restoration benefits both within and beyond site.
Poor	**Good**	**Excellent**

Special value for biodiversity or species diversity

9. Does the site contain or support a large number of species?

Species richness at the site is less than similar sites within the region. **Poor**	Species richness at the site is similar to other sites within the region. **Fair**	Species richness at the site exceeds similar sites within the region, however most species are transient or seasonally present. **Good**	Resident species richness at the site exceeds similar sites within the region and the site is highly utilized throughout the year. **Excellent**

10. Does the proposed site capture habitat used regularly by species of special conservation interest?

Habitat is not documented for use during critical life stages of a listed species. **Poor**	Habitat is used during critical life stages by several species whose populations are not depressed or at risk. **Fair**	Habitat is used during critical life stages by any one species listed in appendices E or F or another reference. **Good**	Habitat is used during critical life stages by more than one state or federally threatened or endangered species. **Excellent**

11. Does the proposed site capture vulnerable habitats, life stages or populations? (Vulnerable habitats, life stages or populations include: seal haul-outs, breeding bird aggregations or rookeries, seasonal bird aggregations, seasonal fish aggregations (feeding or breeding), or fish spawning aggregations).

Site is not documented to include any of the described vulnerable habitats, life stages or populations. **Poor**	Site is documented to support at least one of the described vulnerable life stages. **Fair**	Site is documented to support at least one of the described vulnerable life stages; likely to include more than one. **Good**	Site is documented to support more than one vulnerable habitat, life stage or population. **Excellent**

Ecological processes that sustain the aquatic landscape

12. Would protection of the site protect/maintain ecological processes?

Establishment of aquatic reserve will not protect any geological, physical, chemical, or biological processes within or outside of site. **Poor**	Establishment of aquatic reserve will protect some geological, physical, chemical, or biological processes within the site, but will have limited if any impact on processes beyond the site. **Fair**	Establishment of aquatic reserve will protect some geological, physical, chemical, or biological processes within the site and some processes beyond the site. **Good**	Establishment of aquatic reserve will protect most geological, physical, chemical, or biological processes within the site and some processes beyond the site. **Excellent**

The cultural quality of the site

13. Does the site contain or protect significant cultural resources? Does the site contain heritage, historical, or cultural resources that are eligible for the Washington Register of Historic Places, RCW 27.34.220 or the National Register of Historic Places? Evaluate the value of those described in the proposal from a regional or statewide basis (e.g., sites listed on the state or national historical register or significant historical indigenous use areas would have high values).

No sites have been reported at the site. **Poor**	Sites of state importance have been documented at the site. **Good**	Sites of national importance have been documented at the site. **Excellent**

14. Has the site yielded or is the site likely to yield information important in prehistory or history?

No heritage, historical, or cultural features exist at the site. **Poor**	Heritage, historical, and/or cultural features are documented to exist at the site. Features are common regionally. **Good**	Heritage, historical, and/or cultural features are documented to exist at the site. Features are regionally or nationally important. **Excellent**

Habitats and features represented within the site

Good example (relatively undisturbed) of representative habitats compared with the overall reserve program goal

15. Does the proposed site capture species or habitats that are much less common within the biogeographic region than they were historically?

Habitats found at site are common and there is no evidence of habitat loss. (More than 90% of historic habitat abundance is intact).	Habitats found at the site are not common or there is evidence that habitats have declined by 10-25% from historic abundance within biogeographic region.	Habitats found at the site are becoming rare, or have declined more than 25-75% from historic abundance within biogeographic region.	Habitats found at the site are rare or there is evidence of dramatic habitat loss (less than 25% of historic habitat is intact).
Poor	**Fair**	**Good**	**Excellent**

Habitat types that are under-represented in the aquatic reserves program or marine protected area network

16. Does the site contain representative habitats not otherwise protected in the network of protected areas or aquatic reserves?

All natural habitats found on site are protected within biogeographic region at a level that exceeds their historic representation within biogeographic region or sub-region.	All natural habitats found on site are protected within biogeographic region at a level that is comparable to their historic representation within biogeographic region or sub-region.	All natural habitats found on site are protected within biogeographic region at a level that is below their historic representation, but comparable to the current representation of habitats within biogeographic region or sub-region.	All natural habitats found on site are protected within biogeographic region at a level that is below their historic representation and below current representation of habitats within biogeographic region or sub-region.
Poor	**Fair**	**Good**	**Excellent**

Biogeographical location that is under-represented in the aquatic reserves program or marine protected area network

17. Is the site located in a biogeographic region or sub-region that is underrepresented in the existing reserve network?

25% or more of the biogeographic region or sub-region is protected in aquatic reserves or other regulatory or proprietary protected areas. **Poor**	10 – 25% of the biogeo-graphic region or sub-region is protected in aquatic reserves or other regulatory or proprietary protected areas. **Fair**	5-10% of the biogeographic region or sub-region is protected in aquatic reserves or other regulatory or proprietary protected areas. **Good**	Less than 5% of the biogeographic region or sub-region is protected in aquatic reserves or other regulatory or proprietary protected areas. **Excellent**

Viability of the occurrences of interest

Site features meet the intent of the reserve

18. Are species, habitats, or ecosystem processes consistently associated with reserve site?

Habitats, species, or processes are ephemeral and are inconsistently found at site. **Poor**	Habitats, species, or processes are ephemeral, but are consistently found at site. **Fair**	Habitats, species, or pro-cesses are seasonal and have been consistently associated with the site. **Good**	Habitats, species, or processes are found at the site throughout the year. **Excellent**

Number of ecological processes

19. Does the site contain unique or distinctive physical habitat features (e.g., oceanographic gyre, oceanographic sill, natural beach spit, etc)?

No unique or distinctive features are identified. **Poor**	Site includes parts of unique or distinctive features. **Fair**	Site completely surrounds unique or distinctive ecological features. **Good**	Site completely surrounds unique or distinctive ecological features and includes buffers. **Excellent**

Defensibility of the site

Connectivity to a reserve or protected area network and/or species and/or habitats

20. Does the site provide regional habitat connectivity through any of the following functions: refuge (predator, physiological, high energy), food production, migratory, corridors, spawning, nursery or rearing, riparian vegetation, adult habitat, other functions.

Site appears to be isolated and species neither disperse to or from the site on a consistent basis and the site is not used consistently by species during migration or movements. No connectivity.	Site is used by a variety of species that remain within the region. Site is not consistently used. Limited regional connectivity not clearly established for any site-associated species.	Site is heavily used by one or more species on a consistent seasonal basis, however, species appear to be able to use other sites and are not found at the site in abundance every year. Connectivity is established for habitat utilized by site-associated species for more than one function.	Site is heavily used by one or more species, either throughout the year or on a seasonal basis. If only used seasonally, the site is used consistently and species movements include the site every year. Connectivity is established for habitat utilized by site-associated species. Connectivity established for multiple functions.
Poor	**Fair**	**Good**	**Excellent**

Appropriate size to be sustainable

21. Is area large enough to be self-sustaining?

Site is insufficient for internal recolonization.	Site is large enough to allow limited internal recolonization. However, disturbance events are likely to disrupt entire site.	Site is large enough to allow internal recolonization. Disturbance events are unlikely to disrupt entire site.	Site is large enough to allow internal recolonization. Disturbance events are unlikely to disrupt entire site. Site supports range of successional communities
Poor	**Fair**	**Good**	**Excellent**

Ability to persist over time

22. Can site be successfully managed to maintain the features of interest?

Declines in features of interest are caused by factors external to the site. Reserve designation would have no tangible benefits.	Declines in features of interest are strongly influenced by factors external to the site. Reserve designation would provide tangible benefits.	Declines in features of interest are strongly influenced by factors internal to the site. Reserve designation would have tangible benefits within site boundaries.	Declines in features of interest are strongly influenced by factors internal to the site. Reserve designation would have tangible benefits within and beyond site boundaries.
Poor	**Fair**	**Good**	**Excellent**

Known or anticipated activities that endanger the site or habitat

23. Are there known human-caused or natural ecological concerns to the continued viability of the site?

Existing modifications at the site, and/or adjacent area(s) to the site, will impact the habitat and functions of over 50% of the proposed reserve.	Existing modifications at the site and/or in adjacent area(s) will impact the habitat and functions of less than 50% of the proposed reserve.	There are no existing modifications in or adjacent to the proposed reserve that will impair the habitat and function of the proposed reserve. Present land use regulations do allow for modifications.	There are no existing modifications in or adjacent to the proposed reserve that will impair the habitat and function of the proposed reserve. Existing land use regulations do not permit modifications in or adjacent to the site that will impact the habitat & function of the proposed reserve.
Poor	**Fair**	**Good**	**Excellent**

Potential for factors contributing directly to the area's decline to be prevented

24. Would reserve status provide protection for habitats, species, or processes of interest from encroachment?

Existing uses at the site, and/or adjacent areas to the site, will impact the habitat and functions of more than 50% of the proposed site.	Existing uses at the site and/or in adjacent areas will impact the habitat and functions of 25-50% of the proposed site.	Existing uses at the site and/or in adjacent areas will impact the habitat and functions of 0-25% of the proposed site.	Existing uses, zoning, and land use regulations will complement the proposed site and pose no ecological concerns.
Poor	**Fair**	**Good**	**Excellent**

Manageability of the site

Coordination with other entities, including local jurisdictions and current leaseholders

25. Does the proposal include coordination of reserve actions with other entities, including local jurisdictions and current leaseholders?

Proposal fails to identify any steps for coordination among landowners, stakeholders, and regulators. **Poor**	Proposal identifies steps for coordination with regulators; however, fails to recognize role of landowners or stakeholders. **Fair**	Proposal identifies steps for coordination with Tribes, state agencies, landowners/ stakeholders, education organizations and the public. **Good**

Area previously identified for protection

26. Has another entity previously identified this site or areas within the site as a priority for protection? (Examples include Important Bird Areas (Cullinan 2001), priority areas for Research Natural Area Designation (Dyrness et al. 1975), or priority areas for conservation (e.g., through ecoregional planning, Natural Heritage Program research (Kunze 1984), or similar process (Dethier 1989)).

Site has not been documented as a priority for conservation and does not appear to meet documented conservation planning goals. **Poor**	Site has not been documented as a priority for conservation, however site appears to meet documented conservation goals. **Fair**	Site is included in one planning or priority areas document. Site condition and resources appear to be relatively unchanged since planning effort. **Good**	Site is included in two or more planning or priority areas documents. Site condition and resources appear to be relatively unchanged since planning effort. **Excellent**

Potential cooperative partners for management, monitoring, or enforcement

27. Have potential cooperative management partners been identified?

No management, monitoring, nor enforcement partners are identified in proposal. **Poor**	One or more management, monitoring, or enforcement partners are identified. Potential partners make no official letters of support or commitments. **Fair**	One or more management, monitoring, or enforcement partners are identified. Official letters of support or commitment are made by at least one potential partner. **Good**	Two or more management, monitoring, or enforcement partners are identified. Official letters of support or commitment are made by at least two potential partners. **Excellent**

Adjacent natural areas or public lands

28. Is site adjacent to terrestrial protected areas managed for conservation or restoration purposes?

Not adjacent to a terrestrial protected area. **Poor**	25% of proposed site is adjacent to a terrestrial protected area. **Fair**	50% of proposed site is adjacent to a terrestrial protected area. **Good**	Over 75% of proposed site is adjacent to a terrestrial protected area. **Excellent**

Description of how to measure success (i.e., monitoring) and kinds of monitoring needed

29. Does reserve proposal include a monitoring plan that measures reserve progress towards goals and provides for adaptive management?

Proposal does not include any form of monitoring or adaptive management. **Poor**	Proposal includes adaptive management, but does not include any description of the role of monitoring nor implementation of adaptive management. **Fair**	Proposal describes monitoring plan and adaptive management, but does not describe how monitoring results should be used to influence management. **Good**	Proposal includes monitoring and adaptive management. Plan describes how monitoring results will affect management actions. **Excellent**

Kinds of enforcement needed to make sure incompatible uses and impacts do not encroach on the reserve

30. What kind of enforcement is needed to prevent incompatible uses and impacts from encroaching on the reserve?

Active enforcement is a pre-condition for reserve success. **Poor**	Active enforcement would provide benefits not otherwise available. **Fair**	Reserve designation must be accompanied by stakeholder and resource user education to develop best practices. **Good**	Reserve designation alone is sufficient to protect most resources from their primary ecological concerns. **Excellent**

Evaluation Criteria for Scientific Reserves

In addition to being evaluated using the general criteria that apply to all types of reserves, sites proposed as scientific reserves are evaluated to determine their suitability for designation as a Scientific Reserve. The basis for these criteria for scientific reserve evaluation can be found on pages 24 - 25 of the Final EIS. In order to minimize redundancy, criteria that have already been a part of the general discussion will not be repeated here.

Objective

Scientific reserves should be established to ensure environmental protection by:

1. Providing sites that can be scientifically manipulated for the benefit of knowledge.
2. Providing reference sites against which to measure effectiveness of environmental protection; and
3. Managing sites with unusually rich plant and animal communities.

Site is of interest to scientific community

1. Does site represent a unique research opportunity?

Similar research has taken place within the local ecosystem, but not at the proposed site. **Poor**	Similar research has taken place outside of the local ecosystem; however research has not taken place within local system. **Fair**	Research proposal is novel and has not been undertaken. Site provides opportunity to explore ecosystem. **Good**	Research proposal is a continuation or expansion of existing research at or near research site. **Excellent**

Site is unusually species-rich

2. Does site exceed expected species richness for areas of similar size? (e.g., does site contain plant and animal communities suitable for continuing scientific observations (WAC 332-30-106).

Site has lower species richness than similar sized areas within biogeographic region. **Poor**	Site has species richness comparable to similar sized areas within biogeographic region. **Fair**	Site has species richness in excess of similar sized areas within biogeographic region. **Good**

Site contains a high degree of biodiversity for habitat type

3. Does site exceed expected biodiversity as measured using Shannon's diversity index (an index that measures diversity and evenness of species) for similar habitats?

Habitats have a lower diversity index value than similar habitats within the biogeographic region. **Poor**	Habitats have a comparable diversity index value than similar habitats within the biogeographic region. **Fair**	Habitats have a higher diversity index value than similar habitats within the biogeographic region. **Good**

Site could be manipulated without doing irreparable harm to its neighboring systems or habitats in order to advance knowledge (where applicable)

4. Do proposed manipulations affect the physical (e.g., habitat structure or ecosystem processes) or biological composition of the site?

Manipulation significantly disrupts ecosystem processes or physical structure of site. Restoration is uncertain or would take an extended amount of time. **Poor**	Manipulation significantly disrupts ecosystem processes or physical structure of site. Natural recovery is likely and would be rapid. **Fair**	Manipulation primarily affects biological composition of site. Natural recovery is unlikely or would take extended period of time. **Good**	Manipulation primarily affects biological composition of site. Natural recovery is likely and would be rapid. **Excellent**

5. Are impacts of manipulation restricted to the site?

Proposed research will cause permanent damage to site and impacts will extend beyond the site. **Poor**	Proposed research will cause some permanent damage to site; however, impacts are likely to be contained within the site. **Fair**	Proposed research will not cause any permanent harm to the site or adjacent area or habitat. **Good**

Site has a history of monitoring or an opportunity for long - term monitoring

6. Does site have a historical monitoring record?

Site has no historical monitoring record, regional monitoring data do not exist. **Poor**	Site has no historical monitoring record, however regional monitoring data does exist. **Fair**	Site has a history of biological and physical process monitoring. Site is not included in regional monitoring programs (e.g., PSAMP). **Good**	Site has a history of biological and physical process monitoring. Site is presently included in regional monitoring programs (e.g., PSAMP). **Excellent**

Evaluation Criteria for Educational Reserves

In addition to the general evaluation criteria that apply to all types of reserves, above, sites proposed as educational reserves are evaluated for the following specific criteria as well. The basis for these criteria for educational reserves can be found on page 24 of the Final EIS. In order to minimize redundancy, criteria that have already been evaluated in the general discussion above will not be repeated here.

Objective

Educational reserves should be established to ensure environmental protection by:

- Keeping unique aquatic sites available for environmental education opportunities; and
- Educating people about the value of aquatic habitat to ensure environmental protection.

Network of sites that provide an accessible distribution of sites throughout the state

1. Are environmental education reserves available within biogeographic region? (Examples of other education reserves may include areas operated by U.S. Fish and Wildlife Service, National Park Service, Washington State Parks and Recreation, or The Nature Conservancy that offer educational curricula).

Site is within 50 miles of another educational reserve within the biogeographic region that provides educational services for substantially comparable habitats. **Poor**	Publicly accessible education reserves exist within biogeographic region that contain substantially comparable habitats; however, they are more than 50 miles away. **Fair**	Publicly accessible education reserves exist within biogeographic region; however, other reserves represent a substantially different habitat type. **Good**	No publicly accessible education reserves exist within biogeographic region **Excellent**

Network of sites that provides an adequate distribution among habitat types

2. Is the proposed site a unique example of habitat available for educational opportunities regionally or statewide?

The habitat is common in the region. There would be several similar sites available for educational purposes. **Poor**	The habitat is common in the region. However, few of the sites that contain the habitat are available for educational purposes. **Fair**	There are only a few of the habitat types proposed for a reserve dispersed across the region or state. **Good**

Sites that attract a range of target audiences

3. Is the curriculum integrated into an applied educational program (e.g., school, public education program, etc.) and tailored to the unique features of the site.

Curriculum is not being developed for application to any existing educational programs and/or specific habitat features.	Curriculum is being developed for generic educational application, but for no specific habitat features.	Curriculum is being developed for a specific educational program for an established educational facility or school system, but for no specific habitat features.	Curriculum is being developed for specific educational program for an established educational facility or school system and tailored for the specific habitat features of the proposed site.
Poor	**Fair**	**Good**	**Excellent**

Sites that are compatible with educational-use activities

4. Are activities and conditions in the areas adjacent to the proposed reserve compatible to the uses proposed for the reserve?

Public access and use of the site may have long-term impacts on the site. Most impacts cannot be prevented through passive site management.	Public access and use of the site may have long-term impacts on the site. Most impacts can be prevented through passive site management.	Public access and use of the site is unlikely to have any long-term impacts on the site. Site may require partial or complete seasonal closures to avoid disturbing the local environment.	Public access and use of the site is unlikely to have any long-term impacts on the site. Site can be used for education throughout the year without disturbing the environment.
Poor	**Fair**	**Good**	**Excellent**

Current site conditions or activities adjacent to the site are compatible with an educational reserve

5. Are activities and conditions in the areas adjacent to the proposed reserve compatible to the uses proposed for the reserve?

Adjacent uses and activities are not compatible with educational activities or environmental preservation.	Adjacent uses and activities are mostly compatible with educational activities, but may not be compatible with environmental preservation.	Adjacent uses and activities are compatible with educational activities and presently compatible with environmental preservation (e.g., existing zoning not compatible)	Adjacent uses and activities complement educational activities and support continuing environmental preservation of the site and adjacent areas.
Poor	**Fair**	**Good**	**Excellent**

Site whose ecological integrity can be preserved while providing public access

6. How will the proponent maintain the unique ecological features of the site while providing public access for an education program?

Actions are not adequately addressed or established to ensure compatibility of ecological integrity and public access. **Poor**	Actions are addressed or established, but with no assurance that ecological integrity is maintained. **Fair**	Actions are addressed and established that support the environmental goals of the reserve and promote public access with attention to impacts to the site's ecological integrity **Good**

Site has a history of monitoring and an opportunity for long-term monitoring. (Criterion applicable in cases described by Final EIS 3.2.1.4.3).

7. Does site have a historical monitoring record?

Site has no historical monitoring record, and regional monitoring data do not exist. **Poor**	Site has no historical monitoring record, however regional monitoring data do exist. **Fair**	Site has a history of biological and physical process monitoring. Site is not included in regional monitoring programs (e.g., PSAMP). **Good**	Site has a history of biological and physical process monitoring. Site is presently included in regional monitoring programs (e.g., PSAMP). **Excellent**

Appendix J – Aquatic Reserve Technical Advisory Committee Recruitment

Aquatic Reserve Technical Advisory Committee

Opens: March 1, 2003
Closes: Nominations will remain open indefinitely in order to continue to establish a pool of qualified candidates for future Aquatic Reserve Committees.

The Department of Natural Resources (DNR) is recruiting to develop a pool of qualified individuals to serve on the Aquatic Reserves Technical Advisory Committee (TAC).

Aquatic Reserve Program

The Aquatic Reserves Program is used by DNR to establish aquatic reserves on state owned aquatic lands with unique ecological features and habitats, in order to protect and support those elements.

Duties of the Aquatic Reserves Advisory Committee

Committee members will review, score, and rank nominated sites for the Aquatic Reserves Program (Program) and make recommendations to the Commissioner of Public Lands for further consideration and action. The reviewing, scoring, and ranking criteria are established by DNR and are consistent with the Final Environmental Impact Statement Aquatic Reserves Program Guidance September 6, 2002. Seven people are selected to serve as Committee members for each review cycle and two people are chosen as substitutes. Individuals may be asked to serve during other cycles as well. Committee members must:

1. Be available to meet for one day to be briefed on aquatic reserves and the process for reviewing and scoring proposals for aquatic reserves.
2. Be available for up to 3 days to conduct site visit(s) at proposed aquatic reserves locations.
3. Rate and rank all proposals for aquatic reserves.
4. Meet for up to two consecutive days in Olympia to evaluate aquatic reserve proposals.

DNR will provide staff support for the Committee members. Committee members will not be compensated for their services but are reimbursed for travel, lodging, and meals based on Washington State per diem rates.

Nominations for the Aquatic Reserves Advisory Committee

a. Individuals are invited to submit their qualifications for consideration.
b. Candidates for the advisory committee must meet the minimum qualifications described below.
c. All qualified candidates are placed in a pool from which DNR will select committee members for aquatic reserve nomination cycles.

Preferred Qualifications

1. Advanced degree in one of the following disciplines: Coastal, marine, or freshwater aquatic ecosystems; marine resource management; ecology; oceanography; fisheries science; geology; cultural archeology; sociology or related fields.
2. Established professional experience in one or more of the following areas related to aquatic ecosystems: Teaching; conducting research; or designing, establishing, or managing aquatic conservation areas, aquatic reserves, and/or protected areas.
3. Candidates must disclose all professional affiliations with any of the following organizations:
   a. Washington Department of Natural Resources
   b. Aquatic land user groups, environmental advocacy groups, or private industries that utilize aquatic lands and resources.
   c. Sites under consideration for aquatic reserve status (including research, contract, or advocacy efforts). List sites.
4. Candidates must be willing to commit to the following:
   a. Evaluate aquatic reserve proposals using criteria developed by Washington Department of Natural Resources.
   b. Spend the necessary time to review site proposals and aquatic reserve program information, and to complete scoring and ranking of proposals prior to Committee meetings in Olympia.
      Note: Time requirements are dependent on the number and geographic location of proposals. The time requirements described below are the minimum established for evaluating six reserves during the 2003-year cycle.
   c. Be available to meet for one day to be briefed on aquatic reserves and the process for reviewing and scoring proposals for aquatic reserves.
   d. Be available for up to 3 days to conduct site visit(s) at proposed aquatic reserves locations.
   e. Rate and rank all proposals for aquatic reserves.
   f. Meet for up to two consecutive days in Olympia to evaluate aquatic reserve proposals.
   g. Work collaboratively with fellow committee members to evaluate aquatic reserves.
   h. Submit completed site evaluations at the conclusion of the Committee meeting.

To Apply: Submit information on the desired qualifications to:
E-mail: david.palazzi@wadnr.gov
or mail: Aquatic Reserves Program Manager
Washington Department of Natural Resources
Aquatic Resources Division
P.O. Box 47027
Olympia, WA 98504-7027
360-902-1069

This recruitment notice and other updates and information about the DNR Aquatic Reserve Program can be found on the DNR Aquatic Resources Program web site.
www.dnr.wa.gov/htdocs/aqr/reserves/home.html