INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN NAVAL BASE KITSAP SEPTEMBER 2018








This Page Intentionally Left Blank

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

NAVAL BASE KITSAP

September 2018

This Page Intentionally Left Blank

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN NAVAL BASE KITSAP

September 2018

The plan will be reviewed annually and updated as necessary.

Date of Annual Review	Name and Title of Reviewer	Summary of Updates

Commander, Navy Region Northwest

United States Navy Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670a *et seq*., as amended); Department of Defense Instruction 4715.03 *Natural Resources Conservation Program*; and OPNAV M-5090.1 *Environmental Readiness Program Manual*.

Approved by:

C. S. GRAY
Rear Admiral, U.S. Navy
Commander, Navy Region Northwest

11/2/18
Date

Commanding Officer

United States Navy Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act, as amended, 16 United States Code §670(a) et seq.; Department of Defense Instruction 4715.03, Natural Resources Conservation Program; and OPNAV M-5090.1, Environmental Readiness Program Manual.

Approved by:

E. A. SCHRADER
Captain, U.S. Navy
Commanding Officer

11/2/2018
Date

Installation Environmental Personnel

United States Navy Signature Page

This Integrated Natural Resources Management Plan is a long-term planning document to guide Naval Base Kitsap in the management of natural resources to support its military mission, while protecting and enhancing natural resources for multiple uses, sustainable yield, and biological integrity. The primary purpose of the plan is to ensure natural resources management and military operations are integrated and consistent with legal requirements and stewardship. This plan and the use of the natural resources comply with the legal mandates and, to the extent practicable, are integrated with public ecosystem goals.

Approved by:

GREG LEICHT
Installation Environmental Program Director
Naval Base Kitsap

2/27/2019
Date

TYLER YASENAK
Natural Resources Manager
Naval Base Kitsap

2/28/2019
Date

JULIA STOCKTON
Natural Resources Manager
Naval Base Kitsap

2-27-2019
Date

Region Environmental Personnel

United States Navy Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act, as amended, 16 United States Code §670(a) et seq.; Department of Defense Instruction 4715.03, Natural Resources Conservation Program; and OPNAV M-5090.1, Environmental Readiness Program Manual.

Approved by:

CYNTHIA KUNZ
Sr. Natural Resources Specialist
NRNW Code N45

11/15/2018
Date

United States Fish and Wildlife Service Signature Page

This Integrated Natural Resources Management Plan meets the requiresments of the Sikes Act (16 U.S.C. 670a *et seq*., as amended); and supports U.S. Fish and Wildlife Service policies, management goals, and objectives.

Approved by:

BRAD THOMPSON
Acting State Supervisor, Washington Fish and Wildlife Office
United States Fish and Wildlife Service

11/28/2018
Date

Washington State Department of Fish and Wildlife Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670a *et seq.*, as amended); and support Washington Department of Fish and Wildlife policies, management goals, and objectives.

Approved by:

KELLY SUSEWIND
Director
Washington Department of Fish and Wildlife

11/29/18
Date

National Marine Fisheries Service Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670a *et seq.*, as amended); and supports NOAA/NMFS policies, management goals and objectives.

Approved by:

KRATZ.KIM.W.1365874677 Digitally signed by KRATZ.KIM.W.1365874677
Date: 2019.02.28 07:59:35 -08'00'

KIM KRATZ
NOAA Fisheries Assistant Regional Administrator
National Marine Fisheries Service

Date

This Page Intentionally Left Blank

Executive Summary

The United States Department of the Navy has revised the Integrated Natural Resources Management Plan (INRMP) for Naval Base Kitsap. The revised INRMP provides natural resources management strategies for multiple locations:

- Naval Base Kitsap Bangor, which includes Navy-owned portions of the Toandos Peninsula, Camp Wesley Harris and Zelatched Point and associated waterfront restricted zone listed under 33 CFR § 334.1220 within Hood Canal
- Naval Base Kitsap Bremerton, which includes Puget Sound Naval Shipyard and Intermediate Maintenance Facility, a tenant command of Naval Base Kitsap, Camp McKean and associated waterfront restricted area listed under 33 CFR § 334.1240 within Sinclair Inlet
- Naval Base Kitsap Keyport, which includes Naval Undersea Warfare Center Keyport, a tenant command of Naval Base Kitsap, and associated waterfront restricted area listed under 33 CFR § 334.1230 within Liberty Bay
- Jackson Park Housing Complex and Naval Hospital Bremerton, which are located along Ostrich Bay
- Department of the Navy owned rail line that runs from Shelton, Washington to Naval Base Kitsap Bangor and Bremerton

Naval Base Kitsap is located in western Washington and has outlying properties extending as far north as Alaska. Naval Base Kitsap Manchester, in Washington State, is covered under an INRMP that was signed in 2009 and its currently being revised. Southeast Alaska Acoustic Measurement Facility (SEAFAC), at Back Island Alaska, does not currently have its own INRMP, but one is under development. In western Washington, the Naval Base Kitsap INRMP encompasses properties in Kitsap, Mason, and Jefferson counties and supports approximately 22,000 military and civilian personnel (Commander, Naval Installations Command 2009). Per iNFADS (internet Naval Facilities Assets Data Store), the installation manages 9,385 acres of land, which includes 6,609 acres for Naval Base Kitsap Bangor, 788 acres for Toandos Peninsula, 30 acres for Zelatched Point, 382 acres for Naval Base Kitsap Bremerton, 278 acres for Naval Base Kitsap Keyport, 239 acres for the Jackson Park Housing Complex and Naval Hospital Bremerton, 388 acres for Camp Wesley Harris, 21 acres for Camp McKean, and 650 acres for the Department of the Navy owned rail line (Figure 3-2).

The revised INRMP is a longterm planning document and is organized according to Department of the Navy guidance issued in April 2006, the OPNAV M-5090.1, and DOD Instruction 4715.03. The plan strives to fully integrate and coordinate the natural resources program with other Naval Base Kitsap plans and activities. It establishes goals that represent a long-term vision for the health and quality of Naval Base Kitsap's natural resources. The goals of the plan may be

revised over time to reflect changing missions and environmental conditions. Any future changes in mission, training activity, or technology will be analyzed to assess their impact on natural resources. As new installation plans and Department of the Navy guidance and regulations are developed, they will be integrated with the goals and management actions of the plan. The plan will be reviewed, assessed, and modified as needed on an annual basis to ensure continued integration with other management plans or changes in military mission.

Goals identified for natural resources management at Naval Base Kitsap include the following:

Goal 1: Protect, sustain, and enhance the natural resources at Naval Base Kitsap to ensure that resources are maintaining ecological integrity, while supporting existing and future military needs with no net loss.

Goal 2: Increase awareness of natural resource issues, programs, and responsibilities for sustaining natural resources among the public, Naval Base Kitsap employees, residents, and tenants.

Goal 3: Integrate the Naval Base Kitsap natural resources program with local, state, and regional environmental programs and initiatives to sustain biodiversity and the ecosystem to the maximum extent practicable while meeting the needs of the military mission.

Goal 4: Provide sustainable natural resources related outdoor recreation opportunities.

Goal 5: Improve natural resources management and compliance through enhanced management tools.

The revised INRMP goals will be evaluated via the annual Natural Resources Conservation Metrics evaluation, and documented within the Navy's environmental and Conservation website. This process is discussed further within Section 1.5 of this INRMP.

The revised INRMP was prepared in accordance with and complies with the Sikes Act (16 United States Code [USC] 670a et seq.) as amended (2015), Department of Defense Instruction 4715.03 (*Environmental Conservation Program*), Chief of Naval Operational Instruction M-5090.1 (*Navy Environmental and Natural Resources Program Manual*), and a recent series of Department of Defense and Department of the Navy guidance memoranda on the Sikes Act and Integrated Natural Resources Management Plans. The United States Fish and Wildlife Service, National Marine Fisheries Service, and Washington State Department of Fish and Wildlife have reviewed and signed the INRMP, indicating their mutual agreement with the Commander, Navy Region Northwest, and Commanding Officer, Naval Base Kitsap regarding natural resources management on Naval Base Kitsap. Additionally, the revised INRMP was sent for review to Tribal Governments with Usual and Accustomed Areas.

This Page Intentionally Left Blank

Table of Contents

List of Appendices

List of Figures

List of Tables

NAVAL BASE KITSAP INRMP CROSSWALK TO THE DEPARTMENT OF DEFENSE TEMPLATE

DoD Template	**NBK INRMP**
Cover Page	Cover Page
Signature Page	Signature Pages – separate page for Navy and each signing agency
Executive Summary	Executive Summary
Table of Contents	Table of Contents
Chapter 1 – Overview	Section 1: Overview
1.a. Purpose	1.1 Purpose and Plan
1.b – Scope	1.1 Purpose and Plan
1.c. – Goals and Objectives Summary	1.3 INRMP Vision, Goals, and Objectives
1.d – Responsibilities of Stakeholders	1.6 Roles and Responsibilities
1.e – Commitment of Regulatory Agencies	8.3 Natural Resources Consultation Requirements
1.f – Authority	1.2 Authority
1.g – Stewardship of Compliance Statement	1.4 Stewardship and Compliance
1.h – Review and Revision Process	1.5 Review and Revision Process
1.i – Management Strategies	8.2 Management Strategy
1.j – Integration with other Plans	1.7 Integration of Other Installation Plans
Chapter 2 – Current Conditions and Use	Section 2: NAVBASE Kitsap Overview
2.0 – Installation Information	2.1.1 (NAVBASE Kitsap Bangor and associated properties), 2.1.4 (NAVBASE Kitsap Keyport), 2.1.7 (Jackson Park Housing Complex and Naval Hospital Bremerton), 2.1.10 (NAVBASE Kitsap Bremerton and associated properties)
2.a.1 – Location Statement (concise)	2.1.1 (NAVBASE Kitsap Bangor and associated properties), 2.1.4 (NAVBASE Kitsap Keyport), 2.1.7 (Jackson Park Housing Complex and Naval Hospital Bremerton), 2.1.10 (NAVBASE Kitsap Bremerton and associated properties)
2.a.2 – Regional Land Use	1.4 Stewardship and Compliance
2.a.3 – History and Pre-Military Land Use (abbreviated)	2.1.2 (NAVBASE Kitsap Bangor and associated properties), 2.1.5 (NAVBASE Kitsap Keyport), 2.1.8 (Jackson Park Housing Complex and Naval Hospital Bremerton), 2.1.11 (NAVBASE Kitsap Bremerton and associated properties)
2.a.4 – Military Mission	2.1.3 (NAVBASE Kitsap Bangor and associated properties), 2.1.6 (NAVBASE Kitsap Keyport), 2.1.9

	(Jackson Park Housing Complex and Naval Hospital Bremerton), 2.1.12 (NAVBASE Kitsap Bremerton and associated properties)
2.a.5 – Operations and Activities	2.1.3 (NAVBASE Kitsap Bangor and associated properties), 2.1.6 (NAVBASE Kitsap Keyport), 2.1.9 (Jackson Park Housing Complex and Naval Hospital Bremerton), 2.1.12 (NAVBASE Kitsap Bremerton and associated properties)
2.a.6 – Constraints Map	1.1 Purpose and Plan
2.a.7 – Opportunities Map	2.2 Other Operations, Actiview, and Land and Water Uses
2.b – General Physical Environment and Ecosystems	3 Regional Natural Resources Setting and Current Management (Ecological Setting), 3.1 Physical Setting, 4.1 Physical Conditions (NAVBASE Kitsap Bangor), 5.1 Physical Conditions (NAVBASE Kitsap Keyport), 6.1 Physical Conditions (NAVBASE Kitsap Bremerton), 7.1 Physical Conditions (Jackson Park and Naval Hospital Bremerton)
2.c – General Biotic Environment	4.2 Habitats and Communities (NAVBASE Kitsap Bangor), 5.2 Habitats and Communities (NAVBASE Kitsap Keyport), 6.2 Habitats and Communities (NAVBASE Kitsap Bremerton), 7.2 Habitats and Communities (Jackson Park and Naval Hospital Bremerton)
2.c.1 – Threatened and Endangered Species and Species of Concern	3.6.1 ESA Species Potentially Occurring on NAVBASE Kitsap
2.c.2 – Wetlands and Deep Water Habitats	Executive Summary; 4.2.2 Wetlands (NAVBASE Kitsap Bangor), 5.2.2 Wetlands (NAVBASE Kitsap Keyport), 6.2.2 Wetlands (NAVBASE Kitsap Bremerton), 7.2.2 Wetlands (Jackson Park and Naval Hospital Bremerton)
2.c.3 – Fauna	4.3.2 Fauna (NAVBASE Kitsap Bangor), 5.3.2 Fauna (NAVBASE Kitsap Keyport), 6.3.2 Fauna (NAVBASE Kitsap Bremerton), 7.3.2 Fauna (Jackson Park and Naval Hospital Bremerton)
2.c.4 – Flora	4.3.1 Flora (NAVBASE Kitsap Bangor), 5.3.1 Flora (NAVBASE Kitsap Keyport), 6.3.1 Flora (NAVBASE Kitsap Bremerton), 7.3.1 Flora (Jackson Park and Naval Hospital Bremerton)
Chapter 3 – Environmental Management Strategy and Mission Sustainability	Section 8: Environmental Management Strategy and Mission Sustainability
3.a – Supporting Sustainability of the Military Mission and the Natural Environment	8.1 Supporting Sustainability of the Military Mission and the Natural Environment
3.a.1 – Integrate Military Mission and Sustainability Land Use	8.2 Management Strategy
3.a.2 – Define Impact to the Military Mission	8.4 Planning for NEPA Compliance
3.a.3 – Describe Relationship to Range Complex Management Plan or other Operational Area Plans	N/A
3.b – Natural Resources Consultation Requirements (Section 7, EFH)	8.3 Natural Resource Consultation Requirements
3.c. – NEPA Compliance	8.4 Planning for NEPA Compliance

3.d – Opportunities for Beneficial Partnerships and Collaborative Resource Planning	8.7 Beneficial Partnerships and Collaborative Resource Planning
3.e – Public Access and Outreach	8.6 Public Access and Outreach
3.e.1 – Public Access and Outdoor Recreation	8.8 Outdoor Recreation
3.e.2 – Public Outreach	8.6 Public Access and Outreach
3.e.3 – Encroachment Partnering	8.11 Encroachment Action Plan
3.e.4 – State Comprehensive Wildlife Plans Integration	8.10 State Wildlife Action Plans
Chapter 4 – Program Elements	Section 4: Natural Resources on NAVBASE Kitsap Bangor, Section 5: Current Condition of Natural Resources on NAVBASE Kitsap Keyport, Section 6: Current Conditions of Natural Resources on NAVBASE Kitsap Bremerton, Section 7: Current Condition of Natural Resources on Jackson Park Housing Complex and Naval Hospital Bremerton
4.a. – Threatened and Endangered Species and Species Benefit, Critical Habitat, Species of Concern Management	4.4 ESA Listed Species (NAVBASE Kitsap Bangor), 5.4 ESA Listed Species (NAVBASE Kitsap Keyport), 6.4 ESA Listed Species (NAVBASE Kitsap Bremerton), 7.4 ESA Listed Species (Jackson Park and Naval Hospital Bremerton)
4.b – Wetlands and Deep Water Habitats	4.2.2 Wetlands (NAVBASE Kitsap Bangor), 5.2.2 Wetlands (NAVBASE Kitsap Keyport), 6.2.2 Wetlands (NAVBASE Kitsap Bremerton), 7.2.2 Wetlands (Jackson Park and Naval Hospital Bremerton)
4.c – Law Enforcement	8.9 Law Enforcement
4.d – Fish and Wildlife	4.3.2 Fauna (NAVBASE Kitsap Bangor), 5.3.2 Fauna (NAVBASE Kitsap Keyport), 6.3.2 Fauna (NAVBASE Kitsap Bremerton), 7.3.2 Fauna (Jackson Park and Naval Hospital Bremerton)
4.e – Forestry	3.2.5 Forest Management
4.f. – Vegetation	4.3.1 Flora (NAVBASE Kitsap Bangor), 5.3.1 Flora (NAVBASE Kitsap Keyport), 6.3.1 Flora (NAVBASE Kitsap Bremerton), 7.3.1 Flora (Jackson Park and Naval Hospital Bremerton)
4.g – Migratory Birds	4.3.2.4 Migratory Birds (NAVBASE Kitsap Bangor), 5.3.2.4 Migratory Birds (NAVBASE Kitsap Keyport), 6.3.2.4 Migratory Birds (NAVBASE Kitsap Bremerton), 7.3.2.4 Migratory Birds (Jackson Park and Naval Hospital Bremerton)
4.h – Invasive Species	3.4 Invasive Species
4.i – Pest Management	3.5.2 Nuisance Wildlife and Feral Animal Management
4.j – Land Management	Table 2-1: NAVBASE Kitsap INRMP Land Management Acres
4.k – Agricultural Outleasing	9.4.1 Funding Sources
4.l – GIS Management, Data Integration, Access, and Reporting	8.14 GIS, Data Integration, Access, and Reporting

4.m – Outdoor Recreation	8.8 Outdoor Recreation
4.n – Bird/Animal Aircraft Strike Hazard	3.5.1 BASH
4.o – Wildland Fire	2.2.3 Fire Prevention
4.p – Training of Natural Resources Personnel	8.13 Natural Resources Personnel Training
4.q – Coastal/Marine	2.3.6 Coastal Zone Management Act (CZMA)
4.r – Floodplains	4.1.3.3 Toandos Buffer Zone and Zelatched Point
4.s – Other Leases	N/A
Chapter 5 – Implementation	Section 9: Implementation
5.a – Summary of Project Prescription Development Process	9.1 Project Prescription Development
5.b – Achieving No Net Loss	8.12 Achieving No Net Loss of the Military Mission, 9.5 Effectiveness of INRMP Providing No-Net-Loss to Military Mission
5.c - Use of Cooperative Agreements	9.4.2 Beneficial Partnerships and Cooperative Resources Planning
5.d – Funding Process	9.4.1 Funding Sources and Mechanisms
Appendix 1. Acronyms	Appendix A: Acronyms and Abbreviations
Appendix 2. Detailed Natural Resource Prescriptions	Appendix G: Forestry Prescriptions
Appendix 3. List of Projects	Appendix D: INRMP Projects, Schedules, and Implementation Table
Appendix 4. Surveys; Results of Planning Level Surveys	N/A
Appendix 5. Research Requirements	N/A
Appendix 6. Migratory Bird Management	2.3.3 Migratory Bird Treaty Act (MBTA) & Executive Order (EO) 13186; 4.3.2.4 Migratory Birds (NAVBASE Kitsap Bangor); 5.3.2.4 Migratory Birds (NAVBASE Kitsap Keyport); 6.3.2.4 Migratory Birds (NAVBASE Kitsap Bremerton); 7.3.2.4 Migratory Birds (Jackson Park & Naval Hospital Bremerton)
Appendix 7. Benefits for Endangered Species	3.2.5.3.6 Endangered Species; 8.2 Management Strategy
Appendix 8. Critical Habitat	3.6.1 ESA Species Potentially Occurring on NAVBASE Kitsap (By Species)

1 OVERVIEW OF INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

1.1 Purpose and Plan

The United States Department of the Navy (DON) has revised and combined the Integrated Natural Resources Management Plans (INRMPs) for Naval Base (NAVBASE) Kitsap installations (Table 1-2 & Figure 2-1). This combined INRMP provides natural resources management strategies for NAVBASE Kitsap Bangor (which includes the Navy-owned portions of the Toandos Peninsula and Zelatched Point, and numerous tenant commands to include: Strategic Systems Program (SSP), U.S. Pacific Fleet (PACFLT), Submarine Development Squadron 5 (SUBDEVRON), and Maritime Force Protection Unit (MFPU)); NAVBASE Kitsap Bremerton (which includes the tenant command Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF); NAVBASE Kitsap Keyport (which includes the tenant command Naval Undersea Warfare Center Division, Keyport (NUWCDIV) Keyport); Jackson Park Housing Complex and Naval Hospital Bremerton; Camp Wesley Harris; Camp McKean; and the DON-owned rail line that runs from Shelton, Washington to NAVBASE Kitsap Bangor and Bremerton. The following table identifies the properties covered by the NAVBASE Kitsap INRMP with brief descriptions of their actions.

Installation	Acres	Description
NAVBASE Kitsap Bangor	6,609	NAVBASE Kitsap Bangor, is located in Kitsap County on the eastern bank of Hood Canal, approximately 20 miles west of Seattle, Washington, and 5 miles northwest of the unincorporated town of Silverdale. The installation provides berthing and support services to Navy submarines and other fleet assets. The entirety of the installation, including land areas and adjacent water areas in Hood Canal, is restricted from general public access.
Toandos Buffer Zone	788	The Toandos Buffer Zone is located in Jefferson County on the eastern side of the Toandos Peninsula, on the western bank of the Hood Canal across from NAVBASE Kitsap Bangor. It is undeveloped and acts as a buffer zone for NAVBASE Kitsap Bangor activities. The area surrounding the property is rural.
Zelatched Point	30	Zelatched Point is located in Jefferson County on the southwestern end of the Toandos Peninsula on Dabob Bay. It is across the Hood Canal, approximately 4 miles west of the NAVBASE Kitsap Bangor waterfront. Zelatched Point has one pier and several facilities that support the Naval Undersea Warfare Center (NUWC) Keyport mission for test and evaluation operations within the Dabob Bay Military Operating Area. The area surrounding the property is rural.
Camp Wesley Harris	388	Camp Wesley Harris is located in Kitsap County approximately 8 miles southwest of NAVBASE Kitsap Bangor. It is situated along the crest of the Kitsap Peninsula between Hood Canal and Dyes Inlet, and Seabeck Highway bisects it. Camp Wesley Harris provides a small arms training facility for the military.

Installation	Acres	Description
NAVBASE Kitsap Keyport	278	NAVBASE Kitsap Keyport is located in Kitsap County on the Kitsap Peninsula abutting Liberty Bay. It is approximately 15 miles due west of Seattle and 10 miles north of Bremerton. NUWC Keyport is the major tenant command at the installation. NUWC Keyport provides testing and evaluation for undersea warfare systems, including maintenance and repair, and fleet industrial support for torpedoes, mobile mines, unmanned underwater vehicles, and countermeasures.
NAVBASE Kitsap Bremerton	382	NAVBASE Kitsap Bremerton is located in Kitsap County on the north side of Sinclair Inlet within the city of Bremerton. The eastern portion of the base is a fenced, high-security area known as the Controlled Industrial Area. Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) is the major tenant command of the installation. PSNS & IMF overhauls and repairs all nuclear powered warships. NAVBASE Kitsap Bremerton is a homeport for submarines and aircraft carriers.
Camp McKean	21	Camp McKean is located in Kitsap County on Kitsap Lake, approximately 5 miles west of NAVBASE Kitsap Bremerton. It is a recreational facility that supports Navy commands and authorized Fleet & Family Readiness patrons.
Jackson Park Housing Complex and Naval Hospital Bremerton	239	The properties are located in eastern Kitsap County on the west bank of Ostrich Bay, a small embayment on the south end of Dyes Inlet, Puget Sound. Jackson Park Housing Complex provides residential family housing. Naval Hospital Bremerton is located north of Jackson Park Housing Complex. It provides medical services to active duty and retired military personnel and their dependents.
Rail line from Shelton to Bangor and Bremerton	650 (48 miles)	The railroad line begins in Shelton, Washington (Mason County) and runs to NAVBASE Kitsap Bremerton, and to NAVBASE Kitsap Bangor, in Silverdale (Kitsap County). The property line varies between 25 feet to over 200 feet from the track centerline depending on location. The railroad line provides freight rail service to NAVBASE Kitsap from the Elma-Bangor branch, and provides for limited commercial use.

NAVBASE Kitsap also includes a separate sites containing the Manchester Fuel Department (operated by Fleet Logistics Center Puget Sound) and SEAFAC Back Island Alaska, but the scope of this INRMP does not include these locations as they have separate INRMPs.

This INRMP revision is consistent with guidance and regulations provided in the Department of Defense (DOD) Instruction 4715.03 (*Natural Resources Conservation Program*), Chief of Naval Operational Instructions (OPNAV) M-5090.1 (*Navy Environmental and Natural Resources Program Manual*), and more recent DON and DOD Sikes Act and INRMP guidance memoranda. These guidance documents collectively require a plan and management approach that integrates mission support, multipurpose use, ecosystem or landscape-level management, and environmental compliance and stewardship.

This revised INRMP was developed after a thorough review of the previous INRMPs associated with NAVBASE Kitsap (which include INRMPs for Bangor and Keyport, 2001), review of new

data since the last INRMP, as well as detailed discussions with Naval Facilities Engineering Command (NAVFAC) Northwest natural resources staff and various INRMP stakeholders. This INRMP strives to integrate INRMP activities with other installation plans and base activities and to provide explicit goals and objectives to which natural resources initiatives and projects will contribute. The projects and initiatives contained in this INRMP include a combination of ongoing natural resources management activities from previous years and new projects and activities identified as priorities during the review process.

1.2 Authority

This INRMP is authorized under the Conservation Programs on Military Installations (Sikes Act), as amended; Public Law (PL) 86-797, 16 United States Code (USC) § 670(a) et seq., which requires military installations to prepare and implement INRMPs to provide for:

a) Fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;

b) Fish and wildlife habitat enhancement or modifications;

c) Wetlands protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants;

d) Integration of and consistency among the various activities conducted under the plan;

e) Establishment of specific natural resources management goals and objectives and timeframes for proposed actions;

f) Sustainable use by the public of natural resources to the extent that the use is consistent with the needs of the fish and wildlife resources;

g) Public access to the military installation that is necessary and appropriate for natural resource uses, subject to requirements necessary to ensure safety and military security;

h) Enforcement of applicable natural resources laws and regulations;

i) No net loss in the capability of military installation lands to support the military mission of the installation; and

j) Such other activities as the Secretary of the Navy determines appropriate.

The Sikes Act also sets guidelines for the collection of fees for the use of natural resources such as hunting and fishing.

Over the last several years, various guidance documents have been prepared on the interpretation of the Sikes Act Improvement Act (SAIA) and on INRMP preparation. Below are listed key DOD and Department of Navy (DON) documents relevant to natural resource management.

- ***Memorandum on Implementation of Ecosystem Management in DOD:*** This memorandum issued by the Deputy Under Secretary of Defense on 8 August 1994, was the first formal statement of an ecosystem management approach to land management in the DOD. Ecosystem management is to be achieved through developing and implementing INRMPs. This memorandum contains DOD's 10 principles of ecosystem management as an attachment, which were later included as an enclosure in DOD Instruction 4715.03 and those policies addressed in the 1996 instruction continue in the most recent guidance (see below).

- ***DOD Instruction 4715.03, Natural Resources Conservation Program (18 March 2011) and Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Integrated Natural Resource Management Plan (INRMP) Reviews (1 November 2004):*** This DOD instruction and supplemental guidance pertains to both natural and cultural resources management on DOD lands. It includes budgeting classifications for funding priorities and detailed information on the intent of INRMPs.

- ***DOD Manual 4715.*****03**, Integrated Natural Resources Management Plan (INRMP)) Implementation Manual (25 November 2013). This manual provides procedures to prepare, review, update, and implement INRMPs in compliance with the Sikes Act.

- ***Memorandum on Implementation of Sikes Act Improvement Amendment: Updated Guidance:*** This memorandum of the Under Secretary of Defense, issued on 10 October 2002, provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout the DOD and replaces the 21 September 1998 guidance Implementation of the Sikes Act Improvement Amendments. The October 2002 memorandum and its supplement issued in November 2004 emphasize implementing and improving the overall INRMP coordination process and focus on coordinating with stakeholders, reporting requirements and metrics, budgeting for INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and initiating the INRMP review process.

- ***The Implementation of Sikes Act Improvement Amendment - Supplemental Guidance Concerning Leased Lands (17 May 2005):*** This document provides supplemental guidance for implementing SAIA requirements consistently throughout the DOD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management of all lands for which the subject installation has real property accountability, including leased lands. Installation Commanding Officers (COs) may require tenants to accept responsibility for performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.

- ***OPNAV M-5090.1, Environmental Readiness Program Manual:*** Establishes broad policy and assigns responsibilities for the Naval Natural Resources Program. Ensures each command establish procedures to continuously inform Navy decision makers of the conditions of natural resources, the objectives of INRMPs, and potential or actual conflicts between Navy actions/management plans and environmental requirements. Each command shall recognize and balance environmental stewardship with mission readiness in retaining control and use of Navy land, sea, and air space for sustainment of mission needs and military readiness.

- ***NAVFAC Real Estate Operations and Natural Resources Management Procedure Manual, P-73, Volume II:*** This document addresses CNO natural resources program requirements, guidelines, and standards.

- ***Integrated Natural Resources Management Plan Guidance for Navy Installations (10 April 2006):*** This guidance provides natural resource managers at Navy installations with **a**n interpretation of what processes are needed to prepare INRMPs. This document also includes, per the SAIA guidance, significant new reporting requirements and measures of merit associated with INRMP development, implementation, and annual review.

- ***Memorandum of Understanding (MOU) between the U.S. Department of Defense, U.S. Fish and Wildlife Service (USFWS), and the Association of Fish and Wildlife Agencies. (July 29, 2013)***: This tripartite MOU furthers a cooperative integrated natural resource management program on military installations and further cooperative relationship between the U.S. Department of Defense, U.S. Department of the Interior Fish and Wildlife Service, and state fish and wildlife agencies acting through the Association of Fish and Wildlife Agencies in preparing, reviewing, revising, updating, and implementing Integrated Natural Resource Management Plans for military installations.

1.3 Vision, Goals and Objectives

The following sections detail the overall natural resources management elements at NAVBASE Kitsap and provide specifics on natural resource constituents found at each installation. The goals supported by the INRMP through objectives and projects, which provide management strategies and specific actions to achieve these goals. The goals will ensure the success of the military mission while conserving natural resources. The general philosophies and methodologies used throughout the NAVBASE Kitsap natural resources management program focus on conducting required military activities while maintaining ecosystem viability. These management strategies in the following chapters, lead to the goals and objectives of Chapter 8 that guide the installations.

1.4 Stewardship and Compliance

Conservation biology fully recognizes and embraces the many contributions that need to be made by biologist and non-biologist alike. In many cases, social values, economics, and political factors have more of an impact on natural resources management than do biological sciences. The Installation CO, tenants, operations personnel, and other installation personnel have an influence on environmental conditions at NAVBASE Kitsap; they become part of the solution by working with the Natural Resource Managers (NRMs) and integrating their perspectives within the management process of the installations, and incorporating ecosystem management's "ten guiding principles" as the basis for land use planning and management. The planning and management is pertinent in implementing this INRMP.

As NAVBASE Kitsap faces pressure of increasing demands and fewer resources to meet them, stewardship of the environment becomes a very practical issue. Biodiversity, which refers to the variety of life and the ecological processes that sustain it, is critical to the integrity and sustainability of the NAVBASE Kitsap ecosystems. This concept of biodiversity is central to ecosystem management, which is the basis for NAVBASE Kitsap's natural resources management. Sustainability is a systemic concept to preserve biodiversity and ensure the integrity of natural ecosystems over time while meeting the needs of the military mission. This concept of conservation and sustainability goes beyond the definition of compliance, which is simply meeting the minimum requirements of laws and regulations that pertain to the environment. NAVBASE Kitsap's personnel will take an active approach to managing the natural resources of the installations and integrate all plans and operations into the concepts of biodiversity and sustainability of these resources. This INRMP outlines a strategy for sustaining biodiversity and the ecosystem as well as plans for complying with applicable regulations while meeting the needs of military mission.

1.5 Review and Revision Process

Per DoD Instruction 4715.03 and OPNAV M-5090.1, Natural Resources metrics must be completed annually by each Navy installation with natural resources. The metrics ensure the effectiveness of NAVBASE Kitsap's INRMP. The evaluation will utilize the seven focus areas in the Navy's Conservation Website. These seven focus areas are:

a) Natural Resources Management (Ecosystem Integrity)

b) Listed Species and Critical Habitat

c) Recreational Use and Access

d) Sikes Act Cooperation (Partnership Effectiveness)

e) Team Adequacy

f) INRMP Implementation

g) INRMP (Natural Resource Program) Support of the Installation

Use of the Navy's Conservation Website (U.S. Navy Environmental Portal Account and Common Access Card (CAC) are required for access) to accomplish the INRMP Annual Reviews will also generate Navy conservation program metrics to measure effects of the conservation program on the installation's mission and the status of the installation's relationship with USFWS, National Marine Fisheries Service (NMFS), Washington Department of Fish and Wildlife (WDFW), and other stakeholders as appropriate.

The annual evaluation/metrics must be completed in cooperation with the appropriate field-level offices of the USFWS and WDFW. Navy Region Northwest has also invited the National Oceanic and Atmospheric Administration (NOAA) NMFS to collaborate with installations in the management of NMFS regulated fish and marine mammals located on or around NAVBASE Kitsap properties. Although not required by the Sikes Act, the Navy has invited NMFS to review this INRMP. The cooperating partners will work together to measure both the successes and issues resulting from INRMP implementation. During these reviews, it may be determined that the installation's current INRMP is effective and is not in need of revision. With agreement from USFWS, NMFS (when appropriate, but not required), and WDFW through written documentation, the annual informal evaluations may be used to substitute for the 5-year formal review. Minor changes (updates) can be made to the INRMP following annual reviews to prevent the need for a more costly revision following the review for operation and effect. NAVBASE Kitsap will document annual reviews and work with USFWS, NMFS, and WDFW to use the annual review process to meet the 5-year formal review requirement whenever possible. NAVBASE Kitsap NRMs will coordinate with the partner agencies to coordinate the annual INRMP review at a time and location that is convenient for all.

Section 101(b)(2) of the Sikes Act specifically directs that the INRMPs be reviewed "as to operation and effect" by the primary parties "on a regular basis, but not less often than every five years", emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the Sikes Act (as amended) and contribute to the conservation and rehabilitation of natural resources on military installations.

No element of the Sikes Act is intended to either enlarge or diminish the existing responsibility and authority of the USFWS or WDFW concerning fish and wildlife responsibilities on military lands. An INRMP reflects mutual agreement of the parties concerning the conservation, protection, and management of fish and wildlife resources. All actions and projects in the INRMP are subject to the availability of funds appropriated by Congress, and none of the proposed projects shall be interpreted to require obligation or payment of funds in violation of any applicable federal law including the Federal Anti-Deficiency Act (31 USC § 1341). All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 USC § 1341 et seq.).

1.6 Roles and Responsibilities

1.6.1 Navy Responsibilities

Successfully implementing an INRMP requires the support of natural resources personnel, other installation staff, command personnel, and installation tenants. The following section discusses the responsibilities for INRMP implementation within the United States Navy (USN).

Chief of Naval Operations, Environmental Readiness Division

Chief of Naval Operations (CNO) shall serve as the principal leader and overall Navy program manager for the development, revision, and implementation of INRMPs and shall:

a) Provide policy, guidance, and resources for the development, revision, and implementation of INRMPs and associated National Environmental Policy Act (NEPA) documents.

b) Represent the Navy on issues regarding the implementation of INRMPs and delegate responsibility in writing.

c) Resolve high-level conflicts associated with development and implementation of INRMPs.

d) Approve all INRMP projects before INRMPs are submitted to regulatory agencies for signature.

Commander, Navy Installations Command

The Commander, Navy Installations Command (CNIC) shall:

a) Ensure that installations under its command develop, revise, and implement INRMPs if required, and:
    1) Reevaluate the need for an INRMP at all installations that currently do not have an INRMP.
    2) Following the initial evaluation, reevaluate all remaining installations that do not have an INRMP every five years.

b) Ensure that installations comply with DoD, Department of the Navy (DON) and CNO policy on INRMPs and associated NEPA document preparation, revision and implementation.;

c) Ensure the programming of resources necessary to maintain and implement INRMPs, which involves:

    1) The review of an endorsement of projects recommended for INRMP implementation prior to submittal for signature. These projects are identified in Appendix D;

2) The evaluation and validation of Environmental Program Review (EPR) web project proposals.

d) Participate in the development and revisions of INRMPs, which involves the maintenance of a close liaison with N45, NAVFAC and other budge submitting offices (BSOs).
e) Provide overall program management oversight for all natural resources program elements.

Regional Commanders

The Regional Commanders shall:

a) Ensure that installations comply with DOD, DON, and Director Environmental Readiness Division (CNO) policy on INRMPs, and associated NEPA document preparation, revision, and implementation.

b) Ensure that installations INRMPs undergo annual informal reviews as well as formal five-year evaluations. Ensure installations complete the annual INRMP metric review, and endorse the results prior to submittal to CNIC via the chain of command.

c) Ensure the programming of resources necessary to maintain and implement INRMPs, which involves:

1. The evaluation and validation of EPRWeb project proposals.

2. The funding of installation natural resources management staff.

d) Establish positive, productive relationships with local and regional authorities responsible for natural resource conservation for the benefit of subordinate command functions and INRMP development and implementation is accomplished.

Installation Commanding Officer

The NAVBASE Kitsap Commanding Officer (CO) shall ensure the preparation, completion, and implementation of the INRMP and associated NEPA documentation for this installation and should systematically apply the conservation practices set forth in the Plans.

The installation CO’s role is to:

a) Act as steward of the natural resources under their jurisdiction and integrate natural resources requirements into the day-to-day decision-making process.

b) Ensure natural resources management and the INRMP comply with all natural resources related legislation; Executive Orders (EO) and Executive Memoranda; as well as DOD, SECNAV, DON and CNO directives, instructions, and policies.

c) Involve appropriate tenant, operational, training, or R&D commands in the INRMP review process to ensure no net loss of military mission.

d) Designate by letter, one or more Natural Resources Managers (NRMs) responsible for the management efforts related to the preparation, revision, implementation, and funding for the INRMP. (Appendix I)

e) Involve appropriate Navy Judge Advocate General (JAG) or Office of the General Counsel (OGC) Legal Counsel to provide advice and counsel with respect to legal matters related to natural resources management and INRMPs.

f) Endorse INRMPs via Commanding Officer NAVBASE Kitsap signature.

The installation Commanding Officer at NAVBASE Kitsap holds the highest-ranking position at the installation and is ultimately responsible for all aspects of the installation and its many functions. This includes ensuring that the INRMP is developed, implemented, and fully supported. The installation Commanding Officer can facilitate the implementation of the INRMP by encouraging support down the chain-of-command; ensuring that a process is established for early coordination between the NRMs and key installation staff; and ensuring that natural resources management is integrated with other installation management functions, military operations, security, and Research, Development, Testing & Evalluation (RDT&E) activities.

Installation Environmental Program Director

The Installation Environmental Program Director (IEPD) works for the installation CO to ensure the installation is in compliance with all natural resources related legislation; EO and Executive Memoranda; DOD and CNO directives, instructions, and policies. The NRM is a member of the IEPD's staff who is recommended by the IEPD to the installation CO to be designated the NRM. The IEPD assists in project design, implementation, and in identifying personnel, internal or external to the installation with expertise to accomplish INRMP projects. The IEPD is one of many signatories to the INRMP and works at a high level to ensure its success.

Installation Natural Resource Manager(s) (NRMs)

The NRMs are responsible for natural resources management at NAVBASE Kitsap. The NRM is designated in writing by the Commanding Officer (Appendix I). The NRM duties include ensuring that the CO is informed of natural resource conditions and issues; goals and objectives of the INRMP; and potential or actual conflicts between mission requirements and natural resource mandates.

The NRM is a member of the NAVBASE Kitsap Public Works Department – Environmental Division and is administratively a NAVFAC employee. They are primarily responsible for the preparation, revision and implemention of this INRMP and coordinating with other personnel on the installations as necessary to implement the INRMP to meet the goals and objectives. They

are also responsible for ensuring this plan is reviewed, current, and compliant in coordination with the USFWS, NMFS, and the WDFW. The NRM is responsible for annually compiling, tracking, and maintaining the INRMP metrics on the Navy Conservation Website.

NAVBASE Kitsap divides natural resource management responsibilities among several installations and tenant personnel according to Table 1-1.

Table 1-1: Installation Natural Resource Managers and Areas of Responsibility

NRM Billet	Areas of Responsibility
NRM for NAVBASE Kitsap Bremerton	NAVBASE Kitsap Bremerton, PSNS & IMF industrial area of NAVBASE Kitsap Bremerton, Jackson Park Housing Complex, Naval Hospital Bremerton, and Camp McKean and the Navy Railroad from NAVBASE Kitsap Bremerton to Shelton
NRM for NAVBASE Kitsap Bangor	NAVBASE Kitsap Bangor, NAVBASE Kitsap Keyport, Zelatched Point, Toandos Buffer Zone, Camp Wesley Harris, and the portion of the Navy Railroad from the start of the Bangor spur (east of the Bremerton Airport) to its termination at NAVBASE Kitsap at Bangor
NRM for NAVBASE Kitsap Manchester	NAVBASE Kitsap Manchester (Fuel Depot): Separate INRMP coverage.
NRM for Alaska Sites	Back Island Alaska: Separate INRMP coverage.

The above personnel work in close coordination with each other in managing NAVBASE Kitsap's natural resources and often lend assistance on properties outside their primary areas of responsibility as workloads demand.

Region Program Director for Environmental (N45)

The Region Program Director for Environmental (N45) provides a Senior Regional Natural Resources Specialist to ensure execution of Natural Resources conservation responsibilities in support of the Regional Commander. The specialist reviews and signs INRMPs for technical sufficiency, consistency within the region, and compliance with Navy and DoD policy.

Public Affairs Office

The Public Affairs Office (PAO) provides a significant link between the INRMP and the on-and off-installation communities. The PAO will facilitate communication between offices across the installation, tenant commands, and nearby communities regarding environmental management

initiatives. Within NAVBASE Kitsap, there are multiple PAOs depending on the issue at hand, the installation, and the command.

Naval Facilities Engineering Command Northwest

Naval Facilities Engineering Command Northwest (NAVFAC NW) provides oversight and support for the development, maintenance, and implementation of Navy Region Northwest's installation INRMPs and the natural resource program. NAVFAC Northwest's role in natural resources management is to:

a) Provide technical and contractual support to NAVBASE Kitsap for the preparation, development, and implementation of INRMPs and associated NEPA documents.

b) Facilitate and coordinate the issuance of INRMP-related NEPA documents.

c) Evaluate and disseminate information concerning new technology, methods, policies and procedures for use in the development and implementation of INRMPs.

d) Assist with the development of the INRMP Project Implementation Table, EPR and Legacy project proposals.

e) Provide technical and administrative guidance for the development and execution of contracts and cooperative agreements to develop and implement INRMPs.

f) Facilitate the acquisition of INRMP "mutual agreement" between the Navy, USFWS and state fish and wildlife agencies.

g) Facilitate conflict resolution between the Navy, USFWS and state fish and wildlife agencies and other stakeholders, as necessary.

h) Provide technical oversight and resources for forest management and assist in implementing forest habitat management actions.

i) Provide support and resources to installation fish and wildlife program and assist with hunting and fishing fee and permit collections and distributions.

j) Assist with compiling, tracking and maintaining INRMP metrics on the Conservation website.

NAVFAC NW, including the installation NRMs, are a compilation of professionally qualified foresters, botanist, fisheries specialists, marine mammal experts, marine and terrestrial bird specialist, and knowledgeable biologists for invasive species management. These subject matter experts are all available to support and assist the installation's natural resources program and associated consultations pertaining to ESA Section 7, Magnuson Stevens Act, MMPA, BASH and MBTA.

1.6.2 External Stakeholder Responsibilities

Other Federal Agencies

The Sikes Act directs DOD to seek mutual agreement with the USFWS in the management of natural resources on DOD installations. The USFWS, along with the Navy, has signature approval authority over INRMPs. Navy Region Northwest has invited the National Oceanic and Atmospheric Administration (NOAA) NMFS to collaborate with installations in the management of NMFS regulated fish and marine mammals located on or around NAVBASE Kitsap properties. Although not required by the Sikes Act, the Navy has invited NMFS to review this INRMP. USFWS and NOAA Fisheries biologists may be called upon to provide expertise in environmental areas and support to the NRM through interagency agreements, if necessary.

State Agencies

The Sikes Act also directs the DOD to coordinate with appropriate state fish and game offices in the management of natural resources on DOD installations. The WDFW has signature approval authority over this INRMP. WDFW biologists may be called upon to provide assistance and support to the NRM, if necessary.

Tribal Governments

NAVBASE Kitsap will seek input from tribes whose Usual and Accustomed (U&A) Areas are co-located with waters owned or used by the Navy, pursuant to SECNAVINST 11010.14A, COMNAVREGNWINST 11010.14, and OPNAV M-5090.1. A copy of the draft INRMP will be sent to each tribe, whose input will be sought on the proposed projects.

Usual and Accustomed Areas are based on treaties signed by the United States (U.S.) government and local Tribes whereby Tribes ceded vast tracts of land to the U.S. These treaties have continuing force today and often allow the taking of fish or other rights at usual and accustomed grounds. U&A Areas vary by Tribe and are not universal across all of NAVBASE Kitsap. The following tribes have U&A Areas adjacent to the NAVBASE Kitsap properties covered by this INRMP:

- Jamestown S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Port Gamble S'Klallam Tribe
- Skokomish Tribe
- Suquamish Tribe

1.7 Integration of Other Installation Plans

The existing natural resource management plans for NAVBASE Kitsap installations will be incorporated into the overall NBK INRMP. The existing plans are described in Table 1-2 and show which parts of the installations are covered where.

1.7.1 Integrated Cultural Resources Management Plan (ICRMP)

ICRMPs are currently in draft and being written for individual installation properties. The ICRMPs for each larger NBK property will cover some of the smaller sites that fall within the property management. The NRM will coordinate plans and actions within the INRMP with the Cultural Resources Manager (CRM) to ensure plans and actions are in compliance with laws protecting cultural resources.

1.7.2 Integrated Pest Management Plan

An Integrated Pest Management Plan (IPMP) guides pest management at NAVBASE Kitsap (NAVFAC Atlantic 2011). The plan is reviewed by the Installation Pest Management (IPM) Coordinator annually, and is currently (2017) in the process of being updated with no significant changes. The integrated approach to pest management is a planned program incorporating education, continuous surveillance, recordkeeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. This approach uses targeted, sustainable methods (i.e., effective, economical, and environmentally sound).

The Navy requires the use of State-certified applicators for applying herbicides. Pest problems (e.g., mice, rats) are referred to the Navy's Base Operating Services Contract (BOSC) for resolution. The BOSC must follow the IPMP.

Commander, Navy Region Northwest has established an interagency agreement with the U.S. Department of Agriculture Animal & Plant Health Inspection Service, Wildlife Services (APHIS-WS) for wildlife-damage management activities across the Region, including NAVBASE Kitsap. The intent is to control gulls, Canada geese, and other birds and animals in order to protect human health and safety and minimize damage to structures. This agreement is reviewed annually and managed by the installation NRMs.

Additionally, the Navy has also entered into a Cooperative Agreement (CA) with Kitsap County to conduct noxious, non-native invasive weed surveys and removal on Naval Base Kitsap properties. Currently work will be conducted in 2017 at NAVBASE Kitsap Bangor, NAVBASE Kitsap Keyport, NAVBASE Kitsap Bremerton, and Camp Wesley Harris. All work covered by the CA will include surveys, mapping, and writing of a treatment plan for the control and removal of invasive plant species.

Table 1-2: Existing Natural Resource Plans

Plan	Date	Locations Covered by Plan
Natural Resources Management Plan for Puget Sound Naval Shipyard	February 1994**	Puget Sound Naval Shipyard (area is now NAVBASE Kitsap, Bremerton) East Park Housing (no longer owned by Navy) Jackson Park Housing Olalla Housing (no longer owned by Navy) Camp McKean Railroad right-of-way adjacent to Sinclair Inlet
Naval Submarine Base Bangor Integrated Natural Resources Management Plan	March 2001	NAVBASE Kitsap, Bangor Naval Undersea Warfare Center Detachment Keyport Annex Camp Wesley Harris Toandos Buffer Zone U.S. Railroad from Shelton, WA to Submarine Base Bangor (which is NAVBASE Kitsap, Bangor)
Naval Undersea Warfare Center Division, Keyport, Integrated Natural Resources Management Plan	March 2001*	NAVBASE Kitsap, Keyport
Naval Hospital Bremerton Integrated Natural Resources Management Plan 2005-2009	June 2004	Naval Hospital Bremerton

*The Navy-owned land at Zelatched Point was previously part of NUWCDIV Keyport, but it was not covered in the 2001 INRMP. **The June 2012 INRMP was not in compliance with NEPA as the EA was not completed, however it was a signed document.

2 NAVBASE KITSAP OVERVIEW

2.1 NAVBASE Kitsap Military Mission and History

NAVBASE Kitsap is one of the largest naval complexes in Navy Region Northwest and is composed of NAVBASE Kitsap Bangor, Toandos Peninsula, Zelatched Point, NAVBASE Kitsap Keyport, NAVBASE Kitsap Bremerton, Jackson Park Housing Complex, Naval Hospital Bremerton, and the DON-owned rail line (USN Railroad) from Bangor and Bremerton to Shelton (Figure 2-1). The scope of this INRMP includes only the NAVBASE Kitsap properties mentioned above and not NAVBASE Kitsap Manchester (Fleet Logistics Center Puget Sound operated Fuel Depot) and SEAFAC Back Island Alaska (Figures 2-2 and 2-3), as both are covered under their own INRMPs. The NAVBASE Kitsap INRMP manages 9,385 acres of land including 382 acres for NAVBASE Kitsap Bremerton; 239 acres for Jackson Park Housing Complex and Naval Hospital Bremerton; 278 acres for NAVBASE Kitsap Keyport; 6,609 acres for NAVBASE Kitsap Bangor; 388 acres for Camp Wesley Harris; 21 acres for Camp McKean; 788 acres for Toandos Peninsula; 30 acres for Zelatched Point; and 650 acres (48 mi) of USN Railroad (Table 2-1). NAVBASE Kitsap is located in western Washington State and encompasses properties in Kitsap, Mason, and Jefferson Counties.

Table 2-1: NAVBASE Kitsap INRMP Land Management Acres

Installation	Acres	Description
NAVBASE Kitsap Bangor	6,609	NAVBASE Kitsap Bangor, is located in Kitsap County on the eastern bank of Hood Canal, approximately 20 miles west of Seattle, Washington, and 5 miles northwest of the unincorporated town of Silverdale. The installation provides berthing and support services to Navy submarines and other fleet assets. The entirety of the installation, including land areas and adjacent water areas in Hood Canal is restricted from general public access.
Toandos Buffer Zone	788	The Toandos Buffer Zone is located in Jefferson County on the eastern side of the Toandos Peninsula, on the western bank of the Hood Canal across from NAVBASE Kitsap Bangor. It acts as a buffer zone for NAVBASE Kitsap Bangor, activities. The area surrounding the property is rural.
Zelatched Point	30	Zelatched Point is located in Jefferson County on the southwestern end of the Toandos Peninsula on Dabob Bay. It is across from the Hood Canal, approximately 4 miles west of the NAVBASE Kitsap Bangor waterfront. Zelatched Point has one pier and several facilities, which support the Naval Undersea Warfare Center (NUWC) Keyport mission for test and evaluation operations within the Dabob Bay Military Operating Area. The area surrounding the property is rural.

Installation	Acres	Description
Camp Wesley Harris	388	Camp Wesley Harris is located in Kitsap County approximately 8 miles southwest of NAVBASE Kitsap Bangor. It is situated along the crest of the Kitsap Peninsula between Hood Canal and Dyes Inlet. Camp Wesley Harris provides a small arms training facility for the military.
NAVBASE Kitsap Keyport	278	NAVBASE Kitsap Keyport is located in Kitsap County on the Kitsap peninsula abutting Liberty Bay. It is approximately 15 miles due west of Seattle and 10 miles north of Bremerton. NUWC Keyport is the major tenant command at the installation. NUWC Keyport provides testing and evaluation for undersea warfare system, include maintenance and repair, and fleet industrial support for torpedoes, mobile mines, unmanned underwater vehicles, and countermeasures.
NAVBASE Kitsap Bremerton	382	NAVBASE Kitsap Bremerton is located in Kitsap County on the north side of Sinclair Inlet within the City of Bremerton. The eastern portion of the base is a fenced, high-security area known as the Controlled Industrial Area. Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS&IMF) is the major tenant command of the installation. PSNS & IMF overhauls and repairs all nuclear powered warships. NBK Bremerton is a homeport for submarines and aircraft carriers.
Camp McKean	21	Camp McKean is located in Kitsap County on Kitsap Lake, approximately 5 miles west of NAVBASE Kitsap Bremerton. It is a recreational facility that supports Navy commands and authorized Fleet & Family Readiness patrons.
Jackson Park Housing Complex and Naval Hospital Bremerton	239	The properties are located in eastern Kitsap County on the west bank of Ostrich Bay, a small embayment on the south end of Dyes Inlet, Puget Sound. Jackson Park Housing Complex provides residential family housing. Naval Hospital Bremerton is located north of Jackson Park Housing Complex. It provides medical services to active duty and retired military personnel and their dependents.
Rail line from Shelton to Bangor and Bremerton	650 (48 miles)	The railroad line begins in Shelton, Washington (Mason County) and runs to NAVBASE Kitsap Bremerton, and to NAVBASE Kitsap Bangor in Silverdale (Kitsap County). The property line varies between 25 feet to over 200 feet from the track centerline depending on location. The railroad line provides freight rail service to NAVBASE Kitsap from the Elma-Bangor branch, and provides for limited commercial use.

The mission of NAVBASE Kitsap is to serve as the host command for the Navy's fleet throughout West Puget Sound and to provide base operating services, including support for both surface ships and submarines home-ported at Bremerton and Bangor. NAVBASE Kitsap is the largest facility in Navy Region Northwest and provides world-class service and tenant support,

programs, and facilities that meet the needs of their hosted war fighting commands, tenant activities, crew, and employees.

NAVBASE Kitsap and its tenant activities perform a complex and growing mission that includes home porting and repairing submarines, aircraft carriers, and surface ships. NAVBASE Kitsap and its tenants provide support, research, development, testing, training, technical assistance, and operations in support of the Navy's fleet throughout West Puget Sound.

2.1.1 NAVBASE Kitsap Bangor

NAVBASE Kitsap Bangor is located approximately 8 kilometers (km) (5 miles [mi]) northwest of Silverdale, Washington in Kitsap County and is situated on the eastern bank of Hood Canal. The portion of Hood Canal adjacent to NAVBASE Kitsap Bangor averages 2.4 km (1.5 mi) in width and is bordered on the west by Toandos Peninsula in Jefferson County. The surrounding Toandos Peninsula area is rural in character. Zelatched Point, on Dabob Bay, has a pier used for berthing small craft. Operations within the Dabob Bay Military Operating Area are supported by land-based facilities at Zelatched Point. There is also a landing pad at Zelatched Point to support helicopter operations. Camp Wesley Harris, approximately 13 km
(8 mi) southwest of NAVBASE Kitsap Bangor, is situated along the crest of the Kitsap Peninsula between Hood Canal and Dyes Inlet and is bisected by Seabeck Highway.

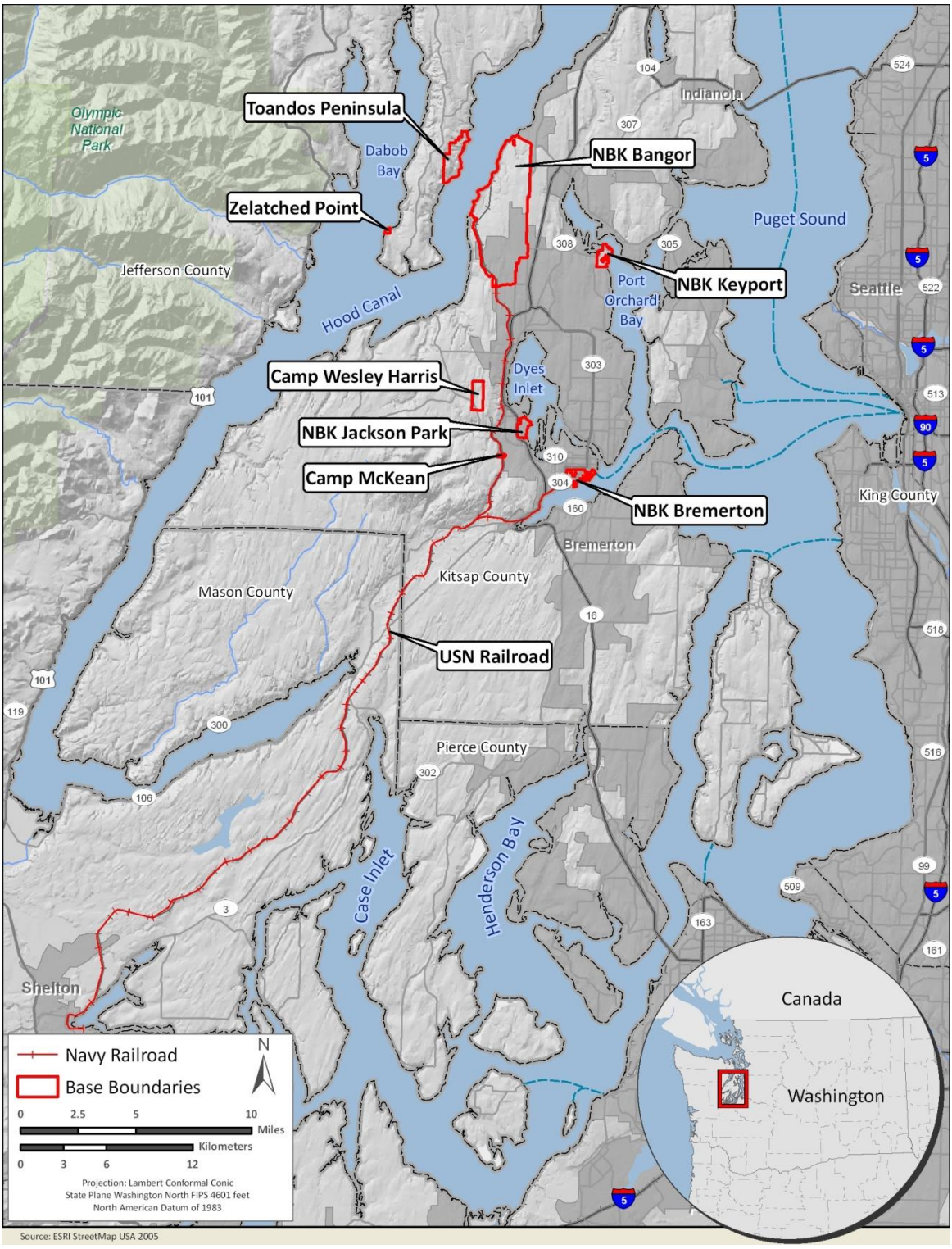

Figure 2-1: NAVBASE Kitsap Location Map

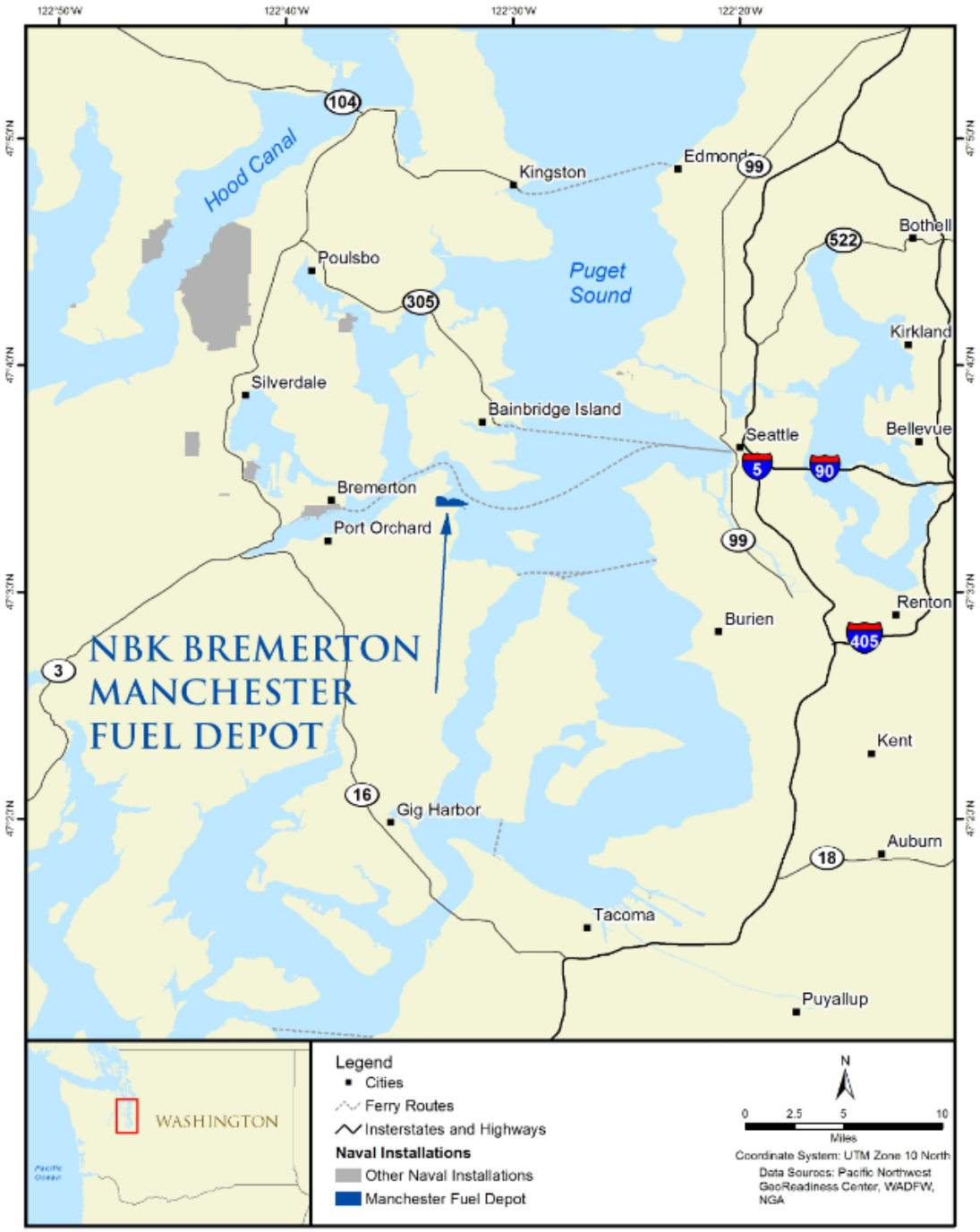

Figure 2-2: NAVBASE Kitsap Manchester Location Map

Figure 2-3: Back Island Alaska Location Map

2.1.2 NAVBASE Kitsap Bangor History

The land for NAVBASE Kitsap Bangor was purchased from landowners beginning in 1941 for the construction of an ammunition depot. In those early days, the base was commissioned as Naval Ammunition Depot, Bangor. “Bangor” was the name of the small community where the acreage was located, which, in turn was named after Bangor, Maine due to their geographical similarities (Navy 2007). In 1943, the Marginal Pier was built to handle the loading of ammunition on Navy transport ships headed for the Pacific Theater during World War II. With the necessities of war, Bangor Naval Magazine began operation on 25 January 1945. To help move supplies and resources between NAVBASE Kitsap Bangor and NAVBASE Kitsap Bremerton, the USN Railroad was built in 1945 and is currently operated and maintained under contract with Puget Sound and Pacific Railroad.

Several changes in status occurred from the time the base was established in 1945 until it was commissioned as a Trident base in 1977. In 1964, the base became a Polaris Missile Storage Facility in addition to its original mission of handling ammunition. The 30 acres at Zelatched Point were acquired in 1964 (USN 2001a). Subsequently, in the late 1970s the missile handling activity became known as Strategic Weapons Facility, Pacific (SWFPAC), responsible for the Trident Missile program. In February 1977, Naval Ammunition Depot stood down and the base was commissioned as Naval Submarine Base Bangor. In August of 1982 the first Trident submarine, USS Ohio, arrived at the Delta Refit Pier on the Bangor waterfront. On 4 June 2004, Naval Submarine Base Bangor was enveloped into a regional concept under Commander, Naval Installations was renamed NAVBASE Kitsap Bangor.

The U.S. Marine Corps used the facilities at the future Camp Wesley Harris site, a property then owned by the Kitsap Rifle and Revolver Club, in the late 1920s (USN 2007a). The federal government began leasing the club’s property in 1933. In 1935, the Marines constructed a mess hall, an administration building, and a bath house at the rifle range. Late in 1940, the government officially took possession of Camp Wesley Harris. In subsequent years, the facility was expanded and upgraded, and some buildings were demolished. The Marines controlled Camp Wesley Harris until it was taken over by the Navy in 1989.

Camp Wesley Harris supported military training by providing a marksmanship and tactical training facility. In 1998, two areas at Camp Wesley Harris were remediated to stabilize lead and other metals in the soil. Most buildings and facilities were demolished in 2005. Only five structures remain: two restrooms, a pump house, a water reservoir, and a training building. Camp Wesley Harris occupies approximately 388 acres and is located 8 mi southwest of NAVBASE Kitsap Bangor, between Hood Canal and Dyes Inlet (USN 2007a).

The pier at Zelatched Point area has been historically used for floatplanes and range craft during test and evaluation operations. The USN Railroad provides freight rail service to NAVBASE Kitsap Bangor from the Elma-Bangor branch. The USN owns approximately 77 km (48 mi) of railroad line, beginning at Shelton, Washington, and running to the PSNS & IMF at NAVBASE

Kitsap Bremerton and to NAVBASE Kitsap Bangor in Silverdale. The railroad was built in 1945 and is currently operated and maintained under contract with Puget Sound and Pacific Railroad. The property line varies between 7.6 meters (m) (25 feet [ft]) to over 61 m (200 ft) from the track centerline, depending on location. Administration of the railroad from Shelton to the shipyard (58 km [36 mi]) is with PSNS & IMF, and from Bremerton Junction to NAVBASE Kitsap Bangor (19 km [12 mi]) is with NAVBASE Kitsap Bangor (USN 2004a).

2.1.3 NAVBASE Kitsap Bangor Mission

The mission of NAVBASE Kitsap Bangor is to support and maintain a Trident submarine squadron and other ships home-ported or moored at the installation and to maintain and operate administrative and personnel support facilities including security, berthing, messing, and recreational services. As part of the nation's sea-based strategic deterrence mission, TRIDENT submarines play a critical role of great strategic importance for the United States. The TRIDENT program consists of submarine-launched ballistic missiles, which have been a vital part of the Navy's strategic deterrence mission since 1956 and are an integral component of the Navy's ability to defend the nation. NAVBASE Kitsap Bangor is the Pacific homeport for the Navy's TRIDENT submarine fleet. NAVBASE Kitsap Bangor is the only naval installation on the west coast with the specialized infrastructure able to support the TRIDENT program. The specialized infrastructure includes buildings, utilities, and systems used to support missile production shops, missile maintenance, missile component storage, and missile handling cranes, in addition to providing security and operational port facilities. These facilities support every aspect of the TRIDENT program operations, services, and systems. Additional Navy owned properties included with NAVBASE Kitsap Bangor include areas directly across the Hood Canal on Toandos Peninsula. Zelatched Point, on the southern end of the Toandos Peninsula, is used for berthing small craft. Camp Wesley Harris' mission is to train submarine and other military personnel in the use of the firearms needed to perform their duties. The USN Railroad, in addition to serving the naval facilities, provides Puget Sound and Pacific Railroad a commercial rail opportunity to haul freight for several commercial clients (USN 2004a).

2.1.4 NAVBASE Kitsap Keyport

NAVBASE Kitsap Keyport is located on the Kitsap Peninsula abutting Liberty Bay, a branch of the Puget Sound. It is approximately 15 miles (24 km) due west of Seattle, Washington, and 10 miles (16 km) north of NAVBASE Kitsap Bremerton. The nearest communities to NAVBASE Kitsap Keyport are Keyport, Silverdale, and Poulsbo, Washington. NUWC Keyport is the major tenant command at NAVBASE Kitsap Keyport.

NUWC Keyport is the Navy's premier provider of cold-water test and evaluation. In this capacity, NUWC Keyport - with remote sites in Hawaii, Southern California and Hawthorne, Nevada - provides depot maintenance and repair, in-service Engineering and fleet industrial support for torpedoes and other undersea warfare systems including mobile mines, unmanned

underwater vehicles, and countermeasures. NUWC Keyport uses NAVBASE Kitsap Bangor facilities for torpedo handling, maintenance, and storage, and conducts test and evaluation activities in the Dabob Bay Range Complex. Three underwater test ranges (Keyport, Dabob, and Quinault Ranges) and five parcels (Bolton Peninsula, Pulali Point, Sylopash Point, Whitney Point, and Zelatched Point) support NUWC Keyport's mission. These ranges are predominantly used to test undersea warfare devices and perform training activities.

2.1.5 NAVBASE Kitsap Keyport History

In 1909, the Navy investigated saltwater range locations between British Columbia and San Diego for testing torpedoes. In June 1910, Congress appropriated $145,000 for the purchase of land on the Kitsap Peninsula abutting Liberty Bay that would later become NAVBASE Kitsap Keyport. The station was formally commissioned in November 1914 as Pacific Coast Torpedo Station and the first new building was constructed in 1915. Additional acquisitions occurred in 1929 and 1943. During World War II, employment at the Naval Torpedo Station began to grow at a rapid pace, reaching 2,035 civilians and 821 military at the close of the war. The workload of torpedo proofing reached a peak of 100 per day in 1944. The workforce decreased to 275 in 1946, but significant activity continued after the war as three-dimensional underwater tracking ranges were designed and installed, and antisubmarine warfare acoustic homing torpedoes were tested and perfected on those ranges. From 1963 through 1969, the NUWC civilian workforce grew from 1,200 to 1,600. This was a result of increasing responsibility in torpedo and other underwater vehicle testing. The Bangor Ordnance Annex ammunition storage area covering 964 acres was placed under the jurisdiction of NUWC Keyport in 1970. The station name was changed in 1978 to the Naval Undersea Warfare Engineering Station (NUWES) to reflect new responsibilities primarily related to undersea warfare engineering. In 1994, NUWES was renamed NUWC. In 1999, the ownership of all Class I property, along with some buildings, were transferred to CNRNW. At that time, CNRNW assigned the natural resources management responsibility to Submarine Base Bangor (now NAVBASE Kitsap at Bangor). In 2000, the Submarine Torpedo Intermediate Maintenance Activity Pearl Harbor became a new Keyport operational site. In June 2004, the property was included in regionalization plans under the new title NAVBASE Kitsap Keyport.

2.1.6 NAVBASE Kitsap Keyport Mission

The primary mission at NAVBASE Kitsap Keyport is to proof, test, and evaluate underwater weapons, weapons systems, and components (USN 2001b). NUWC Keyport, the installation's primary tenant command, currently employs approximately 1,489 civilians, 20 military, and 669 contractor personnel. NUWC Keyport is the Pacific Fleet's designated systems test agent and comprehensive weapon quality engineering and environmental test laboratory. Keyport is also a major in-service engineering activity in support of mine warfare, sonar, underwater fire control, and other undersea warfare systems including those aboard Trident submarines. NUWC Keyport continues to perform its original mission of underwater weapons proofing and testing, utilizing a

comprehensive set of three-dimensional ranges in the Pacific Northwest that provide a broad variety of environmental and test conditions.

2.1.7 Jackson Park Housing Complex and Naval Hospital Bremerton

Jackson Park Housing Complex and Naval Hospital Bremerton are located in eastern Kitsap County on Ostrich Bay, a small embayment on the south end of Dyes Inlet, Puget Sound, Washington. Naval Hospital Bremerton is a separate command from NAVBASE Kitsap. However, beginning in 2011, all Class I property transferred from BUMED to CNIC, and natural resource management at Naval Hospital Bremerton will be conducted by the NAVBASE Kitsap Bremerton NRM.

Situated directly off Highway 3 between Bremerton and Silverdale, Jackson Park Housing Complex provides 870 housing units for military families. Within Jackson Park is Elwood Point Park. This waterfront park features walking paths, picnic areas, a baseball field, and basketball, tennis, and volleyball courts.

Naval Hospital Bremerton is a community-based acute care and obstetrical hospital, offering expert primary care, emergency care and a broad range of medical and surgical specialties, with 36 inpatient beds (with expansion capacity to 72+). The hospital is conveniently located between NAVBASE Kitsap Bremerton and NAVBASE Kitsap Bangor. Naval Hospital Bremerton is parent command for three Naval Branch Health Clinics and the Puget Sound Family Medicine Residency Program. The three clinics are located at NAVBASE Kitsap Bremerton, NAVBASE Kitsap Bangor, and Naval Station Everett.

2.1.8 Jackson Park Housing Complex and Naval Hospital Bremerton History

The Jackson Park Housing Complex and adjacent Naval Hospital Bremerton properties served as an ammunition depot from 1904 through 1959. Entitled Naval Ammunition Depot (NAD) Puget Sound, activities included ammunition manufacturing, storage, assembly, and demilitarization. The NAD Puget Sound also served as the ammunition storage for ships entering the Puget Sound for repairs from World War II. NAD Puget Sound was closed in 1959 and was placed in caretaker status until the mid-1970s when the site was converted to military housing, reassigned to Puget Sound Naval Shipyard, and renamed Jackson Park. Construction of over 800 housing units began in the late 1960s and continued through the 1990s. In 1977, approximately 50 acres were transferred to Naval Regional Medical Center for a new hospital. Today, there are 870 housing units in Jackson Park quartering service families from sea and shore units. Unfortunately, during past operations, materials were improperly disposed of on land and in the marine area thus contaminating soil, groundwater, and the marine environment. Since 1993, environmental reclamation work has been ongoing in the Jackson Park and Naval Hospital area in an effort to identify and remove hazardous materials. Management of Jackson Park Housing was the responsibility of Commander, Puget Sound Naval Shipyard until 1998 when Naval Station Bremerton was established. Commanding Officer, Naval Station Bremerton tendered

Jackson Park Housing until 2004 when regionalization came to West Sound and Jackson Park went under the cognizance of Commanding Officer, NAVBASE Kitsap.

2.1.9 Jackson Park Housing Complex and Naval Hospital Bremerton Mission

The mission of Jackson Park is to provide family housing for Navy personnel and their families stationed at NAVBASE Kitsap. Nestled in the heart of Kitsap County on Ostrich Bay, Jackson Park offers the security of military housing with the comfort of an established neighborhood.

Naval Hospital Bremerton has a threefold-primary mission to support our war fighters, past and present, and their families by: Providing exceptional care anytime, anywhere; shape military medicine through training, research, and graduate medical education; and to prepare our forces for deployment. Naval Hospital Bremerton and its clinic's staff consist of over 1,400 dedicated military, civilian, contract, and American Red Cross volunteer personnel.

Over the course of 2009, Naval Hospital Bremerton had up to 11% of the active duty staff deployed supporting combat units in Iraq, Afghanistan, at Expeditionary Medical Facility Kuwait, and in other locales such as Joint Task Force-Horn of Africa. Active duty staff was also engaged in humanitarian aid and disaster response missions such as Operation Unified Assistance in Haiti and on USNS Mercy for Pacific Partnership 2010 that visited Vietnam, Cambodia, Indonesia, and Timor Leste.

2.1.10 NAVBASE Kitsap Bremerton

NAVBASE Kitsap Bremerton is located on the north side of Sinclair Inlet within the city of Bremerton, Washington, in Kitsap County. NAVBASE Kitsap Bremerton encompasses approximately 382 acres of land, approximately 400 acres of submerged marine Right to Use lands (JLUS 2013), numerous buildings and structures, and 6 dry docks for wet or dry berthing of all sizes and classes of vessels. The eastern portion of the naval base is a fenced, high-security area known as the Controlled Industrial Area (CIA). NAVBASE Kitsap Bremerton is bordered on the south by Sinclair Inlet, and on the north and east by the city of Bremerton. PSNS & IMF is the major tenant command at NAVBASE Kitsap Bremerton.

Camp McKean is located on Kitsap Lake, about 8 km (5 mi) west of NAVBASE Kitsap Bremerton. Camp McKean is primarily for summer day use in support of Navy commands and authorized Fleet & Family Readiness patrons. The site includes a seasonal swimming beach, large pavilion, gazebo, upper picnic field with two shelters, restrooms, fire rings, BBQ grills, children's playground, fishing pier, boat dock, sand volleyball court, and horseshoe pits.

2.1.11 NAVBASE Kitsap Bremerton History

The cornerstone of NAVBASE Kitsap Bremerton's history is Puget Sound Naval Shipyard. Established in 1891 as a naval station on 190 acres, the base was extended in the 1920s by filling in the shoreline with soil from grading the steep hillsides. The construction of dry docks through the 1940s and 1950s provided more soil to fill the shoreline. During World War I, the shipyard

built new ships including 25 submarine chasers, six submarines, two minesweepers, seven seagoing tugs, and two ammunition ships, as well as 1,700 small boats (Pike 2005).

The site originally opened as a repair facility, then expanded in World War I to accommodate shipbuilding. Following the United States entry into World War II, the Shipyard was able to repair and modernize all five surviving battleships from the attack on Pearl Harbor. Throughout the war, the Shipyard repaired, overhauled, and refitted hundreds of U.S. and Allied Forces ships, including 26 battleships, 18 aircraft carriers, 3 cruisers, and 79 destroyers. Nearly one-third of the 1,006 ships in the U.S. fleet were serviced by the Shipyard. In addition, the Shipyard constructed a number of new cruisers and destroyers. By 1945, the wartime workforce had reached more than 32,000 personnel. During the 1950s, the Shipyard's major effort was the extensive program of converting the older aircraft carriers conventional flight decks to angle decks as the Navy entered the era of jet-powered aircraft.

In 1961, the Shipyard was certified as a nuclear repair facility, enabling it to perform the overhauling of the new Polaris Fleet Ballistic Missile nuclear-powered submarines. During the 1990s, Naval Station Bremerton was established to serve as homeport for seven ships: USS CARL VINSON (CVN 70), USS SACRAMENTO (AOE-1), USS CAMDEN (AOE-2), USS RAINIER (AOE-7), USS BRIDGE (AOE-10), USS MOUNT HOOD (AE 29), and USS CALIFORNIA (CGN 36). Naval Station Bremerton provided support and services to approximately 10,000 sailors and their dependents. In June 2004, Naval Station Bremerton was disestablished and included in regionalization plans under the new title NAVBASE Kitsap Bremerton.

2.1.12 NAVBASE Kitsap Bremerton Mission

NAVBASE Kitsap Bremerton is the homeport while providing support and maintenance to vessels needing service. NAVBASE Kitsap Bremerton's largest tenant, Puget Sound Naval Shipyard (PSNS), is the largest and most diverse shipyard on the West Coast and is the second largest industrial facility in the State of Washington, both in terms of plant investment and in the number of civilians employed. Puget Sound Naval Shipyard possesses the capabilities to overhaul and repair all types and sizes of ships of the United States Navy while NAVBASE Kitsap Bremerton also serves as homeport for an aircraft carrier, submarines, and multiple support ships. The shipyard's other significant capabilities include alteration, deactivation, disassembly & recycling, and dry-docking of all types of naval vessels.

2.2 Other Operations, Activities, and land and water uses

Waterfront operations include the overall integration of all port operations. Activities include vessel traffic movement and management, personnel clearance and tracking, and ingress/egress within the restricted areas.

2.2.1 Environmental Restoration Program

The Installation Restoration program was established by the Navy to evaluate and clean-up sites where past practices have resulted in contamination of soils, groundwater, or other media by hazardous substances. These sites are managed by remedial project managers who coordinate work necessary to ensure cost-effective and timely site assessment, planning, and remediation of identified releases consistent with requirements. The Installation Restoration program is separate from the natural resources program for funding and management. Appendix F of the INRMP contains a description of all contaminated sites on NAVBASE Kitsap, and updates/changes to these sites will be incorporated into INRMP updates. The majority of these sites has been cleaned and/or currently has institutional controls on them with long-term monitoring. Occasionally NRMs work with the Installation Restoration program on remedial action projects affecting natural resources. Examples of this are Charleston Beach and Floral Point. NAVBASE Kitsap has several identified sites in various stages of characterization, assessment, monitoring, or closure. The NRM will work with remedial project managers to ensure coordination of both programs.

See Appendix F for specific information on Installation Restoration sites at NAVBASE Kitsap.

2.2.2 Spill Prevention, Control, and Countermeasures (SPCC)

Spill Prevention, Control, and Countermeasures (SPCC) plans have been developed for NAVBASE Kitsap installations (PSNS & IMF Instruction 5090.9E and Naval Base Kitsap Bremerton SPCC Plan). A full description of the plans will not be described here, but it is important to note that the Environmental Division manages the plans; coordinates training and drills for installation staff; carries out inspections of storage tanks, equipment, and procedures that have a potential to release hazardous materials to the environment; and participates as spill response team members in the event of an actual release. The Port Operations Division for each installation is trained and has the necessary equipment to respond to a spill to the water and begin clean-up procedures. The installation's firefighters are trained in hazardous materials response. Both organizations are staffed and available for spill response 24 hours a day. The installations can also call upon Commander, Navy Region Northwest, for help in staffing and equipping a response to a spill. Spill response at NAVBASE Kitsap is covered under the *Navy Region Northwest Oil and Hazardous Substance Integrated Contingency Plan* (COMNAVREG 5090.1) which was approved by the Washington Department of Ecology (WDOE) in 2010. The purpose of the Integrated Contingency Plan is to establish procedures and methods that provide for the improved protection of the state's aquatic environments, natural resources, and public/private interests from the impacts of oil and hazardous substance pollution. In so doing, the plan ensures readiness of personnel and equipment, maximizes the effectiveness and timeliness of oil and hazardous substance spill response procedures, and demonstrates actions taken to coordinate with other state and federal contingency plans. The NRM will participate in

trainings, practice events, and actual spill events if they occur to ensure natural resources are protected and properly accounted for per the INRMP and the Integrated Contingency Plan.

2.2.3 Fire Prevention

Historically the wet climate of western Washington has minimized the duration of the seasonal window of susceptibility for a large-scale fire disturbance. With changing climatic patterns, the precipitation total has not decreased but the duration of the seasonal window of susceptibility to a fire start has increased. This increase combined with the characteristic long fire return intervals indicates this area as low fire frequency but having a high fire intensity and extent once a fire start occurs. The current climate trend provides the opportunity to manage proactively vegetation and accessibility to reduce the rate and extent of fire spread in critical areas. The Navy considers the series of existing firebreaks such as roads, railroads, streams, and other wet areas that transverse all NAVBASE Kitsap installations as currently adequate for wild fire protection and control (USN 2001a). Weeds and brush along the sides of the roads are either sprayed or mowed, helping maintain the efficiency of fuel breaks. NAVBASE Kitsap has full-time manned fire stations at Bremerton, the Jackson Park Housing Complex, Bangor, and Keyport. Outlying areas would receive assistance from local or state fire districts in the event of wildfire (USN 2001a). Support for on-site fire station personnel to become wildfire qualified is essential for effective initial attack response. Areas designated to support development of firefighter qualifications such as hand fire-line construction and other wildland firefighting skills is essential to minimize the size of a fire start on the installations covered by this INRMP.

2.2.4 Project Review Procedure

The installation environmental staff reviews new operations, proposed construction, maintenance projects, and programs to be conducted on the installations. The environmental review coordinator will also attend meetings to go over lists of projects specific to each installation to determine if further review is required. Depending on the initial environmental coordinators review, some projects are coordinated with the installation NRMs. This ensures that the installation is in compliance with all environmental laws and regulations, provides feedback to the project managers regarding costs and length of time to receive permits, and provides an additional design review check to help catch conflicts or other design issues when needed. The process includes the following steps:

a) A program or project manager submits the scope of the new operation, maintenance activity, or construction project to the NAVBASE Kitsap Environmental Office for review. The initial submittal generally includes the project information, including maps, diagrams, and drawings that outline the project and show the location.

b) The environmental review coordinator will receive the package and:

    1. Send it to the correct Environmental Division staff members (sometimes including the NRM) for their review and comments.

c) The environmental review coordinator will coordinate the comments and return them to the program manager. The review comments will include:

1. The identification of any environmental requirements (e.g., wetland buffers);
2. Suggestions for Best Management Practices (BMPs) to minimize or eliminate any potential environmental degradation;
3. The identification of all environmental permits, consultations, and other documents required to carry out the project (e.g., Clean Water Act permits; Section 7 of the ESA requirements; and NEPA documentation);
4. The designation of the environmental staff person who will write and obtain the permits or carry out the environmental consultation process with outside regulatory agencies;
5. An estimation of any costs necessary to obtain environmental permits or other documents; and
6. Provide a schedule for obtaining all permits and documentation.

2.2.5 Hazardous Material and Waste Management

The Environmental Division and the Safety Director review and approve all hazardous material usage on the installation. The installation has hazardous materials storage areas where materials are brought, logged into a tracking system, and disbursed to various tenant commands and vessels upon request.

The installation has hazardous waste storage areas where hazardous waste is stored temporarily. The installations are staffed with hazardous waste employees whose duties are to pick-up hazardous waste from visiting ships and on-base tenant commands and shops, transport it back to the storage areas, profile the waste, repackage it if necessary, and manage the proper shipping and disposal of the waste according to federal and state regulations. The hazardous waste storage areas are equipped with holding tanks, secondary containment, and other measures to prevent any spilled material from entering storm drains.

2.3 Regulatory Requirements for Natural Resources Management

2.3.1 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321 et seq.) requires federal agencies to evaluate the impacts of their proposed actions on the quality of the human environment. The Navy's policies regarding NEPA, OPNAV M-5090.1 Chapter 10, Environmental Planning Under the National Environmental Policy Act and Executive Order 12114, SECNAVINST 5090.6A (SECNAV Instruction 5090.6A, Environmental Planning for

Department of the Navy Actions, dated April 26, 2004), and Navy's Supplemental Environmental Planning Policy, dated 23 September 2004, reinforce NEPA requirements and emphasize environmental planning at the earliest stages of projects. The Navy recognizes that the NEPA process includes the systematic examination of the likely environmental consequences of implementing a proposed action. To be an effective decision-making tool, the Navy integrates the process with other Navy-Marine Corps project planning at the earliest possible time. This ensures planning and decision-making reflect environmental values, avoid delays, and avoid potential conflicts. The Navy is able to achieve its mission at home, at sea, and abroad more efficiently when environmental planning is properly integrated into Navy decision-making for those Navy actions that have the potential for adverse environmental consequences.

2.3.2 Endangered Species Act (ESA)

The Endangered Species Act (ESA) requires federal agencies to manage federally listed threatened and endangered (TES) species and their habitats in a manner promoting conservation of TES species, consistent with recovery plans for such species. Section 7 of the ESA requires all federal agencies to enter into consultation with the USFWS and NMFS whenever actions are proposed that "may affect" listed and proposed TES species of plants and animals. Proposed projects, operations, or other actions, are scrutinized for potential impacts to TES species through a formal review process. ESA Section 7 consultations will be initiated if warranted, otherwise, written documentation that there are no effects to TES species will be generated by the Natural Resources Manager and kept with the project files. The Natural Resources Manager will use this INRMP as a tool to identify the potential impacts of planned Navy actions on endangered or threatened species at an early stage and to provide a basis for altering the action to prevent or minimize those impacts.

Risk to military mission: USFWS or NMFS (or both) may require changes or mitigation that could result in delays and additional costs. Because of this, it is imperative that the Command initiate early environmental/natural resources review of proposed actions, in order to assess risks, develop alternatives, and correctly identify mitigation costs both in terms of time and dollars.

2.3.3 Migratory Bird Treaty Act (MBTA) & Executive Order (EO) 13186

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful.

This Act protects migratory birds and their nests and eggs from being hunted, captured, purchased, or traded, but the United States Fish and Wildlife (USFWS) issues federal depredation permits allowing take under specific conditions. If an installation uses take to manage bird damage other than European starlings (*Sturnus vulgaris)*, house sparrows (*Passer domesticus*), and feral pigeons (*Columba livia*), it may be required to coordinate with the USFWS.

In July 2006, the DoD and the USFWS signed and entered into a Memorandum of Understanding (MOU) to promote the conservation of migratory birds in accordance with EO 13186. This MOU describes specific actions that should be taken by DoD to advance migratory bird conservation; avoid or minimize the take of migratory birds; ensure DoD operations – other than military readiness activities – are consistent with the Migratory Bird Treaty Act.

In part, contractors must have the appropriate permits when performing work for the Navy that may affect migratory birds covered under this Act. NAVBASE Kitsap also has an Interagency Agreement with the US Department of Agriculture, Animal & Plant Health Inspection Service (APHIS) Wildlife Services (WS). This agreement states that APHIS WS will provide assistance to Commander, Navy Region Northwest (COMNAVREG NW) to support wildlife damage management activities on its installations. Existing migratory bird damages include geese, gulls, and terns nesting on rooftops and in areas where accumulations of nesting and fecal matter negatively impact human safety. These damages are currently being managed to acceptable levels, but are expected to persist simply due to our proximity to the Puget Sound. Other concerns may arise in the future. Depredation permits will be obtained prior to conducting actions that would result in taking problem migratory birds or their nests or eggs (in accordance with the Migratory Bird Treaty Act). Emphasis will be given to nonlethal methods, when practical and effective.

2.3.4 Bald and Golden Eagle Protection Act (BGEPA)

The Bald Eagle Protection Act was enacted in 1940; in 1962, Congress extended the Act to cover golden eagles. The Bald and Golden Eagle Protection Act prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. “Take” is defined as to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” a bald or golden eagle. The term “disturb” under the Act was defined via a rule published in the Federal Register on June 5, 2007. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with the normal breeding, feeding, or sheltering behavior.

2.3.5 Marine Mammal Protection Act (MMPA)

The Marine Mammal Protection Act of 1972 (MMPA) prohibits, with certain exceptions, the take (see definition below) of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the import of marine mammals and marine mammal products into the U.S. The Congress passed the MMPA based on the following findings and policies:

- Some marine mammal species or stocks may be in danger of extinction or depletion as a result of human activities;

- These species or stocks must not be permitted to fall below their optimum sustainable population level (depleted);
- Measures should be taken to replenish these species or stocks;
- There is inadequate knowledge of the ecology and population dynamics; and
- Marine mammals have proven to be resources of great international significance.

Definitions

> **Take:** to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal.

The Marine Mammal Protection Act reauthorization bill went to Congress on June 16, 2005. Among other proposals, the bill includes amendments to clarify the harassment definition:

Section 3 (16 USC § 1362) is amended in subsection (18) to read as follows:

"(18) The term "harassment" means any act which–

> (A) [Level A] injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild; or
>
> (B) [Level B] (i) disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered; or (ii) is directed toward a specific individual, group or stock of marine mammals in the wild that is likely to disturb the individual, group, or stock of marine mammals by disrupting behavior, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering.

The NRM will review all proposed projects, operations, and training plans for possible impacts to marine mammals. If impacts to marine mammals are identified, the NRM will provide recommendations to the program/project managers so that changes or mitigation can be considered early in the planning process. There are operations and training that have received prior review regarding marine mammal protection, and the NRM no longer is required to review. They are following the terms and conditions that were set forth in the consultation to continue working. The NRM will also inform personnel that operate watercraft about the MMPA regulations and restrictions regarding marine mammals.

2.3.6 Coastal Zone Management Act (CZMA)

Congress passed the federal Coastal Zone Management Act (CZMA) in 1972 to encourage the appropriate development and protection of the nation's coastal and shoreline resources. The Coastal Zone Management Act gives states the lead role in managing these areas. To assume this role, the state prepares a Coastal Zone Management Program document that describes the State's coastal resources and how these resources are managed. Washington was the first state to receive

federal approval of a Coastal Zone Management Program in 1976. The Washington State Department of Ecology (WSDOE) Shorelands & Environmental Assistance Program (SEA Program) is responsible for implementing Washington's program (WSDOE, 2012). Washington State's Coastal Zone Management Program Document (WSDOE 2001) excludes from the coastal zone those lands that are subject solely to the discretion of the federal government. This exclusion includes military reservations and other defense installations.

OPNAV M-5090.1, Chapter 14 describes how the Navy will operate in areas subject to the Coastal Zone Management Act (CZMA). The Navy is required by the CZMA to ensure activities affecting any coastal use or resource is fully consistent with the enforceable policies of the Washington State Shoreline Management Program, unless Navy compliance is prohibited by law.

2.3.7 Clean Water Act (CWA) & Executive Order (EO) 11990

According to Executive Order 11990 (1977), the term "wetlands" includes areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances does or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. EO 11990 requires Federal agencies to minimize the loss or degradation of wetlands and to enhance their natural values. Section 404 of the Clean Water Act prohibits discharges of dredged or filled material into waters of the U.S., including wetlands, without first obtaining a permit from the U.S. Army Corps of Engineers. OPNAV M-5090.1 refers to 33 CFR § 320-330, Clean Water Act (CWA) Section 404, and requires that the Navy comply with the national goal of no net loss of wetlands, and to avoid loss of size, function, and value of wetlands.

2.3.8 Magnuson-Stevens Fishery Conservation and Management Act

As amended in October 1996, the Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the U.S. Secretary of Commerce (currently delegated to NMFS) on any action proposed to be undertaken that may adversely affect Essential Fish Habitat (EFH). The objective of this EFH assessment is to determine whether or not the proposed project may adversely affect designated EFH for relevant commercial, federally managed fish species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed project. Subsection 50 CFR § 600.920(f) specifies that EFH consultation should be consolidated with existing environmental review procedures required by other statutes, such as ESA, when appropriate. The NAVBASE Kitsap NRMs will review all proposed projects, operations, and training plans for possible impacts to EFH. If impacts to EFH are identified, the NRM provides recommendations to the program/project managers so that changes or mitigation can be considered early in the planning process.

This Page Intentionally Left Blank

3 REGIONAL NATURAL RESOURCES SETTING AND CURRENT MANAGEMENT (ECOLOGICAL SETTING)

The ecological regions of the United States, or "Ecoregions" were first described in 1978 by the U.S. Department of Agriculture (USDA) Forest Service (Bailey 1995). The purpose of the original study was to provide a general description of the ecosystem geography of the United States, which resulted in a map titled *Ecoregions of the United States*. The technique of mapping ecoregions was subsequently expanded to include the rest of North America and the world. In 1993, as part of the Forest Service's National Hierarchical Framework of Ecological Units, ecoregions were adopted for use in ecosystem management (Figure 3-1) (Bailey 1995). NAVBASE Kitsap lies within the Puget Trough ecoregion, which is recognized for its rich, complex, and important marine near shore environment. This ecoregion features a wide variety of deep-water and near shore habitats including coastal lagoons, kelp and sea grass beds, rocky shores, sandy beaches and spits, and salt marsh wetlands. The diversity of life in and around Puget Sound has been influenced by the complex interactions of the freshwater and saltwater environments. These and the surrounding forests support a complex web of plants, fish and other organisms, which include more than 200 species of fish, dozens of marine mammals, hundreds of birds and thousands of marine invertebrate species (WDFW 2005).

NAVBASE Kitsap also lies within the Marine Ecosystem Division (Ecological Unit [EU] 240) of the Humid Temperate Ecosystem Domain (EU 200) (Bailey 1995). The Marine Division is situated along the Pacific Coast between latitudes 40 and 60 degrees north; it is a zone that receives abundant rainfall from maritime polar air masses and has a rather narrow range of temperatures because it borders on the ocean. Coastal mountain ranges influence precipitation markedly in these middle latitudes. Although precipitation is abundant throughout most of the year, it is considerably limited during the summer. The total rainfall is not great by tropical standards, but the cool air temperatures cause a reduction in evaporation and produce a very damp, humid climate, with much cloud cover, resulting in mild winters and relatively cool summers.

NAVBASE Kitsap also occupies the Pacific Lowland Mixed Forest Province (EU 242) that occurs within a north-south depression between the Coast Ranges and the Cascade Mountains. Elevations range from sea level to 1,500 ft (460 m). Soils are principally characterized as mostly Alfisols, Inceptisols, and Ultisols, but are primarily dominated by Inceptisols within the Puget Sound Valley (Bailey 1995).

In 2005, several other scientific and planning entities have utilized this ecoregion unit as the basis for assessment and study, most significantly the non-governmental organization NatureServe, whose work is primary in plant associations and habitat descriptions and

categorizations. The Navy has adopted this classification standard for use in the annual Natural Resource metrics and reporting.

3.1 Physical Setting

3.1.1 Climate & Topography

The climate in the region near NAVBASE Kitsap has a strong marine influence characterized by cool, dry summers and mild, wet winters. Precipitation in this region generally averages 50 - 65 inches per year with over 98% falling in the form of rain. Only 5 - 10% of the annual precipitation occurs between July and September (DON-SBB 2000). The majority of the intense winter storms created in the Pacific Ocean never enters the NAVBASE Kitsap area due to the protection provided by the Olympic Mountains [U.S. Department of Agriculture-Soil Conservation Service (USDA-SCS) 1994]. However, there is a gap located between the Olympic Mountains and the Willipa Hills, which provides a low-level passage for marine air moving inland (USDA-SCS 1994). Occasional hot, dry air masses from east of the Cascades reach the Puget Sound area for brief periods, but temperature extremes are generally modified by weather systems moving eastward from the Pacific Ocean (USN 2001b).

Area topography also influences precipitation levels throughout the region and the surrounding environs. Lowland areas surrounding the City of Bremerton receive an annual precipitation of about 50.6 inches (URS 1999). Precipitation in the higher elevation areas of the watershed can be much greater. For example, precipitation at the Twin Lakes rain gauge in the Gorst Creek watershed, maintained by the City of Bremerton, averages 60 inches per year. Average precipitation on Gold Mountain, the highest point in the Sinclair Inlet watershed, is greater still (URS 1999). Winter snowfall is generally light, averaging 8.8 inches annually. The annual average temperature in the City of Bremerton is 51 degrees Fahrenheit (°F) (URS 1999). Daily mean high and low temperatures for January are 45°F and 34°F, respectively. Daily mean high and low temperatures for August are 75°F and 54°F, respectively (URS 1999).

During summer months, winds in the City of Bremerton area are generally light but persistent, due to the presence of regional sea breezes. From June to September, winds generally blow from the north with velocity ranges 0 - 9 miles per hour (mph). However, the complexity of the shoreline geography in the region can effect wind direction. For instance, wind measurements taken during the summer months of 1994 indicated prevailing winds originating from the east to northeast and blowing toward the landward end of Sinclair Inlet (URS 1999). During the winter, winds are stronger but more variable, associated with the frequent passage of storm systems. Prevailing winds are from the southwest, with velocities often reaching 20 mph from October to May. However, strong winter storms from the north do occur annually, resulting in relatively high-energy wave action on areas of the inlet’s south shoreline.

On average, 5 - 8 days per month, the region experiences clear or partly cloudy days during the winter; whereas during the summer, approximately 20 days per month are clear or partly cloudy

(URS 1999). Relative humidity ranges from 75 - 85% during the day and as high as 85% at night. The frequency of foggy days' averages 10% annually, rising as high as 20% in October and November (URS 1999).

Climate change has not been properly assessed for the majority of DOD installations, including the installations that are covered in this INRMP. The United States Government Accountability Office (GAO) was asked to assess the DOD's actions to adapt to the challenges of climate change during a DOD and Installation audit, with a final report submitted in May 2014. During this audit, it was found that some of the installations were trying to incorporate the required information into their INRMPs with varied interpretations of instructions, while others were leaving it out until further guidance. The GAO report provided 3 recommendations that the DOD concurred with in the final report. These three recommendations were to complete a baseline climate change vulnerability assessment of all DOD sites; provide further direction and information to clarify instructions that were submitted to the installations; and, approval for projects may in future incorporate a climate change adaptation that should be listed in the approval process for funding.

Climate change regulations are evolving. Currently, the following serve as guidance:

EO 13514**:** Oct 2009**.** Energy (GHG reduction), Water, Waste conservation and reduction goals

- Requires agency Strategic Sustainability Performance Plans

Whitehouse Council on Environmental Quality (CEQ): (Mar 2011). "Federal Agency Climate Change Adaptation Planning, Implementing Instructions" require federal agencies to:

- Assess likely effect of climate change on agency's ability to achieve its mission & strategic goals, Sept 30, 2011

QDR: **(**Feb 2010) "The Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required."

Department of Defense Strategic Sustainability Performance Plan: (August 2010). Planning actions in accordance with EO13514

DoDI 4715.03: (Feb 2011). Integrate climate change impact assessment and adaptation planning in INRMPs.

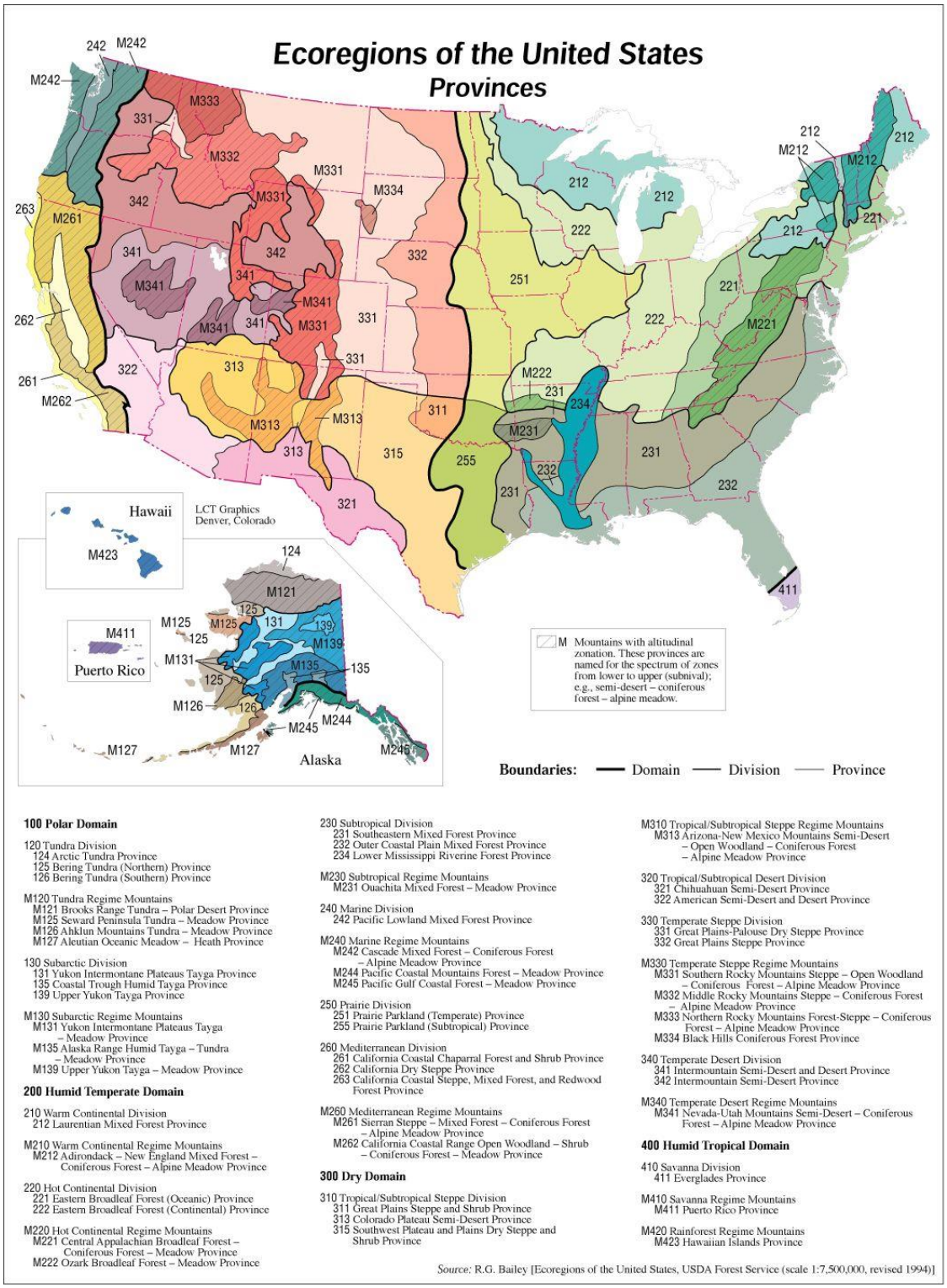

Figure 3-1: Ecoregions of the United States

3.1.2 Water Resources

The Puget Sound Georgia Basin, which encompasses all of the NAVBASE Kitsap installations, is comprised of 13 parallel and similar hydrologic units that discharge into coastal bays, inlets, estuaries, and lagoons of Puget Sound and then toward the Pacific Ocean. The hydrology of streams along the eastern portion of Hood Canal and the Puget Sound Basin are unique in that they are dependent on precipitation and groundwater contribution, and receive snowmelt runoff from the Olympic or the Cascade Mountains (PSSRP 2007). However, much of the western portion of the Puget Sound lies in the rain shadow of the Olympic Mountains that results in reduced precipitation.

The U.S. Geological Survey (USGS) and USDA - Natural Resources Conservation Service (NRCS) developed Federal Guidelines, Requirements, and Procedures for the National Watershed Boundary Dataset, which establishes interagency guidelines, requirements, and procedures that created a national, consistent, seamless, and hierarchical hydrologic unit dataset based on topographic and hydrologic features across the United States (USGS and USDA-NRCS 2009). This Watershed Boundary Dataset (WBD) at a 1:24,000 scale in the conterminous United States consists of digital geographic data that include two additional levels of detailed hydrologic unit boundaries nested within existing or modified 1: 250,000-scale hydrologic units. The WBD document serves as interagency guidance for developing digital geographic data for watersheds.

According to the revised WBD, NAVBASE Kitsap lies within the Puget Sound Sub region 1711 (16,800 square miles) of the Pacific Northwest Region 17 (277,660 square miles). The Puget Sound Georgia Basin drainage system is further defined by 13 hydrological connected watersheds that ultimately discharge into the Strait of Georgia and Strait of Juan de Fuca, then the Pacific Ocean. However, of these 13 connecting watersheds, only three watersheds encompass all NAVBASE Kitsap installations (Figure 3-2) and include:

- Tahuya River-Frontal Hood Canal (171100180102): 157,215 acres
- Little Quilcene River-Frontal Hood Canal (1711001807): 26,165 acres
- Olalla Valley-Frontal Puget Sound (1711001907): 184,408 acres

Washington State also has a watershed identification scheme, the Water Resource Inventory Area (WRIA), which uses a numbering system. All NAVBASE Kitsap installations fall within WRIA 15 (Kitsap) with the exception of the Toandos and Zelatched Point properties, which fall in WRIA 17 (Quilcene-Snow) (WDOE 2007).

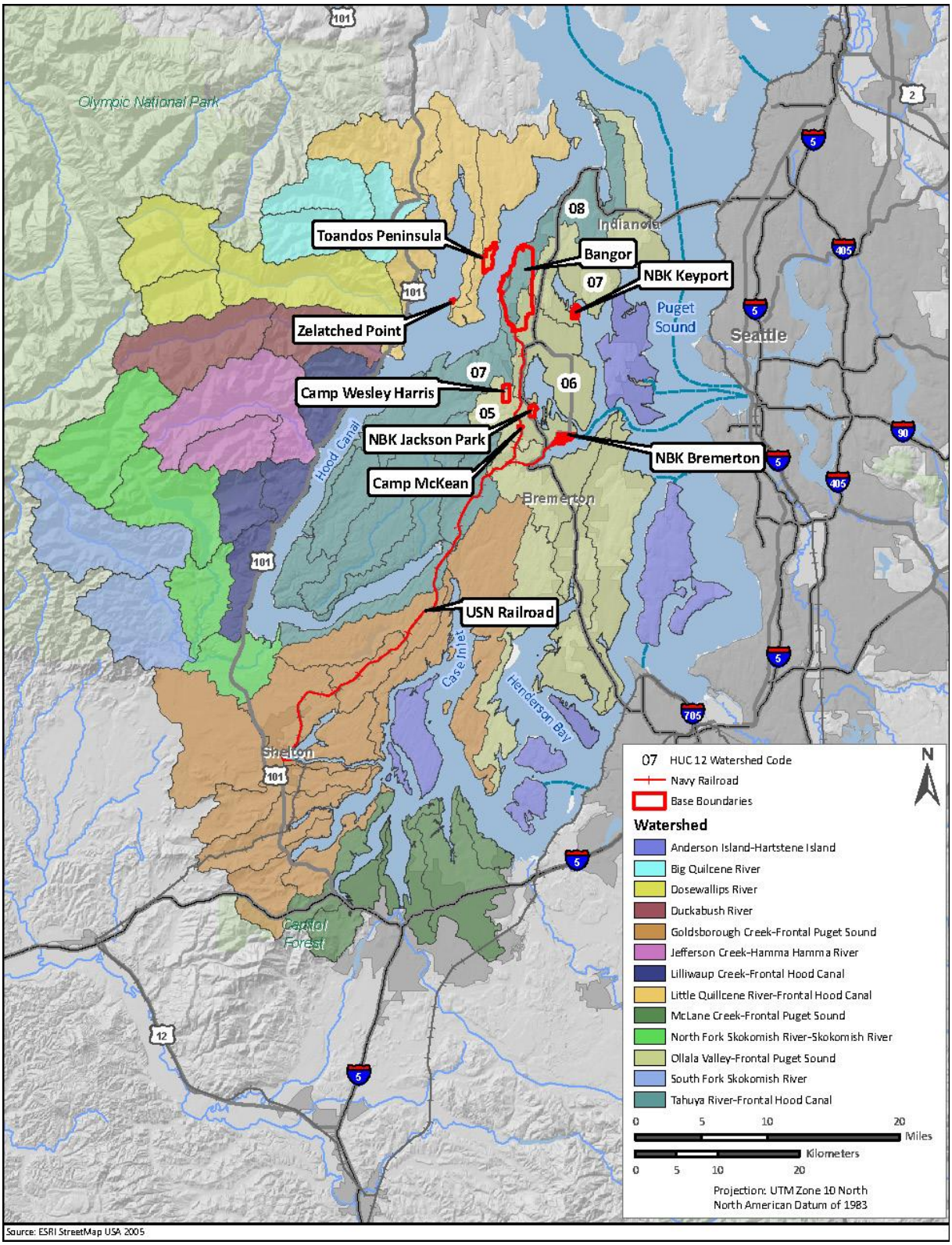

Figure 3-2: NAVBASE Kitsap Watershed Map

3.1.3 Geological Resources

The area encompassing NAVBASE Kitsap and associated military installations lies in the Puget Sound Lowland. The Puget Sound Lowland is a broad structural trough, filled with unconsolidated sediments of Miocene to recent age overlying volcanic bedrock. Several continental ice sheets covered the region during the Quaternary period, resulting in the complex deposition of glacial and interglacial deposits. The latest of these is called the Fraser glaciations and consisted of several ice advances, of which the Vashon Stade was the most extensive.

The Quaternary geologic history for the Puget Lowland is outlined by six stratigraphic units, which are significant features of the hydro geologic system at NAVBASE Kitsap. These units, from youngest to oldest and their general characteristics are discussed below:

- Vashon Recessional Outwash consists of a thin veneer of interceded sand and gravel, deposited by melt water flowing from the receding glacier. These deposits occur mainly in the large north-south trending outwash channels. Localized perched aquifers, situated in outwash-filled depressions in the upper surface of the less permeable Vashon Till provide small quantities of groundwater.

- Vashon Till is a lodgment till typically consisting of a hard, gray, heterogeneous deposit resembling concrete. Thickness ranges from a few feet to over 50 feet. It consists of various sized gravels and boulders suspended in a matrix of clay, silt, and sand that were deposited at the base of the glacier as it moved across the landscape. Till clasts are derived from local basaltic bedrock sources and from granitic and metamorphic sources located in the northern Puget Lowland and British Columbia. The overall dense, compact nature of the till hinders groundwater flow, making it one of the primary aquitards in the area. It serves as a low permeability base for perched aquifers and the upper bounding unit for confining groundwater zones. This unit may not be continuous across the Bangor area.

- Vashon Advanced Outwash consists primarily of coarse sands and gravels beneath the Vashon till. These predominantly glaciofluvial sediments were deposited in the proximal areas in front of and along the sides of the advancing Vashon ice sheet. A typical sequence described by Garling and others (1965) contains poorly sorted gravels at the top, grading down to well sorted, stratified sands and gravels with localized strata of lacustrine silt and clay. This unit is highly permeable and may yield large quantities of water where it extends below the regional water table. Confined groundwater can be encountered where the advance outwash is capped by low permeability till.

- The Kitsap Formation consists of laminated silt and clay with an occasional stratum of sand and gravel, deposited in an interglacial lacustrine environment. Thickness can be as much as 150 feet with the top of the unit normally below sea level although it may be encountered as high as 150 feet above sea level. Unnamed gravel is commonly associated

with the Kitsap Formation, consisting of iron-stained poorly bedded, fine to cobble gravels derived from the Olympic Mountains to the west and reworked granitic pebbles from older glacial tills. The finer-grained portion of this sequence is unimportant as a viable source for domestic water supplies. However, the numerous discontinuous sand and gravel strata of the Kitsap Formation and the unnamed gravel yield small supplies of groundwater.

- The Older Sand and Gravel incorporates the Salmon Springs Drift and pre-Salmon Spring's deposits (undifferentiated) (Garling et al. 1965). The Salmon Springs Drift consists of interceded coarse gravels and sands deposited in a fluvial environment, with local occurrences of glacial till. Pre-Salmon Springs glaciation deposits are undifferentiated and include both glacial and non-glacial fine-grained sands, silts, and clays. These deposits can be differentiated from Vashon deposits by the high degree of iron oxidation, and the inclusion of pumice granules and lenses. The top of these sediments occurs near sea level while the base is seldom encountered. The combined thickness is believed to be over 200 feet. The coarser-grained Salmon Springs Drift is capable of supplying large quantities of artesian groundwater and is reported to be the most important groundwater unit on the Kitsap Peninsula.

- The Tertiary Volcanic Bedrock predominantly consists of dark, fine-grained basalt. In some areas, secondary mineralization has created an amygdaloidal texture. The total thickness of these rocks is not known but is in excess of 7,000 feet. The dense and extremely impermeable character of these rocks renders them unimportant as aquifers.

NAVBASE Kitsap also lies within 42 miles (70-kilometer) of the Seattle Fault, which could be an epicenter for earthquakes. This neighboring fault could generate a shallow crustal event, with potential magnitudes of 8 on the Richter scale (USN 2001b).

3.1.4 Soils & Installation Restoration (IR) Sites

The following soils overview of Kitsap County is from the *Soil Survey of Kitsap County Area, Washington*, by Carl McMurphy [published in 1980 by the U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 1980)]:

"The soils of Kitsap County formed mainly in glacial drift deposited by the most recent of several continent-sized glacial ice sheets. This 3,000-foot thick glacier, emanating from Canada, formed most of the topography and waterways of the area between 13,000 and 15,000 years ago. The predominant deposit, and therefore soil parent material, is glacial till. It generally consists of compact basal till covered by a thin, discontinuous layer of ablation till. The Alderwood, Harstine, Kapowsin, Poulsbo, Shelton, and Sinclair soils formed in this till material. As the glacier approached and receded from the area, melt water streams deposited outwash sand and gravelly sand. The Indianola, Ragnar, Neilton, and Grove soils formed in the outwash material.

Glaciolacustrine silt and clay were also deposited in some places during glaciations. The Kitsap and Kapowsin Variant soils formed in this material."

The Toandos Peninsula falls within Jefferson County. The following soils overview is from the *Soil Survey of Jefferson County Area, Washington*, by Fred McCreary (USDA-NRCS 1975):

"The eastern part of Jefferson County consists of relatively low, rolling to moderately steep, glacial terraces and long, narrow valleys in the northern and northeastern sections. The southern section of this part consists principally of moderately steep to steep glacial terraces and very steep, rough, broken mountain foothills. Most soils are too gravelly and stony or too steep for farming. About half of these soils are relatively poor, and nearly all of them are deficient in the essential elements of nitrogen potassium, and phosphate. Most soils of this eastern section are most suitable for growing trees or other forest products."

3.2 Ecological Communities of Naval Base Kitsap

3.2.1 Wetlands Management

EO 11990, *Protection of Wetlands* (1977), initially defined "wetlands" as those areas inundated by surface water or groundwater with a frequency sufficient to support, and under normal circumstances does or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction (Section 6c). This definition was adopted into the Clean Water Act (CWA) for regulatory purposes [40 Code of Federal Regulations (CFR) § 230.3(t)]. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. EO 11990 requires federal agencies to minimize the loss or degradation of wetlands and to enhance their natural values. Section 404 of the CWA prohibits discharges of dredged or filled material into waters of the U.S., including wetlands, without first obtaining a permit from U.S. Army Corps of Engineers (USACE). According to OPNAV M-5090.1, the Navy will comply with the national goal of no net loss of wetlands, and will avoid loss of size, function, and value of wetlands.

The majority of wetlands in and around developed areas on NAVBASE Kitsap at Bangor have been previously delineated to varying degrees although changes to surface-water hydrology can alter the size of wetlands. Changes in hydrology and the potential for finding additional, typically small wetlands is always present and must be verified on the ground prior to finalizing project design and pursuing implementation. Baseline climate change vulnerability assessment of all DOD sites would help in assessing wetlands and surface-water hydrology, and possible changes to this sytem. Further information to clarify instructions that were submitted to the installations; and, approval for projects may in future incorporate a climate change adaptation that should be listed in the approval process for funding.

Wetlands on NAVBASE Kitsap at Keyport adjacent to developed areas are also generally well delineated. The USN Railroad was surveyed in 2015 to document the location, size, likelihood and quality of wetland presence within the Navy right-of-way. NAVBASE Kitsap properties where limited wetlands information is available include Camp Wesley Harris, Jackson Park and Naval Hospital Bremerton, and the Toandos Buffer Zone. There are no known wetlands within the boundaries of NAVBASE Kitsap at Bremerton.

To help categorize previously undelineated wetlands on Navy owned property, NAVBASE Kitsap uses the WDOE *Wetland Rating System for Western Washington* (WDOE 2014), which is consistent with the U.S. Corps Wetland Delineation Manual and its regional supplements. The purpose of the rating system is to differentiate between wetlands based on the functionality, sensitivity, significance, replacement capability, and rarity of the wetland. Use of this rating system aids NAVBASE Kitsap land managers and planners in protecting and managing wetlands. NAVBASE Kitsap Environmental staff evaluating previously uncategorized wetlands will use the latest version of WDOE's Wetland Rating Form for Western Washington. These staff will have experience and/or education in the identification of natural wetland features, indicators of wetland function, vegetation classes, and ability to distinguish between different plant species.

Wetlands on NAVBASE Kitsap property requiring delineation will fall into Categories I through IV based on the points assigned by WDOE's Wetland Rating Form. Table 3-1 describes the categories and point system to be used on NAVBASE Kitsap wetlands.

Table 3-1: NAVBASE Kitsap Wetland Categories based on Washington State Wetland Rating System

Wetland Category	Description	Scoring
Category I	Wetlands that 1) represent a unique or rare wetland type; or 2) are more sensitive to disturbance than most wetlands; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a high level of functions.	>23
Category II	Wetlands that are difficult, though not impossible, to replace and provide high levels of some functions. Wetlands that are disturbed and may be Estuarine and greater than 1 acre.	20 – 22
Category III	Wetlands with a moderate level of functions and may be Estuarine between 0.1 and 1 acre in size.	16-19
Category IV	Wetland with the lowest levels of function and are often heavily disturbed.	<16

Through NAVBASE Kitsap's Environmental Review process, described in Section 2.2.4, Environmental staff will confirm whether a proposed project will impact wetlands. Proposed projects will maintain undisturbed buffers around wetlands according to Table 3-2.

Table 3-2: Wetland Buffer Widths on NAVBASE Kitsap Properties

Category of Wetland	Buffer Width
Category I	200 feet
Category II	100 feet
Category III	50 feet
Category IV	30 feet

Buffer widths will be measured horizontally from a perpendicular line established at the wetland edge to the buffer width specified in Table 3-2. The Navy's Geographic Readiness Exchange (GRX) provides general mapping for site planning purposes. Mapping tools can plot buffers around water features for planning purposes. Environmental staff performing this analysis should

verify that the applicable GRX layers are based on an up-to-date survey of the water feature as changes in surface-water hydrology could alter wetland boundaries.

Decreases to the above buffer widths must be approved by the NAVBASE Kitsap Environmental Director. Projects requesting a decrease in wetland buffer widths will be required to demonstrate that the decreased buffer will not adversely impact the wetland. Projects where direct impacts to wetlands are unavoidable will require a CWA Section 404 permit and Compensatory Mitigation, as regulated by the USACE.

NAVBASE Kitsap staff will characterize baseline wetland conditions as needed and ensure GIS layers reflect the proper size and conditions as consistent with resources allocated to the installation to implement. NAVBASE Kitsap will enhance the functions and values of these systems as allowable and ensure no loss in size or function.

3.2.2 Streams, Lakes and Riparian Zone Management

3.2.2.1 Streams and Lakes

The management approach to the streams and lakes on NAVBASE Kitsap properties is similar to wetlands management. The location of perennial streams and lakes on NAVBASE Kitsap properties are generally well documented and are detailed on the installation maps presented in Sections 4 through 7. Similar to wetlands, the exact course of streams may change from year to year due to high winter flows, beavers, or other natural changes to surface-water hydrology.

Streams, lakes, and riparian zone management should be considered as watershed processes. Watershed processes are dynamic physical and chemical interactions that form and maintain the landscape and ecosystems. For example, the way that water, sediment, and wood move determine the shape and form of the channel and complexity of the physical features present. A stream with more of these physical features usually supports a greater number of species across the food chain, including fish.

3.2.2.2 Riparian Zones

The benefits of riparian vegetation around streams, lakes, shorelines, and estuarine areas includes preventing/reducing erosion, providing wildlife habitat, providing shade and therefore lowering water temperatures, and removing runoff pollutants via biofiltration. To maintain riparian vegetation, water bodies on or adjacent to NAVBASE Kitsap properties will be classified according to whether the water body supports fish habitat or not. For the purposes of Natural Resource Management at NAVBASE Kitsap, fish habitat is defined as areas of importance to the maintenance of fish, including areas supporting endangered, threatened, and sensitive species; and lakes or streams planted with game fish. Water bodies not previously classified on NAVBASE Kitsap property may require an assessment by fisheries biologist or other specialists to determine whether it supports fish habitat.

Proposed projects in the vicinity of freshwater bodies will be required to maintain riparian buffers according to Table 3-3.

Table 3-3: Riparian Zone Buffer Widths on NAVBASE Kitsap Properties

Category of Water Body	Buffer Width
Contains habitat for salmonids, game fish, and other anadromous fish	150 feet
Does not contain fish habitat	50 feet

Riparian buffers should be measured from the ordinary high water mark or from the top of the bank where the ordinary high water cannot be identified. A building or impervious surface setback line of 15 feet is required from the edge of the buffer. In addition to the above buffers, NRMs will incorporate the following recommendations whenever possible (Washington Sea Grant 2009):

a) **Protect marine riparian soils and vegetation** – prevent damage to native riparian soils and vegetation, including clearing, grading, compaction, covering (paving) and removal.

b) **Restore damaged marine riparian habitat** – restore vegetation, soil characteristics.

c) **Account for scale issues (temporal and spatial)** – when evaluating riparian condition, current functions and potential for future functions, and cumulative effects of alterations. The dynamic nature and connectivity of riparian areas and linkages between riparian and aquatic systems operate at multiple scales.

d) **Exclude all major sources of contamination from the riparian buffer** – including construction, impervious surfaces, mining, septic system drain fields, agricultural activity, clear-cutting, and application of pesticides and herbicides.

e) **Manage riparian areas for the long-term** – for many sites, substantial time, on the order of years to decades, will be required for vegetation to become fully functional.

f) **Require additional structural setbacks landward of buffers –** will allow routine maintenance of structures without compromising buffer function integrity.

g) **Climate change** - has not been properly assessed for the majority of DOD installations, including the installations that are covered in this INRMP. A recommendation by the GAO is a baseline climate change vulnerability assessment of all DOD sites (DoDI 4715.03).

Use of pesticides, fertilizers, and herbicides in riparian buffer areas is prohibited except those approved by the Environmental Protection Agency (EPA) or WDOE for use in fish and wildlife habitat areas. NAVBASE Kitsap planners and environmental project reviewers should ensure that riparian buffers are based on current surveys of the water body. The NAVBASE Kitsap pest managers will follow the WDFW recommended timing restrictions for planning all pesticide applications within riparian and aquatic areas. Pesticide use in the riparian area may only be conducted with approval of the NRM after the NRM ensures the chemical is appropriate for use in aquatic applications, the proper NPDES permit is in place, and all necessary ESA and EFH consultations have been completed.

Reduction of the above specified riparian buffers shall occur only with the written approval of the NAVBASE Kitsap Environmental Director and after demonstration that the water body will not be adversely impacted or that impacts are sufficiently mitigated. Similar to wetlands, unavoidable impacts to streams or lakes will require a CWA Section 404 permit and Compensatory Mitigation, as regulated by the USACE.

NAVBASE Kitsap staff will characterize stream and riparian zone conditions as needed and as consistent with resources allocated to ensure GIS layers reflect the proper size and conditions. NAVBASE Kitsap will enhance the functions and values of these systems as allowable and ensure no loss in size or function.

3.2.2.3 Low Impact Development

The Navy's low impact development (LID) policy for stormwater management (USN 2007d) has set a goal of no net increase in stormwater volume, sediment, or nutrient loading from major renovations and construction projects[1]. To support this goal, the policy directs that LID be considered in project design for stormwater management. The Navy is directed to plan, program, and budget to meet the requirements of this policy starting in fiscal year (FY) 2011. Additionally, Congress enacted Section 438 of the Energy Independence and Security Act (EISA) of 2007 to require federal agencies to reduce storm runoff from federally funded development projects. Federal agencies can comply with EISA Section 438 by incorporating a variety of LID stormwater management practices into the design of development projects.

EISA Section 438 will apply to a larger number of projects on NAVBASE Kitsap as compared with the Navy's LID policy triggers. The EISA provision is as follows:

> **"**The sponsor of any development or redevelopment project involving a federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the

[1] Major renovation projects are defined as having a stormwater component and exceeding $5 million when initially approved. Major construction projects are defined as those exceeding $750 thousand.

maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

A strong component of LID stormwater management is maintaining or mimicking the natural functions of wetland and riparian buffers to infiltrate, evapotranspirate, dissipate, and filter runoff from developed areas. Additionally, maintaining or restoring predevelopment hydrology under the requirements of the EISA Section 438 will further encourage new construction to occur in previously developed areas thus promoting preservation of undeveloped lands.

3.2.3 Shoreline and Nearshore Management

Shellfish, forage fish, and many other wildlife species utilize the beaches and shoreline areas of NAVBASE Kitsap. At NAVBASE Kitsap, proposed projects, operations, or other actions are reviewed for any foreseeable effect on coastal use or resource. This analysis includes direct and indirect environmental effects as well as effects on coastal resources. Review of upland projects could include identification of point and nonpoint source pollution while projects on the shoreline may need review for above water shading and marine habitat impacts. This review will include NAVBASE Kitsap staff with expert knowledge in many areas including the ESA, CWA, wetlands management, forestry, and the Coastal Zone Management Act (CZMA).

CZMA calls for the effective management, beneficial use, protection, and development of the nation's coastal zone. As a means to reach those goals, the CZMA requires participating coastal states, including Washington, to develop management programs that demonstrate how states carry out their obligations and responsibilities in managing their coastal areas. In Washington, the WDOE is responsible for Washington's Coastal Zone Management Program. While the coastline, marine waters, and resources within NAVBASE Kitsap are not within the bounds of the state's enforceable coastal zone program, the "Federal Consistency" section of the CZMA requires NAVBASE Kitsap to comply to the maximum extent practicable with Washington's Coastal Zone Management standards.

During project review, if NAVBASE Kitsap determines an activity is likely to have coastal effects, a consistency determination, accompanied by supporting information is sent to WDOE for review. WDOE has 90 days to review and work with NAVBASE Kitsap to resolve any differences. In addition to project reviews the NRMs will do the following in support of managing NAVBASE Kitsap shoreline habitats:

a) **Inspect the shorelines, especially the beach areas, for manmade debris.** Manmade trash, often consisting of plastic items, washes up on many shorelines in the Puget Sound area. This trash is unsightly, and some items may be perceived as a food source by wildlife and cause harm. Accumulations of trash or manmade objects may remove areas of shore from forage fish spawning opportunities or from bird use. If any derelict fishing nets are observed near or on Navy properties, they will be reported to the Northwest

Straits Initiative at 360-733-1725 or 1-855-542-3935 or online at: http://www.derelictgeardb.org/reportgear.aspx.

b) **Protect aquatic vegetation.** Eelgrass, kelp, and marine algae may be found along some of the sub- and intertidal areas around NAVBASE Kitsap. Eelgrass generally occurs in shallow waters as deep as 10 meters while kelp can be found in waters as deep as 20 meters (Mumford 2007). Both eelgrass and kelp provide an important habitat for marine invertebrate and vertebrate species including ESA listed salmonids and rockfish. The varied types of marine algae in the Puget Sound and Hood Canal are an important food sources for several species of sea birds, fish, and invertebrates. During the program/project review process, the NRM will look for potential impacts to aquatic vegetation and offer alternatives to minimize or eliminate the impacts. Due to the uncertainty surrounding the success of eelgrass restoration and mitigation projects around the Puget Sound, protecting intact vegetation should be considered a priority for all in-water work. Specifics regarding the types of aquatic vegetation found at each of the installations covered within this INRMP can be found in the following installation specific Sections 4 through 7.

c) **Stormwater runoff.** The NRM will work with NAVBASE Kitsap and PSNS & IMF stormwater managers in reviewing proposed projects and programs for stormwater or other discharges, and ensure that these discharges do not degrade the water or sediment quality of the waters surrounding an installation.

d) **Military training.** The Navy and other services conduct training operations at various installations in Puget Sound. However, operations with the potential to impact shorelines are infrequent at NAVBASE Kitsap. Training operations can require that equipment and personnel utilize the near shore areas. The NRM will be familiar as to the seasonal use of beaches by birds and forage fish spawning, and recommend shoreline areas or seasonal timing that will result in minimal or no impact to these species or their habitats. Proposed exercises would go through a thorough review under the NAVBASE Kitsap environmental review process described in Section 2.2.4.

e) **Avoid Shoreline Armoring.** The NRMs will work with NAVBASE Kitsap planners and project managers to minimize new shoreline armoring and to use soft armoring whenever possible. The NRMs will encourage the placement of new buildings, roads, and other development outside of the shoreline area as to avoid the need for armoring. When repairing armoring or installing new armoring, NAVBASE Kitsap will strive to use soft armoring techniques such as large woody debris, gravel berms, beach nourishment, and vegetation, and review the Marine Shorelines Design Guidelines as guidance for work. Soft shore techniques are site specific and have had varied success throughout the Puget Sound. The NRMs will seek the expertise of outside officials when appropriate. The Shorelands and Environmental Assistance Program at the WDOE and/or local Habitat

Biologist from the Washington State Department of Fish and Wildlife may be called upon to assist in the design, implementation, and monitoring of these projects.

3.2.4 Aquifer Management

Management of the aquifers on NAVBASE Kitsap ensures the Navy's ability to continue providing a clean source of potable water (where utilized), prevents saltwater intrusion and contaminant introduction, and helps maintain stream flow during summer months. Some degree of active aquifer management occurs on the following NAVBASE Kitsap installations: NAVBASE Kitsap Bangor, NAVBASE Kitsap Bremerton, NAVBASE Kitsap Keyport, and Jackson Park. Past industrial and military activities have introduced contaminants into the upper aquifers at all four of these locations. Efforts are ongoing at these installations to remediate and/or monitor the groundwater in the upper aquifers. Two installations, NAVBASE Kitsap Bangor and NAVBASE Kitsap Keyport, use the groundwater from deeper aquifers as potable water sources. Wellhead protection programs at NAVBASE Kitsap Bangor and NAVBASE Kitsap Keyport limit development and activities within specified distances to the wells. Wastewater for NAVBASE Kitsap is pumped to the local treatment facilities that are regulated by the WDOE.

Installation specific management of the aquifers at NAVBASE Kitsap Bangor and NAVBASE Kitsap Keyport is provided in Sections 4 and 5. Ongoing remediation efforts and/or long term groundwater monitoring at NAVBASE Kitsap Bangor, NAVBASE Kitsap Bremerton, NAVBASE Kitsap Keyport, and the Jackson Park Housing Complex are aimed at reducing contaminant migration to other aquifers or surface water with impacts to human health and the environment. Information on the Installation Restoration sites for these installations is provided in Appendix F.

3.2.5 Forest Management

3.2.5.1 Authority and Requirement

The authority and requirement to have a Forest Management Plan is contained in an array of laws and DOD, DON, and NAVFAC instructions and directives cited elsewhere in this INRMP. For example, 32 CFR § 190 prescribes policies and procedures for an integrated program for multiple-use management of natural resources on property under DOD control. Title 10 USC, Section 2665, authorizes the sale of forest products as well as reimbursement for the costs of managing forest resources for timber production. This is administered in accordance with DOD Financial Management Regulation Volume 11A, Chapter 16 (August 2002), Accounting for Production and Sale of Forest Products. The Department of the Navy Financial Management Policy Manual, Volume 3, paragraphs 07150 and 035475-79, provide guidance on funding, accounting, and fiscal reporting procedures. The Timber Conservation and Shortage Relief Act of 1990 prohibit export of unprocessed timber originating from federal lands west of the 100th meridian. OPNAV M-5090.1, Environmental and Natural Resources Program Manual, discusses

requirements, responsibilities, and policy for natural resources management for Navy ships and shore activities. NAVFAC P-73, Real Estate Procedures Manual Vol. II, provides contractual guidance for timber sales. DODINST 4715.03 provides policy, requirements, and procedures on the use, sale, and disposition of Government forest products.

In accordance with DOD and DON requirements, the Navy Forest Management Program is centrally funded and centrally executed through NAVFAC. The NAVFAC Northwest Forester will provide professional forestry services to manage and develop the forest resources for the economical production of forest products and the conservation of related resources. The Forester will prepare, and review with the installation, the forestry annual work increments. As this is a centrally managed program, the Forester's services and forest management projects are funded by Forestry Funds, at no cost to the installation. Forest projects may be supported with other funding sources as well. Non-silvicultural forestry actions, such as land clearing for construction or security/safety clearance zones, require that project funds be provided for the professional forester services provided by NAVFAC Northwest.

3.2.5.2 Forest Description

NAVBASE Kitsap forestlands are located on nine operational land components:

a) NAVBASE Kitsap Bangor (including the Ordnance Annex): 3,754 acres of forest

b) Toandos Peninsula: 723 acres of forest

c) Camp Wesley Harris: 355 acres of forest

d) NAVBASE Kitsap Keyport: 52 acres of forest

e) NAVBASE Kitsap Bremerton: small dispersed clumps and urban forest

f) Jackson Park Housing Complex & Naval Hospital: small dispersed clumps and urban forest with a 15-acre parcel northwest of the hospital

g) Camp McKean: small dispersed clumps and urban forest

h) Zelatched Point: 15 acres of forest

i) Navy Shelton-Bremerton-Bangor railroad right-of-way: 300 acres of forest

Total forest acreage is approximately 6,090 acres plus the small dispersed clumps and urban forest at NAVBASE Kitsap Bremerton, Jackson Park and Camp McKean. This acreage could be increased significantly if open and brush areas were planted with native conifers.

The recent history of forest management at NAVBASE Kitsap can be surmised from the existing timber stands. The majority of existing trees are 60 - 125 years old, with a few scattered relict old

growth trees. This indicates that most of the acreage was harvested by pioneering landowners prior to Navy acquisition of the properties.

The reforestation of areas harvested in the 1860s and subsequent decades resulted from natural seeding coinciding with favorable environmental conditions for the establishment of new stands of timber. Since Douglas-fir dominated the acreage adjacent to harvested areas, it was the primary tree available to provide seed. In climatic regimes conducive to its growth, Douglas-fir produces an abundance of seed that can germinate on a wide variety of surface conditions. Therefore, naturally established stands of Douglas-fir tend to be very dense, often containing more than 2,000 stems per acre at an early age. The existing Navy forest stands have essentially developed naturally. Since the Navy acquired the property, there has been active forest management to improve the health and vigor of the forest stands. This Plan will continue those efforts to improve tree and forest health, vigor, and horizontal and vertical structural diversity.

3.2.5.3 Forest Management Plan

This forestry plan provides programmatic and silvicultural policy for ecologically sound and sustainable management of forest resources on NAVBASE Kitsap. It outlines procedures, projects, and silvicultural prescriptions to restore, enhance, conserve, and protect the productivity and resources of approximately 6,090 acres of forest on NAVBASE Kitsap land components. This plan will also address opportunities to reforest or afforest areas currently devoid of trees.

This plan's policies address existing second growth stands as well as restoration of the coniferous forest areas impacted by construction and military uses, which may have reduced the size and quality of the forest. The plan is consistent with DOD policy that forestlands suitable for timber production shall be intensively managed for restoration and improvement of forest resources and economical production of commercial forest products, based on soil-site capabilities and integrated with all aspects of the natural resources program in consonance with military uses and requirements.

Installation forests will be managed on an interdisciplinary, multi-use, watershed basis. This means that other natural resources programs and uses, such as military training, wildlife management, endangered species conservation, wetlands protection, and outdoor recreation will be addressed to assure that all natural resources programs and the military mission are integrated. This approach will facilitate the greatest good for the greatest array of uses over the longest period of time without diminishment of future productivity and land use options. Second growth areas will be managed to enhance structures typical of late succession forests.

Specific management strategies and prescriptions are presented in the Appendix G.

The forest management objectives are to:

a) Support the military mission by maintaining land availability and use options;

b) Maintain forest stands in a healthy productive condition through selective thinning, increasing tree and stand vigor, and enhancing structural diversity in both forestland and urban settings;

c) Maintain slope and soil stability along forest roads;

d) Protect water quality in wetlands, watercourses, and shorelines;

e) Integrate forest management with other natural resources disciplines and programs to protect natural resource attributes associated with forested areas;

f) Support natural resources aspects of sustainable outdoor education and recreation opportunities that are consistent with the carrying capacities of the natural resources upon which they are based; and

g) Utilize income to benefit the natural resources program when harvest of forest products is required.

Management of Navy forests will be coordinated in an integrated, balanced natural resources program that incorporates maintenance of soil productivity, watershed protection, wildlife habitat enhancement, aesthetic qualities, and other natural resource values while providing operating, training, and buffer areas for the military mission, housing, and support facilities. These policies and this plan will guide the preparation of annual increments and the selection of silvicultural techniques and projects used on Navy forests. Annual increments will be reviewed with the installation prior to implementation to assure compatibility with mission requirements.

3.2.5.3.1 Schedule for Review

This INRMP, which includes the Forest Management Plan, will be reviewed annually and then have a 5-year review for operation and effect. The greatest needs in forestry on NAVBASE Kitsap land components lie in the conservation of relict old growth trees; thinning of dense second growth stands to encourage development of understory vegetation and to enhance structural diversity; restoration of the original coniferous forest cover to areas historically impacted by construction of base facilities; and enhancement of existing forest stands impacted by historical operations and uses. This plan will provide stand-by-stand prescriptions tailored to achieve these objectives in both forestland and urban areas.
Thus, the INRMP will need revision when:

a) The prescriptions have been fully implemented and regulated forest stands are achieved;

b) Sufficient time has passed and, in the absence of plan implementation, natural processes have so changed the forest conditions that the plan no longer reflects existing conditions; or

c) Sufficient land use changes have occurred as a result of mission requirements that the plan is outdated.

Given recent types and intensities of mission uses and forestry activities, it is anticipated that annual reviews and updates will be sufficient.

3.2.5.3.2 Program Policy

The Navy Forest Management Program will be administered in consonance with applicable law and regulation. Planning, budgeting, fiscal management, reporting, and implementation will be in accordance with DOD program requirements, including forest management initiatives, mission support, positive community relations and public affairs, ecosystem forest management on a watershed basis, and environmental protection.

3.2.5.3.3 Silvicultural Policies

The Navy is committed to conserving and managing soil, water, forests, fish, wildlife, and outdoor recreation resources. The primary purpose in managing these natural resources is to support our national defense mission, maximize multiple land use benefits, and fulfill land stewardship responsibilities required by applicable laws, Executive Orders, administration initiatives, and DOD Directives. To achieve this purpose, this forestry plan will provide for:

a) Sustainable yield production, conservation, and management of quality forests and wood fiber;

b) Fish and wildlife species habitats;

c) Protection, conservation, and recovery of T&E species and their habitats;

d) Watershed/wetlands protection;

e) Outdoor education and recreation opportunities that are consistent with the carrying capacities of the natural resources upon which they are based; and

f) Development and maintenance of a desirable structural diversity and biological balance in the forest consistent with proven scientific practices.

These purposes will be adapted and applied to forestland and urban forest areas of NAVBASE Kitsap.

Silvicultural stand prescriptions will be interdisciplinary, ecosystem oriented, and considerate of watershed conditions. This means that:

a) Forest management will be holistic to include a wide array of natural resource uses, values and functions;

b) Wildlife and fisheries issues are incorporated into forest management planning, project criteria, and operations (e.g., seasonal restrictions etc.);

c) Wildlife trees, snag retention, and wetlands protection are integral parts of forest management and forest product sales;

d) Thinning prescriptions will achieve vertical and horizontal structural diversity to foster greater opportunities for biological diversity;

e) Stand prescriptions will contribute positively to enhancement of wildlife habitat and corridors, and endangered species protection, conservation and recovery;

f) Wetlands will be protected not only within jurisdictional boundaries, but including hyporheic zones and prescribed buffers;

g) Particular protective attention will be given to palustrine wetlands; and

h) Adjacent land conditions will be considered in prescriptions and implementation schedules.

3.2.5.3.4 Program Execution

The foresters shall also provide professional advice and assistance with mission-related tree issues such as selecting project sites that minimize environmental impacts and preparation of timber appraisals for projects that involve tree removal. The forester will prepare, and review with the installation, the forestry annual work increments. Annual increments describe planned forest management work to be completed during a fiscal year. Upon approval of the annual increment by the Installation Environmental Program Director and receipt of funding, the year's forestry work will be implemented. The annual increments may be adjusted if warranted by unforeseen circumstances or requirements and approved by the Installation Environmental Program Director. Any tree removal shall be approved by the NRM or IEPD.

3.2.5.3.5 Funding Sources

Reimbursement for the cost of managing commercial forest resources for timber production is authorized by 10 USC § 2665 from the sale of forest products. Forest products sale income and reimbursement of forestry expenses are planned, budgeted, and administered by the NAVFAC Northwest forester. The Commercial Forest Management Program for silvicultural and habitat benefit is implemented at no cost to the installation. Non-silvicultural forestry work, such as construction site delineations and clearings, Anti-Terrorism/Force Protection (ATFP) corridors, helipad approach zones, housing and support area urban forests requires that project funds be provided to cover forester labor.

3.2.5.3.6 Endangered Species

This Forest Management Plan fully supports the conservation and recovery of federally and state listed threatened and endangered species. As provided in the 2004 National Defense Authorization Act [PL 108-136, Section 4(a)(3)(B)(i)], DOD lands with approved Sikes Act compliant INRMPs will not be included in critical habitat designations. This Forest Management Plan will support the goals of species conservation, recovery, and habitat protection, where effects to species are possible within the managed areas, as outlined within this INRMP.

3.2.5.3.7 Forestry Contracts

Sales of forest products are accomplished in accordance with NAVFAC P-73, Volume II. All forest products sale contracts, including the personal firewood cutting program, are under the contractual authority of the NAVFAC Northwest Real Estate Contracting Officer. Service contracts used to acquire forestry services are processed in accordance with federal procurement regulations. Forest products sales and forestry services are not combined under one contract. Authority to award both types of contracts rests with NAVFAC Northwest. The forester will provide technical specifications and contract administration for forestry contracts, regardless of funding source.

3.2.5.3.8 Forest Practices

The following practices are commonly used in managing forested lands and may be applied to varying extents to the forested lands of NAVBASE Kitsap land components.

Forest Thinning

Trees need sufficient growing space to maximize diameter growth rates and to maintain tree vigor and health. Dense stands require thinning to allow tree crowns to expand and provide the leaf area necessary for optimum photosynthesis. Thinning also allows sunlight to reach the forest floor and support the development of grasses, forbs, brush, and tree reproduction in a healthy, multi-layered understory. This understory is essential to horizontal and vertical structural diversity. Thinning provides the opportunity for inspection for and removal of diseased trees that threaten the health of the surrounding trees.

Young, dense stands may be pre-commercially thinned to promote optimum tree vigor and health. Since the trees are too small to generate income, these thinning are called pre-commercial. The optimum time to initiate pre-commercial thinning is when saplings are 15 - 30 feet tall, the crowns of adjacent trees have begun to interlock, and dominance has been established. It is recommended that up to approximately 16 feet of growing space be established between high quality or dominant “leave trees.” All other trees between the leave trees are cut down and typically left on the forest floor to decompose, enrich soils, and recycle nutrients. An average spacing of 16 feet between trees establishes an after-thinning density of about 170 trees per acre. No wheeled or tracked equipment will be used, therefore there is no potential for soil

compaction, and work can be done at any time of year. About 20 years following pre-commercial thinning, the stand should be evaluated for a first commercial thinning.

Commercial thinning presumes that the income derived from the thinning will more than pay for the associated expenses. If properly conducted, a thinning should first remove the poor quality trees, leaving the best trees to grow. Considering the average tree diameter and age of the units needing commercial thinning on NAVBASE Kitsap land components, it is recommended that a spacing that provides for wind resistance and room to grow be determined based on stand history, location, height to diameter ratio, etc. Typically, commercial thinning averages approximately 20 feet between trees, establishing an after-thinning density of about 100 trees per acre. For those soils with a high soil compaction potential, skidding activities should be scheduled for the summer or fall months, or other periods of low soil moisture and limited in extent, capitalizing on previously existing skid trails. Scarring of the trunks of residual trees resulting from the falling or skidding of harvested trees should be kept to a minimum, since these scars serve as rot infection centers. Timber sale contracts and pre-commercial thinning contracts will contain definitions, terms, and conditions addressing excessive damage and penalties for exceeding allowable levels of damage. Felled trees are typically limbed, topped, and bucked into log lengths where they lay and their slash lopped and scattered evenly over the forest floor to decompose in depths averaging no greater than 24 inches above grade. This height limit may be exceeded in cases of desirable large organic debris. Any tree removal will be reviewed and approved by a NAVFAC Northwest Professional Forester and must have concurrence from the NRM or IEPD.

The commercial products that would result from forest thinning include primarily Douglas fir sawlogs, and some pole or piling grade material. Lesser quantities of sawlog red alder, western hemlock, western redcedar, western white pine, and grand fir may also be generated. Smaller sized or poor quality material of these species could be utilized as chipping saw, pulpwood, or firewood.

Tree Planting

The beauty and habitat qualities of forested areas at NAVBASE Kitsap land components can be expanded and enhanced by planting trees on open areas, to the extent compatible with other land use requirements. Inter-planting to replace mortality and additional plantings may be conducted in both forestland and urban areas.

3.2.5.3.9 Forest Description and Inventory

An inventory of forestland areas was conducted in 2001. Urban forest areas were not included in this inventory. Forestland areas were grouped based on dominant tree species, stem density/acre, age, and diameter. The results of this inventory are summarized in Appendix G. These data can be used to select forested areas for thinning, prioritization for treatment, and other appropriate management prescriptions. The total forested area on NAVBASE Kitsap land components is

approximately 6,090 acres of forestland plus urban forest clumps and landscape specimen areas including some unique habitats.

3.2.5.3.10 Vegetative Characteristics

The existing forest stands on NAVBASE Kitsap land components may be generally classed in four broad categories: second growth mixed conifer; second growth mixed conifer and broadleaved; ruderal or emergent, broadleaved or conifer; and urban forest.

Second growth mixed conifer forest dominates the installation. It is the result of logging that occurred between the 1880s and 1940s. The second growth stands are dominated by conifers Douglas-fir, western hemlock, western redcedar, and western yew. Shore pine, western white pine, and spruce are present in lower numbers.

Second growth mixed conifer and broadleaved stands have the above conifers plus fractions of big leaf maple, black cottonwood, wild cherry, willow, vine maple, and red alder.

Ruderal or emergent, broadleaved or conifer generally occurs on disturbed sites. Some of these areas are naturally occurring as a result of cropland no longer cultivated, cleared zones and areas impacted by historic construction, or landfills.

Urban forest areas are very small stands, clumps of trees or individual specimens found in housing, industrial, and support areas.

Overall, most second growth and mixed stands are very densely stocked above the desired 100 stems per acre level and are deficient in understory vegetation, reproduction, and structural diversity resulting from high stem densities that preclude adequate light from reaching the forest floor. Understory characteristics (understory calls) are included in the forest inventory.

3.2.5.3.11 Forest Soils

The characteristics of individual soil types can be used to predict the probable impact of various forest management practices on both vegetation and soils. Probable impacts can be predicted for woodland suitability, soil compaction, slope stability, competing vegetation, and tree wind throw. To help maintain soil stability and prevent erosion, silvicultural treatments should be designed to minimize impact to soils. In the event of a natural disturbance such as disease or pest infestation, it is possible that clear-cutting may be necessary to the limits of the disturbance. In this situation, new impacts to the soil resource should be limited to 10% of the area or less.

“Site quality” is a term used to describe the relative productivity of a land area for a particular tree species. It is usually defined in terms of capacity to produce wood. The most common expression of site quality is Site Index. Site Index is based on tree growth patterns and refers to the height of dominant or dominant and co-dominant trees in even-aged stands at some index age, usually 50 years. The height growth of such trees is considered to be independent of stand density over a wide range of densities, and strongly related to site quality. One goal of this plan

is to achieve well stocked, regulated stands in order to take advantage of site productivity and to restore the coniferous forest cover previously found on currently unstocked or marginally stocked lands. Thus, site indices based on existing stand characteristics may increase with management and time. Site Indices used for forest management under this INRMP will be derived from empirical measurements or from published sources, such as the USDA soil surveys.

Most of the soils on NAVBASE Kitsap components are well suited for tree production. The exceptions are soils that are seasonally very wet, wetlands, soils on geologically active slopes, soils on developed sites and restoration sites. Refer to the USDA Soil Conservation Service (USDA-SCS) or Natural Resources Conservation Service (NRCS), Soil Survey of Kitsap, Jefferson, and Mason Counties, Washington, for specific soils mapping units, profile descriptions, and pertinent land use information. Soils of some NAVBASE Kitsap components are not covered by available soil surveys.

Because seed sources of brush and red alder exist on or adjacent to NAVBASE Kitsap land components, it is highly likely that at least a portion of newly planted areas will be invaded by competing vegetation. Many species of conifer seedlings cannot survive in the shade created by competing vegetation. Planted areas should be checked annually for about 10 years following planting for the invasion of fast growing competing vegetation. If seedlings are being over-topped, the competing vegetation can be controlled either by hand cutting, girdling, goat or sheep browsing, or by the use of an approved, properly formulated, and timed, herbicide application.

3.2.5.3.12 Inventory

Forest inventory data is presented in Appendix G. It includes the legend and symbols for forest stand typing.

3.2.5.3.13 Authority and Requirement

The authority and requirement to have a Forest Management Plan is contained in an array of laws and DOD, DON, and NAVFAC instructions and directives cited elsewhere in this INRMP. For example, 32 CFR § 190 prescribes policies and procedures for an integrated program for multiple-use management of natural resources on property under DOD control. Title 10 USC, Section 2665, authorizes the sale of forest products as well as reimbursement for the costs of managing forest resources for timber production. This is administered in accordance with DOD Financial Management Regulation Volume 11A, Chapter 16 (August 2002), Accounting for Production and Sale of Forest Products. The Department of the Navy Financial Management Policy Manual, Volume 3, paragraphs 07150 and 035475-79, provide guidance on funding, accounting, and fiscal reporting procedures. The Timber Conservation and Shortage Relief Act of 1990 prohibit export of unprocessed timber originating from federal lands west of the 100th meridian. OPNAV M-5090.1, Environmental and Natural Resources Program Manual, discusses requirements, responsibilities, and policy for natural resources management for Navy ships and shore activities. NAVFAC P-73, Real Estate Procedures Manual Vol. II, provides contractual

guidance for timber sales. DODINST 4715.03 provides policy, requirements, and procedures on the use, sale, and disposition of Government forest products.

3.2.5.4 Forest Management Practices

A forest management system of area control will be used to foster desirable forest age classes, stand structures, and species composition; to develop and enhance understory vegetation; and to preserve relict old growth tree specimens and endangered species habitats. This will ensure sustainable production of the most desirable timber and other forest products, functions and values while protecting and conserving water quality, endangered species, relict old growth trees, structural and biological diversity, and outdoor recreation and education. It is not considered appropriate or advisable to fragment the forest into a number of stands equal to a rotation age. Rather, stand delineations will be the planning base for future age classes.

Commercial thinning will dominate forest activity over the next two decades. Most of the forestland is densely stocked second growth in need of thinning. It is anticipated that in most years there will be thinning and tree plantings. The typical prescription will specify that 100 of the best commercial species trees, “Leave Trees” will be left uncut and undamaged on each acre, spaced consistently and uniformly throughout the thinning area. In addition to the specified Leave Trees and marked “Wildlife Trees,” small non-commercial sized trees may be left intact. This includes less prevalent species such as wild cherry, willow, cottonwood, yew, madrone, etc. The purposes of this approach include:

a) Sustainable forest management without diminution of future diversity and productivity;

b) Minimizing stand disturbance while opening up the canopy sufficiently to allow more sunlight to reach the forest floor and establish understory vegetation;

c) Preserving and enhancing both horizontal and vertical structural diversity through retention of shade tolerant understory trees and development of grasses, forbs, and woody brush species;

d) Providing a population of understory and suppressed trees that are recruitment for snags in future decades; and

e) Providing botanical and structural diversity that will enhance forest stands for wildlife species.

Due to the extensive facilities development of NAVBASE Kitsap land components and the high value of urban and landscape tree specimens, urban forestry will be a significant effort. All urban forest and tree management issues and projects will be accomplished through NAVFAC Northwest professional foresters consulting with and advising facilities managers. This includes hazard tree assessments, pruning, removal, and replacement.

3.2.5.4.1 Snags, Hollow Logs, and Wildlife Trees

Snags and hollow logs play a very important role in forest ecology. Timber sale contracts will protect snags and downed large organic debris. In addition, trees deemed unique or of special interest for wildlife, such as advanced second growth specimens, isolated relict old growth, trees with large limbs or cavities, or less prevalent species (yew, cottonwood, bigleaf maple, wild cherry, willow, madrone, etc.) will be protected in timber sales contracts and field marked with signs or paint prior to advertisement of a timber sale. Some large standing trees with heart rot or butt rot will be conserved as snags for recruitment later as hollow logs for wildlife when they topple.

Snags and downed hollow logs, important to cavity-nesting birds and other animals, will be left uncut except when determined by the NAVFAC Northwest Forester, in consultation with the timber purchaser, to present a safety hazard and no alternatives are available for safe operation around the snag or hollow log. All naturally downed logs will be left on the forest floor, unless inadvertently moved as part of the logging process, to provide habitat for wildlife including small mammals, salamanders, insects, and other arthropods. Slash left from cutting the tops and branches off harvested trees will be left on the forest floor to allow it to decompose naturally for recycling of the nutrients therein.

3.2.5.4.2 Species to be Grown

Douglas-fir is the mainstay of the Puget Sound forest products industry. Superior to other local species in strength, growth and disease resistance, Douglas-fir is the most useful, and therefore the most valuable, species adapted to most stands on NAVBASE Kitsap land components. Red alder has recently become a viable and valuable commercial species, particularly when the average diameter breast height (DBH) is 14 inches or greater and the stem is straight with limited branching on the lower portion. The larger alder generally occurs near streams and on moist to wet sites in lower slope positions. When alder occurs on drier upland disturbed sites it typically demonstrates small diameters and poor form. Its short lifespan and pioneering properties provide an opportunity for management toward the pre-disturbance native conifer cover-types. Conversion of alder located on moist to wet areas or adjacent to streams and wetlands will be done only if there is a clear benefit to the stream or wetland and the habitats they provide. The alder sites will be evaluated in context with their surroundings and uniqueness. Tree removal in these areas will only be done in a manner that maintains the integrity of streams and wetlands. Documented BMPs are required to be included in contract language and will be diligently administered for compliance. Western redcedar is also a valuable tree for commercial products and structural diversity functions. Cedar will be usually grown on a rotation probably equal to twice that of any other species. Because of shade tolerance and persistent foliage, it contributes significantly to horizontal and vertical structural diversity in the forests. For this reason, western redcedar will be a preferred leave tree in thinning prescriptions. Road and landing locations will be designed to minimize the need for cedar removal.

Most stands on NAVBASE Kitsap components are dominated by Douglas-fir. In these areas, Douglas-fir will be, by default, the most common Leave Tree. Other less frequent species will be also emphasized in selecting leave trees to foster short-term and long-term biodiversity. Species for consideration as preferred leave trees depending on the stand context include, maple, alder, madrone, cherry, willow cottonwood, shore pine, and western white pine.

Natural regeneration of other native species such as alder, willow, wild cherry, cottonwood and maple is expected to diversify stands thinned or replanted, resulting in a species mix that will be more resistant to insect and disease attack through the synergistic effects of tree species and wildlife habitat diversities.

3.2.5.4.3 Reforestation

Reforestation and afforestation will use a mixture of site-adapted native conifer species. Plantings will be conducted the first planting season after harvest to achieve full stocking, which is defined as a minimum of 302 live stems of commercial species per acre. This amounts to a 12 foot on center spacing. Hand planting conifer seedlings will be the method used to reforest openings to fully stock deficient stands or to underplant if appropriate. Hand planting is more expensive than seeding, but affords more rapid and dependable stand establishment and can provide positive influence on stand species composition. Hand planting will be funded by the forestry program or any other fund source and accomplished by service contract. Occasionally, local civic, community service, or youth organizations may coordinate with the Navy to plant trees as a service project. Some planting areas may be site prepared with herbicide applications or cleared and scarified mechanically prior to planting.

3.2.5.4.4 Rotation and Cutting Cycle

It is not appropriate to set a rotation age or cutting cycle for the entire NAVBASE Kitsap forest area until the stands have been brought into a management system. Also, the setting of rigid rotation ages and cutting cycles may reduce the adaptive management needed to adequately strive for vigor, health and structural and biological diversity for all forest resources. Thus, this Forest Management Plan will focus on intermediate silvicultural treatments and thinning that will promote structural diversity and protect endangered species habitats and water quality. However, it is anticipated that pre-commercial and commercial thinning will be followed by a final harvest at a rotation age significantly in excess of 100 years. It is anticipated that rotations will be at ages 150 - 300 years. Some species such as western redcedar may have longer rotation ages. This will allow for development of high quality forest products and forest stands, which will provide superior structural and biological diversity supporting a mixture of consumptive and non-consumptive products, values, and functions.

3.2.5.4.5 Allowable Annual Harvest

The annual tree growth will improve as forest stands are thinned, stocked, and treated. Allowable annual cut will not be determined for this plan since the remedial and developmental treatments

may be considered intermediate. When the plan is revised subsequent to completion of all thinning and plantings, the stands may be in a condition favorable to determination of cutting cycle, rotation age, and allowable annual cut. It is not anticipated that an allowable final cut would involve harvests every year.

3.2.5.4.6 Silvicultural Treatments

Methods of Cutting

Clear-cut final harvest is the silvicultural system best suited to the regeneration of Douglas-fir. Partial cutting could favor the establishment of more shade-tolerant species and a gradual shift in stand species composition away from Douglas-fir towards more shade-tolerant but commercially less valuable species such as grand fir and western hemlock. Except in cases of salvage of timber due to natural wind throw, deadfall or pest infestation/outbreak, landslide, fire or other disturbance, it is anticipated that clear-cutting will not be used under this plan.

Selective cutting will be the system used in both pre-commercial and commercial thinning for the foreseeable future. Intermediate selective cutting will be used to thin stands for the concentration of growth on leave trees, development of horizontal and vertical structural diversity, and increase in value of the residual trees and to salvage mortality losses. Both commercial timber sale thinning and pre-commercial service contract thinning may be used. Thinning will improve stands by removing diseased trees, inferior species, and damaged trees. On mixed alder and conifer stands, located on upland or dry sites selective cutting may be used to remove the alder while leaving the conifers to mature. Additionally, this technique may be used to remove alder from any mixed stand and to make room for supplemental plantings prescribed to achieve site objectives. However, in wet areas or adjacent to streams and wetlands hardwood removal will only be done when there is installation support and a documented need.

In riparian corridors, special care and restrictions will be used, such as machinery exclusion or the use of draft animals, to ensure development of a healthy and vigorous stand of trees that will provide many opportunities for wildlife uses while shading watercourses to maintain preferred water temperature regimes. In the vicinity of a raptor perch or nest trees discovered in field surveys, selective cutting may be used to ensure development and perpetuation of vicinal large, open-grown trees similar to those already chosen as perches providing the treatment is in consonance with the management requirements and restrictions associated with the species.

Insect and Disease Best Management Practices (BMPs)

Insect and disease problems have not reached epidemic proportions in the NAVBASE Kitsap forests in recent years. The following specific forest pests are the most frequently encountered and are listed along with the prescribed control method. Surveys for insect and disease damage as well as control may be accomplished through the *Memorandum of Agreement between the USDA and the DOD for the Conduct of Forest Insect and Disease Suppression on Lands Administered by the U.S. Department of Defense* (1990).

Tent Caterpillar (*Malacosoma spp.*) is usually present in broadleaved trees and does considerable defoliation on a cyclic basis. Whole trees may be defoliated, causing an unsightly mess. Alder is seldom killed by this, and investment in pest control measures, notably spraying, usually is not warranted in forested settings. Urban forests or high value landscape areas may warrant such spraying. In addition, conversion of some ruderal alder areas to native coniferous species will reduce the number of host plants.

Root Rot (*Phellinus weirii)* is a persistent problem, especially on some of the heavier clay soils. Often, infected trees subsequently fall prey to bark beetles, which speeds loss of foliage and mortality and may offer the first outward sign of fungal infection. A great deal of control can be accomplished by clear-cutting the stand, tipping over the stumps to expose them to sunlight and air to kill the fungus and replanting the area back to a disease tolerant conifer species.

Douglas-fir Bark Beetle (*Dendroctonus pseudotsugae*) is frequently seen as a secondary invader of trees weakened by old age or disease. This insect has the potential for epidemic attack, but proper forest sanitation including thinning and harvest of weakened or diseased trees should keep it under control if it becomes a problem. In such cases, patch cutting will be used to salvage infested areas. They will subsequently be replanted with native conifers.

Douglas-fir Tussock Moth (*Orgy pseudotsugata*) has not yet been identified in NAVBASE Kitsap forests. If this defoliating insect does become a problem, control will be difficult. "BT," a biologic control agent may be adapted to use on Tussock moth and the best bet for control. At present, aerial application of insecticides is the only known control method. Any pesticide application will have to be thoroughly reviewed and approved prior to use.

White Pine Blister Rust (*Cronartium ribicola*), an introduced rust, has virtually eliminated white pine from serious management at this time. White pine was not detected in the inventory and is not really a species requiring attention at this time. Development of rust-resistant strains may allow planting white pine in the future.

White Pocket Rot [usually *Phellinus (Fomes) pini*] is a fairly common pathogen in Douglas-fir and is occasionally seen in young second growth. Patch cutting harvest of identifiably infested trees plus a surrounding transition area is the best control.

Fomes Root and Butt Rot (*Fomes annosus*) can infect many conifers and spreads through root grafts. The best control is to harvest the infected tree by toppling and then replant with native conifers. Particularly along roads and in recreation areas where pedestrians camp or walk, risk trees should be removed.

Gypsy Moth (*Lymantria dispar*) is an introduced forest pest that has shown great capacity for destruction and sudden epidemic growth in Washington. Both the European and Asian gypsy moths are of concern. They have not been detected in NAVBASE Kitsap forests. The Navy will continue to cooperate with State and Federal agencies conducting surveys for the moths. Control

is achieved by pheromone trapping, spraying with EPA approved insecticide as well as spraying with "BT" and in accordance with the *Memorandum of Agreement Between USDA and DOD for the Conduct of Forest Insect and Disease Suppression on Lands Administered by The U.S. Department of Defense* (1990).

Wildlife Damage Control

Deer browsing the growing tips of young Douglas-fir and other conifer seedlings may cause reduced height growth and in extreme cases may stop height growth completely until the size of the deer herd is reduced by harvest, disease or a hard winter. In general, this is not a severe problem in NAVBASE Kitsap forests. Deer hunting has been suspended for several years, but could happen in the future if the deer population condition would sustain hunting and the installation so desires. Depredation of deer is not anticipated nor is it considered necessary or feasible. There are not sufficient young plantations to warrant such. The incidence of animal damage on reforestation is one consideration in selecting hunting criteria. Small mammals such as voles, mice, moles, squirrels, rabbits, and mountain beavers also inhibit reforestation by eating seed and seedlings. Seeding is not anticipated as a means of regeneration. Raptor predation helps keep small mammal populations under control. Snags and scattered low-grade perch trees will be left in clear-cut areas as roosts and hunting perches. Further small mammal discouragement is not anticipated.

Fire Suppression

There have been no forest wildfires in the past at NAVBASE Kitsap. Forest fire detection would be by observation from close vicinity or adjacent lands. Given the controls on recreation, the most common source of ignition, human activity, is limited to developed areas. Suppression of wildfire would be accomplished by a combination of installation assets and local fire departments. Timber sale contracts require spark arrestors on all motorized equipment, fire tools (shovel and axe) for each worker, and suppression and reporting of any fire on the sale area. During periods of high fire danger, operations may be stopped or additional requirements such as a fire watch, tank truck with pump, hose, and nozzle may be required. Service contracts for silvicultural treatments also contain fire prevention and suppression requirements.

Slash Treatment

Logging slash, the residual tops, limbs, and non-merchantable logs, will be typically treated during harvest operations by lopping and scattering, or piling or windrowing. Piling or windrowing of slash and undesirable brush clears the soil for reforestation and breaks slash into manageable portions for fire safety. Windrows, broken every 200 feet, achieve the same end, but can also function as windbreaks for seedlings. Slash piles will decay over a period of years while slowly releasing organic nutrients back to the new cycle of growing trees.

Slash from partial cuttings such as selective thinning will typically be lopped and scattered within the forest. There is usually no need to prepare for reforestation in the selective cut areas.

The slash from thinning is of low fire hazard due to overhead shade, closeness to ground and compartmentalization by skid trails. Piled slash provides cover for songbirds and small mammals as well as foraging resources for insectivores such as the Bewick's wren. Slash within 25 feet of roads and structures will be lopped and scattered and will not be piled or windrowed.

3.2.5.5 Personal Use Forest Products Program

A personal-use-only forest products collection program (e.g., firewood) may be established at certain components of NAVBASE Kitsap. If so, it will be implemented, administered, and controlled as directed by COMNAVREG NW and NAVFAC Northwest instructions. The NAVFAC Northwest foresters, when available, may identify suitable and available material and produce a map that must accompany every forest product removal permit. This is an opportunistic program. Availability requires that the suitable material be in areas easily accessed by vehicles. This is not a guaranteed or year-round program. The number of permits allowed to be issued to each authorized patron will be limited. It will be implemented only in areas with suitable material.

In accordance with law and regulation, forest products are government property that may be disposed of through prescribed, legally sufficient, and compliant methods. For the forest products program, this means that a serially numbered permit/bill of sale must be issued. Fees are collected for the sale of Government forest products. These fees are collected by the NAVFAC Northwest foresters and tracked for deposits to the U.S. Treasury. The funds received are deposited to the *Navy Timber Sales Receipts Account Pursuant to DOD Financial Management Regulation* Volume 11A, Chapter 16 (August 2002), Accounting for Production and Sale of Forest Products.

While fruits and berries may be collected for personal use without a permit, certain areas of collection should be avoided. Off-limit areas include industrial areas, installation restoration sites, and residential areas which are off-limits to non-residents. NAVBASE Kitsap residents or employees with questions regarding fruit collection should contact the NRM.

3.2.6 Natural Resources Protection Considerations in Forest Management

3.2.6.1 Control of Non-Point Sources of Water Pollution

Pesticides

Pesticides have been used occasionally in past forest management to kill competing vegetation on tree planting spots. Currently, the only anticipated use of herbicides would be possible spot applications for planting trees in areas of heavy grass sod or competing vegetation. An installation’s desire to reduce grounds maintenance costs in developed areas may lead to additional tree plantings to convert mowed grass areas to nascent forest. Because of the fierce competition the grass poses to the seedlings, herbicides might be used in these situations. Knotweed should be removed very carefully if using mechanical equipment due to the potential

for spreading the invasive species. Careful chemical control may be the only application for removal combined with replanting the areas with native species. Areas near transient water should have a higher priority to limit the spread of knotweed. Shade provided by conifers is the ultimate control for most invasive species. Consequently, planting will occur in most instances following application of pesticides. If pesticides are used, they will be applied by trained and certified personnel in accordance with DOD, EPA, and the installation is Pest Management Plan.

Erosion Control

Erosion in forest areas has not been a problem on NAVBASE Kitsap land components because of the minimal disturbance to soils and roadbeds, the good vegetative cover, and infrequency of silvicultural treatments. Natural development of the forest, timing of silvicultural treatments, choices of low-impact technologies, and improving understory vegetation will protect the forest floor soils, roads, watercourses, and water quality. Improved road grading and maintenance practices have reduced the amount of disturbed soil. Wind erosion will be prevented by maintaining the vegetative cover, slash treatment, and windrows to provide windbreaks. The risk of erosion during the exposed period of logging and early regeneration is greatly reduced by lop and scatter slash treatment, careful planning of cutting unit boundaries, the use of uncut buffer strips, early planting or seeding, and the use of water bars on roads and skid trails steeper than 10% or as needed. Erosion from forest access roads will be minimal since existing graded roads are typically used. These roads were constructed during base construction. Haul spurs may be constructed or reconstructed to facilitate timber hauling. Erosion control requirements are included in timber sale contracts, so additional funds and projects normally should not be required.

Logging Debris

Logging slash will be treated as previously described above or in special cases will be treated or disposed of in a manner to reduce, trap, or repair historic erosion.

Riparian Zones

Restoration and enhancement of coniferous buffer strips around ponds, wetlands, and streams will be a direct benefit to wildlife. It is anticipated that such strips may be managed for wildlife and buffer purposes.

Horses

Due to their very low impact on the forest floor, certain logging or other silvicultural treatment might be accomplished using draught horses or mules instead of machinery such as skidders.

Wetland Protection

Wetlands will be protected in accordance with applicable law and regulation. The erosion control and buffer strip requirements included in the INRMP, and BMP’s included in timber sale and

forestry services contracts will protect wetlands from damage by forestry operations. Howellia is a plant which occurs within the Pacific Northwest, and has been listed as a threatened species since 1994. This plant grows in wetlands surrounded by forests, but has not been actively surveyed for. Our active management of wetlands within NAVBASE Kitsap would provide conservation measures for the species and opportunity for surveys during project walkthroughs.

Endangered Species Protection

Federally listed threatened and endangered (T&E) species will be protected, as described in other sections of this INRMP. Bald eagles and their nest sites will be protected in accordance with laws, regulations, and management guidelines cited herein. Marbled murrelets are not presently known to use the forested areas of the base, but relict old growth trees will be retained and younger forests will be managed as described in this section to become structurally more conducive to nesting use.

Cultural and Historic Site Protection

Prior to ground disturbing silvicultural treatments, the project area will be surveyed for visible or indicative cultural, archeological, or historic sites. Any sites identified in the pre-treatment survey will be reported to Navy archeologists for appropriate evaluation. These sites will be protected during silvicultural treatments by establishing them as exclusion zones. If sites or artifacts are discovered during presale investigations or other field inspections, they will be evaluated and protected from logging activity through restriction of treatments, machinery, and skidding in such areas. The activities under this plan will comply with pertinent law and regulation.

Aesthetics

As with any question involving beauty and appeal, the question of forest aesthetics may be viewed from several perspectives. The common public view of the Navy properties is from a distance. For base employees and visitors, the view is from the immediate foreground. From a distance, this affords a vista of evergreen and deciduous trees, the grassy open areas, shorelines, and housing areas surrounded by grass and trees. Overall, much of it presents a rather pastoral "natural" scene. It is hardly "natural," however, since it is the result of considerable land disturbance and a conversion of old growth forest and native meadows to second growth forest, farmland, open grassy areas, and facilities areas.

In areas thinned pursuant to this plan, it is not so much what is done to encourage structural and biological diversity, as the rate at which it is done that might upset some viewers. Up close, the thinning and reforestation efforts will appear somewhat harsher than from a distance. Logging slash or brush trimmed for tree planting site preparation will appear less attractive as it turns brown and loses its leaves than it did when green and upright. Lopped, piled, or windrowed slash will look better from afar than up close. These issues will be kept in mind when writing a prescription for silvicultural treatments.

Aesthetic considerations in forest management are intended to reduce visual impacts of logging and site preparation and include clean logging, placement, and layout of cutting areas, and buffer strips to create visual barriers, when possible, between work areas and main roads. Coupled with outdoor education, this should fully and fairly inform viewers of the forest's pretreatment condition, management techniques, and goals.

Wildlife Habitat

The silvicultural methods used for reforestation, timber stand improvement, and harvest will be supportive of wildlife. Dense timber stands shade out the understory plants, which provide food and cover for wildlife. Thinning and reforestation will provide young forest stands with a wide diversity of grass, forbs, woody shrubs, and trees for food and cover. This will encourage a diversity of animal species. Treatments to improve the stands will help open up the forest canopy to allow sunlight to reach the forest floor so that the understory will be stimulated, developed, and perpetuated as foraging, nesting, and thermal cover for all wildlife species. Timber harvest might temporarily displace wildlife from the operation area to adjacent undisturbed forest while operations are underway. Quite frequently, browsing and avian species will visit thinning areas during non-working hours to take advantage of the browsable foliage and insects available.

Following patch sanitation salvage clear-cuts, as the area seeds or sprouts to brush, weeds, and young trees, the rapidly growing young forest and decaying logging residues will provide increased forage for deer, granivores, and insectivores. Consequently, predators will benefit. Some species preferring closed canopy habitat will be displaced until the young trees reestablish a closed canopy.

Multiple Use

Within the constraints of mission and safety requirements, the forests are managed for multiple uses to produce sustainable yields of wildlife, timber, and other forest products, clean water, military operations and training, and recreational opportunity.

Road Construction

The roads developed for historic logging and construction and operation of NAVBASE Kitsap land components are usually sufficient for forestry activities. To implement silvicultural treatments, it may be necessary to place crushed rock on existing roads or to develop haul spurs. Haul spurs will be developed using old grades where possible. Where these do not exist or present unacceptable risks, new spurs will be created by meandering between Leave Trees. Road construction will be minimized in order to retain as much land as possible in production and to minimize land disturbance and costs. Reforestation will be up to road edges to reduce occluding ruderal vegetation and to fully stock the site. Full stocking will eventually function as a protector of the road corridor. Within cutting areas, road construction will be limited to temporary spurs and roads as narrow as possible. These temporary spurs will be water barred or otherwise treated (seeding, cross ditching, etc.) to prevent erosion. It is anticipated that forest roads and haul spurs

will also be used for military training, security, Anti-Terrorism/Force Protection, emergency response, fire suppression, recreation, etc.

3.2.6.2 Work Objectives and Thinning Criteria

3.2.6.2.1 Annual Objectives

The long-term forest management goal is to achieve fully stocked, healthy, productive, mix of conifer and hardwood stands of timber for: a sustainable yield of high quality forest products and wildlife habitats with other compatible forest uses and benefits; to protect and preserve relict old growth trees; and to provide land use opportunities for military operations, training, outdoor recreation, and education. The span of this plan will involve thinning, plantings, selective cuts and, in the case of natural disaster or pest infestation, small patch clear-cuts. The actual stands and projects will be spelled out in the annual increment addenda to this plan. Since the bulk of the prescriptions are remedial silvicultural treatments to improve the health, vigor, and structural diversity of the stands and forest as a whole, it is desirable that some work be accomplished each year under this plan.

Specific descriptive silvicultural prescriptions are given in Appendix G.

3.2.6.2.2 Sales Procedures

The NAVFAC Northwest Forester provides professional forestry services to manage and develop the forest resources for the economical production of forest products and the conservation of all forest resources. In coordination with the military mission, the Forester: chooses the areas to be treated based on overall goals, silvicultural needs, resource protection considerations, and stand inventory data; analyzes the potential for environmental impacts of proposed silvicultural treatments and develops protective measures; completes the field work, including volume and value estimates, project or sale boundary establishment, snag and wildlife tree marking, and access spur layout and design; and prepares and administers the forest products sales contract. All logging activities shall be carried out under contract issued by NAVFAC Northwest. Sales of forest products are accomplished in accordance with NAVFAC P-73, Volume II. Service contracts used to acquire forestry services are processed per DOD and federal acquisition regulations. Sales of forest products and forestry services are not combined under one contract. For construction or safety zone clearings, the project proponent will have to fund the survey and marking of the limits of clearing.

The Forester will prepare the timber sale contract and administer it from advertisement and award through operations and completion. The installation will be kept advised of the schedule and progress of all forestry operations. Following award, the Forester will inspect timber sale contract performance to ensure contract compliance and protection of the forest environment. Forestry services contracts will follow similar procedures.

3.2.6.2.3 Forestry Consultations and Support

The Forester will mark silvicultural project boundaries, assist with wetlands and riparian buffers, prepare and administer contracts, and coordinate forestry projects for commercial and pre-commercial thinning, plantings, and other forestry work as needed. This includes forestry consultations in support of base operations, maintenance, repair, and construction projects.

3.2.6.2.4 Public Relations

The Navy's forest management and other natural resources projects have generated significant interest over the years. This has resulted in visits and tours by high-level officials and a great deal of very positive press and media coverage for the Navy. As requested and approved, the Forester will provide docent forest tours, consultations and support for natural resources education events, and tours for school groups, VIPs, governmental agencies, conservation organizations, media, and freelance writers. All such events will be thoroughly coordinated in advance with the installation, COMNAVREG NW, and NAVFAC Northwest Public Affairs Offices.

3.2.6.2.5 Thinning Criteria

There may be approximately 15-200 acres thinned per sale area, typically leaving at least 100 stems per acre of merchantable species trees. Additionally, healthy less abundant species, wildlife trees, snags, and unique specimens will be marked or identified in the contract for retention in furtherance of the goal of improving biological and structural diversity. The following are typical but not exclusive contract provisions governing selection of Leave Trees. These criteria apply to all thinning and will be adjusted as needed in light of specific stand conditions.

3.2.6.2.6 Leave Tree Selection and Cutting

On the coniferous thinning areas, 100 of the best live conifer species shall be left uncut and undamaged as Leave Trees on each acre of the sale area. This equates to a spacing of approximately 20 feet on center between Leave Trees, which are to be uniformly and consistently spaced over the entire sale area. Trees marked with paint and/or signs are designated as wildlife and structural diversity trees, and are to be left uncut and undamaged. Live trees greater than 8 inches DBH so marked may be included in the 100 trees per acre. Dead wildlife trees may not be included in the 100 trees per acre count.

Leave trees shall be selected on the following basis and criteria and shall be marked or clearly designated by description:

a) The largest most vigorous coniferous trees free of defects, disease, or damage.

b) Fastest growth as evidenced by larger relative DBH, greatest height, and light colored bark with active, buff colored crevices.

c) Good form, straightness of the bole, and lack of forked tops.

d) Spacing as near as possible to 20 feet by 20 feet on centers, for a uniform and consistent distribution of 100 Leave Trees per acre.

e) Except for bigleaf maples larger than 18 inches DBH, deciduous trees may not be selected as Leave Trees.

f) No western yew or cedar trees may be cut except as needed for roads and landings.

g) Dead trees, non-merchantable culls, and understory trees less than 6 inches diameter on the stump are not to be selected as Leave Trees, but are to be left uncut when possible.

h) Pitch bleeding western white pine and dwarf mistletoe infected western hemlock shall not be selected as Leave Trees. Live wildlife and structural diversity trees marked with yellow signs and/or paint may be selected as Leave Trees.

i) Healthy, disease-free and non-hazard specimens of less abundant tree species such as madrona, dogwood, wild cherry, willow, bigleaf maple, western yew, and in some cases red alder may not be counted as Leave Trees and may be left uncut and undamaged in the residual stand. Such trees do not have to comply with spacing requirements.

Trees to be cut and removed shall be marked or designated by description and cut so as to avoid damage to all Leave Trees and designated or marked wildlife trees. Trees that are smaller than 6-inches stump diameter and not selected as Leave Trees shall be left uncut when possible. Dead trees and non-merchantable culls shall be left uncut unless they present an unavoidable safety hazard. Trees cut along sale area boundaries shall be felled into the sale area so as to contain slash and debris on the site. Stumps shall be cut as low as practicable and shall not exceed 12 inches high or the length of the diameter at DBH, whichever is greater. Limbs and tops are to be cut from merchantable stems and left in the woods. The Purchaser shall exercise skill, care, and directional felling to minimize damage to residual trees. All felled trees shall be utilized to 5-inch diameter inside bark at the small end by 24 feet in length. Bucking to reduce length or diameter is not allowed. If the Purchaser bucks felled trees to reduce diameter or length, the spoiled merchantable portion will be scaled as though it were whole and the Purchaser will pay for such material at the unit prices bid.

Yarding methodology will be draft horses or mules, skidders, feller bunchers, processors, or cable logging. The method, used will be operated in a manner that minimizes soil disturbance, compaction, and impacts to forest floor organic matter, large organic debris, and understory vegetation.

The only silvicultural clear-cutting permitted will salvage cuts due to fire, insect infestation, disease, blow down, or other natural causes. Clear-cut areas will be replanted the first planting season after harvest. Tree planting may be used in thinning cuts to supplement natural seeding

from the remaining trees. There may be other occasional interplanting to fully stock deficient areas.

No logging or salvage of snags, wind throw, or deadfall downed material will be allowed within the primary buffer zones of bald eagle nest trees. However, portions of these areas may be subject to silvicultural thinning if approved in advance through a very thorough and complete consultation process with the USFWS under applicable law and management guidelines cited elsewhere in this plan.

3.2.6.2.7 Silvicultural Stand Prescriptions

The following silvicultural prescriptions are somewhat general and may be adjusted on a case-by-case basis to address specific site characteristics as determined by site visits near the time of treatment. These prescriptions in general, apply to the forests of all NAVBASE Kitsap components.

Second growth coniferous stands will be thinned to fewer trees per acre in accordance with the guidelines and policies set forth herein. The objectives are to improve the health and vigor of retained trees, encourage structural and species diversity, and develop understory vegetation. The first thinning in areas dominated by conifers areas will result in an average stocking of 100 - 140 leave trees per acre, unless designated as a pole production area.

Stands of red alder (*Alnus rubra*) that are of lower quality in terms of form, health, vigor, and merchantability and are not located in wet areas may be converted to pre-disturbance coniferous forests; whereby, red alder stems are removed and native conifers are planted in the resulting open areas. Species such as bigleaf maple, wild cherry, willow, and other less prevalent hardwoods will be retained to provide habitat diversity in largely coniferous areas. Stands of broadleaved trees including red alder that are of higher quality in terms of form, health, vigor, and merchantability may be thinned using a system of habitat (leave) tree release; whereby a habitat (leave) tree will be selected and all nearby trees whose crowns either touch or are above the crown of the leave tree will be subject to removal. Thinning prescriptions will be designed with BMP’s to protect streams and wetlands.

Open or unstocked areas, to the extent allowable, will be planted with a mix of native species emphasizing those that reflect surrounding natural stands. Patches of disease or infestation may be clear-cut and replanted with the best possible mix of conifers depending on the pathogen present. The ecological and silvicultural principles expressed herein will also be adapted to urban forest settings as needed. The prescriptions may be adapted and adjusted as necessary to accommodate site-specific circumstances.

3.2.6.2.8 Stand Prescription Priorities

The following list outlines priorities intended to support decisions regarding which silvicultural prescriptions to execute and which prescriptions to wait for later implementation. All

prescriptions or planned forestry actions that are a part of a mission critical or hazard reduction project shall have the highest priority over all other projects. However, when projects are not mission critical or for hazard reduction, selection for implementation shall consider the list of priorities below. Implementation of multiple project priorities may occur at one time particularly when there is adequate funding available (e.g., reforestation, etc.). The priorities are as follows for prescriptions which:

a) Reforest or afforest an area that has previously been denuded of standing timber. In many areas this may include site preparation.

b) Rely on pre-commercial thinning to stop density dependent mortality as a means of increasing stand health and vigor.

c) Convert sites with invasive species as a major component into stands with native, healthy, and vigorous vegetation.

d) Open canopies to increase residual stand health, productivity, and form while increasing light for the development of a productive understory for vertical and horizontal structural diversity and wildlife habitat and reduce the incidence of competition caused mortality. Stands with the highest relative densities will be treated first.

e) Involve management for interior species habitat; whereby, treatments are utilized to attain old growth characteristics as outline in the Forest Service document PNW-RN447.

f) Contribute to the existing qualities of special or unique habitats such as riparian areas, etc.

g) Seek to attain high levels of horizontal and structural diversity through stratification of the stand whereby, large spaced selective thinning with inter-planting is utilized. This will occur primarily on second growth stands of larger DBH that have already been thinned.

3.2.6.2.9 Wildfires and Prescribed Burning

The forests of NAVBASE Kitsap land components have developed in response to particular physical and biological factors. These factors, and thus the forest structures and compositions, change over time with plant succession, natural and human disturbance regimes, and changes in weather patterns. The natural disturbance regimes of the plant communities have been significantly altered by human interference, largely in the form of fire suppression. Prescribed burning is not considered a viable management option for these areas due to the proximity of built structures and privately owned property. Prescribed burning has not been used to manage forests or forest understory fuel loads at NAVBASE Kitsap land components in the past and is not likely to be considered in the future.

The risk of wildfire to humans and built structures is not perceived as a serious problem on the NAVBASE Kitsap land components. The moist climate of the Puget Sound area is seldom conducive to the rapid spread of wildfires and the weather in the region rarely produces lightning storms during the dry months of the year. The topography is mostly flat enough that the rate of spread for a wildfire would be relatively slow. However, if a large-scale fire did occur, it would likely be driven by strong winds from the east through the dense and connected canopy and less effected by topography. Road systems would act as firebreaks and are anticipated to provide adequate access by firefighting equipment to virtually all of NAVBASE Kitsap land components. In addition, human access (the primary cause of fire starts) to the vast bulk of NAVBASE Kitsap forest areas is very restricted.

3.3 Grounds Maintenance and Related Activities

Active grounds maintenance activities with the potential to impact natural resources are carried out at all NAVBASE Kitsap properties with the exception of the Toandos Buffer Zone and Zelatched Point. These activities include landscaping, invasive species control, pest management, and control of nuisance species and feral animals at NAVBASE Kitsap installations.

3.3.1 Grounds Maintenance

The Navy maintains a regional contract for grounds maintenance that covers NAVBASE Kitsap installations with the exception of the Toandos Buffer Zone, Zelatched Point, and the Navy Railroad. Grounds maintenance along the rail line involves vegetation control adjacent to the tracks and is carried out by the railroad contractor under Navy supervision. Additionally, a contract with Kitsap County noxious weed group is working on invasive species around the installations. This contract is to control those areas that are not covered under active maintenance. At facilities with active maintenance, the grounds are divided into Improved, Semi-Improved, and Unimproved areas. Improved grounds are further divided into Prestige and Non-prestige areas. Examples of the land use in the above grounds classification areas are as follows:

a. Improved

    1. Prestige – base headquarters areas, main gate areas, and ball fields/parade grounds;

    2. Non-Prestige – high public use areas such as administration areas, and military and family support areas (e.g., commissary, Naval Exchange, base theater, etc.);

b. Semi-Improved – roadsides in less developed areas, ammunition magazines, and industrial areas; and

c. Unimproved – areas with little to no maintenance except at the boundaries (e.g., forest, fields).

The above land use designations dictate the level of landscape maintenance service an area is to receive. Prestige areas will receive the highest level of care with more frequent mowing, watering, trimming, pruning, fertilizer application (not currently applied), seeding, tree maintenance, and debris removal. Between the Prestige and Unimproved levels, where no service generally occurs besides infrequent debris removal and hazard tree maintenance, the allowable grass and hedge heights are incrementally increased and the frequency of maintenance is decreased. The regional grounds maintenance contract covers the areas outside of the base family housing developments at NAVBASE Kitsap Bangor, NAVBASE Kitsap Bremerton, and NAVBASE Kitsap Keyport. A Public-Private Venture (PPV) housing contractor is responsible for maintaining the grounds in the family housing areas at these locations. The Jackson Park Housing Complex and Naval Hospital Bremerton are included in the regional grounds maintenance contract. The PPV contractor is not subject to the above land use designations for defining the levels of grounds maintenance service; however, the family housing areas under their purview are considered to be maintained at the Prestige level.

The high levels of maintenance in Prestige areas around main gates, athletic fields, and command buildings will likely remain in the foreseeable future. In other areas, NAVBASE Kitsap is continually seeking opportunities to reduce maintenance, resource use, and costs by downgrading Non-Prestige, Semi-Improved, and family housing Prestige areas to lower grounds classification levels. Examples to reduce landscape maintenance include reducing the frequency of maintenance (e.g., mowing every two weeks versus every week), reducing landscaped areas and allowing forest cover to naturally dominate, and use of drought tolerant, native ground cover plants in place of lawn or high maintenance beds.

Current (2010) installation specific land use designations are available from Public Works grounds maintenance personnel. These land use designations will be considered a baseline for the purposes of this INRMP. Based on these designations NAVBASE Kitsap has the following INRMP goal and objective for grounds maintenance:

> **Goal 1**: Reduce the total amount of landscaped areas at each NAVBASE Kitsap installation by 10% by the year 2020.
>
> **Objective 1.1**: Develop a comprehensive Grounds Maintenance Management Plan that will reappraise the current land use designations at NAVBASE Kitsap and the level of grounds service per designation. The plan will also detail the landscape maintenance reduction plan and the methods to be employed to meet the above goal. This plan will supplement the INRMP and will be included as an Appendix in future revisions.

Projects with direct natural resource benefits identified by installation NRMs and listed in Appendix D are related to reducing grounds maintenance efforts at NAVBASE Kitsap.

3.4 Invasive Species

The Washington State Noxious Weed Control Board has developed the following classes depending on abundance, threat, and distribution for invasive and nonnative plant species in Washington:

Class A: Nonnative species limited in distribution in Washington. State law requires that these weeds be eradicated.

Class B: Nonnative species that are either absent from or limited in distribution in some portions of the state but very abundant in other areas. The goals are to contain the plants where they are already widespread and prevent their spread into new areas.

Class C: Nonnative plants that are already widespread in Washington state. Counties can choose to enforce control, or they can educate residents about controlling these noxious weeds.

The Washington State Noxious Weed Control Board's Web site should be checked regularly for updates to species and their status regarding control at http://www.nwcb.wa.gov/nwcb_nox.htm.

Invasive and nonnative species observed on NAVBASE Kitsap are presented in Table 3-4. If applicable, the Washington State Noxious Weed Control Board class is presented.

Table 3-4: Invasive and Non-native Species Found on NAVBASE Kitsap

Common Name	Scientific Name	Class
Plants		
Spotted knapweed	*Centaurea biebersteinii*	B
Thistle spp.	*Cirsium* spp.	C
Scotch broom	*Cytisus scoparius*	B
Common teasel	*Dipsacus sylvestris*	C
St. John's wort	*Hypericum perforatum*	C
Reed canarygrass	*Phalaris arundinacea*	C
Japanese knotweed	*Polygonum cuspidatum*	B
Tansy ragwort	*Senecio jacobaea*	B
Common groundsel	*Senecio vulgaris*	C
Animals		
European starling	*Sturnus vulgaris*	NA

Natural resources staff will survey NAVBASE Kitsap and create a plan with GIS components to prioritize areas with invasive species for eradication and subsequent restoration with native plants as consistent with resources allocated to the installation.

Information on these planned activities is contained in Appendix D.

3.5 Animal Management

3.5.1 Federally Listed Threatened and Endangered (T&E) Species

Federal agencies are required by the Endangered Species Act (ESA) to manage federally listed T&E species, and ensure consistency with plans for recovery of such species. This INRMP is meant to be used as a tool to identify at an early stage the potential impacts of the planned and ongoing Navy actions on T&E species and to provide avoidance and minimization measures.

3.5.2 Federal Candidate Species

Candidate species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities (USFWS 2011). NMFS also maintains a list of species of concern for which more information is needed before they can be proposed for listing (USFWS 2011). Candidate species receive no statutory protection under the ESA (USFWS 2011). USFWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA (USFWS 2011). The NRMs at NAVBASE Kitsap are aware of candidate species potentially present at NAVBASE Kitsap, and work with the agencies on alleviating threates to the species. Those candidate species potentially present at NAVBASE Kitsap are listed in Table 3-5.

3.5.3 Bird Aircraft Strike Hazard (BASH)

Naval Hospital Bremerton has an occasionally used helicopter landing pad to the southeast of the main hospital building. The helicopters may present a danger to birds. The Naval Hospital participates in the BASH Program. As a result, the vegetation near the landing-pad has been removed to limit its attractiveness to wildlife. This program promotes land management practices to minimize bird attractants and safety procedures to recognize, control, and avoid hazardous bird concentrations.

3.5.4 Nuisance Wildlife and Feral Animal Management

At NAVBASE Kitsap, the BOSC only handles pest problems related to insects and rodents such as mice and rats. The IPMC and the NRM are notified when other agency’s need to be involved for pest problems related to feral animals or other nuisance wildlife. The IPMC and/or NRM will coordinate with the Pierce, Kitsap, or Jefferson County Humane Societies for feral cat and dog

control as needed. Prevention and control of feral animals on NAVBASE Kitsap installations is detailed in Figure 3-3.

Chronic problems with birds and other nuisance wildlife are managed by USDA wildlife specialists under contract with NAVBASE Kitsap. NAVBASE Kitsap has a long standing contract with the USDA APHIS-WS. The USDA APHIS-WS maintains wildlife permits and Migratory Bird Depredation permits issued by the USFWS. Compliance with the permits, including reporting and recordkeeping, is the responsibility of the USDA APHIS-WS.

Typical activities carried out by USDA APHIS-WS staff on NAVBASE Kitsap include providing educational information, Canada geese hazing, bird deterrent system installation on critical facilities, nuisance animal (e.g., squirrel, raccoon, opossum) trapping and relocation, and assistance with injured birds and animals on base.

Though rarely needed on NAVBASE Kitsap, the USDA APHIS-WS and WDFW have the capability to deal with larger animals including black bear, bobcats, coyote, and mountain lion. Trapping, euthanasia, or relocation of larger animals requires the approval of the NRM who will work with WDFW to ensure the proper permits are in place. USDA APHIS-WS staff will incorporate non-lethal techniques as appropriate and lethal methods when warranted and approved by the NRM, which may include trapping and shooting. The USDA APHIS-WS staff work closely with the installation NRMs in carrying out their duties and provide valuable information on the presence and behavior of wildlife based on their observations.
Bi-monthly reports of NAVBASE Kitsap nuisance wildlife management are sent to the installation NRMs. The feedback provided by USDA APHIS-WS staff generally involves observations of wildlife in the developed portions of the NAVBASE Kitsap installations. When conducting reviews of new activities or development at NAVBASE Kitsap, this feedback proves useful to NRMs in providing suggestions to program/project managers for ways to minimize or mitigate wildlife impacts with the goal of preventing further nuisance issues.

Site-specific discussion of pest and nuisance wildlife management at the NAVBASE Kitsap installations is provided in Sections 4 through 7.

3.5.5 Species of Concern

NAVBASE Kitsap installations manage for bats of the genus *Myotis*. The preservation of aquatic habitat promotes the conservation of bats. Maintaining standing dead trees, and increasing tree species diversity and varities contributes to the development of roosting and habitat for bat species in the area. In March 2016, white-nose syndrome was confirmed in a Little Brown Bat (*Myotis lucifugus*) near Seattle, WA. The fungal disease is primarily spread from bat-to-bat, and is unknown how it will affect bats in the state. NAVBASE Kitsap installations are working regionally to try and conduct surveys (Appendix D) on Naval Installations to obtain more data on species, numbers, and locations of colonies.

The Western Pond Turtle (*Acinemys marmorata*) is listed as a candidate species. It can be found in small isolated populations within slow streams, wetlands, ponds and lakes within the lowlands of Puget Sound. In Washington State the western pond turtle has been affected by shell disease. This disease is associated with a fungal or bacterial infection due to other environmental factors, and is more common in captive turtles than in naturally occurring populations. Surveys for reptiles & amphibians at the installations will include this species in further work.

The Fisher (*Pekania pennanti*) has not been listed and is a federal species of concern due to the states proactive conservation measures, such as reintroducing the species to its historic range (Olympic National Park in 2008). Currently the Fisher is listed as an endangered species by the State of Washington, and has the possibility of entering Zelatched Point or the Toandos Buffer Zone. Monitoring by the state was completed in 2013, and the home ranges of the tagged animals were not found to be within our sites at that time.

Dept. of Navy Feral Cat Policy

Department of the Navy
Office of the Chief of Naval Operations
2000 Navy Pentagon
Washington, D.C. 20350-2000

In Reply Refer To: 5090, Ser N456M/1U595820, 10 Jan 2002

From: Chief of Naval Operations
Subj: Policy letter preventing feral cat and dog populations on Navy property
Ref: (a) SECNAVINST 6410-1A, of 16 Aug 1994, Veterinary Health Services
(b) AFPMB TIM #37, Guidelines for Reducing Feral/Stray Cat Populations on Military Installations in the U.S.
(c) OPNAVINST 6250.4B, of 27 Aug 1998, Pest Management Programs
(d) Executive Order 13112, of 3 Feb 1999, Invasive Species

1. This letter clarifies the application of reference (a) regarding the prevention of free roaming (also called wild, feral or stray) tat and dog populations on Navy installations. The objective is to prevent injury or disease to Navy personnel, and eliminate adverse impacts on native wildlife. It requires Navy commands to institute pro-active pet management procedures in order to prevent establishment of free roaming cat and dog populations. Free roaming cats and dogs pose a potential public health threat to personnel on Navy installations, and they pose a threat to wildlife including endangered species and migratory birds.

2. Existing policy at paragraph 4-2c(4) of reference (a) states Dogs, cats, and other privately-owned or stray animals will not be permitted to run at large on military reservations. Consistent with this policy, Navy commands must ensure the humane capture and removal of free roaming cats and dogs. Consistent with this requirement, Trap/Neuter/Release (TNR) programs will no longer be established on Navy land. All existing TNR programs on Navy land must be terminated no later than 1 January 2003.

3. Responsible pet ownership is a key factor in eliminating free roaming cat and dog populations. In consultation with supporting Army Veterinary Office, installations shall implement appropriate pet management measures to preclude establishment of feral cat/dog populations, including, but not limited to the following:

Require installation residents to keep and feed pet animals indoors or under close supervision when outdoors (such as on leash and collar or other physical control device - cage, fenced yard etc.).

Encourage neutering or spaying of cats and dogs before they reach reproductive age (exceptions to this policy can be made on a case by case basis as determined by the Installation Commander).

Require routine vaccinations of vats and dogs for rabies and other diseases as required by federal, state and local laws and ordnances. A current vaccination record is required at time of registration of pets.

Require microchipping registration (or other system of pet identification approved by supporting veterinary office) of all pet cats and dogs brought onto installations. Installation residents must register cats and dogs and have pets wear registration or identification tags at all times.

Prohibit the feeding of feral animals on the installation.

Provide educational materials to pet owners regarding installation regulations and general pet management.

Enforce prohibition of abandonment of animals on installations.

Comply with all humane and animal control regulations at the federal, state and local level (and their equivalents in host nation countries).

Navy installations in Europe that do not have a supporting veterinary office contact 100th Medical Detachment (VA HQ) (011) 49-622-177-2968; for all other locations that do not have a supporting veterinary office the POC is the VETCOM HQ, Commander (210) 221-6522.

4. Effective prevention, management and elimination of feral cat and dog populations requires close coordination and cooperation between natural resources, pest management, security, veterinary, and housing personnel to develop and implement an effective and humane program. Reference (b) provides information for preventing free roaming cat populations on military installations General pest management guidelines are detailed in reference (c). Every effort should be made to work with other federal, state and local agencies to support reference (a) and reference (d) by eliminating free roaming cat and dog populations on Navy land. Navy commands. should work with local animal control agencies to determine the best approach for the ultimate disposition of the captured animals. Every effort should be made, if practical, to find homes for adoptable feral cats and dogs.

5. My point of contact on this issue is Mr. Joe Cook, CNO N456M, at (703) 602-5335, or DSN 332-5335.

William G. Mattheis

WILLIAM G. MATTHEIS
Deputy Director, Environmental
Protection, Safety and Occupational
Health Division

Don't Let Your Cat Go AWOL

https://www.denix.osd.mil/denix/Public/ES-Programs/Conservation/Legacy/SafeCats/safecats.html

Military bases often struggle with how to manage domestic cat populations. Frequent transfers of personnel often means cats are left behind, abandoned to fend for themselves. Lucky cats find a new human, but most are not so fortunate. Base commanders must deal with how to humanely and cost-effectively resolve the issue of too many free-roaming cats. ***As a cat owner, you are an important part of the solution.***

Figure 3-3: Department of Navy Feral Cat Policy

3.6 Special Management and Protection of Species

3.6.1 ESA Species Potentially Occurring on NAVBASE Kitsap

Table 3-5 provides the names and status of the federally listed ESA species potentially occurring on NAVBASE Kitsap:

Table 3-5: ESA and Sensitive Species Potentially Present within NAVBASE Kitsap Properties

Species	Status		Installation									
	Federal (critical habitat)	Washington	Camp McKean	Camp Wesley Harris	Jackson Park Housing Complex	Naval Hospital Bremerton	NAVBASE Kitsap, Bangor	NAVBASE Kitsap, Bremerton	NAVBASE Kitsap, Keyport	Navy Railroad	Toandos Buffer Zone	Zelatched Point
Fauna												
Marbled murrelet	T	T			X	X	X		X		X	X
Bald eagle	SoC	S	X	X	X	X	X	X	X	X	X	X
Puget Sound chinook salmon	T	C			X	X	X	X	X	X	X	X
Hood Canal summer-run chum salmon	T	C					X				X	X
Puget Sound steelhead	T				X	X	X	X	X	X	X	X
Bull trout	T	C			X	X	X	X	X		X	X
Bocaccio	E	C			X	X	X		X		X	X
Canary rockfish	-	C			X	X	X		X		X	X
Yelloweye rockfish	T	C			X	X	X		X		X	X
humpback whale (Mexico DPS)	T	E			X	X	X	X	X		X	X
humpback whale (Central America DPS)	E	E			X	X	X	X	X		X	X
Southern resident killer whale	E	E			X	X		X	X			
Fisher	SoC	E									X	X

Species	Status		Installation									
	Federal (critical habitat)	Washington	Camp McKean	Camp Wesley Harris	Jackson Park Housing Complex	Naval Hospital Bremerton	NAVBASE Kitsap, Bangor	NAVBASE Kitsap, Bremerton	NAVBASE Kitsap, Keyport	Navy Railroad	Toandos Buffer Zone	Zelatched Point
yellow-billed cuckoo (riparian)	T	C		X	X	X	X		X	X	X	X
Burrington jumping-slug	PO-C						X					
Evening fieldslug	PO-C				X	X	X	X	X			
Cascades frog	PO-C										X	X
Flora												
Howellia	T	T		X		X	X		X	X	X	X
tall bugbane	SoC	S					X					
Torrey's peavine	SoC	T		X								
Yellow cedar	PO-C			X	X	X	X		X	X	X	X
pink sand-verbena	SoC	E									X	
C=Candidate, E=Endangered, S=Sensitive, SoC=Species of Concern, T=Threatened, PE=Potentially Extirpated, P=Proposed, PO=Potential												

3.6.2 Special Management Criteria

Navy management & protection plans for TES species must demonstrate compliance with strict criteria, intended to ensure the adequacy of management for the benefit the species. The three criteria are:

1) Conservation Benefit: The plan must benefit the species.
2) Implementation of the Plan: Assurances must be in place to ensure implementation.
3) Management Effectiveness: Assurances the plan will be effective.

The original criteria language was written within USFWS Guidelines for Coordination on INRMPs (June 2015). The Navy has adopted the criteria to benefit the document development between the Sikes Act partners.

3.6.3 Marbled Murrelet

Marbled murrelets were listed as threatened under the ESA on 1 October 1992 {Federal Register (FR) 57[191]: 45328-45337, effective date 28 September 1992}. Marbled murrelets range from the Aleutian Archipelago in Alaska to central California. The majority of their lives are spent in the marine environment within 1.6 miles of shore, where they feed primarily on small fish such as sandlance and Pacific herring. Marbled murrelets nest in inland forests, typically in old

growth, mature stands at lower elevations. Nesting occurs from late March to late September when both parents tend a single young.

3.6.3.1 Critical Habitat

The primary constituent elements (PCEs) of critical habitat identified by USFWS are: (1) individual trees with potential nesting platforms, and (2) forested areas within one-half mile of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height. The site potential tree height is the average maximum height for trees given the local growing conditions, and is based on species-specific site index tables. This includes all such forest, regardless of contiguity. These primary constituent elements are essential to provide and support suitable nesting habitat for successful reproduction (61 FR 26256).

Critical habitat has been designated for marbled murrelets but there is no designated critical habitat on or near NAVBASE Kitsap properties.

3.6.3.2 Marbled Murrelet Special Management and Protection Requirements

Criteria 1: Conservation Benefit

The NRM or designated staff will do the following (as needed and as resources allow):

- Continue to survey forested areas to identify potential nest sites during vegetation surveys and as needed by project requirements;
- Monitor for marbled murrelet use and implement special protection measures, such as timing restrictions on human activities and protection of trees;
- Record areas used by marbled murrelets, such as foraging areas along the shore, that may overlap with human activities; and
- Use information gained to update the INRMP and provide management guidance to the installation's command and departments.
- Monitors are placed during pile driving projects to avoid take of marbled murrelets. All pile driving activities are to cease upon detection of the murrelets within the monitoring zone. The Navy has limited installation of piles within the survey area to:
    - Summer (April 1 through September 30) – 75 days of total driving up to 90 minutes per day, and;
    - Winter (October 1 through March 30) – 30 days of total pile driving up to 90 minutes per day.

Murrelet surveys will assist USFWS in monitoring population trends. Although most murrelet nesting habitat has been eliminated by logging, by protecting potential habitat and foraging areas

from development, these areas could provide for an increase in suitable nesting habitat in decades to come.

The installation command will ensure that all proposed actions at the installations that potentially affect (including beneficially affect) marbled murrelets comply with Section 7 of the ESA, which requires, at a minimum, informal consultation with USFWS. This management action will benefit marbled murrelets because any action potentially affecting marbled murrelets will be reported to and reviewed by USFWS, possibly resulting in subsequent mitigation requirements. Navy personnel have worked in-depth with the USFWS over the past year to ensure planned actions do not significantly affect marbled murrelets.

Criteria 2: Implementation of the Plan

NAVBASE Kitsap annually funds and staffs the NRM positions. The NRM is responsible for implementation of the INRMP. The NRM is also able to call upon environmental planners and specialists within NAVFAC Northwest as well as USFWS and WDFW to assist in conservation and environmental compliance requirements. The NRM has the authority to implement maintenance and protection plans and obtain all necessary authorizations or approvals for proposed management actions.

The NRM annually develops projects and seeks funding for natural resources management issues, including habitat enhancement projects and special projects to assist in the recovery of T&E species, as circumstances require. The NRM will regularly meet with the installation's command and departments to ensure that proposed new or changed operations and missions consider marbled murrelet protection measures.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will work with the regulatory partners to identify where management is effective and incorporate changes to the plan that would benefit murrelets.

3.6.4 Bull Trout

On 1 November 1999, the USFWS designated all populations of bull trout in the coterminous U.S. as threatened under the ESA (FR 64[210]: 58910-58933, effective date 1 December 1999).

As a species, bull trout exhibit primarily freshwater phases, including resident and migratory life cycles. A portion of coastal bull trout may use an anadromous life strategy that was not well documented in the past (Rieman and McIntyre 1993), but recent work by Goetz et al. (2004/2005) has tracked bull trout from Puget Sound river systems into marine waters and back again. This suggests that some bull trout utilize both freshwater and saltwater habitats for foraging within the same year or even within the same season. They have also been tracked from one river system to another, which also suggests that they are not bound to natal or birth river systems but are able to explore and forage in different watersheds in Puget Sound. While there

are no documented bull trout streams on NAVBASE Kitsap, marine waters along the shorelines are known to contain bull trout, which may spawn in the Skokomish River or in rivers along the Strait of Juan de Fuca.

3.6.4.1 Critical Habitat

On 30 September 2010, USFWS redesignated critical habitat for bull trout but final designation did not include areas on Navy installations covered by this INRMP (FR 75: 63898). The exclusion was based on data that the military activities occurring at the sites are courrently being conducted in a manner that minimizes impacts to bull trout habitat. Additionally, nearshore areas adjacent to Navy installations and those areas designated as marine security areas or restricted zones provide some additional conservation benefits, as recreational and commercial vessels are prohibited from entering. Our INRMPs will continue to provide a benefit to the species, and we will continue to discuss with the agencies regarding future designations.

Primary constituent elements (PCEs) are the physical or biological features essential to the conservation of the species, as identified within the critical habitat designation for the species. Within the boundaries of designated critical habitat, the USFWS determined that the following PCEs are essential for the conservation of bull trout and may require special management considerations or protection (75FR 63931):

(1) Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

(2) Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

(3) An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

(4) Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

(5) Water temperatures ranging from 2 to 15 ^{o}C (36 to 59 ^{o}F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.

(6) In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and

juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

(7) A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

(8) Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

(9) Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

3.6.4.2 Bull Trout Special Management and Protection Requirements

Criteria 1: Conservation Benefit

The lack of potential spawning habitat on NAVBASE Kitsap limits the ability to protect, restore, or maintain suitable habitat conditions for bull trout. To conserve and protect marine habitats that may contain bull trout, the NRM and/or WDFW will conduct forage fish spawning surveys as needed and as consistent with resources allocated to the installation to implement. The NRM will ensure that actions that may take place in or near forage fish spawning areas be restricted to the approved in water work windows or as agreed to with the regulatory agencies. To protect and restore coastal processes, the NRM will seek opportunities to replace armored shorelines with soft solutions and limit the installation of new armoring. The NRM will seek opportunities to conduct annual beach cleanups that remove manmade debris and potential contaminant sources, benefiting migrating and foraging bull trout. The NRM will seek and support opportunities to restore riparian vegetation and healthy forests that allow for natural erosional processes. Additionally, the NRM will seek funding and/or other opportunities to conduct fish surveys and aquatic vegetation surveys in the marine waters surrounding Naval Base Kitsap. The NRM will conduct or seek funding to conduct an evaluation of the unnamed stream on Toandos Peninsula to document existing conditions and identify potential enhancement opportunities.

The NRMs will work with NAVBASE Kitsap and PSNS & IMF stormwater managers in reviewing proposed projects and programs for stormwater or other discharges, and ensure that these discharges do not degrade the water or sediment quality of the waters surrounding an installation.The Environmental staff will also identify operations and infrastructure that could affect water quality (i.e., storm drains that release directly to marine waters or pesticide applications near intermittent streams), and coordinate with the command and NAVBASE Kitsap departments to minimize or eliminate releases to marine waters. The NRMs, under the direction of the Environmental Director, will provide assistance if required to the development of spill prevention, control, and countermeasures for the facility and for operations. The NRMs or other

designated environmental staff will regularly inspect any structures that extend below the mean higher high water (MHHW) line and keep the structures free of debris or other materials that could hinder movement along the shoreline.

NAVBASE Kitsap will ensure that all proposed routine construction and repair activities that will take place below the MHHW line be restricted to the approved in-water work time for bull trout, dependent upon tidal reference area as published by the USACE, Seattle Regulatory Branch. The installation command will ensure that all proposed actions that potentially affect (including beneficially affect) bull trout comply with Section 7 of the ESA, which requires, at a minimum, informal consultation with USFWS; this includes emergency repairs to structures and other activities that are required by the installation's mission.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will work with the regulatory partners to identify where management is effective and incorporate changes to the plan that would benefit bull trout.

3.6.5 Chinook Salmon

On 24 March 1999, NMFS listed the Puget Sound Chinook salmon as threatened. This status was reaffirmed on 28 June 2005 (FR 70[123]: 37160-37204, effective date 29 August 2005) and again on 15 August 2011 (FR 76[157]: 50448-50449). The Puget Sound Chinook Endangered Species Unit includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound, and the Strait of Georgia in Washington, as well as twenty-six artificial propagation programs.

3.6.5.1 Critical Habitat

On 2 September 2005, critical habitat for Chinook salmon was designated, with the exclusion of the waters within the boundaries of DOD managed lands and waters (FR 70[170]: 52630-52858, effective date 2 January 2006). Exclusion was based off the benefits provided within the INRMP, which include: erosion control, protect riparian zones, minimize stormwater and construction impacts, reduce contaminants, and monitor listed species and their habitats. In these areas, critical habitat consists of the water, substrate, and the adjacent riparian zone of accessible estuarine and riverine reaches and extends to a depth of 30 meters below the mean lower low water (MLLW) line.

Primary constituent elements (PCEs) are the physical or biological features essential to the conservation of the species, as identified within the critical habitat designation. Within the

boundaries of designated critical habitat, the primary constituent elements essential for the conservation of the Puget Sound ESU of Chinook salmon are those sites and habitat components that support one or more life stages, including (FR 70: 52630):

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

(2) Freshwater rearing sites with:

> (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
>
> (ii) Water quality and forage supporting juvenile development; and
>
> (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;

(4) Estuarine areas free of obstruction and excessive predation with:

> (i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
>
> (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
>
> (iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

(5) Nearshore marine areas free of obstruction and excessive predation with:

> (i) Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
>
> (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

3.6.5.2 Chinook Salmon Special Management and Protection Requirements

Criteria 1: Conservation Benefit

This is the same as the Criteria 1 section for bull trout, described in Section 3.6.3.2.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit Chinook salmon

3.6.6 Steelhead

On 11 May 2007, NMFS listed the Puget Sound Distinct Population Segment (DPS) of steelhead as a threatened species (FR 72[91]: 26722-26735). The Puget Sound steelhead DPS includes all naturally spawned winter-run and summer-run steelhead populations below natural and man-made impassable barriers, in streams in the river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, bounded to the west by the Elwha River and to the north by the Nooksack River and Dakota Creek, as well as the Green River natural and Hamma Hamma winter-run hatchery steelhead stocks.

Steelhead is the name commonly applied to the anadromous form of the biological species *Oncorhynchus mykiss*. Steelhead exhibits perhaps the most complex suite of life-history traits of any species of Pacific salmonid. Steelhead can be anadromous (steelhead), or freshwater residents (rainbow or redband trout), and under some circumstances yield offspring of the opposite life-history form. Those that are anadromous can spend up to seven years in freshwater prior to smoltification and then spend up to three years in saltwater prior to first spawning. Steelhead are also iteroparous (meaning individuals may spawn more than once), whereas the Pacific salmon species are principally semelparous (meaning individuals generally spawn once and die). Within the range of West Coast steelhead, spawning migrations occur throughout the year, with seasonal peaks of activity. In a given river basin there may be one or more peaks in migration activity; since these ‘runs’ are usually named for the season in which the peak occurs. Some rivers may have runs known as winter, spring, summer, or fall steelhead runs.

3.6.6.1 Critical Habitat

Critical habitat for the Puget Sound DPS of steelhead was proposed in January 2013 (78 FR 2725). The final ruling came on 24 February 2016 (81 FR 9251) for Puget Sound steelhead, and was effective on 25 March 2016. This includes approximately 2,031 miles of freshwater and estuarine habitat in Puget Sound, Washington. NAVBASE Kitsap has been excluded from this critical habitat designation as our INRMP addresses Puget Sound steelhead habitat and contains measures that provide benefits to the DPS. Examples of benefits are: actions that eliminate fish

passage barriers, control erosion, protect riparian zones, increase stream habitat complexity, and monitor listed species and their habitats.

Primary constituent elements (PCEs) are the physical or biological features essential to the conservation of the species, as identified within the critical habitat designation for the species. Within the boundaries of designated critical habitat, the primary constituent elements essential for the conservation of the Puget Sound DPS of steelhead are those sites and habitat components that support one or more life stages, including (81 FR 9251):

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

(2) Freshwater rearing sites with:

> (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
>
> (ii) Water quality and forage supporting juvenile development; and
>
> (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;

(4) Estuarine areas free of obstruction and excessive predation with:

> (i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
>
> (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
>
> (iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

(5) Nearshore marine areas free of obstruction and excessive predation with:

> (i) Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
>
> (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

3.6.6.2 Steelhead Special Management and Protection Requirements

Criteria 1: Conservation Benefit

This is the same as the Criteria 2 section for bull trout, described in Section 3.6.3.2.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit steelhead.

3.6.7 Bocaccio

On 28 April 2010, NMFS listed the Puget Sound DPS of Bocaccio as endangered (FR 75[81]: 22276-22290). Threats to the species include areas of low dissolved oxygen (DO), mortality associated with fishery bycatch, the reduction of kelp habitat necessary for juvenile recruitment, habitat disruption, derelict gear, climate changes, species interactions (including predation and competition), diseases, and genetic changes. The combination of these factors, in addition to the rockfish's particular life history traits, has contributed to declines in the species within Georgia Basin and Puget Sound.

The coloring of Bocaccio is olive brown on back, and pink on sides. The adult Bocaccio are most commonly found in depths of 160 to 820 feet, but also may be as deep as 1,560 feet, with rocky bottoms and outcrops as their main focus for habitats.

3.6.7.1 Critical Habitat

On 11 February 2015, critical habitat for Bocaccio was designated, with the exclusion of the waters within the boundaries of DOD managed lands and waters. The proposed critical habitat rule for the listed DPSs was published in the Federal Register on August 6, 2013 (78 FR 47635), and describes the final rule. This critical habitat excludes the waters within the boundaries of DOD managed waters in the nearshore zone due to Navy security zones. In these areas, critical habitat consists of the water and substrate from the extreme high tide datum down to the MLLW line. Benefits to the species that led to the exclusion are: actions that improve shoreline conditions, control erosion and water quality, prevention of and prompt response to chemical and oil spills, and monitoring of listed species and their habitats.

(1) Physical or Biological Features Essential to the conservation of adult Bocaccio (78 FR 47638) are: Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities

(2) Water quality and sufficient levels of dissolved oxygen to support growth, survival, and reproduction, and feeding opportunities, and

(3) The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

Physical and Biological features essential to the conservation of juvenile Bocaccio (78 FR 47638) are:

(1) Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities; and

(2) Water quality and sufficient levels of dissolved oxygen to support growth, survival, and reproduction, and feeding opportunities.

3.6.7.2 Bocaccio Special Management and Protection Requirements

Criteria 1: Conservation Benefit

The NRM and/or WDFW will conduct forage fish spawning surveys along the shorelines of the installations, as agreed to in the annual metrics meeting and as consistent with resources allocated to the installation to implement. WDFW is conducting nearshore surveys (where access is feasible) to assess juvenile rockfish species and assemblages. Surveys are being conducted using non-lethal survey techniques (such as quantitative video surveys, scuba transects, etc.) as recommended by NMFS and WDFW due to rockfish susceptibility to barotraumas. Surveys include potential habitat mapping of rocky areas (with and without kelp) and sandy areas or areas that support eelgrass. Additionally, the conservation benefits discussed above for bull trout may also benefit Bocaccio, particularly those that occur within the nearshore environment.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit Bocaccio.

3.6.8 Yelloweye Rockfish

On 28 April 2010, NMFS listed the Puget Sound DPS of Yelloweye rockfish as threatened (FR 75[81]: 22276-22290). Threats to the species include areas of low dissolved oxygen (DO), mortality associated with fishery bycatch, the reduction of kelp habitat necessary for juvenile

recruitment, habitat disruption, derelict gear, climate changes, species interactions (including predation and competition), diseases, and genetic changes. The combination of these factors, in addition to the rockfish's particular life history traits, has contributed to declines in the species within Georgia Basin and Puget Sound.

Yelloweye rockfish are found in depths of 300 to 590 feet with rocky bottoms and outcrops. They are orange red to orange yellow in color with bright yellow eyes. The adults usually have a single light band on their lateral line.

3.6.8.1 Critical Habitat

On 11 February 2015, critical habitat for Yelloweye rockfish was designated, with the exclusion of the waters within the boundaries of DOD managed lands and waters. The proposed critical habitat rule for the listed DPSs was published in the Federal Register on August 6, 2013 (78 FR 47635) and describes the final rule. This critical habitat excludes the waters within the boundaries of DOD managed waters in the nearshore zone due to Navy security zones. In these areas, critical habitat consists of the water and substrate from the extreme high tide datum down to the mean lower low water (MLLW). Benefits to the species that led to the exclusion are: actions that improve shoreline conditions, control erosion and water quality, prevention of and prompt response to chemical and oil spills, and monitoring of listed species and their habitats.

(1) Physical or Biological Features Essential to the conservation of adult and juvenile Yelloweye Rockfish (78 FR 47638) are: Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities

(2) Water quality and sufficient levels of dissolved oxygen to support growth, survival, and reproduction, and feeding opportunities, and

(3) The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

3.6.8.2 Yelloweye Rockfish Special Management and Protection Requirements

Criteria 1: Conservation Benefit

The NRM and/or WDFW will conduct forage fish spawning surveys along the shorelines of the installations, as agreed to in the annual metrics meeting and as consistent with resources allocated to the installation to implement. WDFW is conducting nearshore surveys (where access is feasible) to assess juvenile rockfish species and assemblages. Surveys are being conducted using non-lethal survey techniques (such as quantitative video surveys, scuba transects, etc.) as recommended by NMFS and WDFW due to rockfish susceptibility to barotraumas. Surveys include potential habitat mapping of rocky areas (with and without kelp) and sandy areas or areas that support eelgrass. Additionally, the conservation benefits discussed above for bull trout may also benefit Yelloweye rockfish, particularly those that occur within the nearshore environment.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit Yelloweye rockfish.

3.6.9 Hood Canal Summer Run Chum

On 25 March 1999, NMFS listed the Hood Canal Summer Run ESU as a threatened species (FR 64[57]: 14508-14517). This listing was reaffirmed in 2005 (FR 70[123]: 37160-37204) and again in 2011 (FR 76[157]: 50448-50449. This ESU includes all naturally spawned populations of summer run chum salmon in Hood Canal and its tributaries, plus populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington, and four artificial propagation programs: Hamma Hamma Fish Hatchery, Lilliwaup Creek Fish Hatchery, Union River/Tahuya, and Jimmycomelately Creek Fish Hatchery.

Chum salmon usually spawn in coastal areas and juveniles out-migrate to marine waters almost immediately after emerging from the gravel in February. For this reason, the survival and growth in juvenile chum salmon depends less on freshwater conditions than on favorable estuarine and marine conditions. The smaller chum salmon juveniles tend to remain in nearshore, shallow areas, while larger juveniles move into deeper water, similar to the Chinook salmon out-migrants.

3.6.9.1 Critical Habitat

Final critical habitat was published on 2 September 2005, with effective date of 2 January 2006, with the exclusion of the waters within the boundaries of DOD managed lands and waters FR 70[170]: 52630-52858). In these areas, critical habitat consists of the water, substrate, and the adjacent riparian zone of accessible estuarine and riverine reaches and extends to a depth of 30 meters below MLLW.

Primary constituent elements (PCEs) are the physical or biological features essential to the conservation of the species, as identified within the critical habitat designation for the species. Within the boundaries of designated critical habitat, the primary constituent elements essential for the conservation of the Hood Canal Summer Run ESU are those biological features essential to the conservation of the ESU. The specific PCEs include:

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.

(2) Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water

quality and forage supporting juvenile development; and natural cover such as shade submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

(3) Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

(4) Estuarine areas free to obstruction with water quality, water quantity, and and salinity conditions supporting juvenile and adult physiological transitions between fresh-and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

(5) Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic befetation, large rocks and boujlders, and side channels.

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, support growth and maturation.

3.6.9.2 Hood Canal Summer Run Chum Special Management and Protection Requirements

Criteria 1: Conservation Benefit

This is the same as the Criteria 1 section for bull trout, described in Section 3.6.3.2.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit chum.

3.6.10 Southern Resident Killer Whale

Southern Resident Killer Whales (SRKW), a subpopulation of *Orcinus orca*, was designated as endangered by NMFS on 18 November 2005 (FR 70[222]: 69903-69912, effective date 16 February 2006). Factors that are thought to contribute to the decline of the SRKW population include prey availability, human-generated noise, vessel presence/harassment, and chemical contamination.

Orcas have been observed in Admiralty Inlet and the Strait of Juan de Fuca on numerous occasions, and they occasionally visit areas farther south in Puget Sound. The SRKW subpopulation are fish-eaters; other orca populations that visit the area are mammal-eaters (primarily seals in Puget Sound) and are known as the Transient population because they are not thought to be regular inhabitants of Puget Sound, as are the SRKW. Researchers have studied the SRKW and have documented the identification markings of each animal. To the casual observer, however, it is difficult to tell if a group of orcas are Transients or SRKW, unless feeding behavior is observed. The SRKW typically hunt for fish in deeper waters, but females and sub-adults have been observed hunting for salmon in rock crevices in shallow water (NMFS 2005). SRKW seem to prefer Chinook salmon when available, but will also consume lingcod, flat fish, rockfish, and herring (NMFS 2005).

3.6.10.1 Critical Habitat

On 29 November 2006, critical habitat for SRKW was designated with the exclusion of the waters within the boundaries of DOD managed lands and waters (FR 71[229]: 69054-69070, effective date 29 December 2006).

Joint NMFS-FWS regulations for listing threatened and endangered species and designating critical habitat shall consider those physical and biological features that are essential to the conservation of the species. Pursuant to the regulations, such PCEs include, but are not limited to the following:

(1) Space for individual and population growth, and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter

(4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally,

(5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

3.6.10.2 Southern Resident Killer Whale Special Management and Protection Requirements

Criteria 1: Conservation Benefit

Food habits research indicates that SRKW prefer Chinook salmon. The conservation measures identified above for Chinook salmon are also expected to benefit SRKW. The NRM will monitor SRKW movements through use of the Orca Network to ensure Navy activities do not affect SRKWs that may be foraging in the marine water of NAVBASE Kitsap. The installation will ensure that all proposed actions at the installation that potentially affect (including beneficially

affect) SRKW comply with Section 7 of the ESA which requires, at a minimum, informal consultation with NMFS.

In addition, any action that may affect SRKW may also require a permit under the MMPA. All installations will ensure that all proposed actions at the installation that potentially affect (including beneficially affect) SRKW comply with the requirements of the MMPA.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

The NRM or designated staff will record areas of SRKW use in the waters of or near the installation. The information will be used to update the INRMPs and provide management guidance to the installation's commands and departments. During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit SRKW.

3.6.11 Humpback Whale

In 1965, humpback whales were protected from hunting by the International Whaling Commission (commercial harvesting continued into the 1970s by the Soviet Union) and were listed as endangered under the ESA on 2 June 1970 (Berzin 2008, FR 35[106]: 8491-8498). In 2016, NMFS published a final decision changing the status of humpback whales under the ESA (effective October 11, 2016). Previously humpback whales were recognized as worldwide, but recent changes have recognized the existence of 14 distinct population segments (DPSs).

In the North Pacific, there are three distinct population groups: a Central America population (endangered), a population that migrates between Hawaii and Alaska (delisted), and a Mexico-California-Alaska population (threatened) that seasonally migrates past Washington State between breeding areas and feeding areas. During the summer, humpback whales in the North Pacific migrate and feed over the continental shelf and along the coasts of the Pacific Rim, from Point Conception, California, to the Gulf of Alaska, Prince William Sound, and Kodiak Island. Humpback whales spend the winter in three separate wintering grounds: the coastal waters along Baja California and the mainland of Mexico, the main islands of Hawaii, and the islands south of Japan (SAIC 2001).

In recent years, humpback whales have been intermittently sighted in Puget Sound. An analysis of data compiled by the Orca Network, a community based marine mammal monitoring effort, shows humpbacks are regular visitors to the Strait of Juan de Fuca (although in low numbers) but are infrequent visitors to Puget Sound (Orca Network data 2002-2004).

3.6.11.1 Critical Habitat

Critical habitat has not been designated for the humpback whale.

3.6.11.2 Humpback Whale Special Management and Protection Requirements

Criteria 1: Conservation Benefit

The installation will ensure that all proposed actions at the installation that potentially affect (including beneficially affect) humpback whales comply with Section 7 of the ESA, which requires, at a minimum, informal consultation with NMFS. In addition, any action that may affect humpback whales may also require a permit under the MMPA. All installations will ensure that all proposed actions at the installation that potentially affect (including beneficially affect) humpbacks comply with the requirements of the MMPA.

Criteria 2: Implementation of the Plan

This is the same as the Criteria 2 section for marbled murrelets, described in Section 3.6.2.2.

Criteria 3: Management Effectiveness

The NRM or designated staff will record areas of humpback whale use in the waters of or near the installation. The information will be used to update the INRMPs and also provide management guidance to the installation's commands and departments. During the annual review of the INRMP, NAVBASE Kitsap will consult with the regulatory partners to identify necessary changes to the plan that would benefit humpback whales.

3.6.12 State Species of Concern Management

Species of concern in Washington include those species listed as state endangered, state threatened, state sensitive, or state candidate, as well as species listed or proposed for listing by the USFWS or the NMFS. A complete list of Washington State species of concern may be found at http://wdfw.wa.gov/wlm/diversty/soc/soc.htm. The purpose of the listing is to identify and classify native wildlife species that have need of protection and/or management to ensure their survival as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting of a species can be achieved.

NAVBASE Kitsap NRMs will cooperate with WDFW biologists in developing good management practices for State Sensitive Species. There are additional special status species (Birds of Conservation Concern (BCC), which identifies species, subspecies, and populations of all migratory nongame birds that are likely to become candidates for listing under the ESA. NRMs will stay familiar with the lists of species that may be found on the installation properties and strive to conserve, restore, and protect habitats important to these species subject to the military missions of each of NAVBASE Kitsap's installation properties.

The NRMs will contact the WDFW Shellfish biologists regarding management, conservation, and restoration of the Olympia oyster (*Ostrea lurida*), a state candidate species, found at NAVBASE Kitsap at Bangor, NAVBASE Kitsap Keyport, and the Jackson Park Housing Complex. NAVBASE Kitsap will support actions to restore the Olympia oyster on Navy

controlled property. Updated management strategies for the Olympia oyster will be included in future INRMP revisions.

This Page Intentionally Left Blank

4 NATURAL RESOURCES ON NAVAL BASE KITSAP BANGOR

4.1 Physical Conditions

NAVBASE Kitsap Bangor and its associated facilities (Camp Wesley Harris, Toandos Peninsula, and Zelatched Point) lie in the Puget Sound lowland between the Cascade and Olympic mountain ranges and located along a 4.5-mile stretch of Hood Canal, approximately 20 miles west of Seattle, Washington (Figure 4-1). The Hood Canal is a long fjord-like body of marine water that borders NAVBASE Kitsap Bangor to the west. The physiography of NAVBASE Kitsap Bangor is characterized by flat-topped ridges that range in elevation of 300 to 500 feet above sea level in the northern portion, while the southern part of the base consists of a till plain, with several north-south trending rounded hills or drumlins. Across the Hood Canal are Toandos Peninsula and Zelatched Point in Jefferson County (on the west shore of Hood Canal and east shore of Dabob Bay, respectively. The terrain on the peninsula tends to be steeper than that on the main base of NAVBASE Kitsap Bangor with hills rising up to 500 feet above sea level. Camp Wesley Harris is one of the only NAVBASE Kitsap facilities not to have direct connection with marine water and is situated in the bed of a former lake with an elevation from 400 - 520 feet above sea level. The northern two-thirds of the camp consists of rolling hills and a marshy area of approximately 10 acres containing a shallow pond near the north-central end of the area.

4.1.1 Hydrology

NAVBASE Kitsap Bangor drainage consists of five small streams entering Hood Canal and two tributaries of Clear Creek exiting to the southeast, which empty into Dyes Inlet. The *TRIDENT Support Site Environmental Impact Statement* (USN 1974) identified 15 small streams affected by NAVBASE Kitsap Bangor included in the records of the Washington State Division of Water Resources with stream designations 128 - 140. Recorded stream flows range from a minimum flow of 0.01 cubic feet per second (cfs) to a maximum flow rate of 4.0 cfs derived from a 2.07 square mile drainage area for the stream passing through Devil's Hole Lake. Drainage areas for the streams vary from 0.03 - 3.68 square miles.

Clear Creek drains approximately 750 acres of NAVBASE Kitsap Bangor before exiting Navy property and entering Silverdale. Major drainages from NAVBASE Kitsap Bangor to Hood Canal include streams that flow through Cattail Creek estuary, Hunters Marsh, and Devil's Hole Lake. Overland flow from much of the western portion of NAVBASE Kitsap Bangor is routed to Hood Canal through a series of stormwater outfalls.

Within the boundaries of NAVBASE Kitsap Bangor are three lakes, a small pond, and four large marshes. Besides their primary functions to provide stormwater control, these bodies of water

also provide quality outdoor recreation opportunities and unique habitats for a variety of wildlife species. Brief discussions of these bodies of water are provided below:

- **Devil's Hole Lake.** In the early 1940s a reservoir, which has a surface area of about 2.6 hectares (15 acres) and known as Bangor Lake or Devil's Hole Lake, was created near the mouth of Devil's Hole Creek, when Sea Lion Road was constructed (DON-SBB 2000). Devil's Hole Lake is fed by a watershed area of approximately 3.0 square miles. There are approximately 3.5 miles of streams that feed into this lake. A water level control structure on the culvert draining Devil's Hole Creek created the lake and it effectively blocked the flow of these streams into Hood Canal. However, Devil's Hole had a fish ladder installed in 1979 at the outlet to Hood Canal, which afforded NAVBASE Kitsap the opportunity to attempt to reintroduce Coho salmon into this watershed area. Although the program was stopped in 1991, NAVBASE Kitsap continued to have returns until the catastrophic winters of 1993 and 1994, which caused a silting in of the spawning habitat and the returns of "wild" fish diminished substantially. The lake also provides habitat for otter, beaver, Canada goose, American wigeon, mallard ducks, and serves as great blue heron rookery. The lake is closed to recreational fishing from 15 September through 15 June. In 1998, the Navy hired WDFW to conduct an assessment of species use and habitat conditions at Devil's Hole (WDFW 2000). The report also describes factors that may limit anadromous salmonids use of Devil's Hole and provides recommendations for corrective measures to improve utilization and survival of salmonids (WDFW 2000).

- **Trident Lakes.** These lakes were constructed as stormwater retention facilities to prevent large fluctuations in volume and speed of stormwater entering the West Fork of Clear Creek. Trident lakes serve as the headwaters of this stream. The lower reaches of Clear Creek off of Navy property support steelhead trout, Chinook salmon, chum salmon, Coho salmon, as well as sea run cutthroat trout; however, these species have no access to the lake itself due to the outfall design. The Trident lakes area is currently used as a recreational area having such amenities as picnic tables, restrooms, outdoor cooking facilities, and playground equipment. The lakes are stocked with catchable rainbow trout in order to allow for a put-and-take fishing opportunity. In 2017, it was found that unknown people who have access to the lakes put pumpkinseed fish within them. These fish have accessed the downstream, and have ended up in Clear Creek. In 2018 the lakes will be drained down and the panfish will perish. After this, the lakes will be filled and restocked with sterile rainbow trout.

- **Wilkes Marsh.** Wilkes Marsh is a natural marsh that has been deepened in spots by a peat farming operation that took place prior to Navy ownership. It provides habitat for an amphibian population and nesting habitat for waterfowl such as mallards, wigeon, buffleheads, and northern shovelers. The overflow of this marsh flows to Cattail Creek

Estuary and due to the peaty soils, provides an excellent source of nutrients into the system.

- **Bullhead Marsh.** Bullhead Marsh is a wetland area created in part by the construction of Bullhead Road. This is an upland marsh, and has no obvious overland connectivity pathways. It is the home to an active osprey nest and contains a diverse reptilian population. It also provides nesting habitat for many species of waterfowl. In 1998, the southern portion of this marsh was dedicated to the memory of Sgt. Maj. Nicholas W. Shupe, who gave a great deal of support to the Fish and Wildlife program while serving as NAVBASE Kitsap Game Warden.

- **Hunters Marsh.** This marsh was created when the Navy constructed the Explosive Handling Wharf (EHW). The marsh is adjacent to a great blue heron rookery as well as providing habitat for many amphibian and waterfowl species. It is directly connected to Hood Canal via a drop culvert.

- **Lake Ruth.** The impoundment was built to serve as an interim sewage lagoon while the transition was made between an existing sewage treatment plant and the new plant built by Kitsap County. A unique feature is the lack of any incoming or draining streams. The lake has no surface connection to other fish habitat. After extensive sampling, the Navy decided to use this lake as a recreation outlet for spiny-ray fishing. Two thousand largemouth bass fingerlings were purchased and planted into the lake. Working with WDFW, the Navy determined that the bass numbers had increased, there were three distinct age classes, and the size of the fish had increased to about 1.5 pounds. Bluegills were then introduced as a forage species and a catch-and-release fishery program was started. This lake was opened to fishing until security restrictions increased and fishing was closed to lower base. The lake also supports waterfowl as well as amphibian species. It had bullfrogs introduced in the early 1980s, and is the only body of water on NAVBASE Kitsap at Bangor that has a non-native introduced species.

- **Floral Point Salt Water Marsh.** The salt marsh at Floral Point is less than 1 acre in size and supports a diverse population of both plant and bird species. Sedges, rushes, perennial pickleweed are a few of the plants that flourish here. Gulls, dowitchers, dunlin, and killdeer are bird species that are prevalent in this area. This marsh acts as a buffer between the uplands and the marine habitat. It serves as a reservoir of food and as a shelter when bad weather occurs. This is the largest salt marsh at NAVBASE Kitsap, with high levels of diversity.

Three distinct aquifer systems in superposition have been identified at NAVBASE Kitsap at Bangor. An intermediate groundwater zone has also been identified within the Kitsap Formation (USN 2001a). The aquifer systems found on the main base of NAVBASE Kitsap at Bangor have been designated, in order of increasing depth (USN 2001a):

- Vashon recessional outwash (seasonal aquifer) (perched aquifer)
- Vashon till (aquitard)
- Vashon advanced outwash (water table aquifer) (shallow aquifer)
- Kitsap Formation (Kitsap Formation aquitard and intermediate groundwater zones)
- Older sand and gravel (sea level aquifer).

To better understand the hydrogeology of NAVBASE Kitsap at Bangor and vicinity, the U.S. Geological Survey conducted hydrological studies during the years of 1998 (USGS 1998), 2002 (USGS 2002), and more recently in August 2006 (USN 2006a). These studies were conducted to provide the knowledge of the hydro-geologic framework and directions of groundwater movement to determine influx rates of salinity into freshwater systems, and to determine water movement within the local Hood Canal. For terrestrial waters, maps of water levels in wells indicate that groundwater moves from inland areas of higher altitude toward streams or near-shore areas of lower altitude with little influx from the Hood Canal (USGS 1998). The rates of this water movement were dependent on elevation and under normal situations; water movement was well-channelized with little chance of flooding. Local precipitation is the primary source of water recharging the aquifers with the bulk of the precipitation occurring during the winter months. The precipitation and subsequent infiltration directly recharges the seasonal zone in the Vashon recessional outwash and the water table aquifer beneath the till.

Regionally, the recharge to the intermediate groundwater zones is through flow from the water table aquifer as indicated regionally by vertical pressure gradients that are primarily downward (USGS 1998). Discharge occurs from the water table aquifer at springs along the shoreline and in stream drainages where the water table intersects the ground surface. The sea level aquifer regionally discharges to Hood Canal to the west and Puget Sound to the east. Simulation of groundwater flow systems indicated that for selected future groundwater pumping on and near the base, the risk is low that significant concentrations of on-base groundwater contamination will reach off-base public-supply wells and hypothetical wells southwest of the base (USGS 2002). The evaluation also shows that future saltwater encroachment of aquifers below sea level may be possible, but this determination has considerable uncertainty and the amount of time it would take for encroachment to occur is unknown. For water movement on the Hood Canal, regardless of the direction of flow, current velocities were relatively weak and changes in flow rates oscillated due to residual currents in the localized portion of the Hood Canal (USN 2006a). The magnitude of these fluctuating currents in the area of NAVBASE Kitsap at Bangor was on the order of 10 centimeters per second (cm/sec), with peak values of 20 - 25 cm/sec; a relatively slow rate of which only fine-grained sediments are typically resuspended above 20 cm/sec (USN 2006a).

NAVBASE Kitsap Bangor uses groundwater from sea level aquifers as a potable water source. The drinking water program is managed by the Public Works Department with direct oversight by NAVBASE Kitsap Environmental staff. There are six drinking water wells at NAVBASE Kitsap Bangor four of which are active. To protect the aquifer NAVBASE Kitsap Bangor maintains a Well Head Protection Plan (WHPP) that limits activities within certain distances of the wells (USN 2004c). The WHPP establishes several well head protection areas (WHPA) around each well. A WHPA is defined as the surface and subsurface area surrounding the water well through which contaminants are reasonably likely to move toward each well. The NAVBASE Kitsap Bangor WHPP establishes a sanitary control area (SCA) of 100 feet around each well. Groundwater modeling is used to calculate the time of travel (TOT) for groundwater to move from a point of entry at the surface to its point of withdrawal at the well. The results of the modeling provide three additional WHPAs around each well: 1, 5, and 10-year TOT rates. The following rules and guidelines have been established for the NAVBASE Kitsap Bangor WHPAs:

- Further development is restricted within the SCA around each well. Routine maintenance of existing structures is permissible. Storage of hazardous materials and use of pesticides in the SCA is prohibited.

- Eliminate potential sources of microbial and chemical contamination within the 1-year TOT boundary. Restrict new sewage lift stations, sewer lines, or sewage or stormwater management facilities within the 1-year TOT where possible. New development should be restricted as feasible. If new development is necessary, it should not include industrial type facilities that include significant material handling, storage, or outdoor laydown.

- Within the 5-year TOT area, potential chemical contaminant sources are controlled by pollution prevention and risk reduction management. New development should be limited to light industrial facilities that do not involve significant material handling, storage, or outdoor lay down areas.

- The NAVBASE Kitsap Bangor land use policy for the area within the 10-year TOT boundary is to encourage planners to recognize the long-term source of the drinking water supplying the installation when siting future facilities or operations with high-risk sources of ground water contamination.

Camp Wesley Harris is one of the only NAVBASE Kitsap facilities not to have direct connection with marine water and is situated in the bed of a former lake with an elevation from 400 - 520 feet above sea level. The northern two-thirds of the camp consists of rolling hills and a marshy area of approximately 10 acres containing a shallow pond near the north-central end of the area. Surface water resources at Camp Wesley Harris are tributaries to Chico Creek, a known salmon stream, and Wildcat Creek and drains to Dyes Inlet. Stormwater runoff flows overland, generally to the central portion of the facility to a topographically lower area. Beaver play a significant role

in preventing the flow from leaving the facility. A beaver deceiver was placed on a culvert, along a man-made ditch, that exits the main part of the facility, to prevent flooding of the site and surrounding areas. There are a few wetland areas on Camp Wesley Harris capable of retaining stormwater runoff (USN 2007a). Groundwater beneath Camp Wesley Harris largely results from infiltration from precipitation. The Vashon Recessional till provides for perched or seasonal shallow groundwater zones above the low permeability hardpan, which also acts as a confining layer for the deeper aquifers. The Salmon Springs formations create a sea level aquifer that has high capacity and is capable of supporting high groundwater yields. This aquifer receives recharge through leakage from the overlying zones. The Kitsap Formation acts as an aquitard for the sea level aquifer. Discharge from the shallow aquifer occurs at springs along the shoreline and in area streams (USN 2007a).

The Toandos Peninsula falls within the Dabob-Thorndyke Watershed of Water Resources Inventory Area (WRIA) 17 (Cascadia 2003). This sub-basin, located on the Bolton and Toandos Peninsulas in southeastern WRIA 17, takes its name from Dabob Bay and Thorndyke Creek. Beside Thorndyke Creek, the only other significant stream is Tarboo Creek; most of the other 30-plus streams in the sub-basin are less than a mile long. Streams on the Navy's Toandos property flow east to the Hood Canal, while those at Zelatched Point flow north and west to Dabob Bay. The Dabob-Thorndyke sub-basin receives 39.4 inches of annual precipitation but has a recharge rate of only 14.4 inches per year, largely because glacial till underlies about 70% of the sub-basin (Cascadia 2003).

4.1.2 Water Quality

4.1.2.1 NAVBASE Kitsap Bangor

In 2005 and 2006, a water quality study was conducted to establish a baseline and identify seasonal trends in certain chemical and physical water quality parameters along the Bangor shoreline (SAIC 2006). These data were used to quantify changes and potential impacts to water quality and to help with habitat characterization. The study area included an approximate 3-mile stretch of the shoreline in the vicinity of and including the NAVBASE Kitsap Bangor shoreline. The water quality sampling stations were collocated with the intertidal fish seining locations. The seining locations were selected to be comparable with historical surveys conducted in the 1970s, with some site modifications necessitated by Base security measures (SAIC 2006). This study was divided up into two phases to determine water quality for fish populations, they were:

- Phase I: Water quality and fish presence and habitat utilization studies were conducted at NAVBASE Kitsap Bangor in summer 2005 and winter/spring 2006. The studies were intended to characterize summer water quality based on fish occurrence and distribution, from June through September 2005. The Phase I survey was not conducted through the end of the established Hood Canal fish work window, but it did give an indication of the water quality for most of this window.

- Phase II: This phase was intended to document the water quality for fish species along the NAVBASE Kitsap Bangor shoreline, with a particular emphasis on the timing of the juvenile salmonid outmigration during the winter and spring months. The timing of the juvenile salmonid outmigration, based on past surveys, begins in late January to early February and concludes in late spring to early summer. This report is intended to be a comprehensive report incorporating both the 2005 summer and 2006 winter/spring surveys.

The Phase II study focused on the analysis of four water quality parameters: temperature, salinity, Dissolved Oxygen (DO), and turbidity. Temperatures during the two sampling phases differed seasonally, being predictably colder in the winter than the summer, and the average temperature at the beach seine station during summer months exceeded ecology water quality standards, possibly due to the shallow depth of most of the sites or freshwater inputs from proximal wetland outfalls. Salinity levels during both phases were comparable to the rest of the Puget Sound, while DO levels dropped below the fish stress level of 5 milligrams per liter (mg/L) twice during the summer sampling season, but returned to healthy levels in the winter (SAIC 2006). However, the average DO concentrations during both phases were above ecology water quality standards by an average of 7 mg/L (SAIC 2006). Turbidity readings averaged less than two Nephelometric turbidity units (NTU) for both seasons and were well within the water quality standards for marine waters of less than 50 NTU (SAIC 2006).

DO levels within the Hood Canal are known to reach very low levels in the summer months and early fall months (a.k.a. hypoxia). This is especially true in the southern Hood Canal where natural and manmade environments combine to create conditions that can be deadly to underwater species. The NRM will stay abreast of the Hood Canal Dissolved Oxygen Program and support future studies as deemed appropriate by the IEPD.

4.1.2.2 Camp Wesley Harris

A water quality study has not been conducted at Camp Wesley Harris. If further cleanup of the site, or additional activities to be held at the site, a study will be required at a later date.

4.1.2.3 Toandos Buffer Zone and Zelatched Point

A water quality study has not been conducted at Toandos Buffer Zone or Zelatched Point. If needed, a project will be submitted in future planning cycles.

4.1.3 Soils

4.1.3.1 NAVBASE Kitsap Bangor

The soils of NAVBASE Kitsap Bangor are the remains of a glacial till, which is characterized by a moderately compacted till layer, 20 - 40 inches below the surface. This is overlaying a very compacted till or hardpan layer that has been identified as Alderwood and Poulsbo soil types.

Above the till layer, water can move relatively easily but does not penetrate through the till layer as fast, creating a high water table during the winter months when precipitation is at its greatest and increasing the chance of erosion of upper soils. Lateral surface flows are evident in depressions, along hillside seeps, streams, and road cuts. Wetlands are often associated with areas where the topography is not steep enough to allow for lateral water flow; however, in most areas the till plains are nearly level or have gentle slopes allowing for sufficient drainage. In association with till plains are soils formed from glacial lake sediment deposits that are often the results of Pleistocene ice dam lakes; the largest of which has been named Glacial Lake Snoqualmie. These are identified as the Kitsap soil units and are often highly eroded; leaving remnant pocket areas of fine sediments characterized by silt loam and silty clay loam soils with depths to 60 inches. Within these soils, water also moves slowly and can show signs of pooling and/or flooding during the winter months with a potential of erosion or sluffing of soils during periods of extreme precipitation.

Soils that were deposited from glacial melt water as the glaciers retreated are referred to as glacial outwash terraces soils and classified into soil units as Indianola, Neilton, and Ragnar soils. These soils are composed of layers of gravel, sand, and silt that were deposited together and are often very deep, coarse in nature, well drained, and are not often associated with pooling water.

Alluvial deposition soils occur within stream bottoms and other low-lying areas that are characteristic of poor drainage and surface-water ponding. These soils are classified as Custer, Norma, and McKenna soil types, and are frequently associated with wetland and stream soil map units. In poorly drained bottomland areas, deep deposits of decomposed or slightly decomposed plant materials are often found producing a high organic soil; this soil type is identified as the Mukilteo soil unit. Many of these deposition-derived soils are classified as hydric soils, and as such were formed under conditions of saturation, flooding, or long-term ponding lengthy enough to develop anaerobic conditions. A second type of hydric soil with a lower organic content, beach soils, are often associated with sloping sands and gravels above mean high tide; and can be deposited by winds or flooding events. These beach soils can become tightly packed together, preventing oxygen replenishment and forming anaerobic conditions.

NAVBASE Kitsap Bangor has been listed twice on the EPA’s National Priorities List for investigation and, if necessary, cleanup of past waste disposal sites (SAIC 2007). In January 1990, the Navy and the EPA entered into a Federal Facilities Agreement to ensure that environmental impacts associated with past practices at the base are investigated and remedial actions are completed as needed to protect human health and the environment.

A comprehensive sediment investigation was conducted in 1994, as part of the Remedial Investigation at NAVBASE Kitsap Bangor under the Comprehensive Long-Term Environmental Action Navy program to determine whether chemical contaminants from Navy activities and upland contaminated sites were introduced to marine sediments (SAIC 2007). During the

investigation, metals, polycyclic aromatic hydrocarbons (PAH), phthalates, phenols, and some chlorinated pesticides were detected in NAVBASE Kitsap Bangor sediments. The contamination within these sediment samples were below the state promulgated sediment quality standards (SQS) and cleanup screening level (CSL) standards for determining potential adverse effects to benthic organisms. The State of Washington sets the CSL criteria based on location and severity of the contaminant (WAC 173-204-520). A list of these criteria can be found at http://apps.leg.wa.gov/wac/default.aspx?cite=173-204-520. Sediment contamination was found to exceed the CSL guideline values at locations near the Service Pier, Marginal Wharf, and Keyport/Bangor Dock, although none exceeded the SQS levels. However, at locations near the Service Pier, Marginal Wharf, and Keyport/Bangor Dock, sediment concentrations for copper, lead, mercury, zinc, PAHs, bis(2-ethylhexyl)phthalate, and dibenzofuran exceeded the SQS and CSL guideline values (SAIC 2007). Service Pier sediments exceeded CSL guideline values for fluorene, phenanthrene, and total low molecular weight polycyclic aromatic hydrocarbons. Results from bioassay testing near the service pier also exceeded the CSL for minor adverse effects. Bis(2-ethylhexy)phthalate exceeded the CSL at Marginal Wharf, but bioassay testing results were below the SQS toxicity standards for no adverse effects (SAIC 2007, Hart Crowser Inc. 2000).

Monitoring results from the sediment quality investigation at NAVBASE Kitsap Bangor, at Service Pier, Marginal Wharf, and Keyport/Bangor Dock are indicated below (SAIC 2007):

- At Service Pier, surface sediment concentrations for PAHs and dibenzofuran were confirmed to be decreasing and found below the SQS standards in 1996 and 1998;
- At Marginal Wharf, surface sediment concentrations for mercury, copper, PAHs, dibenzofuran, and bis(2-ethylhexyl)phthalate were confirmed to be decreasing and found below the SQS standards in 1996 and 1998; and
- At Keyport/Bangor Dock, surface sediment concentrations for PAHs were confirmed to be decreasing and expected to be below SQS standards by 2005. Bis(2-ethyhexyl) phthalate was confirmed to be below SQS standards in 2000.

In general, the surface and subsurface sediment quality is good in the areas investigated along the NAVBASE Kitsap Bangor waterfront, with the exception of some surface sediment. None of the subsurface samples collected exceeded the numeric criteria, indicating that the material is suitable for open-water disposal if dredging were required (SAIC 2009).

4.1.3.2 Camp Wesley Harris

Soils at Camp Wesley Harris were derived in a similar fashion to those at NAVBASE Kitsap Bangor's main base. Soils are derived from a glacial till that is characterized by a moderately compacted till layer, 20 - 40 inches below the surface. This is overlaying a very compacted till or hardpan layer that has been identified as an Alderwood soil type, which makes up the majority of

the soils at Camp Wesley Harris. The Alderwood series consists of moderately deep soils with a cemented pan, is moderately well drained, and usually is found on glacially modified foothills and valleys with slopes of 0 - 65% (USDA-NRCS 1980). Taxonomic classification for this soil type is loamy-skeletal, isotic, and mesic Vitrandic Dystroxerepts soils. Although these soils are moderately well drained and have moderately rapid permeability to the densic layer (physically root restrictive zone due to soil compaction), they have very slow permeability at lower depths (USDA-NRCS 1980).

Camp Wesley Harris lacks attached bodies of water, and most of the terrain is generally rolling hills with some erosional drainage. Alluvial deposition soils occur within stream bottoms and other low-lying areas, which are characteristic of poor drainage and surface-water ponding. For this region, these soils are classified as Custer, Norma, and McKenna soil types that are frequently associated with wetland and stream soil map units. McKenna soils can be found at Camp Wesley Harris in the northern section of the camp and just outside the boundaries to the west. The McKenna series consists of moderately deep to dense till with poorly drained soils formed in glacial drift in depressions and drainage ways with slopes of 0 - 5% (USDA-NRCS 1980). Taxonomic classification for this soil type is loamy-skeletal, mixed, superactive, nonacid, and mesic Aquandic Epiaquepts soils. This soil type can drain slowly, and in areas with deep deposits of decomposed or slightly decomposed plant materials containing high organic matter, soils of the Mukilteo soil unit are formed. These soils are classified as hydric for Kitsap County. McKenna soils can also be classified as hydric when associated with Alderwood soils with a slope from 0 - 6% (USDA-NRCS 1980). The only other soils types at Camp Wesley Harris are soils in the Shelton series. These soils can be found in the southwest corner of the site and are moderately deep, moderately well drained soils that formed in glacial till that are found on undulating to rolling glacial moraines (USDA-NRCS 1980). Taxonomic classification for this soil type is medial-skeletal, mixed, and mesic Typic Haploxerands soils.

Camp Wesley Harris has been used for many years as a firing range. Remedial action to stabilize or remove lead from the soil took place in 1998. However, Camp Wesley Harris is listed in Washington's Hazardous Sites List (WDOE 2007) with a rank of 2. Sites listed with ranks 1 or 2 are considered the highest priority for cleanup. The status of Camp Wesley Harris is "Ranked, awaiting remedial action" (USN 2007a).

4.1.3.3 Toandos Buffer Zone and Zelatched Point

The Toandos Buffer Zone and Zelatched Point are across the Hood Canal from the main base of NAVBASE Kitsap Bangor on an isthmus of land called the Toandos Peninsula. The soils of this peninsula are similar to those soils across the Canal at the main base.

On the Navy's Toandos facility, there are 12 soil types identified by the USDA-Natural Resources Conservation Service (USDA-NRCS) Web Soil Survey (USDA-NRCS 1980). Within the boundaries of the facility, there is no dominant soil type, although Sinclair series is found on-

site and increases in frequency just west of the facility boundary. Sinclair series consists of moderately well drained soils that are generally found in uplands, are not hydric, and are developed from very compact Vashon gravelly glacial till in rainfall that ranges 45 - 55 inches (USDA-NRCS 1980). Another upland soil within the facility is the Dabob series that consists of moderately deep to cemented pan, moderately well drained very gravelly sandy loam associated with forested areas. Taxonomic classification for this soil type is loamy-skeletal, isotic, mesic Vitrandic Dystroxerepts soils that are not considered hydric (USDA-NRCS 1980). The Cassolary series is another dominant soil at the facility and tends to be found on terraces and terrace escarpments with a slope of 0 - 50%. These soils consist of very deep, moderately well drained soils formed in reworked glacial drift and marine sediments and are classified as coarse-loamy, mixed, superactive, mesic Vitrandic Haploxerepts soils (USDA-NRCS 1980). The only soils classified as hydric by USDA-NRCS for the county of Jefferson soils within the facility are McMurray and Belfast series soils (USDA-NRCS 1980). The McMurray series consists of deep, very poorly drained soils formed in partially decomposed woody and herbaceous organic material and are usually found in depressional areas on glacial till plains, on outwash plains, or in abandoned glacial stream channels (USDA-NRCS 1980). The Belfast series consists of deep, moderately well drained soils that formed in stratified alluvium and are usually found on nearly level floodplains (USDA-NRCS 1980). Both of these soil types make up only a small area of the facility and are found adjacent to the Hood Canal.

At Zelatched Point there are four main soils types found within the borders of the facility: Tidal Marsh series, Coastal Beach series, Hoypus soil series, and Cassolary soil series. The dominant soil type on-site is the Cassolary series. It is similar to the same soil found at the Navy's Toandos Buffer Zone facility and is generally associated with terraces (USDA-NRCS 1980). The Hoypus series consists of very deep, somewhat excessively drained soils, that formed in glacial outwash, and are usually found on outwash plains and hills with slopes of 3 - 50%. The taxonomic classification for this soil series is sandy-skeletal, isotic, and mesic Typic Xerorthents soils. The only hydric soils at Zelatched Point are the soils associated with the tidal marsh that are mucky silt loam for the first 6 inches and stratified sand to silty clay for the next 60 inches or so (USDA-NRCS 1980).

4.2 Habitats and Communities

4.2.1 Wildlife Habitat

NAVBASE Kitsap Bangor and associated installations consist of developed lands, but are dominated by terrestrial forest habitat types. Forested areas comprise 3,754 acres of NAVBASE Kitsap Bangor, 355 acres of Camp Wesley Harris, and 723 acres of Toandos. Most of the forests within the managed lands of NAVBASE Kitsap Bangor are in the western hemlock/salal plant association groups. Red alder (*Alnus rubra*) often dominates early seral stages in this association. Douglas-fir, a long-lived seral species, is common. Western hemlock and western redcedar (*Thuja plicata*) will dominate the climax stage of succession.

Land use is shown in Tables 4-1 through 4-3.

Table 4-1: NAVBASE Kitsap Bangor Land Cover

Description	Acreage	% of Land Use
Developed Land	1,500	24
Forest Land	3,754	61
Surface Water	54	1
Wetlands	254	4
Disturbed Lands	593	10
Total	6,130	100

Table 4-2: Camp Wesley Harris Land Cover

Description	Acreage	% of Land Use
Developed Land	3	1
Forest Land	355	92
Surface Water	0.2	0
Wetlands	22	6
Disturbed Lands	5	1
Total	388	100

Table 4-3: Toandos Land Cover

Description	Acreage	% of Land Use
Developed Land	37	5
Forest Land	723	94
Surface Water	0	0
Wetlands (Est.)	8	1
Disturbed Lands	0	0
Total	768	100

4.2.1.1 NAVBASE Kitsap Bangor

At present, NAVBASE Kitsap Bangor is dominated by forests, which are comprised of both evergreen and deciduous forest stands in which their distribution is dependent on soil moisture. Evergreen stands are common on the drier soils and are predominantly Douglas-fir with western hemlock, western white pine (*Pinus monticola*), western redcedar, lodgepole pine (*Pinus*

contorta), and grand fir. The deciduous stands inhabit about 1,500 acres, are usually found on the mesic soils, are predominantly red alder with bigleaf maple (*Acer macrophyllum*), and vary in age and understory composition dependent upon when the last timber harvest took place. Understory vegetation varies from salal or shallon (*Gaultheria shallon*) on the drier soils to sword fern (*Polystichum munitum*) and salmonberry (*Rubus spectabilis*) on the mesic soils, while other common understory species are hemlock and cedar seedlings, rhododendron (*Rhododendron spp.*), and evergreen huckleberry (*Vaccinium ovatum*).

The forest stands are not consistent over the base due to historical use and age stand development, with some younger stands in early successional development (i.e., Ecosystem Initiation Stage) while other stands are in more advanced successional development of very dense medium-aged stands (i.e., Canopy Exclusion Stage), with little or no understory component. As the forest matures, the canopy closes allowing less light to reach the ground and increasing competition for light. This results in a forest floor understory comprised of one or two species, mostly shade-tolerant plants, such as sword fern and salal. In the forest systems that have been managed and commercially thinned to increase light availability and tree health, these systems are in "Understory Reinitiation Stage" and allow for new seedling growth by removing competition. NAVBASE Kitsap Bangor uses this plan to manipulate forest stands to benefit wildlife. There are a few older unmanaged stands in the Toandos Buffer Zone that have possibly developed into the "Fully Functional Stage" which approaches "Old Growth" conditions. The primary disturbance to vegetation has been timber harvesting. Additional disturbances can include fire, insects, disease, wind throw, invasive plant species, and impacts from deer, mountain beaver, and black bears.

- **Upland Successional Forest Habitats.** These are habitats that are strictly defined by age of the timber stand. These stands are recently cut over stands having the understory impacted by the harvest operation. Having the canopy opened allows for sunlight to reach previously shaded forest floor, changing the understory composition from shade tolerant to sun species. Native blackberry, trailing blackberry, thimbleberry, orchard grass, and fescue make up the species list in these areas.

- **Grassland and Shrubland Habitats.** NAVBASE Kitsap Bangor contains many diverse grassland habitats. Some of these areas were left as remnants of pasture and orchard operations by inhabitants prior to the Navy's purchase of the property in the 1940s. Other grassland areas were created as a result of mitigation actions in the Installation Restoration Program. This program involves cleaning up and mitigating past hazardous waste sites. In areas where the mitigation involved was intrusive, the area was graded and planted with native grasses. These grasslands are found in outlying, non-industrial areas.

- **Orchard Habitats.** Small orchards left by early residents at NAVBASE Kitsap Bangor are important habitat for wildlife. Maintaining and/or enhancing the health of the orchards helps to offer beneficial habitat to various wildlife species. During a cultural

resource survey, it was suggested the orchard trees may be from original stock brought to this country, and the preservation of the genetic stock could have value.

- **Open Land Habitats.** These habitats tend to have trees scattered throughout the area, allowing sunlight to reach the forest floor. The number of plant species becomes more varied and consists of various grasses, blackberry, thimbleberry, horsetail, and both perennial and annual flowering plants. This provides forage for many animals and birds. All species from small to large mammals, seed eating birds, insectivores, as well as predator species gather in this habitat.

Provided below is a brief discussion on the various aquatic habitat types that make up the inland and shoreline habitats found on NAVBASE Kitsap Bangor:

- **Palustrine Forested Wetland Habitats.** These wetland habitats consist of primarily three types; deciduous forested, coniferous forested, and shrub-dominate wetlands. These wetlands that have been traditionally called marshes, swamps, bogs, fens, ponds, and sloughs. They are primarily found in heavily forested areas and are usually dominated by vegetation. Many of these small wetlands are scattered through the forested portions of NAVBASE Kitsap Bangor. Wilkes Marsh is identified as a noteworthy Palustrine wetland in the Upper Hood Canal watershed. Wilkes Marsh is a 4-acre, manmade marsh, partially deepened by a peat farming operation that took place prior to Navy ownership. It not only provides habitat for amphibian and reptile species but also provides nesting habitat for waterfowl including mallards, American wigeon, buffleheads, and northern shovelers. The overflow from this marsh flows into Cattail Creek Estuary, and due to the peat soils, provides an excellent source of nutrients into the system.

- **Saltwater Eelgrass Habitats.** According to underwater video surveys performed at NAVBASE Kitsap Bangor, patchy eelgrass beds were present at EHW North, EHW South, Delta Pier South, and Devil's Hole South (SAIC 2005a). With the exception of EHW South, continuous eelgrass beds were observed at all beaches. Overall, EHW North appeared to have the largest percentage of bottom showing the presence of eelgrass (35.4%). EHW North also showed the densest and largest areas of continuous eelgrass beds (20.8%). The lowest percentage of bottom showing the presence of eelgrass (13.1%) was observed at Delta South. Although continuous eelgrass beds were not observed at EHW South, the greatest percentage of bottom showing patchy eelgrass was observed at EHW South (21.4%) (SAIC 2005a).

- **Intertidal Habitats.** Intertidal habitats are one of the most diverse habitats within the boundaries of NAVBASE Kitsap Bangor and are highly diverse in both plant and animal species. Tidal fluctuations flush and feed this system, bringing in nutrients from other areas in the marine system, providing the vehicle nature uses for exchanging reproductive material (i.e., seeds, oyster and clam spat, crab, and snail eggs). This habitat also contains

eelgrass beds, which are vital to the survival of summer-run chum salmon smolt. This salmon species was added to the Endangered Species List as a "threatened" species in 1999.

- **Devil's Hole Creek Watershed Habitat.** The entire Devil's Hole Creek watershed is within NAVBASE Kitsap Bangor (DON-SBB 2000). Devil's Hole Lake has a surface area of about 2.6-hectares. It was created near the mouth of Devil's Hole Creek in the 1940s when Sea Lion Road was constructed (DON-SBB 2000). A fishway was constructed at the Devil's Hole Lake outlet in 1979 to provide access to the watershed for anadromous salmonids through various channel types (DON-SBB 2000). Channel types found in the Devil's Hole watershed include regime, braided, forced pool-riffle, plane-bed, and step-pool channels. The regime channel types found in Devil's Hole Creek, just upstream from Devil's Hole Lake, are characterized by sandy bottoms with a dune ripple pattern forming in the sand (DON-SBB 2000). Further upstream, the stream reach assumes a braided channel configuration and has a little more gradient feature. Downstream of the Snook Road culvert, Devil's Hole Creek assumes step pool channel morphology (DON-SBB 2000). This channel type occurs in higher gradient channels where the stream energy organizes fairly regular accumulations of larger substrates and wood at intervals approximately equal to the width of the channel (DON-SBB 2000). The remaining reaches surveyed were classified as either plane-bed or forced pool-riffle channels. Bank condition of the various stream reaches are considered to be in fair condition, having an adequate stream health with most having a mixed conifer/hardwood riparian zone consisting of mature or nearly mature trees (DON-SBB 2000).

4.2.2 Wetlands

4.2.2.1 NAVBASE Kitsap Bangor

NAVBASE Kitsap Bangor contains wetlands that have been in existence for a very long time and have been determined to be "naturally occurring," while other wetlands were created in the 1940s when the Navy acquired the property. These wetlands were manmade as the result of construction activity such as road building and have existed long enough that a diverse native plant species community has become established. NAVBASE Kitsap Bangor has delineated 254 acres of wetlands throughout forested-shrub and intertidal habitats. Hydric soils found within NAVBASE Kitsap Bangor boundaries include beaches, Custer sandy loam, McKenna gravelly loam, Mukilteo muck, and Norma fine sandy loam. Forested-shrub wetlands are located within the various terrestrial habitats that exist on NAVBASE Kitsap Bangor. Provided below is a brief discussion on the various types and components of each of these wetlands:

- **Deciduous Forested Wetlands.** These wetland areas consist of deciduous trees such as red alder or big-leaf maple. The trees provide shade, keeping water temperatures cool, and supplying a rich organic food source as they shed their leaves. As the wetland water

levels rise and fall, some trees are killed by having the root zones inundated with water. The trees quickly rot, providing homes for cavity nesters, food for insect foragers, and after they have fallen into the wetland, additional organic matter from which the other existing wetland plants feed.

- **Coniferous Forested Wetlands.** These wetlands have Douglas-fir and lodgepole pine in close proximity to their edge, and the waters are usually somewhat acidic and brackish in color. Acidic tolerant plants, such as hardhack, reed canarygrass, and water lilies, are indicators of the wetland community, but trees are still an important component as they provide a temperature regulation as well as providing necessary large woody debris as they decay and fall to the surrounding area.

- **Shrub Dominated Wetlands.** These wetlands are peat bogs in origin, containing hardhack, serviceberry, skunk cabbage, and cattails. The wetlands are usually open, providing easy access for waterfowl species. Due to the lack of canopy cover, they are warmer than other types of wetlands and provide habitat for the more water-dependent life cycles of amphibian and reptile species.

Estuarine Ecological System wetlands are deep-water tidal habitats and adjacent tidal lands that are occasionally diluted by freshwater runoff from the land, and these wetlands have been found to exist in front of Devil's Hole Lake and Hunters Marsh. Cattail Lake has been converted back to its original state as a creek, which drains to Hood Canal. It now functions like a natural creek with its lower reaches being inundated by tidal waters. Provided below is a brief discussion on the Riverine wetlands and their various components:

- **Riverine Ecological System Wetlands.** These systems include all wetlands within channels that have moving water. Within the boundaries of NAVBASE Kitsap Bangor there are five drainages to Hood Canal, and one drainage to Dyes Inlet. Three streams drain directly into Hood Canal and two drain indirectly through Cattail Creek estuary and Devil's Hole. The East, Middle, and West Forks of Clear Creek begin on NAVBASE Kitsap Bangor but flow off base. Camp Wesley Harris drains to Dyes Inlet through Wildcat Creek and Chico Creek. The Toandos Buffer Zone drains to Hood Canal through three unnamed streams.

4.2.2.2 Camp Wesley Harris

Camp Wesley Harris has the McKenna soils that are classified as hydric soils. Wetlands are present at the installation but have not been delineated.

4.2.2.3 Toandos Buffer Zone and Zelatched Point

Wetland surveys have not been conducted at Toandos Buffer Zone property and Zelatched Point.

4.3 Flora and Fauna

4.3.1 Flora

4.3.1.1 Terrestrial Flora

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain terrestrial flora similar to that typically occurring in Kitsap and Jefferson counties. Forested and non-forested habitats exist with forested habitats being the largest land cover type. The forests are comprised of both evergreen and deciduous forest stands. The evergreen stands predominantly contain Douglas-fir with western hemlock, western white pine, western redcedar, lodgepole pine, and grand fir. The deciduous stands are predominantly comprised of red alder and bigleaf maple (USN 2001a).

Understory species include salal, evergreen huckleberry, Pacific rhododendron (*Rhododendron macrophyllum*), salmonberry (*Rubus spectabilis*), sword fern, Oregon grape (*Mahonia nervosa*), trailing blackberry (*Rubus ursinus*), elderberry (*Sambucus racemosa*), and stinging nettle (*Urtica dioica*) (USN 2001a).

For a complete listing of terrestrial flora potentially occurring on NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.1.2 Aquatic Flora

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain aquatic flora similar to that typically occurring in all terrestrial lakes, streams, and rivers in Kitsap and Jefferson counties. Obligate wetland flora species that may be found on NAVBASE Kitsap properties include yellow pond lily (*Nuphar polysepalum*), skunk cabbage (*Lysichiton americanus*), pickleweed (*Salicornia virginica*), pondweed (*Potomogeton sp.*), and water cress (*Nasturtium officinale*) (USN 2001a).

Facultative wetland plants that may be found on NAVBASE Kitsap properties include hardhack (*Spiraea douglasii*), lady fern (*Athyrium filix-femina*), aspen (*Populus tremuloides*), Northwestern sedge (*Carex concinnoides*), Pacific Coast bulrush (*Scirpus pacificus*), alder, aster (*Aster subspicatus*), Puget Sound gumweed (*Grindela integrifolia*), saltgrass (*Distichlis spicata*), saltweed (*Atriplex patula*), coast willow (*Salix hookeriana*), and the invasive reed canarygrass (*Phalaris arundinacea*) (USN 2001a).

Eelgrass (*Zostera marina*) is the dominant marine flora species found in the Hood Canal. The 2005 Habitat Survey Report provides the abundance of eelgrass found in Hood Canal at the Delta South and Devil's Hole South sampling points.

Additionally, preliminary studies in support of the environmental analysis for the proposed Explosives Handling Wharf show Macroalgae straddling the eelgrass habitat (Hart Crowser

2011). The intertidal zone between 0 feet and -1 feet MLLW is dominated by macroalgae mostly composed of green ulvoids (*Ulva spp*.) and the occasional red alga (*Gracilaria sp.*). Drift laminarian kelp fronds were noted in deeper areas, perhaps suggesting a deeper presence where larger rock substrates (cobbles, boulders, and glacial erratics) may occur offering opportunity for colonization. Macroalgae within the survey area was more prevalent in the shallow subtidal/intertidal than at deeper depths (Hart Crowser 2013). It is not noted as a dominant habitat type. And, density comparisons between the 2011 report to the 2013 report showed no noticeable decrease or increase in aquatic flora.

For a listing of aquatic flora potentially occurring on NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.2 Fauna

4.3.2.1 Invertebrates

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain invertebrate species similar to those typically observed in Kitsap and Jefferson counties. Species observed may include ants (family *Formicidae*), sweat bees (family *Halictidae*), jumping spiders (family *Salticidae*), and hobo spiders (*Tegenaria agrestis*). Other aquatic species that occur can include species of mosquitoes (family *Culicidae*), mayflies (family *Baetidae*), damselflies and dragonflies (order *Ordonata*), and water beetles (order *Coleoptera*) (USN 2001a, SAIC 2005a).

For a complete listing of invertebrates potentially occurring on NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.2.2 Fish and Shellfish

Species of shellfish found in the Hood Canal include the Pacific oyster (*Crassostrea gigas*), Manila clam (*Tapes japonica*), native littleneck clam (*Protothaca staminea*), butter cockle (*Saxidomus giganteus*), gaper clam (*Tresus capox*), helmet crab (*Telmessus cheiragonus*), Olympia oyster (*Ostrea lurida*), hairy shore crab (*Hemigrapsus oregonensis*), and the red rock crab (*Cancer productus*) (USN 2001a, SAIC 2005b).

A freshwater fish survey conducted in 2008 provides information on the species of fish found in the various water bodies on NAVBASE Kitsap Bangor. Species found in Devil's Hole Lake include Coho salmon (*Oncorhynchus kitsutch*), which are currently a NMFS Species of Concern, Chinook salmon (*Oncorhynchus tshawytscha*), rainbow trout (*Salmo gairdneri*), threespine stickleback (*Gasterosteus aculeatus*), Pink Salmon (*Oncorhynchus gorbuscha*), cutthroat trout (*Salmo clarki*), and species of sculpin (family *Cottidae*). Resident cutthroat trout are found in virtually every freshwater system along the west side of the Kitsap peninsula, north and south of NAVBASE Kitsap Bangor, and in the Hood Canal. Devil's Hole Lake has a fish ladder that allows the Devil's Hole watershed to support anadromous fish (SAIC 2005b, USN 2001a).

Cattail Lake contains species such as threespine stickleback and cutthroat trout. Species found in Lake Ruth include bluegill sunfish (*Lepomis macrochirus*) and released largemouth bass (*Micropterus salmoides*). According to WDFW, rainbow trout, largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and brown bullhead (*Ameiurus nebulosus*) are also present in the lake (WDFW 2009).

No species of fish were observed in Wilkes Marsh, Hunters Marsh, Bullhead Marsh, the EHW Retention Pond, Escolar Pond, or Darter Pond during the sampling for the 2008 freshwater fish survey.

A beach seine survey in 2005 found the most abundant fish species were shiner perch (*Cymatogaster aggregata*) (85.9%), surf smelt (*Hypomesus pretiosus*) (4.4%), Sculpin sp. (family *Cottidae*) (3.1%), gunnel species (family *Pholidae*) (2.9%), and threespine stickleback (*Gasterosteus aculeatus*) (3.1%). The five most abundant fish species caught in the 2006 beach seine survey were Pacific herring (*Clupea harengus pallasi*) (50.1%), chum salmon (19.3%), surf smelt (12.7%), shiner perch (6.2%), and Pacific sand lance (*Ammodytes hexapterus*) (5.9%) (SAIC 2005a).

Pacific sand lance and Surf smelt have documented spawning locations along the shorelines of the Hood Canal and Dabob Bay. Bangor environmental staffers have been continuously conducting forage fish sampling on the installations to provide additional data to the agencies, which includes areas that are not accessible to some.

For a listing of fish and shellfish potentially occurring on or in water adjacent to NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.2.3 Reptiles and Amphibians

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain herpetofaunal species similar to those typically observed in Kitsap and Jefferson counties. Surveys have found native species such as northwest salamanders (*Ambystoma gracile*), long-toed salamanders (*Ambystoma macrodactylum*), rough-skinned newts (*Taricha granulosa*), red-legged frogs (*Rana aurora*), and Pacific treefrogs (*Hyla regilla*). The introduced bullfrog (*Rana catesbeiana*) was detected during a 1995 survey (SAIC 2005a, USN 2001a).

Chytridiomycosis disease is an infectious disease in amphibians caused by high levels of chytrid Batrachochytrium dendrobatidis (Bd). Surveys were conducted at NAVBASE Kitsap Bangor during the summer of 2013. Volunteers were trained by three online webinars, and were sent kits to conduct the sampling. Of the 20 samples taken during the summer of 2013, only 7 came back positive for Bd. Although Bd is present on the majority of military sites tested during this study, it is noted that tat this time the fungus does not appear to have a negative impact on amphibian species. Currently, there have not been reports of dead or dying amphibians on the installation. These recommendations are incorporated here as part of the natural resources management at *NAVBASE Kitsap properties*.

• Wet or muddy boots, fishing, and camping equipment may be contributing to the spread of the disease. Sterilize equipment with a solution of diluted bleach if the equipment is used in wetlands off the installation.

• Monitor wetland sites in the spring for dead/dying frogs. A high mortality rate of amphibians may indicate Bd infection.

• Do not allow the collection or translocation of amphibian species on or off the installation.

• Prevent the release of exotic amphibian pets on DoD installations.

• Increase the awareness of military personnel and installation residents about the disease.

For a complete listing of reptiles and amphibians occurring on NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.2.4 Migratory Birds

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain bird species similar to those typically observed in Kitsap and Jefferson counties. NAVBASE Kitsap Bangor provides habitat for over 100 species of birds. There is a robust and diverse population of birds due to the base location on Hood Canal. The four marshes on the base also provide nesting habitat for waterfowl that include mallards (*Anas platyrhynchos*), wigeon (*Mareca spp.*), buffleheads (*Bucephala albeola*), and northern shovelers (*Anas clypeata*). Bullhead marsh is home to an active osprey (*Pandion haliaetus*) nest, and Hunters Marsh is adjacent to a great blue heron (*Ardea herodias*) rookery. Other species found in the marshes include gulls (*Laru spp.*), dowitchers (*Limnodromus spp.*), dunlin (*Erolia alpina*), and killdeer (*Charadrius vociferous*) (USN 2001a). There is an additional great blue heron rookery adjacent to the base. An active Bald eagle nest (Figure 4-4) is located on NAVBASE Kitsap Bangor, and though not protected by ESA, they are still managed by the Bald and Golden Eagle Protection Act.

Neotropical migratory birds pass through NAVBASE Kitsap Bangor managed lands on their annual migrations. The majority of neotropical migratory birds are songbirds, but there are also many shorebirds, some raptors, and a few types of waterfowl that migrate. Species of migratory birds that can be found on the base include Townsend's warbler (*Dendroica townsendi*), varied thrush (*Ixoreus naevius*), green-winged teal (*Anas carolinensis*), Hutton's vireo (*Vireo huttoni*), American Robin (*Turdus migratorius*), and the spotted sandpiper (*Actitis macularia*) (USN 2001a).

For a listing of migratory that occur, or pass through, NAVBASE Kitsap Bangor facilities, see Appendix E.

4.3.2.5 Mammals

NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point all contain mammal species typically observed in Kitsap and Jefferson counties. Terrestrial mammals that have been found on NAVBASE Kitsap Bangor include black-tailed deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), cougar (*Puma concolor*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), short-tailed weasel (*Mustela erminea*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), fox (*Vulpes vulpes*), and bobcat (*Lynx rufus*).

Other species include bats (i.e., *Lasionycteris spp.*, *Lasurus spp.*, and *Myotis spp.*), long-tailed vole (*Microtus longicaudus*), Pacific mole (*Scapanus orarius*), brush rabbit (*Sylvilagus bachmani*), and the deer mouse (*Peromyscus maniculatus*) (SAIC 2008). Marine mammal species recently observed near the base in Hood Canal include harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), gray whale (*Eschrichtius robustus*), white sided-dolphin (*Lagenorhynchus obliquidens*), killer whale (*Orcinus orca*), humpback whale (*Megaptera novaeangliae*) and Dall's porpoise (*Phocoenoides dalli*) (SAIC 2008 and USN 2001a). Harbor seals are quite common and are often found in the water, on small boats and barges throughout NAVBASE Kitsap Bangor. California sea lions are also a common sight, hauling-out onto the hulls of the submarines (USN 2001a). Regular monitoring of the PSB and Delta pier is conducted to determine Steller and California sea lion usage.

For a listing of terrestrial and marine mammal species that potentially occur on NAVBASE Kitsap Bangor facilities, see Appendix E.

4.4 ESA Listed Species

Several ESA listed species have been observed or have the potential to occur at NAVBASE Kitsap Bangor, Camp Wesley Harris, the Toandos Buffer Zone, and Zelatched Point (Table 4-4) (USN 2001a, USFWS 2009, and WDFW 2009). Marbled murrelets (*Brachyramphus marmoratus*) have been identified on the Hood Canal south of Delta Pier. Potential nest platform trees have been identified on NBK Bangor adjacent to a proposed project area. Due to a contractual issue, the 2016 surveys were incomplete and were not conducted as required by the Pacific Seabird Group (PSG) Survey protocol. Additional surveys conducted by the PSG surveys protocol were conducted in the spring of 2017 and will continue in the spring of 2018. Due to known presence in water, pile driving within Hood Canal during the nesting season, April 1 – September 23, will not begin until 2 hours after sunset and will cease 2 hours prior to sunset (NOAA data: http://www.esrl.noaa.gov/gmd/grad/solcalc/). October 3, 2014 the final ruling on the listing of the western yellow-billed cuckoo as threatened under ESA. They require large blocks of riparian habitat for breeding (particularly woodlands with cottonwoods and willows) and dense understory foliage appears to be an important factor in nest site selection (USFWS 2011a). Surveys have not been conducted for the species, but current vegetation surveys will note any habitat on the installation. Additionally, the northern spotted owl is listed as threatened,

and the range is currently not within NAVBASE Kitsap properties. However, both of these bird species may occur within NAVBASE Kitsap Bangor or associated properties but are typically secretive and hard to detect. Surveys have not been conducted, but consideration is taken during maintenance timing and activities.

The Hood Canal contains three federally listed species of salmonids, the Puget Sound Chinook, the Hood Canal summer-run chum salmon, and the Puget Sound steelhead. These fish migrate through the tidal waters near NAVBASE Kitsap Bangor but are not known to inhabit steams flowing from the base. A small unnamed stream near the southern boundary of the Toandos Buffer Zone has been documented by WDFW as potential steelhead habitat. The federally listed bull trout (*Salvelinus confluentus*) is also present in Hood Canal and can pass through the tidal waters near NAVBASE Kitsap Bangor (USN 2001a), with a greater chance of occurrence in Dabob Bay near Zelatched Point. In addition, two species of rockfish, Boccaccio (*Sebastes paucispinis*) and yelloweye (*Sebastes ruberrimus*), have the potential to occur in Hood Canal near NAVBASE Kitsap Bangor, but have not been identified in recent surveys. ESA listed marine mammals that have been known to visit Hood Canal include the killer whale and the humpback whale (USN 2001a and USN 2007c). Hood Canal was an important part of the southern resident killer whale range until the late 1970s when visits declined. No confirmed reports of southern residents have occurred since 1995, and the Hood Canal is not designated as critical habitat.

Due to ESA listed salmon within Hood Canal, the in-water work window for NAVBASE Kitsap Bangor, Toandos Peninsula & Zelatched Point is July 16 – January 15.

Table 4-4 provides a list of ESA species that can potentially occur on or near NAVBASE Kitsap Bangor.

Table 4-4: ESA Listed Species Potentially Occurring at NAVBASE Kitsap at Bangor Facilities

Common Name	Scientific Name	Facility	Federal Status	State Status
Birds				
Marbled murrelet	*Brachyramphus marmoratus*	Bangor, CWH, ZP, TBZ	Threatened	Threatened
Yellow-billed cuckoo	*Coccyzus americanus*	CWH, Bangor, ZP, TBZ	Threatened	Candidate
Northern Spotted owl	*Strix occidentalis caurina*	ZP, TBZ	Threatened	Endangered
Fish				
Puget Sound Chinook salmon	*Oncorhynchus tshawytscha*	Bangor, ZP, TBZ	Threatened	Candidate
Hood Canal summer run chum salmon	*Oncorhynchus keta*	Bangor, ZP, TBZ	Threatened	Candidate
Puget Sound Steelhead	*Oncorhynchus mykiss*	Bangor, ZP, TBZ	Threatened	-
Bull trout	*Salvelinus confluentus*	Bangor, ZP, TBZ	Threatened	Candidate
Bocaccio	*Sebastes paucispinis*	Bangor, ZP, TBZ	Endangered	Candidate
Yelloweye rockfish	*Sebastes ruberrimus*	Bangor, ZP, TBZ	Threatened	Candidate
Mammals				
Humpback whale (Mexico DPS)	*Megaptera novaeangliae*	Bangor, ZP, TBZ	Threatened	Endangered
Humpback whale (Central America DPS)	*Megaptera novaeangliae*	Bangor, ZP, TBZ	Endangered	Endangered
Southern resident killer whale	*Orcinus orca*	Bangor, ZP, TBZ	Endangered	Endangered
Flora				

Common Name	Scientific Name	Facility	Federal Status	State Status
Howellia	*Howellia aquatilis*	CWH, Bangor, ZP, TBZ	Threatened	Threatened

Key:
CWH: Camp Wesley Harris; ZP: Zelatched Point; TBZ: Toandos Buffer Zone

Figure 4-1: NAVBASE Kitsap Bangor Aerial Photo

Figure 4-2: Toandos and Zelatched Point Map

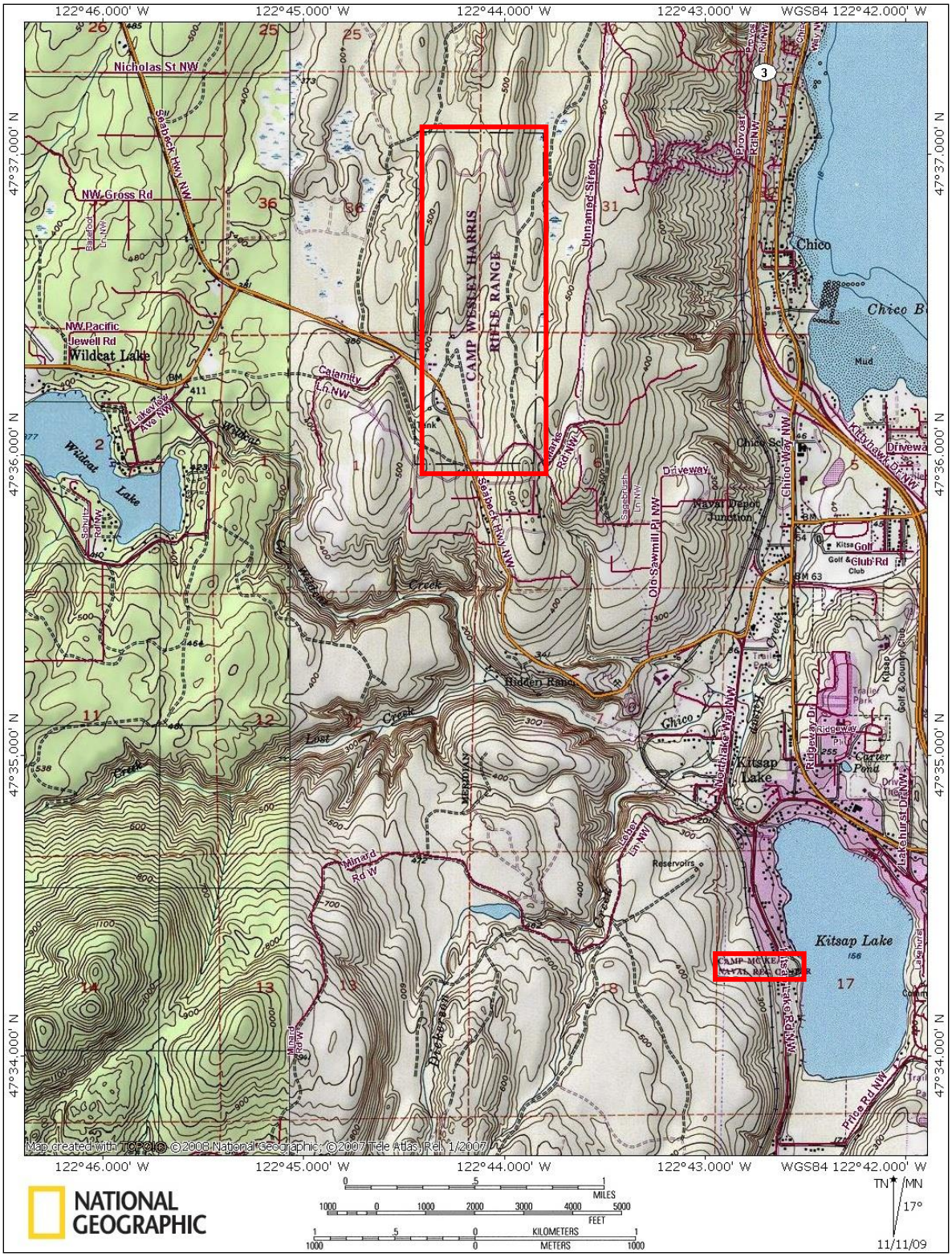

Figure 4-3: Camp Wesley Harris and Camp Mckean Map

Figure 4-4: NAVBASE Kitsap Bangor Bald Eagle Nest Locations

5 CURRENT CONDITION OF NATURAL RESOURCES ON NAVBASE KITSAP KEYPORT

5.1 Physical Conditions

NAVBASE Kitsap at Keyport, located on Liberty Bay near the inlet to Port Orchard Bay, encompasses 255 acres on Puget Sound (USN 2001b). The majority of NAVBASE Kitsap Keyport is situated at a 60-foot elevation, and the surrounding topography consists of gentle slopes (less than 5%) leading into Liberty Bay.

5.1.1 Hydrology

NAVBASE Kitsap Keyport is located within the 184,408-acre Olalla Valley-Frontal Puget Sound watershed (USN 2001b). Several upland areas serve as sources for stormwater infalls onto Navy property. The base lies at the bottom of a natural drainage basin for the Keyport area and receives run-on from the south, north, and west. Stormwater from agricultural areas, livestock areas, residential areas, and the town of Keyport flows onto Navy property. Also up-gradient from Keyport are several Kitsap County sewage lift stations that in the event of overflow would ultimately discharge onto Navy property (USN 2009a). Regional groundwater flows from upland areas in Kitsap Peninsula west towards Hood Canal and east towards Liberty Bay. Two aquifers (a shallow, unconfined sea-level aquifer and a deeper artesian aquifer) are present on NAVBASE Kitsap Keyport. In addition, Keyport Creek, a perennial stream, flows south to north and enters Keyport Lagoon (also known as Shallow Lagoon). Keyport Lagoon is connected to Liberty Bay by a spillway. Both the aquifers and Keyport Creek are recharged from local precipitation, the majority of which occurs during the winter months (USN 2001b).

NAVBASE Kitsap Keyport also uses groundwater as a source of potable water. Management of the aquifer and wellhead protection areas is similar to management at NAVBASE Kitsap Bangor and is described in Section 5.1.1.

5.1.2 Water Quality

NAVBASE Kitsap Keyport is primarily an industrial facility and has had impacts on water quality from its almost 100 years of continued operation. The Navy has conducted cleanups and is currently monitoring the water quality in various wells installed around the installation.

See Appendix F for more information on the clean-up sites.

Keyport Lagoon, located on the eastern side of NAVBASE Kitsap Keyport, is a brackish lagoon that is recharged from Keyport Creek and two emergent marsh wetlands on NAVBASE Kitsap Keyport (NAVFAC Northwest 2008). Surface water elevation on the lagoon fluctuates between 0.1 and 0.3 feet during tidal cycles due to the raised sill/spillway that prevents saline waters from

entering the lagoon except at high tides. Water quality for Keyport Lagoon, collected between 1993 and 2008, indicates that the lagoon contains well-mixed, oxygenated water with a salinity range of 16 - 20 parts per thousand (ppt), which is lower than the 26 ppt level traditionally found on the open Liberty Bay side of the lagoon (NAVFAC Northwest 2008).

5.1.3 Soils

Soils on NAVBASE Kitsap Keyport consist of glacial till soils that have been classified as Dysteric Xerothents, Kapowsin, and Kapowsin Variant soils (USN 2001b). These soils were formed during the last ice age and are characterized by a moderately compacted till layer, 20 - 40 inches below the surface, overlaying a very compacted till or hardpan layer. Water moves freely in the compacted till layer and tends to pool once it reaches the hardpan layer, particularly during winter months. These soils are generally found in depressions, hillside seeps, streams and road cuts, and wetlands (USN 2001b). The soils generally found along beaches in Liberty Bay are also hydric in nature and consist of sand and gravel (USN 2001b).

Sediment Quality

The marine waters of Port Orchard are listed on the CWA 303(d) list of impaired waters (NAVFAC Northwest 2008). During the early 1990s, NAVBASE Kitsap Keyport conducted studies to determine if contaminants were present in Keyport Lagoon. The data from these studies determined that only four chemicals of concern were detected in the lagoon. Sources of contamination were determined to be discharged from the sewer treatment plant and storm drainages (NAVFAC Northwest 2008).

5.2 Habitats and Communities

5.2.1 Wildlife Habitat

NAVBASE Kitsap Keyport is characterized by several habitat types including developed lands, forests, surface water, and wetlands (Table 5-1). The majority of land cover at NAVBASE Kitsap Keyport is developed land, which is suitable habitat for species accustomed to an urbanized environment. Forest habitat on NAVBASE Kitsap Keyport varies from newly established to mature second growth and includes upland successional, upland, and open forests. These habitats are comprised of evergreen and deciduous forest stands with Douglas-fir (*Pseudotsuga menziesii*) as the predominant species. Other habitat types on NAVBASE Kitsap Keyport include deciduous and coniferous-forested wetlands, shrub dominated wetlands, and intertidal, saltwater marsh, and marine habitats.

Table 5-1: Land Cover Types on NAVBASE Kitsap Keyport

Description	Acreage	% Of Land Use
Developed Land	164	64
Forest Land	53	21
Surface Water	22	9
Wetlands	16	6
Total	**255**	**100**

Habitats on NAVBASE Kitsap Keyport include (USN 2001b):

- **Upland Successional Forest Habitats:** These habitats are strictly defined by the age of the timber stand. These stands are recently cut over stands having the understory impacted by the harvest operation. Having the canopy opened allows sunlight to reach previously shaded forest floor, changing the understory composition from shade tolerant to sun species. Native blackberry, trailing blackberry, thimbleberry, orchard grass, and fescue make up the species list in these areas.

- **Open Habitats:** Open habitats occur where the trees are scattered throughout the area allowing sunlight to reach the forest floor. Plant species become more varied as a result and consist of various grasses, blackberry, thimbleberry, horsetail, and both perennial and annual flowered plants. This allows for many animals and birds to gather food. All species from small mammals to large mammals, seed eating birds as well as insectivores, gather in this habitat as well as those species that predate upon these species.

- **Upland Forest Types:** This habitat consists of a reasonably dry area containing Douglas-fir and western hemlock with a sword fern and salal understory. These habitats vary in age and understory composition dependent upon when the last timber harvest took place. This habitat is important for thermo-regulation for deer, provides nesting habitat for birds, and dependent upon downed large woody debris, provides living areas for various small mammal species.

- **Deciduous Forested Wetlands:** These wetland areas consist of wetland plants with an important component being large deciduous trees, usually red alder. The trees provide shade, keeping water temperatures cool, and supply a rich organic food source as they shed their leaves. As the wetland rises and falls, some of the trees are killed by having the root zones inundated with water. These trees quickly rot, providing homes for cavity nesters, food for insect foragers, and after they have fallen into the wetland, additional organic matter from which the other existing wetland plants feed.

- **Coniferous Forested Wetlands:** These wetlands have Douglas-fir and western redcedar in close proximity to their edge. The waters are usually somewhat acidic and brackish in color. Acidic tolerant plants such as hardhack, reed canarygrass, and water lilies make up this community. The trees are an important component of this habitat as they provide a temperature regulation as well as necessary large woody debris as they decay and fall to the surrounding area.

- **Shrub Dominated Wetlands:** These wetlands contain hardhack, serviceberry, skunk cabbage, and cattails. They are open and provide easy access for waterfowl species. Due to the lack of canopy cover, they are warmer than other types of wetlands and therefore provide habitat for the more water dependent life cycles of herptilian species.

- **Intertidal Habitats:** These habitats are some of the most diverse habitats within the boundaries of NAVBASE Kitsap Keyport. They are highly diverse in both plant and animal species. The tides both flush and feed this system, bringing in nutrients from elsewhere in the marine system, as well as providing the vehicle by which reproductive material is exchanged, i.e., seeds, oyster and clam spat, crab and snail eggs, etc.

- **Saltwater Marsh Habitat:** These habitats are utilized by waterfowl for nesting and feeding. Pickleweed, Puget Sound gumweed, seaside plantain, Pacific silverweed, and saltwater bulrush are located in the saltwater marshes.

- **Marine Habitat:** These habitats include the waters of Liberty Bay, Port Orchard, and Puget Sound. These marine waters sustain a large variety of fish, shellfish, avian, and marine mammal species.

5.2.2 Wetlands

NAVBASE Kitsap Keyport has Estuarine, Palustrine, and Riverine wetlands (USN 2008a). Estuarine wetlands are characterized as “deep-water tidal habitats and adjacent tidal lands that are occasionally diluted by freshwater runoff from the land” (USN 2001b). Palustrine wetlands are characterized as “wetlands that are usually dominated by vegetation, and includes areas that have been traditionally called marshes, swamps, bogs, fens, ponds, and sloughs.” Riverine wetlands include “all wetlands within channels, which have moving water” (USN 2001b). NAVBASE Kitsap Keyport’s wetlands are classified as (USN 1994):

- **E2USN:** A wetland of the Estuarine Ecological System, in the Intertidal Ecological Subsystem (2), Unconsolidated Shore Class, with a water regime modifier of Regularly Flooded

- **E2AB/USN:** A wetland of the Estuarine Ecological System, in the Intertidal Ecological Subsystem (2), Aquatic Bed and Unconsolidated Shore Classes, with a water regime modifier of Regularly Flooded

- **E10WL:** A wetland of the Estuarine Ecological System, in the Subtidal Ecological Subsystem (1), Open Water Class, with a water modifier of Subtidal
- **E2EMP:** A wetland of the Estuarine Ecological System, in the Intertidal Ecological Subsystem (2), Emergent Class, with a water regime modifier of Irregularly Flooded
- **PSSY:** Palustrine, with shrub/scrub vegetation, saturated/semipermenant/seasonal
- **PFO/SSY:** Palustrine, forested, with shrub/scrub vegetation, saturated/semipermenant/seasonal
- **PEMY:** Palustrine, emergent vegetation, saturated/semipermenant/seasonal

Wetlands on NAVBASE Kitsap Keyport consist of the following (USN 2001b):

- Sixteen acres of delineated wetlands found along beaches that consist of Belfast fine sandy loam, McMurray/Mukilteo muck, and Norma fine sandy loam soils (USN 2001b).
- A 20-acre, shallow, Estuarine lagoon, which is called both Shallow Lagoon and Keyport Lagoon (USN 2001b). The Keyport Lagoon currently supports two distinct habitat types. The first is emergent marsh, which is located at the fringe of the Keyport Lagoon, potentially providing habitat functions for birds, fish, and mammals. The second is near-shore, subtidal soft bottom. The lagoon is a brackish, artificially flooded tide pool that resembles a freshwater lake. A small perennial stream (Keyport Creek) enters the lagoon on the west between two Estuarine emergent marsh wetlands. There are several emergent marsh wetland areas in the southeast corner and along the western boundary. The permanently flooded areas of the emergent marsh wetlands contain salt-tolerant vegetation but have low salinity levels (NAVFAC Northwest 2008). The lagoon ultimately drains to Port Orchard Bay over a spillway at an elevation of 10.5 feet MLLW on the northwest. The lagoon is currently being studied for a restoration project that would remove the spillway and restore intertidal functions.
- A 10-acre marsh located on the western boundary of NAVBASE Kitsap Keyport, which is used by waterfowl for nesting and fishing habitat (USN 2001b).
- Six acres of tidelands at NAVBASE Kitsap Keyport to the extreme low water level of –4.5 feet. The beaches are composed predominantly of cobble, pea gravel, and sand.
- One perennial stream (Keyport Creek) in NAVBASE Kitsap Keyport. This stream originates off base and drains the southern portion of Keyport, flowing northeast into Keyport Lagoon and then into the waters of Liberty Bay and Puget Sound (USN 2001b).

The largely suburban layout of NAVBASE Kitsap Keyport and the relatively small nature of the wetlands, streams, and riparian areas make ensuring the health of these systems a primary goal for maintaining habitat and ecosystem health.

5.3 Flora and Fauna

5.3.1 Flora

5.3.1.1 Terrestrial Flora

The dominant habitats at NAVBASE Kitsap Keyport are forested and non-forested landscaped habitat. The forests are comprised of both evergreen and deciduous forest stands. The evergreen stands predominantly contain Douglas-fir with western hemlock and western redcedar. The deciduous stands are predominantly comprised of red alder and bigleaf maple (USN 2001b). Understory species include salal, evergreen huckleberry, Pacific rhododendron, salmonberry, sword fern, Oregon grape, trailing blackberry, elderberry, vine maple (*Acer circinatum*), Pacific madrone, yew, cascara, and stinging nettle (USN 2001b).

For a complete list of terrestrial flora potentially occurring at NAVBASE Kitsap Keyport, see Appendix E.

5.3.1.2 Aquatic Flora

NAVBASE Kitsap Keyport contains aquatic flora similar to that typically occurring in all terrestrial lakes, streams, and rivers in Kitsap, Mason, and Jefferson counties. Obligate wetland flora species can include yellow pond lily, cattail (*Typha latifolia*), skunk cabbage, bulrush, water parsley (*Oenanthe sarmentosa*), pickleweed, veronica (*Veronica spp.*), pondweed, duckweed (*Lemna spp.*), smartweed (*Polygonum spp.*), monkey flower (*Mimulus guttatus*), and water cress (USN 2001b).

Facultative wetland plants can include hardhack, lady fern, aspen, sedges (*Carex spp.*), rushes, alder (*Alnus spp.*), aster (*Aster subspicatus*), Puget Sound gumweed (*Grindela integrifolia*), saltgrass, saltweed, and coast willow (USN 2001b).

For a complete list of aquatic potentially occurring at NAVBASE Kitsap Keyport, see Appendix E.

5.3.2 Fauna

5.3.2.1 Invertebrates

Invertebrates that can be found on NAVBASE Kitsap Keyport can include ants (family *Formicidae*), sweat bees (family *Halictidae*), jumping spiders (family *Salticidae*), and hobo spiders (*Tegenaria agrestis*). Other aquatic species that occur can include species of mosquitoes

(family *Culicidae*), mayflies (family *Baetidae*), damselflies and dragonflies (*order Ordonata*), and water beetles (order *Coleoptera*) (USN 2001a, SAIC 2005a).

5.3.2.2 Fish and Shellfish

Species of shellfish can include the Pacific blue mussel (*Mytilus edulis*), Olympia oyster (*Ostrea lurida*), Pacific oyster, Manila clam, native littleneck clam, butter clams, gaper clam, helmet crab, hairy shore crab, and the red rock crab (SAIC 2005a). The fish species found in the marine and freshwaters of the installation are similar to the other NAVBASE Kitsap properties; Chinook salmon, Puget Sound steelhead, Chum, and Coho salmon may be found in the marine waters while sticklebacks, sculpins, and cutthroat trout are indicative species found in Keyport Lagoon.

Beginning in 2005, the Navy has collaborated with the Puget Sound Restoration Fund to help restore Olympia Oysters in Puget Sound. The Puget Sound Restoration Fund works with a number of groups including the Suquamish Tribe, Northwest Indian Fisheries Commission, Baywater Incorporated, and the WDFW to restore habitat in the Puget Sound. As the west coast's only native oyster, the Olympia oyster and has long been an important resource to Tribes throughout the Puget Sound. Overharvesting in the early 1900s combined with pollution and habitat loss has devastated oyster populations throughout the Northwest. In past efforts to help restore oyster beds, the Navy provided access to the main pier at NAVBASE Kitsap Keyport and the use of a Navy barge to transport hundreds of cubic yards of oyster shells. The shells were sprayed off the deck of the barge with a high power water hose to tidelands where they provide habitat for oyster larvae. The last iteration of this program occurred in June of 2009 with approximately 700 cubic yards of oyster shells seeded in the tidelands of Dogfish Bay just north of NAVBASE Kitsap at Keyport. The NRM will work with WDFW shellfish biologists, as needed, to ensure updated management strategies for the Olympia oyster are included in future INRMP revisions.

For a complete listing of fish and shellfish potentially occurring at NAVBASE Kitsap Keyport, see Appendix E.

5.3.2.3 Reptiles and Amphibians

Species of reptiles and amphibians found on NAVBASE Kitsap Keyport can include northwest salamanders, long-toed salamanders, rough-skinned newts, red-legged frogs, and Pacific treefrogs (USN 2001b).

For a complete listing of reptiles and amphibians potentially occurring on NAVBASE Kitsap Keyport, see Appendix E.

5.3.2.4 Migratory Birds

Species of birds found on NAVBASE Kitsap Keyport can include mallards, wigeon, buffleheads, northern shovelers, and osprey. Other species can include great blue heron, gulls, dowitchers,

dunlin, and killdeer (USN 2001b). The majority of neo-tropical migratory birds are songbirds, but migrating species include many shorebirds, some raptors, and a few types of waterfowl. Species of migratory birds that can be found on the base include Townsend's warbler, varied thrush, green-winged teal, Hutton's vireo, robin, and the spotted sandpiper (USN 2001b).

For a complete listing of migratory birds potentially occurring at NAVBASE Kitsap Keyport, see Appendix E.

5.3.2.5 Mammals

Terrestrial mammals that can be found on NAVBASE Kitsap Keyport include black-tailed deer, river otter, short-tailed weasel, coyote, raccoon, fox, and bobcat. Other species include species of bats, long-tailed vole, Pacific mole, brush rabbit, and the deer mouse (*Peromyscus maniculatus*) (USN 2001b). Marine mammal species that can occur near NAVBASE Kitsap Keyport include the harbor seal, California sea lion, white sided-dolphin, killer whale, and Dall's porpoise (SAIC 2008, USN 1994).

For a complete listing of mammals potentially occurring on NAVBASE Kitsap Keyport, see Appendix E.

5.4 ESA Listed Species

Several federal listed species have been observed at NAVBASE Kitsap Keyport or have the potential to occur (Table 5-2) (USN 2001b, USFWS 2009). Migratory and resident birds with potential to occur include marbled murrelets and bald eagle. Murrelets have been observed offshore during survey efforts. No upland surveys have been conducted to determine if nesting habitat is present on NAVBASE Kitsap Keyport. The yellow-billed cuckoo has potential to be present at NAVBASE Kitsap Keyport. They require large blocks of riparian habitat for breeding (particularly woodlands with cottonwoods and willows) and dense understory foliage appears to be an important factor in nest site selection (USFWS 2011a), but is very elusive and difficult to detect. Surveys have not been conducted, but consideration is taken during maintenance timing and activities.

Liberty Bay and Port Orchard Bay contain the federally listed species of salmonids, the Puget Sound Chinook salmon and steelhead. Neither species is known to inhabit Keyport Lagoon or Keyport Creek. In addition, two species of rockfish (Boccaccio, and yelloweye) have potential to occur in Liberty Bay and Port Orchard Bay near NAVBASE Kitsap Keyport but have not been identified in recent surveys. These species have been listed under the ESA and are listed as candidate species by WDFW. Marine mammals that have been known to visit Liberty Bay and Port Orchard Bay include the southern resident killer whale (rare visitor) and the humpback whale (very rare) (USN 2001b and USN 2007c).

Due to ESA listed salmon within the waters of Keyport, the in-water work window is: July 16 – March 2. Forage fish occur in the waters near Keyport, and therefore timing of forage fish species windows will be taken into account during project consultation.

While no longer listed under ESA, bald eagles are still protected under the MBTA and the Bald and Golden Eagle Protection Act.

Table 5-2: ESA Listed Species Potentially Occurring at NAVBASE Kitsap Keyport

Common Name	Scientific Name	Federal Status	State Status
Birds			
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	Threatened
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Candidate
Fish			
Puget Sound Chinook salmon	*Oncorhynchus tshawytscha*	Threatened	Candidate
Puget Sound Steelhead	*Oncorhynchus mykiss*	Threatened	-
Bocaccio	*Sebastes paucispinis*	Endangered	Candidate
Yelloweye rockfish	*Sebastes ruberrimus*	Threatened	Candidate
Mammals			
Humpback whale (Mexico/Central America DPS)	*Megaptera novaeangliae*	Threatened/Endangered	Endangered
Southern resident killer whale	*Orcinus orca*	Endangered	Endangered
Flora			
Howellia	*Howellia aquatilis*	Threatened	Threatened

Figure 5-1: NAVBASE Kitsap Keyport Aerial Photo

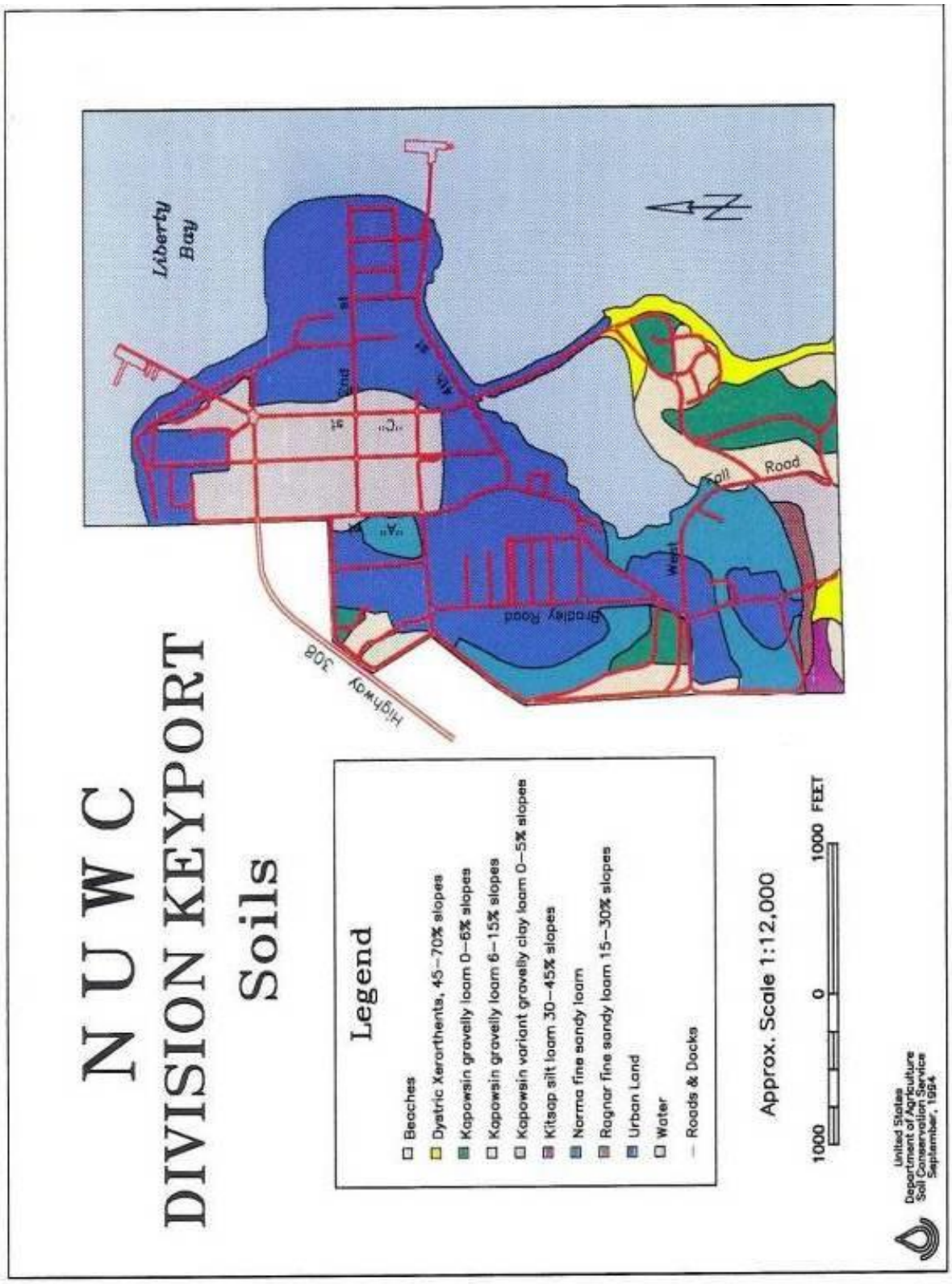

Figure 5-2: NAVBASE Kitsap Keyport Soil Maps

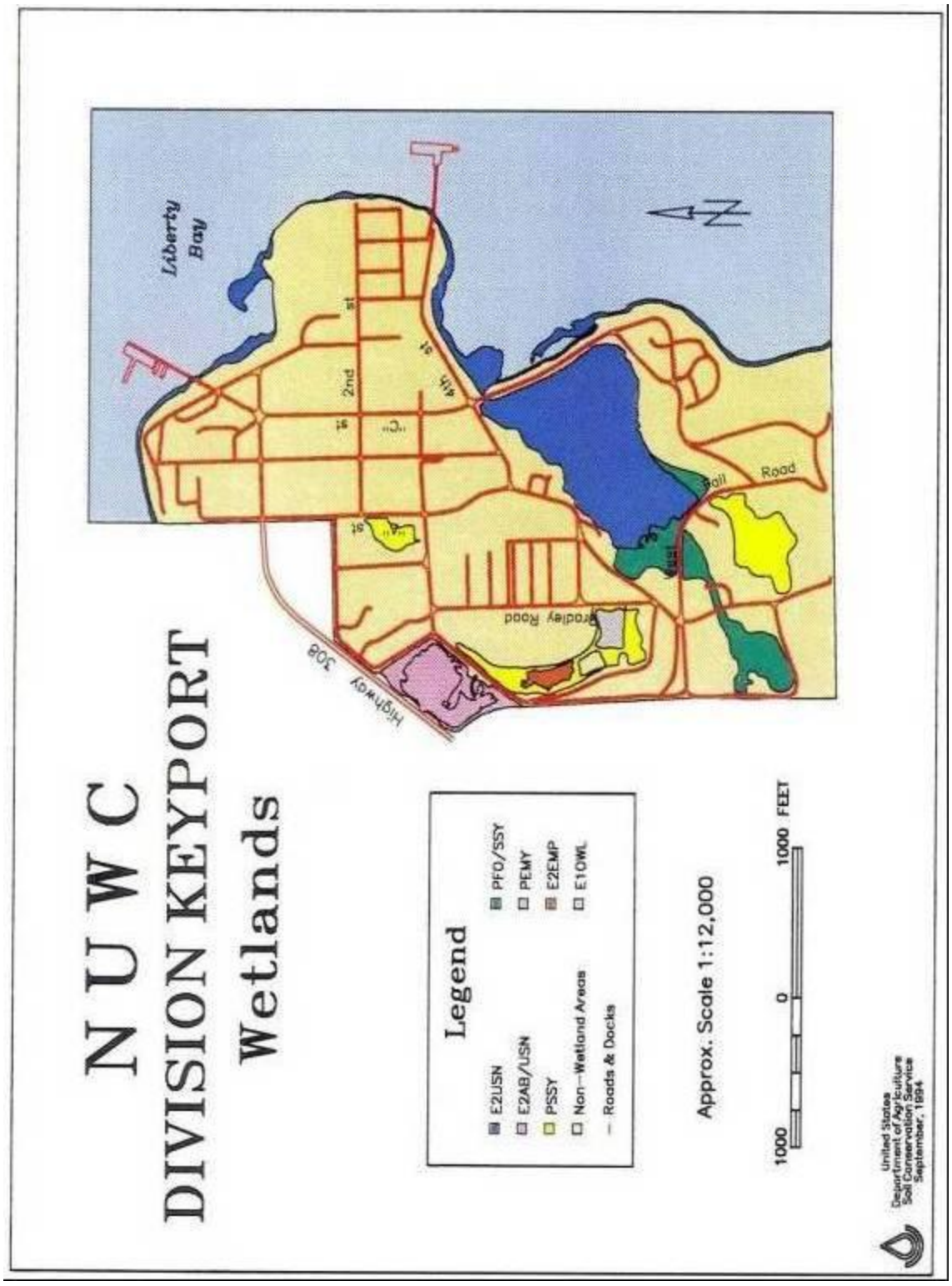

Figure 5-3: NAVBASE Kitsap Keyport Wetlands Map

Figure 5-4: NAVBASE Kitsap Keyport Osprey Nest Map

6 CURRENT CONDITION OF NATURAL RESOURCES ON NAVBASE KITSAP BREMERTON

6.1 Physical Conditions

NAVBASE Kitsap Bremerton is currently a homeport to multiple ships and provides regional administrative and logistical support to Department of Defense activities in the Puget Sound area. NAVBASE Kitsap Bremerton is a 400-acre facility located adjacent to the city of Bremerton, Washington (Figure 6-1). Although mainly an industrial facility, NAVBASE Kitsap Bremerton also has administrative buildings, personnel support and recreational facilities, bachelor housing units, and individual family housing. The industrial area includes a large steam utility plant, an industrial waste pretreatment facility, oily waste treatment systems, warehouses, fire stations, six dry docks, and piers for both active and inactive fleet maintenance. The Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) provides timely and cost efficient ship maintenance, modernization, and technical and logistics support. PSNS & IMF is responsible for managing natural resources in the Controlled Industrial Area (CIA), which is in the eastern portion of NAVBASE Kitsap Bremerton. Properties associated with NAVBASE Kitsap Bremerton include the USN Railroad to Shelton and Camp McKean.

NAVBASE Kitsap Bremerton is located on the north side of Sinclair Inlet. The northern boundary of the NAVBASE Kitsap Bremerton forms the southern boundary of the City of Bremerton. NAVBASE Kitsap Bremerton has several large tenant commands, including the PSNS & IMF, and the Naval Supply Systems Command Fleet Logistics Center (FLC) Puget Sound. With the exception of some recreational fields and housing areas, the upland area of NAVBASE Kitsap Bremerton is almost exclusively a paved industrial and administrative installation with maintained landscaped areas around buildings. There are groups of large trees, primarily Douglas-firs, at the housing/administration areas. Many trees within these areas are about 100 years old and qualify as contributing elements to the historic housing districts, which requires special landscaping management. Within NAVBASE Kitsap Bremerton are six dry docks and 12 moorings and piers.

There are 650 acres of off-site railroad right-of-way property belonging to NAVBASE Kitsap. This property is in the form of a partially forested buffer along 58 miles of railroad track. Approximately 350 acres are forested. The railroad runs from Shelton to Bremerton with three sidings before coming to a junction where it goes into Bremerton. PSNS & IMF Environmental staff manages the Bremerton to Shelton portion of the USN Railroad.

Camp McKean consists of about 5 acres of land with relatively shallow elevation changes and is adjacent to Kitsap Lake. Natural resource management of Camp McKean is provided by NAVBASE Kitsap staff.

6.1.1 Hydrology

The majority of NAVBASE Kitsap Bremerton is made up of impervious surfaces, requiring an extensive system for collection and distribution of surface water runoff. There are an estimated 156 stormwater outfalls within NAVBASE Kitsap Bremerton, all draining to Sinclair Inlet. Of these, there are 92 outfalls that drain an area greater than 5,000 square feet (0.11 acres) (EPA 2008). There are no streams, natural ponds, lakes, or wetlands located within NAVBASE Kitsap Bremerton. The majority of the waterfront is riprapped, contained by quay walls, has piers and wharves extending from the shore, or contains other manmade structures. The exceptions are on the west end of the installation at Charleston Beach, where the Navy removed riprap to restore a segment of the shore, and north of Pier 7.

Sinclair Inlet is a relatively shallow inlet approximately 3.5 miles long. Surrounding slopes are moderate, with steep bluffs along the shoreline at the inlets southern and western ends. Freshwater input is from stream runoff, direct precipitation, and groundwater flow. The two largest streams are Gorst Creek and Blackjack Creek. Gorst Creek flows into the westernmost end of the inlet, and Blackjack Creek enters the inlet just east of the city of Port Orchard. Most of the shallow flats in the inlet occur at the mouths of these two creeks. Other significant tributaries to the inlet are Ross and Anderson Creeks, which enter the inlet on the southern shore. The mouth of Wright Creek is on the northwest shore of the inlet.

6.1.1.1 USN Railroad

The USN Railroad was constructed in the 1940s and is approximately 48 miles long running from Shelton to Bremerton/Bangor, and has 21 major culverts of various sizes and configurations that convey streams and stormwater runoff under the railroad line. These allow transfer of water and, in some cases, allow for passage of juvenile and adult salmon into waters upstream of the culverts (USN 2004a). Cutthroat trout are present in all of the fish bearing streams along the railroad. During a 2004 survey of these culverts to determine the availability for these culverts to function as a fish-passage, five culverts were found to be complete fish-passage barriers and another six were found to be partial fish-passage barriers (mostly juvenile fish blockages under specific flow conditions) (USN 2004a). Not only are these culverts noted as a fish barrier, they also significantly alter the natural geomorphological process in each watershed. They cause scour immediately downstream, and starve further downstream reaches of important sediment and woody debris. A summary of the culverts conditions and general information is in Table 6-1.

Since the 2004 survey, a fish ladder has been installed at Heins Creek (milepost .71) and trash racks have been removed along several of the Deer Creek tributaries and at the Sherwood Creek Tributary (milepost 17.96). The culvert along the Airport tributary of the Union River was replaced in FY2014, and a 48-inch concrete culvert that blocked all fish movement was removed and replaced with a new a new arch culvert that meets WDFW design guidance for fish passage. Additionally, a new culvert survey for fish passage was completed for the entire rail line to Bangor and Bremerton in June 2015. This study is helping prioritize culvert project submittals

for replacement and assist future mitigation planning, and can be obtained by contacting NAVBASE Kitsap Bremerton Environmental Department.

6.1.1.2 Camp McKean

Camp McKean is located along the shoreline of Kitsap Lake. The lake is approximately 238 acres with a 29-foot maximum depth and is part of the Chico Creek watershed. Kitsap Creek, an outlet of Kitsap Lake, feeds Chico Creek, which flows into Dyes Inlet at Chico Bay. Camp McKean has no streams or wetlands. Stormwater flow from the parking lot is directed into storm drains that flow to Kitsap Lake.

Table 6-1: Summary of USN Railroad Culvert General Information

R&R Mile Post	Stream Watershed Description	Barrier Status
.39	Shelton Creek	Passable
.57	Tidal Backwater to Shelton Creek	Passable
.67	Cranberry Creek	
1.88	Tributary to Oakland Bay	Total Barrier
2.19	Tributary to Oakland Bay	Total Barrier
2.8	Stormwater	
3.79	John's Creek	Passable
5.2	Tributary to Cranberry Creek	Underwater. Same System as 5.36
5.36	Tributary to Cranberry Creek	Partial Barrier (67%)
6.42	Tributary to Lake Limerick	Total Barrier
6.6	Cranberry Creek	Passable
6.74	Stormwater	
6.91	Tributary to Cranberry Creek	Total Barrier
7.52	Tributary to Cranberry Creek	Total Barrier
8.2	Tributary to Cranberry Creek	Total Barrier
8.9	Tributary to Deer Creek	Partial Barrier (33%)
9.28	Tributary to Deer Creek	Partial Barrier (33%)
9.51	Unknown	
9.59	Stormwater	
9.76	Stormwater	
10.5	Tributary to Deer Creek	Partial Barrier (33%)

R&R Mile Post	Stream Watershed Description	Barrier Status
10.55	Tributary to Deer Creek	Not Located
12.01	Tributary to Deer Creek	Total Barrier
12.15	Stormwater	
12.73	Tributary to Deer Creek	Total Barrier
13.1	Tributary to Deer Creek	Total Barrier
13.77	Tributary to Deer Creek	Total Barrier
14.11	Stormwater	
14.89	Deer Creek Headwaters	Passable
15.75	Tributary to Sherwood Creek	Partial Barrier (33%)
16.5	Tributary to Sherwood Creek	No Usable Habitat
16.88	Tributary to Sherwood Creek	Partial Barrier (67%)
17.84	Tributary to Sherwood Creek	Total Barrier
17.96	Tributary to Sherwood Creek	Partial Barrier (33%)
18.1	Tributary to Sherwood Creek	Total Barrier
19.3	Tributary to Lake Anderson	Total Barrier
20.26	Tributary to Lake Devereaux	No Useable Habitat
21.67	Tributary to Hood Canal	Partial Barrier (33%)
21.84	Tributary to Hood Canal	Total Barrier

R&R Mile Post	Stream Watershed Description	Barrier Status
23.97	Tributary to Hood Canal	No Useable Habitat
25.65	Stormwater	
28.48	Tributary to Union River	Passable
30.04	Tributary to Union River	No Useable Habitat
31.55	Tributary to Gorst Creek	Partial Barrier (67%)
31.78	Tributary to Gorst Creek	No Useable Habitat
32.09	Tributary to Gorst Creek	Total Barrier
32.55	Tributary to Gorst Creek	Total Barrier
32.62	Tributary to Heins Creek	Total Barrier
33.06	Stormwater	
33.19	Tributary to Heins Creek	Partial Barrier (33%)
33.6	Heins Creek	Total Barrier
34.58	Tributary to Kitsap Creek	Total Barrier
36.09	Dickerson Creek	Partial Barrier (67%)
36.65	Tributary to Chico Creek	Total Barrier
37.48	Tributary to Chico Creek	Total Barrier
37.66	Tributary to Chico Creek	Total Barrier
38.11	Tributary to Dyes Inlet (North & South)	Total Barrier
38.36	Tributary to Dyes Inlet	Total Barrier

R&R Mile Post	Stream Watershed Description	Barrier Status
38.51	Tributary to Dyes Inlet	Total Barrier
38.91	Tributary to Dyes Inlet	Total Barrier
39.21	Tributary to Dyes Inlet	Total Barrier
39.xx		Not Located
40.25	Koch Creek	Total Barrier
40.74	Tributary to Dyes Inlet	Total Barrier
41.35	Tributary to Strawberry Creek	Total Barrier below RR
42.95	Strawberry Creek Headwaters	Partial Barrier (33%)
Bremerton Spur		
0.05	Tributary to Gorst Creek	Same as 32.09
0.08		Not Located
0.71	Heins Creek	Partial Barrier (67%)
1.04	Jarstad Creek	Total Barrier
1.58	Tributary to Gorst Creek	Partial Barrier (33%)
2.12		Not Located
2.24		Not Located
3.36	Wright Creek	Partial Barrier (33%)
3.64	Tributary to Sinclair Inlet	Total Barrier

6.1.2 Water Quality

The ecology of Sinclair and Dyes Inlet has been impacted by the historical releases of pollutants from past practices (point sources), which have resulted in a legacy of contamination in

sediments, fish, and shellfish. The WDOE assesses surface waters for impairments based on the Clean Water Act Sections 303(d) and 305(b) requirements. During the 2004 water quality assessment, WDOE determined that (USN 2008a):

> Sinclair and Dyes Inlet are listed as "impaired water bodies" by the State of Washington (WDOE 2008). Under Section 303(d) of the CWA, states, territories, and tribes are required to develop lists of impaired water bodies known as the 303(d) list (EPA 2009). The 1998 303(d) list for the inlets included listings for heavy metal and organic contaminants in the sediments and tissues of marine organisms, and many stream segments within the watershed were listed for fecal coliform and/or temperature (WDOE 1998). The CWA requires Total Maximum Daily Loads (TMDLs) to be developed for constituents that do not meet water quality standards (EPA 2009).

- Meanwhile, ongoing watershed development is leading to the loss of natural habitat, increases in runoff from the landscape, and more nonpoint source pollution. During the 2004 water quality assessment, WDOE determined that (USN 2008a): A Sinclair Inlet waterbody segment located east and south of the NAVBASE Kitsap Bremerton does not achieve WDOE's dissolved oxygen standard and is defined as impaired.

- There are number of waterbody segments in Sinclair Inlet where pH and temperature are a concern (waters of concern) but data are not sufficient for listing as impaired.

- There is a waterbody segment adjacent to the west end of the Shipyard where pH, temperature, fecal coliform, and dissolved oxygen are of concern.

- There are a number of segments that the available data shows that water quality is achieved for particular parameters. While this varies by segment, the parameters generally are fecal coliform, dissolved oxygen, and ammonia.

In addition, USGS assessed water quality parameters in Sinclair Inlet in 1998 and determined that turbidity levels met state standards for marine waters. However, DO levels were exceeded in Kitsap County in 1998, 2001, and 2003. Studies suggest that water quality parameters in Kitsap County near NAVBASE Kitsap Bremerton were adversely affected by runoff and sedimentation from highly urbanized areas, highways, commercial and residential areas, and industrial areas (USN 2008b).

In 2000, a collaborative partnership formed through Project Environment Investment (ENVVEST) partnership of PSNS & IMF, WDOE, EPA, and local stakeholders began conducting a comprehensive water quality improvement project for the watersheds of Sinclair and Dyes Inlet (Federal Register 2000, WDOE 2008). By addressing environmental concerns at the proper ecological scale, Project ENVVEST has made major contributions in addressing environmental concerns in Sinclair and Dyes Inlet by providing data to support TMDLs of priority constituents and developing a more efficient and effective means of protecting the

environment. The goal of Project ENVVEST is to create an alternative model for the development and implementation of environmental regulations and provide the technical data and information needed to implement TMDLs for the Sinclair/Dyes Inlet Watershed adjacent to the Shipyard (USN 2000, EPA 2000) and achieve real improvements in environmental quality with less cost.

Through this collaboration and cooperation, the ENVVEST working groups have improved the understanding of the Sinclair/Dyes Inlet Watershed. In November 2003, 1500 acres of shell fishing beds in Dyes Inlet were reopened for the first time in decades based on the elimination of combined sewer overflow events by the City of Bremerton and results of the ENVVEST modeling studies. The ENVVEST working group also completed a watershed monitoring and modeling effort that involved all the stakeholders in conducting a comprehensive sampling program throughout the watershed in support of the fecal coliform TMDL for Sinclair and Dyes Inlet (Navy, EPA, WDOE 2000) and produced an integrated model of the Sinclair and Dyes Inlet watershed. This model was used to simulate fecal coliform discharge scenarios needed for the TMDL (Johnston et al. 2008). In addition, the ENVVEST team completed a major effort to monitor storm event runoff of heavy metals, toxic organic contaminants, nutrients, and suspended particulates in the watershed to determine contaminant loads as a function of upstream land use/land cover and storm intensity (EPA 2000, Dunagan 2008). The ENVVEST team also evaluated ambient water and sediment quality, and assessed contaminant bioaccumulation and effects to marine organisms within the Inlet (Johnston et al. 2008).

6.1.3 Soils

There are three main soil types found at NAVBASE Kitsap Bremerton: Alderwood series, Neilton series, and Urban Land – Alderwood complex (USDA-NRCS 1980) (Figure 6-3). The soils around the piers and dry docks were placed to create the shoreline of the shipyard. The soil is considered a modified urban soil complex. In this case, it has been classified as an Alderwood derived soil and has some of the characteristics of the Alderwood series, such as formed from glacial till soils and a very gravelly sandy loam (USDA-NRCS 1980); although, soil characteristic such as drainage and hydric classification are not generally predicted by USDA-NRCS for altered soils. While classified as Alderwood, the soil is highly disturbed and contains fill from multiple sources. The natural soils of NAVBASE Kitsap Bremerton are the remains of a glacial till, which is characterized by a moderately compacted till layer, 20 - 40 inches below the surface. This is overlaying a very compacted till or hardpan layer that has been identified as an Alderwood soil type which makes up the majority of the soils at NAVBASE Kitsap Bremerton. The Alderwood series consists of moderately deep to a cemented pan, moderately well drained soils, and usually found on glacially modified foothills and valleys with slopes of 0 - 65% (USDA-NRCS 1980). Taxonomic classification for this soil type is loamy-skeletal, isotic, and mesic Vitrandic Dystroxerepts soils. Although these soils are moderately well drained and have moderately rapid permeability to the densic layer (physically root restrictive zone due to soil compaction) and very slow permeability below (USDA-NRCS 1980). Alderwood soils

with a slope from 0 - 6% can be classified as hydric when found near permanent water bodies (USDA-NRCS 1980). The Neilton series is the third soil type found at NAVBASE Kitsap Bremerton and consists of very deep, excessively drained soils that formed in glacial outwash and is often associated with terraces and terrace escarpments. Taxonomic classification for this soil type is sandy-skeletal, mixed, and mesic Dystric Xerorthents soils (USDA-NRCS 1980).

6.1.3.1 Camp McKean

Camp McKean is located on the banks of Kitsap Lake. Besides soils in the Alderwood series, soils next to Kitsap Lake are comprised of soils from the Harstine series. Soils in this series are characterized by a moderately deep to cemented pan, moderately well-draining soils, and usually found in sandy glacial till on uplands. Taxonomic classification for this soil type is coarse-loamy, isotic, and mesic Vitrandic Dystroxerepts type soil (USDA-NRCS 1980). In Kitsap County, Harstine soils are classified as hydric (USDA-NRCS 1980). Just east of Kitsap Lake and slightly higher in elevation are the soils in the Dystric Xerothents soil series. These soils are composed of deep, well-drained soils that formed in glacial till and are situated on the sidewalls of drainages.

6.1.3.2 Sediment Quality

The predominant substrate in Sinclair Inlet proper is mud and muddy sand. Biological communities in Sinclair Inlet are fairly typical of muddy embayments in central Puget Sound, which are primarily depositional environments (URS 1999). Sediments in Sinclair Inlet near NAVBASE Kitsap Bremerton have been placed on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List (Superfund) for metal and organic chemical contamination resulting from industrial operations and other base activities in Sinclair Inlet (USN 2008b). As a result, six operable units have been designated at NAVBASE Kitsap Bremerton for cleanup (USN 2008b).

A summary of the operable units at NAVBASE Kitsap Bremerton is provided in Appendix F.

6.2 Habitats and Communities

6.2.1 Wildlife Habitat

Wildlife habitat on NAVBASE Kitsap Bremerton is limited based on the intensive development that has occurred on the base. The majority of the base is paved and the shoreline consists of quay walls and armor rock, which supports little vegetation growth and offers limited habitat to marine species when compared to undeveloped areas. While natural habitat is highly disturbed, a variety of plant and animal species make their home or migrate through NAVBASE Kitsap Bremerton at different times of the year.

Camp McKean is a recreational facility located along Kitsap Lake. Half of the property has been cleared for personal use and the area uphill of the lake is steeply sloped and forested. The main area of the camp is fenced in, preventing movement of species but the forested area provides

habitat for many birds and mammals. The forested section has a stream that collects stormwater from surrounding areas, but due to excessive slope has been inaccessible by fish.

The Railroad is comprised of forest, streams and wetlands. Most area of the railline is located in remote areas, where the only disturbance was from the railroad. A wetland survey was conducted to along the line to map where possibly wetlands may occur. Additionally, a culvert assessment for fish passage was completed in 2015 to assess the streams that are blocked by railroad culverts.

6.2.2 Wetlands

There are no wetlands within NAVBASE Kitsap Bremerton or on Camp McKean (USN 1994). The Navy Railroad, requiring a sturdy roadbed to support train and freight movement, does not have any wetlands within the boundary of the tracks and track shoulders. However, the rail line crosses many streams, and some have riverine and forested wetland complexes. The Navy has conducted a survey of those immediate wetlands that could be identified and mapped areas along the railroad. This information can be obtained by contacting the NAVBASE Kitsap Bremerton Environmental Department.

6.3 Flora and Fauna

6.3.1 Flora

6.3.1.1 Terrestrial Flora

Terrestrial flora species commonly found on NAVBASE Kitsap Bremerton are similar to species observed in other highly developed areas in Kitsap County. Douglas-fir, western hemlock, western redcedar, and western white pine are the principle native coniferous tree species. Native deciduous tree species include red alder, bigleaf maple, and Pacific madrone. Common native understory plants include Indian plum, elderberry, salmonberry, vine maple, snowberry, rhododendron, sword fern, and salal. Ornamental trees, fruit trees, shrubs, and grasses have been planted in most open area and are maintained under base landscaping contracts. Some landscaping, including shrubs, ivy, and trees are contributing elements to the historic districts in the upland areas of NAVBASE Kitsap Bremerton.

For a complete listing of potentially occurring terrestrial flora found at the NAVBASE Kitsap Bremerton, see Appendix E.

6.3.1.2 Aquatic Flora

Sinclair Inlet shorelines do not support significant populations of aquatic vegetation (URS 1999). Eelgrass does not occur within the inlet or on adjacent shorelines and macroalgae is limited to the photic zone where hard substrates (riprap bulkhead, cobbles, and gravel) are present. The most commonly found species include sea lettuce and kelp (*Ulva* and *Laminaria spp.*).

In 2008, an underwater survey was conducted near Pier B for a proposed construction project. Vegetation observed in the western and central transects included sparse amounts of sea lettuce (*Ulva sp.*) and red algae species (*Porphyra spp.*). Vegetation along the mole wall of Dry Dock 6 was generally in very low abundance and limited to only a few species. Vegetation observed along this transect includes sparse macroalgae growing on riprap and debris and included iridescent seaweed (*Iridaea cordata*) (USN 2008a).

6.3.2 Fauna

6.3.2.1 Invertebrates

Invertebrates that can be found at NAVBASE Kitsap Bremerton include brittle stars (*Amphiodia urtica*), snails (*Odostomia spp.*), sea anemones (*Anthopleura spp.*), shrimp (*Palaemon spp.*), nudibranchs (*Nudibranchia*), sponges (*Porifera*), and sea cucumbers (*Parastichopus californicus* and *Cucumaria spp.*). Rocky and hard intertidal substrates support barnacles (*Balanus* and *Semibalanus spp.*), mussels (*Mytilidae*), limpets (*Lottidae*), and snails (*Gastropoda*) (USN 2008b).

During a 2008 underwater survey to support construction of Pier B (USN 2008a), the following observations were made at Dry Dock 6: marine life within this transect were relatively sparse and indicated a low diversity of marine species using this riprap area adjacent to the mole wall. Marine organisms noted in this area included the California sea cucumber (*Parastichopus californicus*), sea anemone (*Anthopleura sp.*), starfish (*Pisaster ochraceus*), tubeworm (*Serpula vermicularis*), red rock crab (*Cancer productus*), and kelp crabs (*Pugettia producta*). Even though marine species presence was sparse, the selection present appeared healthy and active. The California sea cucumber was the most abundant species observed at the time of the survey. This is likely due to the accumulation of detritus trapped in the interstitial spaces of the riprap along the mole wall footing creating a favorable foraging condition for this species. Observations of marine life within transects along Pier B are very similar to Dry Dock 6 while other areas of the waterfront have extensive growths of barnacles, mussels, tubeworm, anemones, bryozoans, and other epibenthic organisms are present.

For a complete listing of potentially occurring invertebrate species found on NAVBASE Kitsap Bremerton, see Appendix E.

6.3.2.2 Fish and Shellfish

Species of shellfish in Sinclair Inlet include butter clams, gaper clams (*Tresus capax*), littleneck clams, cockles (*Clinocardium nuttallii*), geoducks (*Panopea generosa*), northern horse mussel (*Modiolus modiolus*) and bay mussels. Dungeness crabs (*Cancer magister*), graceful crabs (*Cancer gracilis*), red rock crabs, decorator crabs (*Majidae sp., Oregonia gracilis*, and *Chorilia longipes*), kelp crabs (*Pugettia producta*), snow crabs (*Chionoecetes bairdi*), porcelain crabs (*Petrolisthes eriomerus*), and pea crabs (*Pinnixia schmitti*) (USN 2008a). Mussels (*Mytilus spp.*) are the most frequently occurring shellfish species at NAVBASE Kitsap Bremerton and densely cover many pilings and waterfront structures.

Fish species include English sole (*Parophrys vetulus*), rock sole (*Lepidopsetta bilineata*), lingcod (*Ophiodon elongates), starry* flounder (*Platichthys stellatus*), Pacific tomcod (*Microgadus proximus*), shiner perch (*Cymatogaster aggregata*), pile perch (*Rhacochilus vacca*), Pacific herring, Chinook salmon, coho salmon, chum salmon, steelhead trout, and cutthroat trout (USN 2008a). The littoral zone is generally dominated by shiner perch and juvenile salmon with the open water dominated by juvenile salmon, forage fish, and threespine stickleback. The most abundant fin fish species is rat fish; followed by English sole, skates, sculpins, and flounders (starry & sand).

Gorst Creek, to the southwest of NAVBASE Kitsap Bremerton, supports hatchery produced Chinook salmon. The Gorst Creek hatchery releases over 2 million Chinook salmon every year that pass through Sinclair Inlet. Charleston Beach, along with other local beaches in Sinclair Inlet, can be spawning areas for surf smelt and other forage fish. Ross Point, directly across the Inlet, supports a recreational surf smelt fishery.

A study of the distribution, abundance, size, and trophic relationships of juvenile salmonids in the marine near shore environment of Sinclair Inlet was conducted to increase the understanding of how juvenile salmon use shoreline environments in the Puget Sound (Fresh et al. 2003). The study found that juvenile salmon utilized littoral habitats in Sinclair Inlet from early spring through early fall, and both hatchery and wild juvenile Chinook salmon from throughout the Puget Sound foraged along Sinclair shorelines during late spring and summer. Diet analysis showed that the juvenile Chinook salmon fed on a diverse mixture of aquatic and terrestrial insects, decapod crustaceans, amphipods, polychaetes, and barnacle larvae. Underscoring the importance of the linkage between terrestrial habitats and the near shore environment, about one-third of the juvenile salmon's diet consisted of terrestrial insects and at least fifty insect families were identified in the stomach contents of juvenile salmon. Simulations of the hydrologic and tidal conditions present during the release of hatchery-reared, juvenile Chinook salmon from the Gorst Creek Hatchery (19 May – 30 June, 2002) showed that the out-migrating salmon remained in Sinclair Inlet about a week to 10 days longer than predicted from flushing alone (Washington Department of Health 2003). These results indicate that proper management of the near shore ecosystem is important not only on the local scale but also for the whole region.

At Camp McKean, chum salmon utilize the lower reaches of Kitsap Creek. Coho Salmon use the upper reaches of the creek as well as Kitsap Lake, which provides migratory and first-year habitat. According to WDFW, rainbow trout, largemouth bass, bluegill, and brown bullhead are also present in the lake.

Due to ESA listed species of salmon and the possibility of bull trout within Sinclair Inlet, the in-water work window for Bremerton is: July 16 – February 15.

Fish species found within Un-Named, Johns, Cranberry, Deer, Sherwood, Lake Devereaux, Gorst, Heins, and Jarstad creeks, and the Union River along the USN Railroad include Coho, Chinook, sockeye (*Oncorhynchus nerka*), and chum (*Oncorhynchus keta*) salmonids, and steelhead trout (*Oncorhynchus mykiss*) (USN 2004a).

For a listing of fish and shellfish potentially found at NAVBASE Kitsap Bremerton, see Appendix E.

6.3.2.3 Reptiles and Amphibians

The highly developed nature of NAVBASE Kitsap Bremerton limits habitat for reptiles and amphibians.

For a listing of reptiles and amphibians potentially occurring in the areas surrounding Sinclair Inlet, see Appendix E.

6.3.2.4 Migratory Birds

The industrial nature of NAVBASE Kitsap Bremerton limits the suitable habitat for avian species, though many species of birds can be seen in Sinclair Inlet at different times of the year. The flat rooftops of warehouses along the shoreline are used by great numbers of glaucous-winged gulls throughout the year and as nesting grounds. Since 2003, these flat roofs have also provided nesting grounds for a colony of Caspian terns that damage roofs and prevent work in those areas. To prevent further nesting, USDA Wildlife Services have created a wire grid system with flagging to dissuade Caspian terns from nesting on these roofs.

Species of birds that can be seen in Sinclair Inlet include greater scaups (*Aythya marila*), lesser scaups (*Aythya affinis*), ring-necked ducks (*Aythya collaris*), Caspian terns (*Hydroprogne caspia*), surf scoters (*Melanitta perspicillata*), white-winged scoters (*Melanitta deglandi*), American wigeons (*Anas americana*), Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), common goldeneye (*Bucephala clangula*), mergansers (*Mergus sp.* and *Lophodytes sp.*), and bufflehead. Other abundant species included glaucous-winged gulls (*Larus glaucescens*), mew gulls (*Larus canus*), western grebes (*Aechmophorus occidentalis*), double-crested cormorants (*Phalacrocorax auritus*), Pacific loons (*Gavia pacifica*), American coots (*Fulica americana*), and pigeon guillemots (*Cepphus columba*) (USN 2008a).

Shorebirds and waterfowl can include sandpipers (*Scolopacidae*), dunlins (*Calidris alpina*), snipe (*Gallinago gallinago*), egrets, and great blue herons. Birds of prey include peregrine falcons, bald eagle (*Haliaeetus leucocephalus*), and osprey.

Caspian terns (*Hydroprogne caspia*) are a gull-like species found throughout Washington from the Puget Sound to the Columbia River. While non-breeders can often be seen in small groups, the species is known for its large colonies in Grays Harbor, the Columbia River, and the Dungeness Spit. In the spring of 2003, Caspian terns were first observed in small numbers at NAVBASE Kitsap Bremerton. Caspian terns continued to return each spring in greater numbers with 723 observed in 2006 and close to 1,000 observed in 2007 nesting on the rooftops of buildings 970, 514, and 449. The flat roofs of these buildings provided nesting habitat safe from coyotes and other predators, while Sinclair Inlet offered an abundant food source. The large numbers of Caspian terns, a species protected under the Migratory Bird Treaty Act, created a major disruption to work inside the shipyard, damaged roofs, and created health and safety issues.

To prevent future problems due to nesting Caspian terns, the USDA-Wildlife Services and NAVBASE Kitsap Bremerton developed a strategy using non-lethal methods to discourage birds from nesting on rooftops at NAVBASE Kitsap (Steve Holtom, USDA-Wildlife Services, personal communication). On rooftops where Caspian terns had nested in the past, a wire grid system with Mylar flagging was installed. Effigies of coyotes and wolves were placed on other roofs and additional non-lethal techniques were authorized. The effectiveness of the effigies did

not work as well as the wire grid systems. The wire grid strategy was demonstrated in the summers of 2008 and 2009 as no nests were observed at NAVBASE Kitsap Bremerton. The wire grid strategy continues with repairs to the wire grid system performed annually. Regular monitoring for the presence of Caspian terns, and outreach to NAVBASE Kitsap workers on interactions with wildlife are actively in place. As of 2017, there have been no Caspian terns nesting on roofs at NAVBASE Kitsap Bremerton.

For a complete listing of birds that have been seen or could potentially occur on or near NAVBASE Kitsap Bremerton, see Appendix E.

6.3.2.5 Mammals

Mammals found on NAVBASE Kitsap Bremerton are typical of small mammals found in highly developed areas within Kitsap County and include squirrels, opossums, raccoons, river otters, and the occasional deer. NAVBASE Kitsap Bremerton is currently home to an unknown number of Northern River Otters who have established a burrow in the floating boathouse and docks at Mooring F. The otters use the walkways surrounding the boathouse as a haul out. This use has generated complaints from employees who use the area and must routinely clean excrement from the walkway. While currently a localized issue, if the problems persist or grow worse, NAVBASE Kitsap Bremerton natural resource staff will examine a number of solutions to stop river otters from entering work areas. Initial options will include, but will not be limited to, sealing all openings to burrows and/or work sites and using noise and light as deterrents.

For a complete listing of mammals potentially occurring on NAVBASE Kitsap Bremerton, see Appendix E.

6.3.2.6 Marine Mammals

Marine mammal species that have been observed in the vicinity of NAVBASE Kitsap Bremerton include Pacific harbor seal, California sea lion, gray whale, Dall's porpoise, southern resident killer whale, Steller sea lion, the humpback whale, and harbor porpoise (*Phocoena phocoena*) (USN 2008a). California sea lions and harbor seals are known to utilize the NAVBASE Kitsap Bremerton Port Security Barrier and submarine hulls as haul outs.

6.4 ESA Listed Species

Several ESA listed species have been observed or have the potential to occur at NAVBASE Kitsap Bremerton (Table 6-2) (USN 1994, USN 2008a, USFWS 2009). The only migratory and resident birds observed or with potential to occur are marbled murrelets. No marbled murrelets have been observed at NAVBASE Kitsap Bremerton and no habitat exists on or near the installation. The federally listed Yellow-billed cuckoo has the possibility to be found along the Navy Railroad. They require large blocks of riparian habitat for breeding (particularly woodlands with cottonwoods and willows) and dense understory foliage appears to be an important factor in

nest site selection (USFWS 2011a). Surveys have not been conducted, but consideration is taken during maintenance timing and activities. Sinclair Inlet contains federally listed species of salmonids, including the Puget Sound Chinook salmon and the steelhead. Puget Sound Chinook salmon critical habitat has been designated for Sinclair Inlet. Federally listed bull trout (*Salvelinus confluentus*) have the possibility to be found within Sinclair Inlet. Although very rare, they are still considered in project assessments. In addition, two species of rockfish, Boccaccio, and yelloweye may reside in Sinclair Inlet near NAVBASE Kitsap Bremerton; however, it is very unlikely due to no suitable substrate or habitat. Fish surveys have been recorded to date, with no occurences at Bremerton or associated properties. ESA listed marine mammals that have been known to visit or have the potential to occur in Sinclair Inlet include the southern resident killer whale (rare visitor), and the humpback whale (very rare visitor) (USN 2008a, USN 1994, and USN 2007b). Humpback whales are rare visitors to the Puget Sound.

6.5 Bald and Golden Eagle Act

While no longer listed under ESA, bald eagles are still protected by the MBTA and the Bald and Golden Eagle Protection Act. Currently one active bald eagles nest is being monitored on the facility (Figure 6-2).

Table 6-2: ESA Listed Species Potentially Occurring at NAVBASE Kitsap Bremerton

Common Name	Scientific Name	Site	Federal Status	State Status
Birds				
Marbled murrelet	*Brachyramphus marmoratus*	Bremerton	Threatened	Threatened
Yellow-billed cuckoo	*Coccyzus americanus*	RR	Threatened	Candidate
Fish				
Puget Sound Chinook salmon	*Oncorhynchus tshawytscha*	Bremerton, RR	Threatened	Candidate
Puget Sound Steelhead	*Oncorhynchus mykiss*	Bremerton, RR	Threatened	-
Bull trout	*Salvelinus confluentus*	Bremerton	Threatened	Candidate
Bocaccio	*Sebastes paucispinis*	Bremerton	Endangered	Candidate
Yelloweye rockfish	*Sebastes ruberrimus*	Bremerton	Threatened	Candidate
Mammals				
Humpback whale (Mexico DPS)	*Megaptera novaeangliae*	Bremerton	Threatened	Endangered
Humpback whale (Central America DPS)	*Megaptera novaeangliae*	Bremerton	Endangered	Endangered
Southern resident killer whale	*Orcinus orca*	Bremerton	Endangered	Endangered
Flora				
Howellia	*Howellia aquatilis*	RR	Threatened	Threatened

6.6 Special Management Areas

These areas on NAVBASE Kitsap Bremerton contain natural resources that warrant special conservation or management efforts.

6.6.1 Charleston Beach

Charleston Beach was created in 2001-2002 as mitigation for the construction of Pier D. The beach consists of 12,000 square feet of intertidal habitat along 300 ft of shoreline on the western edge of NAVBASE Kitsap Bremerton. The creation of Charleston Beach included the placement of several feet of fish mix to provide habitat for juvenile salmon and as spawning ground for surf smelt. Along the shoreline, a soft embankment was installed and planted with native species.

The beach has shown substantial success with regular surveys finding evidence of surf smelt spawning. While showing success as spawning grounds, the steep angle of the beach, heavy wave action, and lack of natural sand supply has led to heavy erosion. In 2007, 2010 and again in 2015, much of the fish mix was completely eroded and active erosion of the embankment fill material was occurring. The major area of erosion is along the west end of the beach, while the eastern portion has shown more success with less erosion and establishment of saltwater tolerant vegetation. To mitigate this erosion, the Navy has completed interim repair actions to stabilize the bluff and enhance beach habitat with the placement of fish mix, which is ongoing, until a long-term solution is identified.

6.6.2 Dry Docks

NAVBASE Kitsap Bremerton includes six dry docks managed by PSNS & IMF. These parallel dry docks are arranged along the shoreline, oriented north to south, and open at their south ends to Sinclair Inlet. They are used predominantly for the maintenance and repair of Navy vessels and other assets. A typical dry dock operation includes four major actions: flooding, caisson removal, caisson replacement, and dewatering/pump down. Dry docks are swept, washed, and inspected prior to flooding in accordance with BMPs required by PSNS & IMF's National Pollutant Discharge Elimination System (NPDES) permit. A process-water collection system measures dry dock discharges for turbidity and diverts water to the City of Bremerton sanitary sewer system if the maximum turbidity level is detected. In addition, each dry dock has a bubble curtain installed at each dry dock entrance, which is turned on whenever a caisson is removed. The goal of the bubbles is to divert fish from entering a flooded dry dock.

In 2004, through consultation with NOAA Fisheries, the Navy determined that dry dock operations at NAVBASE Kitsap Bremerton are likely to adversely affect Puget Sound Chinook that may enter the dry dock during caisson removal and may be pumped out during dewatering. An incidental take statement was included in the Biological Opinion specifying Reasonable and Prudent Measures (RPMs) to minimize incidental take.

A new LOA was issued in 2011 following additional consultation with NMFS to continue the RPMs issued in the 2004 Opinion. The RPMs in the 2004 Opinion are still necessary and appropriate to minimize incidental take of all salmonid species, include Puget Sound steelhead. Terms and conditions from the 2004 LOA include proper maintenance of the process water collection system to minimize deleterious contaminants from entering Sinclair Inlet and

minimizing the period that caissons are removed from dry docks during periods of peak junveile salmonid migration, through contacting local tribal and WDFW habitat biologists to determine when migration are occurring. Within the 2011 LOA, there is a condition to document all listed salmonids encountered during dry dock operations. This also included consultation on three (now two) species of ESA listed rockfish, and states that dry dock operations are not likely to adversely affect these species. Puget Sound Steelhead and Souther Resident Killer whale were included in the scope of the Febraury 2011 LOA.

6.6.3 Historic Districts

Located in the uplands of NAVBASE Kitsap Bremerton are four historic housing districts: Officers Row Historic District, Old Puget Sound Radio Station Historic District, the Old Marine Reservation Historic District, and the Old Naval Hospital Historic District. With structures dating back to 1896 and through distinct building eras of World War I and World War II, these districts are highly intact both in their architectural and in their landscaping. Landscaping includes old growth deciduous trees, fruit trees, roses, ivy, and old growth shrubs and vines. The landscaping in these four districts is managed to maintain historical significance in compliance with the National Historical Preservation Act. The Puget Sound Naval Shipyard National Historic Landmark district does not include landscaping or additional vegetation of historic significance. Maps and information concerning historic areas are available from the NRM.

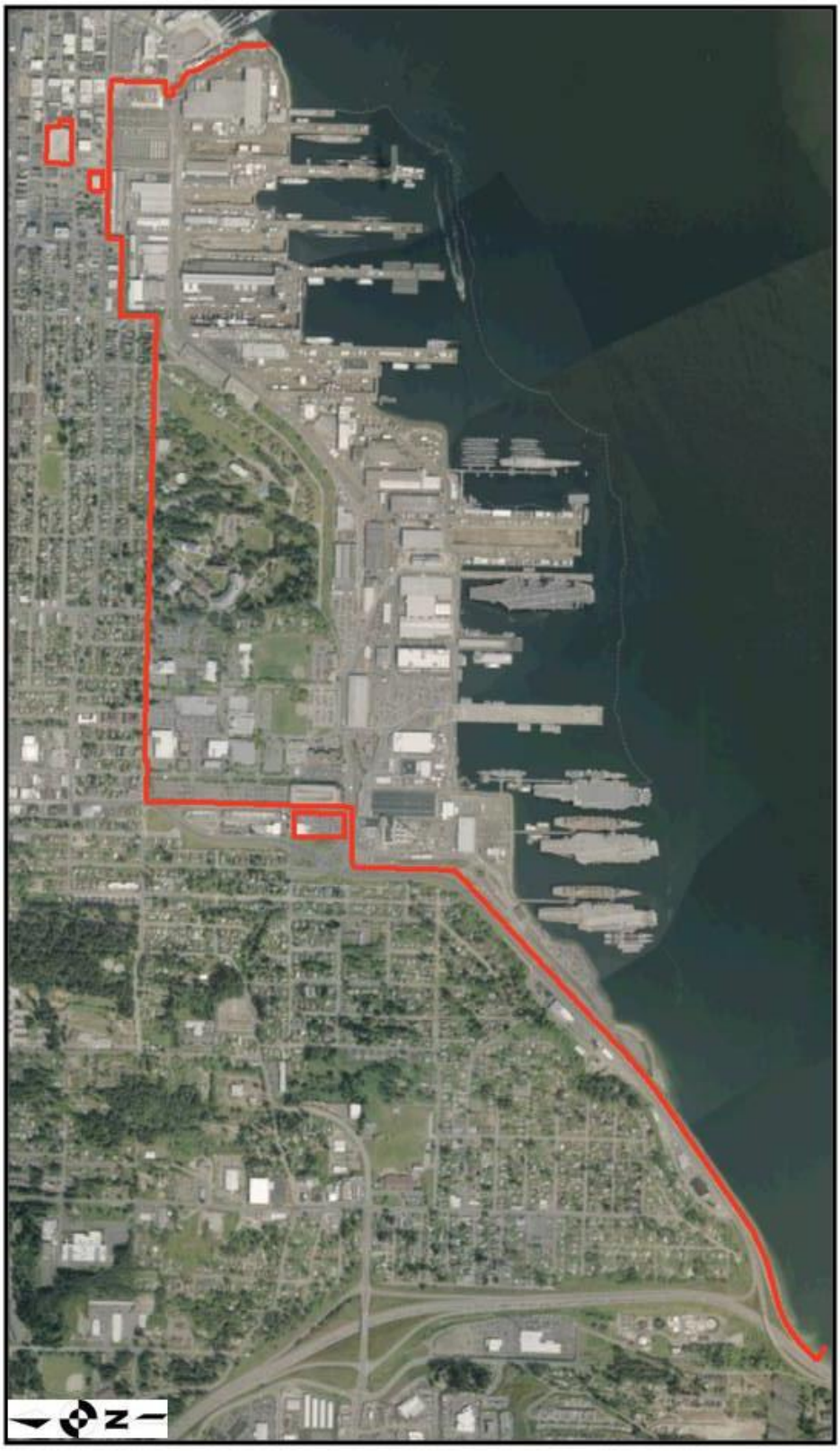

Figure 6-1: NAVBASE Kitsap Bremerton Aerial Photo

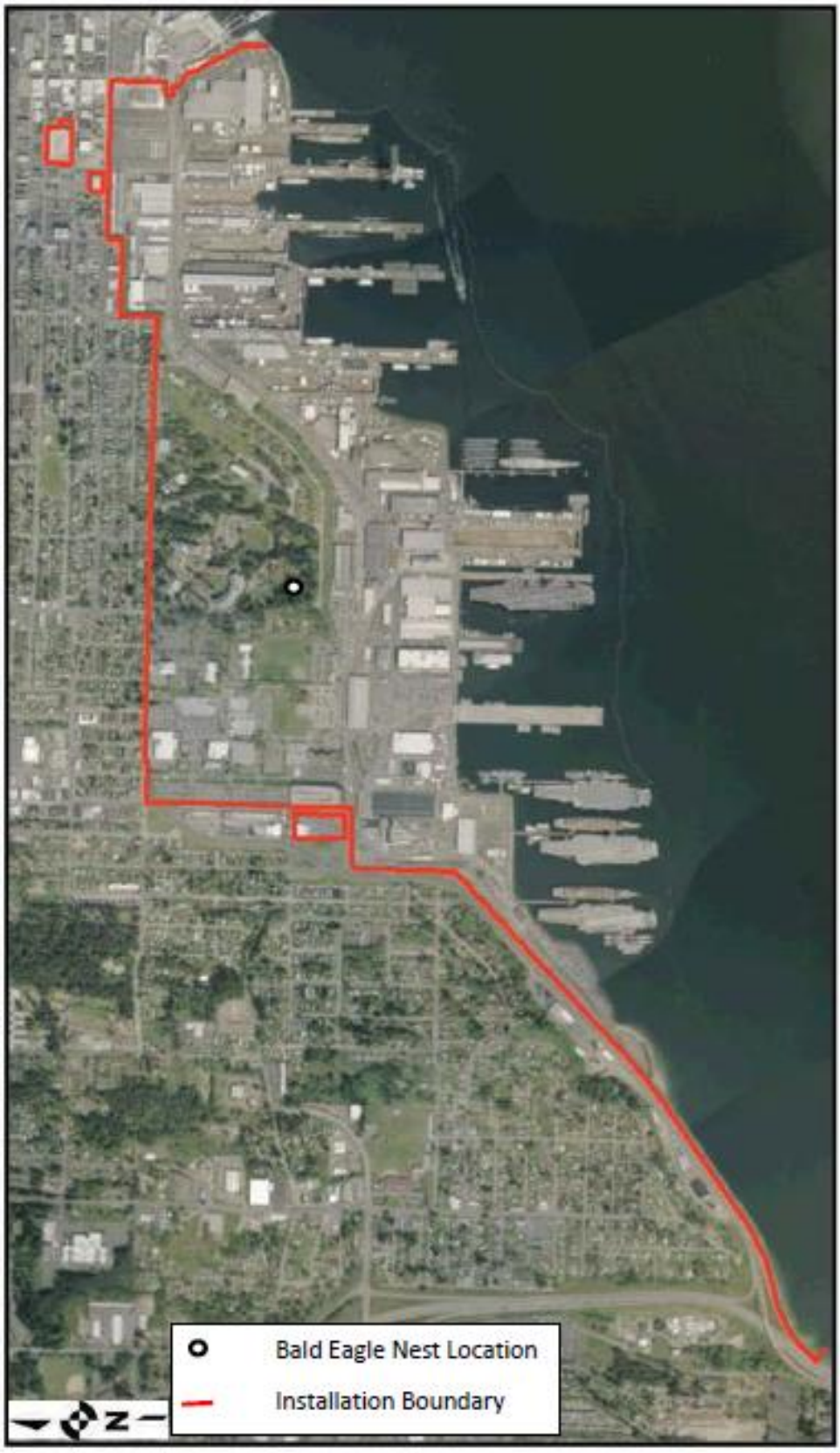

Figure 6-2: NAVBASE Kitsap Bremerton Bald Eagle Nest Location

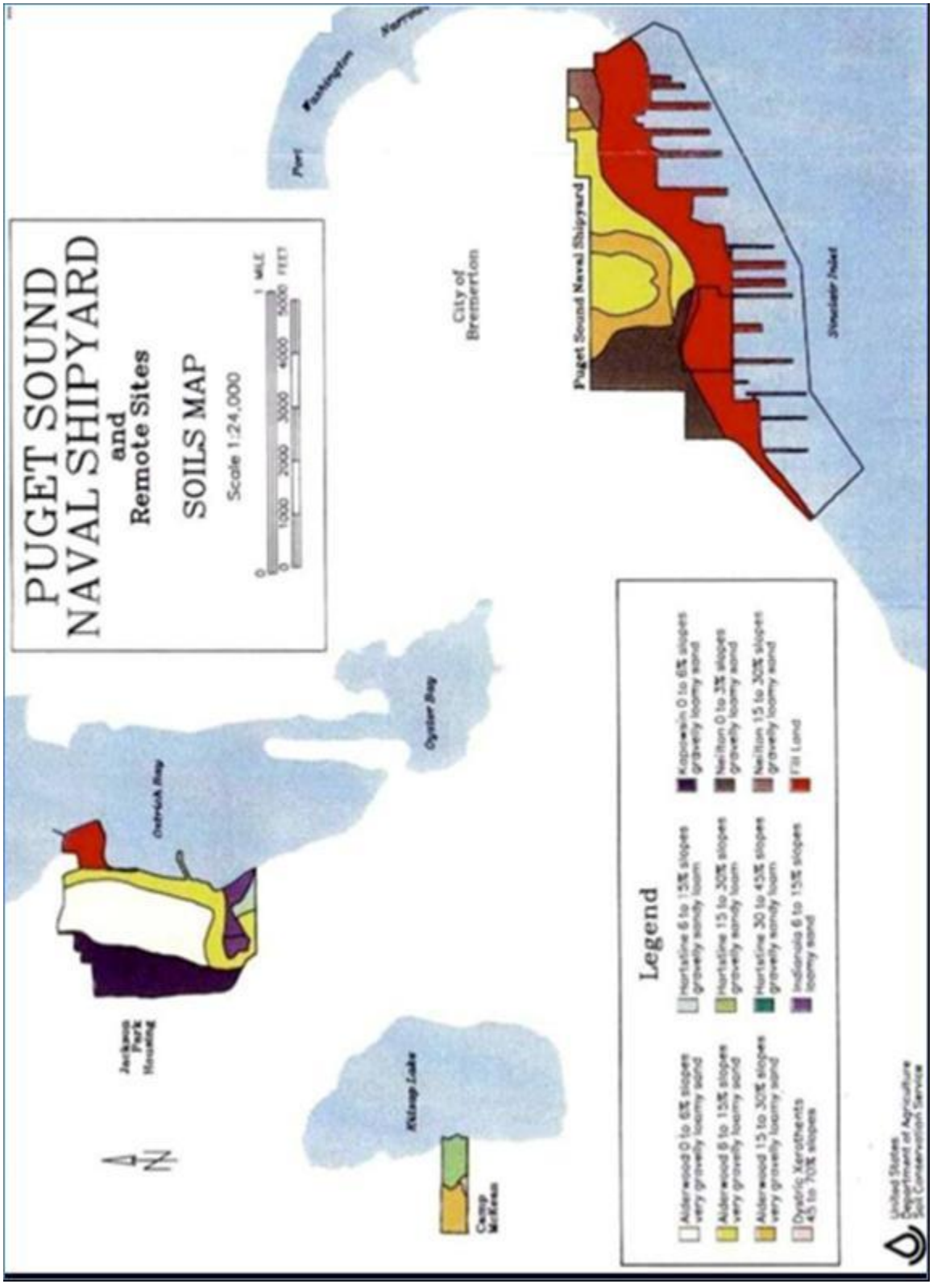

Figure 6-3: NAVBASE Kitsap Bremerton, Camp McKean, and Jackson Park Soils Map

This Page Intentionally Left Blank

7 CURRENT CONDITION OF NATURAL RESOURCES ON JACKSON PARK HOUSING COMPLEX & NAVAL HOSPITAL BREMERTON

7.1 Physical Conditions

Jackson Park Housing Complex and Naval Hospital Bremerton are contiguous to one another along the west shoreline of Ostrich Bay in Kitsap County. Jackson Park is to the south of Naval Hospital Bremerton. Jackson Park Housing Complex is a residential housing facility for Navy and non-Navy families with support facilities that include a conference hall, child development center, store, fire station, and maintenance support facilities. In 2014, the Navy transferred ownership of the Jackson Park Housing to a Public-Private Venture (PPV) (USN 2013) housing program to ensure cost efficiency in compliance with Executive Order (EO) 13423. Naval Hospital Bremerton is the primary Navy health care facility in the Northwest and the only Navy teaching hospital. The hospital is a secondary care facility providing general, clinical, and hospitalization services for eligible active duty, retired military personnel, and their dependents. The mission of Naval Hospital Bremerton is to meet the healthcare needs of the fleet and all eligible beneficiaries within its area of responsibility and to provide graduate medical education for family practice interns and residents.

Before Jackson Park and Naval Hospital Bremerton were constructed in the 1970s and 1980s, the property was used as an ammunition depot where personnel made, cleaned, and destroyed military weapons, ammunition, and maintenance equipment. Waste products from these operations have left behind contaminates on Navy owned property. These areas have been addressed by the Navy's Installation Restoration Program and continue to be monitored.

The site occupies 239 acres with a topography ranging from a relatively flat section along the shoreline of Ostrich Bay to approximately 180 feet above mean sea level at the western edge of the site (USN 2002a) (Figure 7-1). While most of the property has been converted from its original use to suburban style housing and hospital, several of the original buildings remain including bunkers and concrete block buildings that are now used as a fire station, grounds maintenance, and storage. Elwood Point, a sandpit extending east from the shoreline of Jackson Park has long been a place of importance to the Suquamish Tribe who had established seasonal camps above the beach while clam digging, hunting, and fishing in the surrounding area.

7.1.1 Hydrology

Jackson Park and Naval Hospital Bremerton lie within the 184,408-acre Olalla Valley-Frontal Puget Sound watershed of the Puget Sound drainage basin. There are two perennial streams and three intermittent streams at Jackson Park. Two small streams on the south end flow into a

narrow wetland, which drains to Ostrich Bay via a culvert. The other streams flow into culverts that drain to Ostrich Bay.

Ostrich Bay is a small embayment on the south end of Dyes Inlet. Both Dyes Inlet and Ostrich Bay are relatively shallow embayments with an average depth less than 35 feet. The three largest salmon bearing creeks near Jackson Park are Chico Creek, Clear Creek, and Barker Creek. The water circulations within Ostrich Bay are mainly from the tidal current and wind with an average residence time of one to five days. Not including Elwood Point, the majority of the shoreline at Jackson Park is riprapped with one pier, closed to public use, extending into Ostrich Bay.

7.1.2 Water Quality

A 1998 marine water quality monitoring program of the Kitsap County Health District found that 83% of the stations sampled in Dyes Inlet (10 out of 12) met their turbidity standard. The two stations that did not meet their standard were at the mouths of Clear and Chico Creeks. Their higher rates could be explained by the proximity of the stations to stormwater and freshwater outfalls. In most cases, the turbidity levels were far below the threshold that had been previously identified; therefore, turbidity was considered to meet standards in Dyes Inlet.

DO or oxygen saturation is a relative measure of the amount of oxygen dissolved in the water in units of mg/L. The State of Washington has set the standard of DO for Class A marine waters, such as Dyes Inlet, at greater than 6.0 mg/L. Water quality sampling of Dyes Inlet by the WDOE's Puget Sound Ambient Monitoring Program (PSAMP) from January through September 1995 and by the Kitsap County Health District in 1998 found DO levels exceeding the standard level. The only station failing to meet this standard was at the mouth of Clear Creek. Possible explanations could include temperature changes or phytoplankton die-off. Based on these two sources of information, the DO habitat indicator was considered to meet standards in Dyes Inlet.

Due to the relatively dense human population along riparian areas and the former industrial nature of Jackson Park, numerous sources of point and non-point pollution have affected the water quality in Dyes Inlet. As a result, Dyes Inlet is on the WDOE 303(d) List of Contaminated Waters for exceedance of chemicals, such as polychlorinated biphenyls (PCBs), mercury, and zinc. In addition, there have been detectable levels of volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), metals, PCBs, and ordnance compounds in the project area. Barker Creek, Clear Creek, and Dyes Inlet are on the 303(d) list for fecal coliform contamination. Although these rates are lower than past results, the Kitsap County Health District found fecal coliform concentrations exceeding Class A Surface Water Standards at two of their twelve stations (Chico and Clear creeks). The 2000 report (USN 2002a) concludes that, given the numerous chemicals that have been detected and the risk factors that have been identified for Dyes Inlet, the water quality/nutrient indicators may not meet state standards in Dyes Inlet.

7.1.3 Soils

The soils of Jackson Park Housing Complex and Naval Hospital Bremerton are the remains of a glacial till, which is characterized by a moderately compacted till layer, 20 - 40 inches below the surface. This is overlaying a very compacted till or hardpan layer that has been identified as Alderwood soil types which makes up the majority of the soils. The Alderwood series consists of a moderately deep to a cemented pan of moderately well drained soils usually found on glacially modified foothills and valleys with slopes of 0 - 65% (USDA-NRCS 1980). Taxonomic classification for this soil type is loamy-skeletal, isotic, and mesic Vitrandic Dystroxerepts soils. These soils are moderately well drained and have moderately rapid permeability to the densic layer (physically root restrictive zone due to soil compaction) and very slow permeability (USDA-NRCS 1980). Alderwood soils with a slope from 0 - 6% can be classified as hydric when found near permanent water bodies (USDA-NRCS 1980) similar to those soils near Ostrich Bay.

Sediment Quality

Marine surface sediments in Ostrich Bay range from medium and fine sands to silts, with the intertidal and beach zone above MLLW characterized by cobbles and coarse sand. Silts are more common at depths below -20 feet MLLW because the subtidal zone is generally unaffected by winds and tides.

Sediment contamination within Jackson Park waterfront has been documented in a number of studies, resulting in the closure of tidelands of Dyes Inlet to human harvest of shellfish (see USN 2009b for information on these studies). Within Dyes Inlet, clams and crabs have been shown to be contaminated with several compounds, including pentachlorophenol, 3,3-dichlorobenzidine, cadmium, mercury, and silver at concentrations exceeding SQS levels (USN 2009b). Sediments in Dyes Inlet are also listed in the 303(d) *Threatened and Impaired Waterbody List for Kitsap County* for contamination by a variety of chemicals, including bis(2-ethylhexyl)phthalate and mercury. Due to the multiple SQS exceedances reported in previous studies, the sediment contamination indicator is considered an environmental risk for Dyes Inlet (USN 2009b).

7.2 Habitats and Communities

7.2.1 Wildlife Habitat

The habitat characteristics found on and near Jackson Park Housing Complex and Naval Hospital Bremerton encompasses saltwater and freshwater wetlands, forested areas, and residential housing (USDA-SCS 1994). The native plant habitats consist of various coniferous, hardwoods, and understory species such as Douglas-fir, western hemlock, western redcedar, western white pine, red alder, bigleaf maple, Madrona, Indian plum, elderberry, salmonberry, snowberry, huckleberry, and various fern species (USDA-SCS 1994).

7.2.2 Wetlands

Jackson Park Housing Complex contains two small freshwater wetland systems that are characterized as Palustrine and Riverine wetlands (USDA-SCS 1994). The Palustrine System consists of two wetlands located within forested areas of Jackson Park and is the result of waters dammed behind an old concrete structure, culvert, and road (USDA-SCS 1994). The Riverine System includes the wetlands within channels that have moving waters, including the stream located behind the concrete dam impoundment (USDA-SCS 1994). Virtually all of the wooded wetlands at Naval Hospital Bremerton were created from a historic railroad bed/road built by the Navy. The road has been naturally reclaimed and now backs up water to form several wetlands.

In addition, Jackson Park Housing Complex and Naval Hospital Bremerton abut saltwater wetlands that are part of the Estuarine System. They are comprised of deepwater tidal habitats and adjacent tidal wetlands that are somewhat protected from, but have at least partial access to, open waters and occasionally undergo dilution by freshwater runoff (USDA-SCS 1994). A salt marsh (Estuarine intertidal emergent) along the northern end of the shore extends for approximately 60 feet out onto the tidal flat. The vegetation is almost entirely Lyngby's sedge (*Carex lyngbyei*), with some soft-stem tule (*Schoenoplectus tabernaemontani*), and seaside arrowgrass (*Triglocin maritima*) near the forested edge.

7.3 Flora and Fauna

7.3.1 Flora

7.3.1.1 Terrestrial Flora

The upland of Jackson Park and Naval Hospital Bremerton is dominated by mowed grass lawns. The forest habitat at Jackson Park Housing Complex and Naval Hospital Bremerton consists mainly of small, dispersed clumps and urban forests surrounded by maintained lawns. The exceptions to this are the 15 acres of continuous woodlands to the northwest of the main hospital building and a similar sized wooded area on the southern boundary of Jackson Park Housing Complex. Along fringe and undeveloped areas, terrestrial flora species can include Douglas-fir (*Pseudotsuga menziesii*), western redcedar (*Thuja plicata*), beaked hazelnut (*Corylus cornuta*), red alder, and bigleaf maple (USN 2000a). Understory species include salal (*Gaultheria shallon*), soft brome (*Bromus hordeaceus*), salmonberry (*Rubus spectabilis*), sword fern (*Polystichum munitum*), Oregon grape (*Mahonia nervosa*), trailing blackberry, and elderberry (USN 2000a).

Above the intertidal zone, vegetated mats composed primarily of seashore saltgrass and pickleweed occur in some areas, with fat-hen saltbush (*Atriplex prostata*) and saltmarsh sandspurry (*Spergularia salina*) present in certain spots. Still higher are some areas with salt-tolerant species such as Lyngby's sedge; Puget Sound gumweed; and tall pepperweed (*Lepidium densiflorum* Schrad. Var. *elongatum*) mixed with pickleweed, seashore saltgrass, and fat-hen saltbush. Vegetation of Elwood Point is dominated by a grass lawn occasionally used as a sports

field, with shrubby areas and a mixture of large trees. The largest trees are up to 3 feet in diameter. Native species include Douglas-fir, black cottonwood, western redcedar, madrone, and bigleaf maple. Non-native species are also present, notably black locust and holly. English ivy is dense and invasive in some areas.

For a complete list of potentially occurring terrestrial flora observed at Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

7.3.1.2 Aquatic Flora

Wetland flora species can include, cattail (*Typha latifolia*), skunk cabbage (*Lysichiton americanus*), bulrush, water parsley, pickleweed, Pacific silverweed (*Potentilla anserine spp. pacifica*), and slough sedge (*Carex obnupta*) (USN 2000a). Facultative wetland plants can include redtop (*Agrostis gogamtea*), lady fern (*Athyrium filix-femina*), western crabapple (*Malus fuscas*), sedges (*Carex spp.*), rushes, alder, Puget Sound gumweed, saltgrass, saltweed, and Pacific willow (*Salix lasiandra*) (USN 2000a).

In 2000, an expansive bed of drifting and partially buried algae, dominated by *Ulva fenestrata* and *Ahnfeltia spp.* was observed south of Elwood Point in water depths from -0.5 feet to -11.5 feet MLLW. Scattered, but attached *Ulva fenestrata* was observed north of Elwood Point along a more erosional shoreline (Foster Wheeler 2000).

For a complete list of aquatic flora potentially occurring at Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

7.3.2 Fauna

7.3.2.1 Invertebrates

Invertebrates can include ants (family *Formicidae*), sweat bees (family *Halictidae*), jumping spiders (family *Salticidae*), snails (*Littorina spp., Nucella spp.,* and *Polinices spp.*), and hobo spiders (*Tegenaria agrestis*) (USN 2000a).

In 2000, the substrate at depths greater than 12.5 feet MLLW was found to be generally fine grained and covered with a sometimes-dense mat of benthic diatoms. These benthic diatoms were being grazed by a significant population of small sea cucumbers (*Parastichopus califonicus*). The pier supported a luxurious fouling community, including a significant wild population of Mediterranean mussels (*Mytilus edulis galloprovincialis*). Hundreds of Cancer crabs, possibly *Cancer magister*, were observed on the perimeter of the pier foraging on the biological debris raining down from the fouling community (Foster Wheeler 2000). Other species include starfish, gastropods, and burrowing anemone.

For a complete listing of invertebrates potentially occurring at Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

7.3.2.2 Fish and Shellfish

Species of shellfish can include the Pacific oyster, Manila clam, butter clam, bay mussel, native littleneck clam, gaper clam, butter cockle, shrimp (*Pandalus spp.* and *Crangon alaskensis*), and the red rock crab (USN 2000a). Ostrich Bay is under a shellfish closure advisory from the Washington State Department of Health.

Fish species include English sole (*Parophrys vetulus*), rock sole (*Lepidopsetta bilineata*), starry flounder (*Platichthys stellatus*), Pacific tomcod (*Microgadus proximus*), shiner perch (*Cymatogaster aggregata*), pile perch (*Rhacochilus vacca*), Pacific herring, Chinook salmon, coho salmon, chum salmon, steelhead trout, and cutthroat trout (USN 2008a). Nearby Chico Creek supports populations of four salmon species including chum, coho, steelhead, and cutthroat trout with the chum population being one of the largest in South Puget Sound.

For a complete listing of potentially occurring fish and shellfish observed on Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

7.3.2.3 Reptiles and Amphibians

No recent reptile and amphibian survey has occurred at Jackson Park Housing Complex and Naval Hospital Bremerton. Species commonly found in urban areas in Kitsap County, such as the western toad (*Bufo boreas*), rubber boa (*Charina bottae*), red-backed salamander (*Plethodon vechiculum*), ensatina (*Ensatina eschscholtzii*), rough-skinned newt (*Taricha granulosa*), Pacific chorus/treefrog (*Pseudacris/Hyla reglla*), and northern red-legged frog have the potential to occur (USN 2007b).

7.3.2.4 Migratory Birds

The sheltered nature of Ostrich Bay from strong winds and currents combined with nearby forests allows many bird species to live or migrate through the embayment at different times of the year.

Species of birds that may be found on the installation include mallards, American wigeon (*Anas americana*), buffleheads, western grebe, osprey, great blue heron, and gulls (USN 2000b). Other species potentially occurring include greater scaups (*Aythya marila*), lesser scaups (*Aythya affinis*), ring-necked ducks (*Aythya collaris*), Caspian terns (*Hydroprogne caspia*), surf scoters (*Melanitta perspicillata*), white-winged scoters (*Melanitta deglandi*), Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), common goldeneye (*Bucephala clangula*), and mergansers (*Mergus sp.* and *Lophodytes sp.*). Other abundant species included glaucous-winged gulls (*Larus glaucescens*), mew gulls (*Larus canus*), double-crested cormorants (*Phalacrocorax auritus*), Pacific loons (*Gavia pacifica*), American coots (*Fulica americana*), and pigeon guillemots (*Cepphus columba*).

Shorebirds and waterfowl can include sandpipers (*Scolopacidae*), dunlins (*Calidris alpina*), snipe (*Gallinago gallinago*), peregrine falcons (*Falco peregrinus*), bald eagle (*Haliaeetus leucoephalus*), and purple martin (*Progne subis*).

For a listing of birds potentially occurring at Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

Naval Hospital Bremerton has an occasionally used helicopter landing pad to the southeast of the main hospital building. The helicopters may present a danger to birds. The Naval Hospital participates in the Bird Aircraft Strike Hazard (BASH) Program. As a result, the vegetation near the landing-pad has been removed to limit its attractiveness to wildlife. This program promotes land management practices to minimize bird attractants and safety procedures to recognize, control, and avoid hazardous bird concentrations.

7.3.2.5 Mammals

Typical mammal species that may be observed on Jackson Park Housing Complex and Naval Hospital Bremerton are the species that have learned to adapt to areas with high human populations including: Douglas squirrel (*Tamiasciurus douglasii*), Townsend's chipmunk (*Tamias townsendii*), raccoon, deer, vagrant shrew (*Sorex vagrans*), opossum, and the deer mouse (USN 2007b). Marine mammal species that could occur in the vicinity of Ostrich Bay include Pacific harbor seal, California sea lion, gray whale, Dall's porpoise, southern resident killer whale (rare visitor), and harbor porpoise (*Phocoena phocoena*).

For a complete listing of mammals that could potentially occur at Jackson Park Housing Complex and Naval Hospital Bremerton, see Appendix E.

7.4 ESA Listed Species

Several federally listed species have been observed or have the potential to occur at Jackson Park and Naval Hospital Bremerton (Table 7-1) (USN 2000a, USFWS 2009, and WDFW 2009). There have been no observations of marbled murrelets, nor is there old growth habitat potential. The federally listed yellow-billed cuckoo also has the potential to occur at Jackson Park and Naval Hospital Bremerton. They require large blocks of riparian habitat for breeding (particularly woodlands with cottonwoods and willows) and dense understory foliage appears to be an important factor in nest site selection (USFWS 2011a). Surveys have not been conducted, but consideration is taken during maintenance timing and activities.

Ostrich Bay contains federally listed species of salmonids, including the Puget Sound Chinook salmon and steelhead. Puget Sound Chinook salmon critical habitat has been designated for Ostrich Bay. Bull trout are federally listed as threatened and though are unlikely to occur within Ostrich Bay, but will be noted as no formal surveys have been conducted of the waterway. In addition, two species of rockfish (Boccaccio, and yelloweye) have the potential to reside in

Ostrich Bay, though no recent fish survey has recorded their presence and habitat conditions would not suggest their presence. Southern Resident Killer whales and Humpback whale sightings are rare in the south Puget Sound and very rare in Ostrich Bay.

7.5 Bald and Golden Eagle Act

While no longer listed under ESA, bald eagles are still protected by the MBTA and the Bald and Golden Eagle Protection Act. A single bald eagle nest is located adjacent to the Naval Hospital, along the shoreline (Figure 7-2).

Table 7-1: ESA Listed Species Potentially Occurring at Jackson Park Housing Complex and Naval Hospital Bremerton

Common Name	Scientific Name	Federal Status	State Status
Birds			
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	Threatened
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Candidate
Fish			
Puget Sound Chinook salmon	*Oncorhynchus tshawytscha*	Threatened	Candidate
Puget Sound Steelhead	*Oncorhynchus mykiss*	Threatened	-
Bull trout	*Salvelinus confluentus*	Threatened	Candidate
Bocaccio	*Sebastes paucispinis*	Endangered	Candidate
Yelloweye rockfish	*Sebastes ruberrimus*	Threatened	Candidate
Mammals			
Humpback whale (Mexico DPS)	*Megaptera novaeangliae*	Threatened	Endangered
Humpback whale (Central America DPS)	*Megaptera novaeangliae*	Endangered	Endangered
Southern resident killer whale	*Orcinus orca*	Endangered	Endangered
Flora			
Howellia	*Howellia aquatilis*	Threatened	Threatened

Figure 7-1: Jackson Park and Naval Hospital Bremerton Aerial Photo

Figure 7-2: Jackson Park and Naval Hospital Bremerton Bald Eagle Nest Location

This Page Intentionally Left Blank

8 ENVIRONMENTAL MANAGEMENT STRATEGY AND MISSION SUSTAINABILITY

8.1 Supporting Sustainability of the Military Mission and the Natural Environment

The fundamental components of NAVBASE Kitsap's natural resources management program are personnel and funding. OPNAV M-5090.1 requires each installation to have a designated (in writing) NRM, one who is knowledgeable and trained in the particular resource issues for that area or region. At NAVBASE Kitsap, the NRMs occupy permanent, funded positions. These positions ultimately report to the installation CO through the Installation Environmental Program Director (IEPD) and the Public Works Officer (PWO). The NRMs can call upon other environmental professionals within Navy Region Northwest, NAVFAC Northwest, and outside experts or stakeholders to assist in the management of natural resources. The NRMs will integrate environmental protection, conservation, enhancement/restoration, and outdoor recreation within the constraints of the installation's military mission; at the same time, the NRMs will identify risks to the environment that may result from military activities and report these potential risks to the Command so that alternatives may be developed that reduce or eliminate the potential impacts.

8.2 Management Strategy

A past trend in resource management has been to select and manage a single species based on their perceived importance, either as products or commodities or their status as threatened or endangered species. While this approach can be successful in some instances, single-species management, whether a protected marine mammal or an endangered bird, has severe limitations recognized by the scientific and natural resources community. The health of a single species seldom acts as a good surrogate for the health of an entire ecosystem. This type of management often favors a handful of species at the expense of overall ecosystem health. Ecosystem management is a process that considers the environment as a complex system functioning as a whole (multiple species), not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole. The ecosystem management approach has the overarching goal of protecting the properties and functions of natural ecosystems. Over the long term, this approach will maintain and improve the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies and communities. Maintenance of healthy ecosystems supports realistic military training and testing, which in turn promotes mission readiness.

NAVBASE Kitsap's Natural Resources Management Program is based on the premise that responsible stewardship and ecosystem management are synonymous and are compatible with integrated natural resources management. Implementation of any type of management activity

whose impacts are not fully understood should be tied directly to implementation of a corresponding monitoring program. The intent is to integrate management activities with ongoing scientific monitoring to provide reliable data and identify trends and causal relationships including both positive and negative impacts of management activities. Acceptable levels or thresholds of management intensity will be identified for different species, taxa, ecosystems, and associations. The management guidelines and prescriptions in an installation's INRMP will be revised periodically as site-specific data become available. The INRMP is developed to provide ongoing management direction based on scientific data and a higher level of knowledge of the installation's ecosystems and their inter-relationships. The goal of this INRMP is to bring together and integrate all management activities (e.g., forestry and wildlife management) in a way that sustains, promotes, and restores or enhances the health and integrity of the ecosystems. Integrated ecosystem management is sound stewardship, and will enusure, over the long-term, the maximum return of ecosystems goods and services at minimum cost to the Navy's mission.

8.2.1 Early Review and Risk Assessment

Early review of proposed construction actions and the assessment of environmental risk are done by the installation's review process. This requires that all new projects, programs, and operations, or changes to existing projects, programs, and operations be reviewed by the Environmental Division staff for potential impacts to the environment including potential impacts to natural resources. The NRMs at NAVBASE Kitsap will review planned actions, assess the risks to natural resources, and provide comments and/or alternatives to the action proponents that will minimize or eliminate the risks, if possible. The early review process also allows the installation an opportunity to identify the appropriate NEPA documents that will be generated based on the proposed action and the alternatives.

8.2.2 Restoration and Enhancement of Resources

Restoration or enhancement of natural resources is planned and carried out through several different methods with projects that range from control of invasive species to beach and wetland restoration. NRMs coordinate with the public works staff to identify areas for weed control or native planting as discussed in the Grounds Maintenance section in Chapter 3. Other projects are identified by the NRM or Natural Resources staff as standalone projects with funding requested through sources identified in Section 9.4.

A large number of restoration projects are part of larger construction projects that provide the opportunity to enhance or restore wetlands, riparian areas, or wildlife habitat. Examples include replacing undersized culverts to ensure fish passage and revegetating disturbed lands with native plantings. The NRM will work with project managers as early as possible in the design phase to ensure opportunities for restoration or enhancement of natural resources are fully utilized.

Additional restoration is required under federal law for projects impacting wetlands, waterways, or Tribal Treaty rights. The size and effort of these efforts are dictated by the impact of the

project and must be approved by the regulatory agencies involved. Previous projects include beach and lagoon restorations, scientific studies, and interpretive displays.

8.2.3 Adaptive Management

Ecosystem management calls for enhanced efforts to understand complexity, to open up to new ideas and challenges, and to incorporate a broad diversity of perspectives into thoughtful, multidisciplinary management. Managers know enough about broad patterns of ecological systems to initiate well-considered management plans in an experimental fashion, monitor early results of those plans, and then modify them as more information accumulates. This process is known as adaptive management. Adaptive management is more than just monitoring the effectiveness of management actions. It requires that the assumptions underlying a management approach, as well as expected outcome, be made explicit before action is taken. Adaptive management involves establishing a hypotheses and a framework for analyzing differences between expected and observed outcome. Adaptive management is also about experimentation and probing ecosystems to understand how they operate.

8.3 Natural Resources Consultation Requirements

NEPA and Navy policy require early review and coordination for environmental considerations. This is achieved by the installation's environmental review process, which requires all new projects, programs, and operations, or changes to existing projects, programs, and operations be reviewed by the NRMs for potential impacts to the environment, including potential impacts to natural resources. The NRMs review planned actions, identify the risks to natural resources, and provide comments and/or alternatives to the action proponents that will minimize or eliminate the risks, if possible. The early review process also allows the NRMs an opportunity to work with other Navy personnel to identify the appropriate environmental documents that will be generated based on the proposed action and the alternatives.

The potential large amount of time needed to conduct consultations with regulatory agencies and stakeholders makes it imperative to initiate early environmental/natural resources review of proposed actions in order to assess risks, develop alternatives, and correctly identify mitigation costs in terms of both time and dollars. Regulatory agencies and/or affected parties may request changes or mitigation that could result in delays and additional costs. NRMs shall participate in early review of proposed actions in order to assess risks, develop alternatives, and correctly identify mitigation costs in terms of both time and dollars

8.3.1 Species Consultation Requirements

8.3.1.1 Threatened and Endangered (T&E) Species Consultations

Federal agencies are required by the Endangered Species Act (ESA) to manage federally listed threatened and endangered (T&E) species and their habitat in a manner that promotes conservation of T&E species and is consistent with species recovery plans. Section 7 of the ESA

requires all federal agencies to enter into consultation with the USFWS and NMFS whenever proposed actions may affect listed T&E species of plants and animals. Proposed projects, operations, or other actions are scrutinized for potential impacts to T&E species through a formal review process. ESA Section 7 consultations will be initiated if warranted, otherwise, written documentation that there are no effects to T&E species will be generated by the Natural Resources Manager and kept with the project files. The Natural Resources Manager will use this INRMP as a tool to identify the potential impacts of planned Navy actions on endangered or threatened species at an early stage and to provide a basis for altering the action to prevent or minimize those impacts. All injured or deceased T&E species observed on or adjacent to NAVBASE Kitsap will be reported to the appropriate State or Federal wildlife agency.

Risk to military mission: USFWS or NMFS (or both) may require changes or mitigation that could result in delays and additional costs. Because of this, it is imperative that the Command initiate early environmental/natural resources review of proposed actions, in order to assess risks, develop cost-effective alternatives, and correctly identify mitigation costs both in terms of time and dollars.

8.3.1.2 Essential Fish Habitat (EFH) Consultations

The Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the U.S. Secretary of Commerce (which has been delegated to NMFS) on any action proposed to be undertaken that may adversely affect essential fish habitat (EFH). The objective of this EFH assessment is to determine whether or not the proposed project may adversely affect designated EFH for relevant commercial, federally managed fish species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed project. At each installation, proposed projects, operations, or other actions, are scrutinized for potential impacts to T&E species and EFH through a formal review process. Section 7 consultations will be initiated if warranted, otherwise, written documentation that there are no effects to T&E species will be generated by the NRM and kept with the project files. EFH impact review will be consolidated with the ESA review and combined with ESA consultation documents sent to NMFS when possible. For projects that may adversely affect EFH habitat and not T&E listed species, the EFH consultation will be sent with a determination of no effect for ESA listed species. The timeframe for completion of an ESA/EFH consultation can range from 30 days for an informal consult to over 6 months for a formal consult.

Risk to military mission: NMFS may require changes or mitigation that could result in delays and additional costs. Because of this, it is imperative that NAVBASE Kitsap initiate early environmental/natural resources review of proposed actions, in order to assess risks, develop cost-effective alternatives, and correctly identify mitigation costs both in terms of time and dollars.

8.3.2 Marine Mammal Protection Consultation

The Marine Mammal Protection Act (MMPA), subject to limited exceptions, prohibits any person, (including federal agencies) or vessels subject to the jurisdiction of the United States from "taking" marine mammals on the high seas, in U.S. waters, or on land under U.S. jurisdiction. "Taking" includes the "harassment" of a marine mammal. Section 101(a)(5) of the MMPA directs the Secretaries of Commerce and Interior to allow upon request, the incidental (but not intentional) taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing) within a specified geographical region if certain findings are made and regulations are issued. Permission may be granted to "take" marine mammal(s) incident to Navy activities if the regulatory agencies Secretary determine that the Navy action:

a) Will have a negligible impact on the species or stock(s); and

b) Will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses.

Marine mammals may also be subject to the ESA requirements discussed in Section 3.6.1.

The installation NRMs will review planned construction projects or operations that have an in-water component to them such as pile driving, removal, demolition, or dredging, and the potential for marine mammals to be present in the vicinity of the action area. If projects are identified and marine mammals are present, the NRMs will determine if an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) is required for the action. LOAs are issued for up to 5 years and IHAs for 1 year or less; however, NMFS needs more time to issue LOAs than IHAs. If an IHA or LOA is required, additional coordination with NAVFAC Northwest may be required to ensure the proper level of NEPA documentation is obtained.

The MMPA requires a consultation and application to obtain an IHA or LOA through the NMFS headquarters in Washington D.C. The MMPA website notes that it takes 6-9 months for NMFS to issue an IHA and 12-18 months to issue an LOA.

8.4 Planning for National Environmental Policy Act Compliance

The NEPA of 1969 (42 USC § 4321 et seq.) requires federal agencies to evaluate the impacts of their proposed actions on the quality of the human environment. The Navy's policies regarding NEPA including OPNAV M-5090.1, Secretary of the Navy Instruction (SECNAVINST) 5090.6A, *Environmental Planning for Department of the Navy Actions* (26 April 2004), and *Navy's Supplemental Environmental Planning Policy* (23 September 2004), echo NEPA and emphasize environmental planning at the earliest stages of projects. The Navy recognizes that the NEPA process includes the systematic examination of the likely environmental consequences of implementing a proposed action. To be an effective decision-making tool, the Navy integrates the process with other Navy-Marine Corps project planning at the earliest possible time. This

ensures that planning and decision-making reflect environmental values, avoid delays, and avoid potential conflicts. The Navy is able to achieve its mission at home, at sea, and abroad more efficiently when environmental planning is properly integrated into Navy decision-making for those Navy actions that have the potential for adverse environmental consequences.

The NRMs are not exempt from the review process, or from the requirements of NEPA. For example, commercial logging actions must be reviewed for environmental risks and impacts. The process is the same as if the proposed action is a building project or a new training operation.

Impacts to the military mission: Alternatives to proposed actions must be identified and investigated for projects that require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). This translates into time and money, and because of this, it is imperative that the installation's Command initiate early environmental/natural resources review of proposed actions, in order to assess risks, develop alternatives, and correctly identify mitigation costs both in terms of time and dollars.

8.5 Coordination and Planning for Construction and Facility Maintenance

Planning actions are reviewed for natural resource implications. Common facility maintenance actions are assessed during the proposal review. This ensures that the installation is in compliance with environmental laws and regulations, and provides feedback for length of time to receive permits, and conflicts with natural resources issues that may have been overlooked. For in-water maintenance projects that require a permit from the US Army Corps of Engineers, ESA and EFH consultations must be completed prior to permit request.

When maintenance is not reviewed upfront, then maintenance actions are reviewed as a project. Required permits and consultations are identified during this project review and actions are documented in this manner.

Major construction projects (MILCONs) are reviewed during the project development. At this time NEPA planning and processing is occurring to identify environmental elements that may affect the scope, schedule, and budget. Early communication between action proponents and NRMs is vital in order to ensure a thorough review of the project alternatives and to enable NAVFAC Northwest planners to secure funding for NEPA actions.

8.6 Public Access and Outreach

Use of recreation areas on NAVBASE Kitsap installations (within access limited sites) are limited to military, civilian employees of DOD, and retired military, including their dependents, relatives, and guests. Sponsors must accompany dependants, relatives, and guests. General civilian use of the installation is not permitted at this time. Tribal access is addressed through separate agreements.

Successful implementation of this INRMP relies upon educating and raising awareness about protecting and enhancing the natural environment among NAVBASE Kitsap residents, tenants, and employees. Public outreach regarding natural resources is typically accomplished through the installation Public Affairs Office. Outreach activities include participation with Earth Day events and invitations to local officials and newspapers to view restoration or protection measures. Additional Navy publications such as The Salute and Currents newsletter can be utilized for outreach and natural resources education.

8.7 Beneficial Partnerships and Collaborative Resource Planning

The NRM will maintain contact with the DoD Partners in Flight (PIF) program and Partners in Amphibian and Reptile Conservation (PARC) program to stay situationally aware of project and program opportunities as they develop. USDA Wildlife Services provides support for pest issues where animals may need to be removed from the installations.

8.8 Outdoor Recreation

NAVBASE Kitsap provides some outdoor recreation opportunities for military personnel, their families, and DOD civilian employees. To encourage outdoor recreation, NAVBASE Kitsap operates an active outdoor recreation and rental equipment program with organized boating trips, skiing, and hiking activities. People and social uses/needs are an integral part of ecosystem management. The outdoor recreation program is based on providing quality experiences while sustaining ecosystem integrity. Among the outdoor recreation activities provided are recreational fields, tennis courts, picnic areas, hiking, jogging, cycling, fishing, and wildlife viewing. Security requirements limit the geographical extent of these activities to certain areas. Unfortunately, high levels of recreational use can have negative impacts on the environment so constant monitoring of recreational use is necessary to ensure permanent damage to the natural and cultural resources does not occur.

Camp McKean is available for summer day use in support of Navy commands and authorized Fleet & Family Readiness patrons. The site includes a seasonal swimming beach, large pavilion, gazebo, upper picnic field with two shelters, restrooms, fire rings, BBQ grills, children’s playground, fishing pier, boat dock, sand volleyball court, and horseshoe pits. Boats carried from the parking lot to the beach are allowed to launch, all other boats can use the public boat launch found on the south end of the lake. Unless an area is reserved, all park areas (except the pavilion) are available on a first come, first served basis. Facility reservations are made at Pacific Edge Outfitters.

8.9 Law Enforcement

Several organizations on NAVBASE Kitsap provide enforcement capability to help ensure compliance with laws, regulations, and management initiatives. Violations documented by NAVBASE Kitsap organizations responsible for compliance are reported in accordance with

existing regulations to the appropriate state or federal agency. Violations are referred to the NAVBASE Kitsap CO for determination regarding investigation, adjudication, and corrective and/or punitive action. Law enforcement aboard NAVBASE Kitsap associated with individual actions beyond official federal duties, including poaching, is the responsibility of base security or other entity as directed by the CO and with technical assistance from the IEPD and NRM. Occasionally, the services of state and federal fish and wildlife agency or other regulatory enforcement personnel are involved where their technical expertise or manpower is needed.

8.10 State Wildlife Action Plans

As a stakeholder in the management of natural resources on the installation, WDFW works closely with NAVBASE Kitsap on various fish and wildlife conservation issues, ranging from onsite habitat protection to invasive species control. WDFW also cooperates with the installation on developing and conducting wildlife and habitat research and surveys.

8.11 Encroachment Action Plan

Because growth continues to surround the installations, the potential for the community to impact and to be impacted by the Navy increases. In addition, demands on Navy facilities, transportation networks, utilities, and natural resources often accompany increasing density inside and outside the fence (NAVFAC Northwest, April 2010). To learn more about the specific encroachments issues and other encroachment details please refer to the NAVBASE Kitsap Encroachment Action Plan. Use of an In-Lieu-Fee (ILF) Program is the Navy's preferred compensatory mitigation for unavoidable impacts to aquatic resources from proposed actions that may encroach upon the community.

8.12 Achieving No Net Loss of the Military Mission

Implementation of this INRMP by NAVBASE Kitsap will ensure proper management of natural resources while maintaining no net loss to the military mission of NAVBASE Kitsap, as well as providing for "environmentally wise" growth, development, and redevelopment activities. Supporting the elements contained within this plan will require not only that the INRMP be implemented but that development is conducted in an environmentally sensitive way with cooperation between environmental, engineering, operational, and planning personnel.

8.13 Natural Resources Personnel Training

Training for natural resources personnel is vital to ensuring that NAVBASE Kitsap staff are knowledgeable and kept abreast of current natural resources laws, regulations, and guidance. NAVBASE Kitsap natural resources personnel would benefit from attending professional conferences and meetings including the annual National Military Fish and Wildlife Association conference, regional natural resources seminars and training, Geographic Information System (GIS) classes, and training related to management of wetlands, forests, and invasive species.

Training needs for the NAVBASE Kitsap NRMs will be assessed on an annual basis in coordination with their supervisors. OPNAV M-5090.1, section 12-3.15 lists the minimum training requirements that are required by all NRMs to complete. Funds for natural resources training will be allocated on an as-needed basis.

8.14 GIS, Data Integration, Access & Reporting

The US Navy Geographic Readiness Exchange (GRX) currently provides general mapping resources for site planning purposes. Currently, data coverage of Natural Resource media is limited. It is currently necessary to "data mine" for datasets and coverage from other public sources in order to improve the utility of GIS for natural resource management purposes and as a tool to enable informed decision making. A spatial data standard has been developed to ensure contracts have consistent information regarding these tasks, as provided below:

Data development, mining and integration will be an on-going effort. As the INRMP is expanded and adapted to accommodate information and objectives new data requirements will become apparent. Data and analysis developed will be archived and maintained by GRX.

Given the adaptive nature of natural resource management, there are sometimes several concurrent scientific efforts underway to evaluate, describe, classify, and manage resources, processes, and measures. Eventually, certain standards will become favored and may be either entirely new or replace and succeed a previous standard. This has GIS implications.

8.15 Natural Resources Management Goals and Objectives

The following goals detail the overall natural resources management elements at NAVBASE Kitsap and provide specifics on natural resource constituents found at each installation as identified in the previous sections. The general philosophies and methodologies used throughout the NAVBASE Kitsap natural resources management program focus on conducting required military activities while maintaining ecosystem viability. These goals are supported by objectives and projects, which provide management strategies and specific actions to achieve these goals. The following list of goals and supporting objectives along with the projects identified in Appendix D of this INRMP willensure the success of the military mission while conserving natural resources:

Goal 1: Protect, sustain, and enhance the natural resources at NAVBASE Kitsap to ensure that these resources are maintaining ecological integrity, while supporting existing and future military needs with no net loss.

Objective 1.1 *Manage for no net loss in NAVBASE Kitsap's capability to support the military mission.*

Objective 1.2 *Sustain and enhance healthy wetland, riparian, and shoreline areas and buffers.*

Objective 1.3 Redesign existing landscaped areas so they are low-maintenance. Incorporate native trees, shrubs, and herbaceous plants where appropriate. Selection of plant species used in landscape design should be drought tolerant to limit need for irrigation after establishment.

Objective 1.4 Prioritize areas with invasive species for eradication and subsequent restoration with native plants.

Objective 1.5 Protect soil resources from erosion through prevention and control practices.

Objective 1.6 Minimize the amounts of fertilizers, nutrients, and pesticides applied on NAVBASE Kitsap.

Objective 1.7 Assess and enhance the biological conditions of aquatic and terrestrial ecosystems.

Objective 1.8 Promote and implement alternative stormwater management approaches, including low impact development, to minimize adverse impacts of surface runoff from impervious areas. Maintain or mimic natural systems when possible.

Objective 1.9 Promote management practices to control the damage caused by feral animals and nuisance wildlife, both to NAVBASE Kitsap facilities and to sensitive wildlife populations.

Objective 1.10 Ensure compliance with the Federal Endangered Species Act, the Migratory Bird Treaty Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the Marine Mammal Protection Act in all construction, maintenance, operations, and landscaping activities at NAVBASE Kitsap.

Objective 1.11 Review all planned construction projects for natural resources impacts. The review will focus on meeting the goals and objectives of this INRMP.

Goal 2: Increase awareness of natural resource issues, programs, and responsibilities for sustaining natural resources among the public and NAVBASE Kitsap employees, residents, and tenants.

Objective 2.1 Provide opportunity for Tribal consultation on the INRMP.

Objective 2.2 Conduct annual INRMP metrics meetings with USFWS, WDFW, and NMFS.

Objective 2.3 Provide information on base wide natural resource initiatives to NAVBASE Kitsap employees, residents, and tenants (e.g., Earth Day activities).

Goal 3: Integrate the NAVBASE Kitsap natural resources program with local, state, and regional environmental programs and initiatives to sustain biodiversity and the ecosystem to the maximum extent practicable while meeting the needs of the military mission.

Objective 3.1 Partner with local city, county, and tribal governments and with non-governmental organizations for natural resource enhancement projects.

Objective 3.2 Partner with state and federal agencies for natural resource projects.

Goal 4: Provide sustainable natural resources-related outdoor recreation opportunities.

Objective 4.1 Provide quality outdoor recreation experiences through the trails, picnic areas, and fishing areas while sustaining ecosystem integrity.

Goal 5: Improve natural resources management and compliance through enhanced management tools.

Objective 5.1 Maintain or acquire adequate funding and resources to ensure natural resources staff have access to Global Positioning System (GPS) units, GIS support, and training.

Objective 5.2 Maintain existing data layers with the most up-to-date natural resources data and develop layers for natural resources data not currently in the base GIS database.

This Page Intentionally Left Blank

9 IMPLEMENTATION

9.1 Project Prescription Development

The most recent policy on INRMP implementation is contained in DOD Manual 4715.03: *Integrated Natural Resources Management Plan (INRMP) Implementation Manual* (Nov 2013). According to this guidance, an INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for natural resources management projects, activities and other requirments in support of goals, and objectives identified in the INRMP;
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP;
- Invite annual feedback from the appropriate cooperating offices on the effectiveness of the INRMP;
- Documents specific INRMP accomplishments undertaken each year; and
- Evaluate the effectiveness of past and current management activities and adapting those activities as needed to implement future actions.

Key elements of INRMP implementation (e.g., projects) are addressed in Appendix D, NAVBASE Kitsap INRMP Projects, Schedules and Implementation Table. All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 USC 1341 et seq.).

9.2 Priority Setting and Funding Classification

Project priority within this INRMP is initially determined by funding classification, as defined in Department of Defense Instruction 4715.03, *Natural Resources Conservation Program* as follows (DOD 2011):

> ***1. Recurring Natural Resources Conservation Management Requirements.*** *Includes activities needed to cover the recurring administration, personnel, and other costs associated with managing DOD's natural resource conservation program that are necessary to meet applicable compliance requirements* (*federal and state laws, regulations, Presidential [Executive Orders] EOs, and DOD policies*) *or which are in direct support of the military mission.*

Priority will be given to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, as well as annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and recordkeeping, maintenance of natural resources conservation equipment, and compliance self-assessments.

***2. Non-Recurring Natural Resources Management Requirements**. Non-recurring requirements will be prioritized using the below classifications:*

***a**. Current Compliance. Includes installation projects and activities to support:*

***(1)** Installations currently out of compliance (e.g., received an enforcement action from an authorized Federal or State Agency or local authority).*

***(2)** Signed compliance agreement or consent order.*

***(3)** Meeting requirements with applicable Federal or State laws, regulations, standards, E.O.s, or DOD policies.*

***(4)** Immediate and essential maintenance of operational integrity or military mission sustainment.*

***(5)** Projects or activities that will be out of compliance if not implemented in the current program year. Those activities include:*

***(a)** Environmental analyses for natural resources conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources.*

***(b)** Planning documentation, master plans, compatible development planning and INRMPs.*

***(c)** Natural resources planning level surveys.*

***(d)** Reasonable and prudent measures included in incidental take statements of biological opinions, biological assessments, surveys, monitoring, reporting of assessment results, or habitat protection for listed, at-risk, and candidate species so that proposed continuing actions can be modified in consultation with the USFWS or NMFS.*

(e) *Mitigation to meet existing regulatory permit conditions or written agreements such as those required in chapter Title 33 USC, Chapter 26.*

(f) *Nonpoint source pollution or watershed management studies or actions needed to meet compliance dates cited in approved State coastal nonpoint source pollution control plans, as required to meet consistency determinations consistent with Coastal Zone Management.*

(g) *Wetland delineation critical for the prevention of adverse impacts to wetlands so that continuing actions can be modified to ensure mission continuity, as required by chapter Title 33 USC, Chapter 26.*

(h) *Compliance with missed deadlines established in DOD executed agreements.*

b. Maintenance Requirements. *Includes those projects and activities needed to meet an established deadline beyond the current program year and maintain compliance. Examples include:*

(1) *Compliance with future deadlines.*

(2) *Conservation, GIS mapping, and data management to comply with Federal or State laws, regulations, standards, E.O.s, or DOD policies.*

(3) *Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives.*

(4) *Wetlands enhancement to minimize wetlands loss and enhance degraded wetlands as required by chapter Title 33 USC, Chapter 26.*

(5) *Conservation recommendations in biological opinions issued pursuant to ESA.*

c. Enhancement Actions Beyond Compliance. *Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or E.O., and are not of an immediate nature. Examples include:*

(1) *Community outreach activities, such as International Migratory Bird Day, Earth Day, National Public Lands Day, Pollinator Week, and Arbor Day activities.*

> ***(2)*** *Educational and public awareness projects, such as interpretative displays, oral histories, Watchable Wildlife areas, nature trails, wildlife checklists, and conservation teaching materials.*
>
> ***(3)*** *Restoration or enhancement of natural resources when no specific compliance dictates a course or timing of action.*
>
> ***(4)*** *Management and execution of volunteer and partnership programs.*

To further facilitate project funding, the Navy has developed four Environmental Readiness Levels (ERL) (DON 2014a). Descriptions of each of the four Navy ERLs are described below (USN 2006a).

a. Environmental Readiness Level 4 (absolute minimum level of environmental readiness capability required to maintain compliance with applicable legal requirements):

1. Supports all actions specifically required by law, regulation or Executive Order (DOD Class I and II requirements) just in time.
2. Supports all DOD Class 0 requirements as they relate to a specific statute such as hazardous waste disposal, permits, fees, monitoring, sampling and analysis, reporting and recordkeeping.
3. Supports recurring administrative, personnel, and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (DOD Class 0).
4. Supports minimum feasible Navy executive agent responsibilities, participation in [Office of the Secretary of Defense] OSD sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.

b. Environmental Readiness Level 3:

1. Supports all capabilities provided by ERL4.
2. Supports existing level of Navy executive agent responsibilities, participation in OSD sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.
3. Supports proactive involvement in the legislative and regulatory process to identity and mitigate requirements that will impose excessive costs or restrictions on operations and training.
4. Supports proactive initiatives critical to the protection of Navy operational readiness.

c. Environmental Readiness Level 2:

1. Supports all capabilities provided under ERL3.

2. Supports enhanced proactive initiatives critical to the protection of Navy operational readiness.
3. Supports all Navy and DOD policy requirements.
4. Supports investments in pollution reduction, compliance enhancement, energy conservation, and cost reduction.

d. Environmental Readiness Level 1:

1. Supports all capabilities provided under ERL2.
2. Supports proactive actions required to ensure compliance with pending/strong anticipated laws and regulations in a timely manner and/or to prevent adverse impact to Navy mission.
3. Supports investments that demonstrate Navy environmental leadership and proactive environmental stewardship.

9.3 Project Development and Tracking

Once identified, natural resources projects and funding allocations are tracked via the Navy Environmental Program Requirements Web Database (EPRWeb) (USN 2006b). The Navy uses the database to determine programming and budgeting requirements for projects under the Planning, Programming, Budget, and Execution System (PPBES) process (DON 2014a). The Navy also uses the database information to develop its annual Environmental Quality Report (EQR) for Congress (DON 2014a).

Natural resources management projects identified in Appendix D of this INRMP will be entered into the EPRWeb database. This ensures that projects are reviewed by the chain of command and are documented for inclusion in the annual EQR report to Congress (USN 2006b). Once funding has been allocated, natural resources staff at NAVFAC Northwest will update the EPRWeb with the date project funding was received and the progress made towards project completion (USN 2006b).

The Navy has developed the Navy Conservation Website to assist installations with INRMP development and implementation. Annual NRDCS updates show installations where they stand with regard to INRMP implementation. The NRDCS also requires each installation to answer specific questions related to implementation to ensure that INRMP implementation meets all regulatory requirements. Navy guidance suggests that project progress be updated at least twice per year in EPRWeb.

9.4 Funding Sources and Mechanisms

The PPBES budget process employed by the DOD is an ongoing, continuously reviewed process. The process can be summarized as follows (DOD 2005):

- The PPBES process consists of long-range planning to anticipate and secure requirements to meet security threats and accomplish program goals.
- Resources to meet these requirements are estimated and programmed by program managers in the Future Year Defense Plan (FYDP). The FYDP is a list of resource requirements for the next 6 years. Specifically, the FYDP comprises the subsequent fiscal year budget and funding requirements projected out 5 years.
- The FYDP resources are then analyzed via the Programming Process. In the Programming Process, program managers reassess their requirements, reprioritize planned activity, reevaluate existing funding guidance, and estimate their funding needs for the next budget year and the subsequent five fiscal years (referred to as Program Objectives Memoranda (POM) 1–5).
- The POM process takes place within Defense Components beginning in the fall of each year. Then each DOD component submits the POM in the spring to the OSD. The OSD reviews the budget submissions and develops the President's budget that will be submitted to Congress. At the installation level, data submissions to support this are made to the Major Commands twice annually, in fall and spring.
- Based on POM decisions of each component, budget controls are issued to the field commands for budget preparation.

The time scale of an INRMP fits well into the DOD PPBES forecasting process. One full cycle of the DOD budget process includes the next budgeted fiscal year and projections for the following five fiscal years. One full cycle of the INRMP, with upper command approval, covers a 5-year period. This means that by relying on an INRMP that is updated regularly, you should be able to project relatively accurate funding requirements for natural resources management for 5-year periods, at a minimum (DOD 2005).

The Regional Commander (N45) is responsible for requesting NAVBASE Kitsap sufficient staff and other resources to implement the INRMP. NAVBASE Kitsap is responsible for annual coordination with USFWS and WDFW, requesting funds for INRMP implementation, and documenting implementation actions. However, due to funding limitations, the projects and schedules proposed in this revised INRMP are targets to facilitate natural resources program objectives. When requested funds are not received, natural resource management projects and the programming schedule may be reexamined. In addition, plans may be adapted to account for the

revised project schedule, and the proposed budget may be adjusted to account for available funding.

9.4.1 Funding Sources

Once a project has been placed into the EPRWeb database, a funding source needs to be determined. In general, ERL level 3 and 4 projects will receive funding, but it is up to natural resource managers to find funds for ERL level 1 and 2 projects (USN 2006b). The following are the primary funding sources for Navy natural resources programs (USN 2006b):

a. **O&MN Environmental Funds**. The majority of natural resource projects are funded with Operations and Maintenance, Navy (O&MN) environmental funds. These appropriated funds are the primary source of resources to support must-fund, just-in-time environmental compliance (i.e., Navy ERL 4 projects). O&MN funds are generally not available for Navy Environmental Readiness Level 3 - 1 projects. In addition to the restriction to Environmental Readiness Level 4 requirements, there are other limitations placed on the use of O&MN funds:

   1. Only the initial procurement, construction, and modification of a facility or project are considered valid environmental funding requirements. The subsequent operation, modification due to mission requirements, maintenance, repair, and eventual replacement is considered a Real Property Maintenance funding requirement. For example, the cost of initially installing a BMP can be funded through O&MN, but future maintenance or repair of that BMP must be paid by Real Property Maintenance funds.

   2. When natural resource requirements are tied to a specific construction project or other action, funds for the natural resource requirements should be included in the overall project costs. For example, if a permit for filling wetlands is required as part of a military construction (MILCON) project, the costs of obtaining the permit and implementing required mitigation should be paid by MILCON funds as part of the overall construction project costs.

b. **Legacy Funds.** The Legacy Resource Management Program (Legacy Program) is a special congressionally mandated initiative to fund military conservation projects. Although the Legacy Program was originally funded 1991 - 1996 only, funds for new projects have continued to be available through this program. The Legacy Program can provide funding for a variety of conservation projects, such as regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, monitoring and predicting migratory patterns of birds and animals, and national partnerships and initiatives, such as National Public Lands Day. If the installation plans to request Legacy Program funds, it should be aware of the following:

1. The availability of Legacy funds is generally uncertain early in the year.

2. Pre-proposals for Legacy projects are due in March and submitted using the Legacy Tracker Web site: http://www.dodlegacy.org/.

3. Project proposals are reviewed by the Navy chain-of-command before being submitted to the DOD Legacy Resources Management Office for final project selection.

4. The Legacy Website provides further guidance on the proposal process and types of projects requested.

c. **Forestry Revenues.** Revenues from the sale of forest products on Navy lands are a source of funding for forestry and potentially other natural resources management programs. Forestry revenues provide funds for two different funding programs:

1. Annual Navy Forestry Funds. These funds support commercial forestry operations at installations. Borrowed from NAVFAC Headquarters (NAVFAC HQ) O&MN funds at the beginning of each fiscal year, the funds are reimbursed when the forestry revenues are received. The NAVFAC field offices solicit funding needs each year from installations with commercial forestry programs in place. Forestry operations must be commercially viable to be eligible for these funds. The NAVFAC field offices can work with installations to make a work plan, known as an annual increment, for the commercial forestry program and ensure that all funding needs are included. Funding recommendations are forwarded from the field offices to NAVFAC HQ for final approval and disbursement of funds, based on revenue from timber sales.

2. DOD Forestry Reserve Account. Forestry revenues are first used to reimburse commercial forestry expenses. Then, as directed by DOD Financial Management Regulation 7000.14-R Volume 11A, 40% of installation net proceeds for the fiscal year are distributed to the state that contains the installation. The funding is used to support road systems and schools. Once the commercial forestry expenses are reimbursed and a portion of the proceeds are distributed among the state counties, any remaining amount is transferred to a holding account known as the DOD Forestry Reserve Account. Reserve account funds can be used for the following:

- Improvement of forest lands.

- Unanticipated contingencies in the administration of forest lands and the production of forest products for which other funding sources are not available within an acceptable timeframe (e.g., actions necessary as a result of a storm or wildfire).

- Natural resources management that implements approved plans and agreements. To be eligible for funding, these project must (1) be specifically included in an approved management plan, such as an INRMP, and (2) provide for at least one of the following purposes: fish and wildlife habitat improvements or modifications; range rehabilitation where necessary for support of wildlife; control of off-road vehicle traffic; specific habitat improvement projects and related activities; and adequate protection for species of fish, wildlife, and plants considered threatened or endangered.

- Projects included in a) and b) are generally given preference in the allocation of these funds. The amount available through this account varies from year to year, but the amount remaining for natural resources management as described in c) is relatively small. The NAVFAC field offices usually solicit project proposals for the Forestry Reserve Account once there is an indication of the level of funding available (usually January or February). Installations need not harvest timber to be eligible for Reserve Account funds. Proposals are submitted to NAVFAC HQ via the field office where they are reviewed and forwarded to the DUSD (I&E) for final selection. The installation should contact a NAVFAC field office or consult reference (f) for more information on funding availability and timelines. It is important to note that these funds may not be used for "must fund" projects.

d. **Agricultural Outleasing.** Money collected through the leasing of Navy-owned property for agricultural use is directed back into the natural resources program and reallocated throughout the Navy by NAVFAC HQ. These funds are available to natural resource managers primarily for agricultural outlease improvements and potentially for natural resources management and stewardship projects once the primary objective is met. Agricultural and grazing leases revenues from agricultural outleasing are available for the following:

1. Administrative expenses of agricultural lease (salaries of professional and technical support of the grazing and cropland programs in direct support of agricultural outlease that meet INRMP goals and objectives, training, scientific meetings, parts and supplies).

2. Initiation, improvement, and perpetuation of agricultural outleases (increased productivity, reduced soil erosion, and fencing).

3. Implementation of INRMP Stewardship Projects (compliance measures should be budgeted from O&MN Conservation POM process).

4. The NAVFAC field office sends a request for project proposals for agricultural outleasing funds to the regions and installations in November of each year. Proposals are submitted to the field office and reviewed. Recommended projects are forwarded

to NAVFAC HQ for final review and project selection. While the available funding varies from year to year, this is one of the more consistent funding sources for implementing INRMP projects that are not Level 1 requirements. The installation should contact the field office for additional information on funding availability and timeline.

e. **Fish and Wildlife Fees.** User fees collected for the privilege of hunting, fishing, or trapping will be collected, deposited, and used in accordance with the Sikes Act and the DOD financial management regulations. The Sikes Act specifies that user fees collected for hunting, fishing or trapping shall be used only on the installation where collected. Further, collections will be used exclusively for fish and wildlife conservation and management on the installation where collected.

   The same fee schedule will be used for all participants with the exception of senior citizens, children, and the handicapped. Membership in an installation conservation organization will not give members priority in participating in hunting, fishing, and trapping programs. Efforts should be made to utilize the services of the installations MWR function to collect and administer these funds locally in accordance with Sikes Act authorization.

f. **Recycling Funds.** An installation with a Qualified Recycling Program (QRP) may use proceeds for some types of natural resource projects. Proceeds must first be used to cover QRP costs. Up to 50% of net proceeds may then be used for pollution abatement, pollution prevention, composting, alternative fueled vehicle infrastructure support, vehicle conversion, energy conversion, or occupational safety and health projects, with first consideration given to projects included in the installation's pollution-prevention plans. Remaining funds may be transferred to the non-appropriated MWR account for approved programs or retained to cover anticipated future program costs. Natural resource projects can be funded as pollution prevention/abatement (e.g., wetlands or riparian forest restoration) or MWR projects (e.g., trail construction and maintenance).

g. **Strategic Environmental Research and Development Program (SERDP) Funds:** SERDP is DOD's corporate environmental research and development program, planned and executed in full partnership with the Department of Energy (DOE) and USEPA, with participation by numerous other federal and non-federal organizations. SERDP funds for environmental and conservation is allocated through a competitive process. Within its broad areas of interest the SERDP focuses on Cleanup, Compliance, Conservation, and Pollution Preventions technologies. The purpose of the conservation technology program is to use research and development to provide improved inventory and monitoring capabilities; develop more effective impact and risk assessment techniques; and provide improved mitigation and rehabilitation capabilities. Recently, the program solicited Statements of Need for conservation technology proposals to research indicators of stress

on threatened and endangered species and to develop techniques to inventory and monitor threatened and endangered species in accessible areas.

h. **Non-DOD Funds.** Many grant programs are available for natural resources management projects, such as watershed management and restoration, habitat restoration, and wetland and riparian area restoration. When federally funded, these programs typically require non-federal matching funds. However, installations may partner with other groups to propose eligible projects. Below is one example of a grant program:

   The Five-Star Restoration Challenge Grants Program is sponsored by the National Association of Counties, National Association of Service and Conservation Corps, National Fish and Wildlife Foundation, and Wildlife Habitat Council in cooperation with USEPA, NMFS, and other sponsors. This program provides modest financial assistance ($5,000 - $20,000) on a competitive basis to support community-based wetland and riparian restoration projects that build diverse partnerships and foster local natural resource stewardship. Installations would need to partner with other groups to be eligible for this type of program. Applications are due in March. Information is available on the Web at http://www.epa.gov/owow/wetlands/restore/5star/. INRMPs should include valid Class 2 and 3 projects and actions that would enhance an installation's natural resources. Nontraditional sources of funding for natural resources programs include non-appropriated reimbursable funds (i.e., agricultural outleasing, forestry, hunting and fishing fees) and appropriated reimbursable funds (e.g., DOD Legacy Program, USDA Pest Management Program). These accounts are sources of funds for Class 3 projects. Installations, however, should not depend on reimbursable programs to fund their natural resources management programs.

As discussed in Section 8.3 an additional funding source for natural resource projects is mitigation money set aside as needed from Navy construction projects. At NAVBASE Kitsap, construction projects that typically require mitigation include pier construction and repair, shoreline construction, and upland construction impacting forest resources, streams, or wetlands. As a general practice, NAVBASE Kitsap planners and NR staff will attempt to minimize construction impacts and the need for mitigation early in the design stage of projects; however, it will not be possible to avoid in all cases. This discussion is included here to explain that unfunded projects listed in Appendix D may be executed as mitigation for a construction projects if they adequately compensate for the construction impacts and is found acceptable to the permitting agencies. Execution of Appendix D projects as mitigation will be reflected in the next annual update of the INRMP.

9.4.2 Beneficial Partnerships and Collaborative Resources Planning

The following list contains partnerships and collaborative agreements that DOD has entered to assist with natural resources management.

- NAVBASE Kitsap, as part of DOD, benefits from the January 2006 Memorandum of Understanding (MOU) between DOD, USFWS, and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resources Management Program on Military Installations.
- NAVBASE Kitsap, as part of DOD, benefits from the July 2006 MOU between the USFWS and DOD to Promote the Conservation of Migratory Birds.
- NAVBASE Kitsap, as part of DOD, benefits from the November 2006 MOU between DOD and USDA-NRCS for coordinating activities to preserve land and improve water quality on lands surrounding government-owned military bases.
- NAVBASE Kitsap, as part of DOD, benefits from the 1996 MOU between the USEPA and DOD for coordinating of Integrated Pest Management activities.
- NAVBASE Kitsap, as part of DOD, benefits from the 1996 cooperative agreement between DOD and The Nature Conservancy for conducting natural resources inventories at installations.

9.5 Effectiveness of INRMP Providing No-Net-Loss to Military Mission

Implementation of this INRMP by NAVBASE Kitsap will ensure that the natural resources on NAVBASE Kitsap will continue to support the NAVBASE Kitsap mission. This INRMP strives to integrate natural resources management with other base plans and activities. It also establishes goals that represent a long-term vision for the health and quality of NAVBASE Kitsap's natural resources. The INRMP goals may be revised over time to reflect changing missions and environmental conditions. Any future changes in mission, training activity, or technology should be analyzed to assess its impact on natural resources. As new plans and DON guidance and regulations are developed, they will be integrated with the goals and management actions of this INRMP. The INRMP will be reviewed, assessed, and modified as needed on a regular basis to ensure continued integration with other management plans or changes in military mission.

9.6 Annual Update and Review

Navy guidance directs installations to coordinate their annual Metrics program evaluation with the appropriate field-level offices of the USFWS and the state fish and wildlife agency (for NAVBASE Kitsap, WDFW) to enable partners to measure both the successes and issues resulting from INRMP implementation (USN 2006b). NAVBASE Kitsap has invited NOAA Fisheries to review this INRMP since species and habitats regulated by NMFS are found within NAVBASE Kitsap boundaries. Additionally, tribes with "usual and accustomed" harvest areas adjacent to individual NAVBASE Kitsap properties have been invited to review this plan. Results of the evaluation and feedback will be used by NAVBASE Kitsap natural resources

managers to determine the effectiveness of the installation natural resources management program and to provide data for the Navy portion of the DOD annual report to Congress (USN 2006b).

This Page Intentionally Left Blank

10 LIST OF PREPARERS

Michael Hardiman
Environmental Engineer
NAVBASE Kitsap
Naval Facilities Engineering Command Northwest

Terri Jones
Forester
Naval Facilities Engineering Command Northwest

Cindi Kunz
Senior Natural Resources Specialist
Naval Facilities Engineering Command Northwest

Tye Yasenak
Natural Resources Manager
NAVBASE Kitsap
Naval Facilities Engineering Command Northwest

Julia Stockton
Natural Resources Manager
NAVBASE Kitsap
Naval Facilities Engineering Command Northwest

This Page Intentionally Left Blank

11 REFERENCES

ADUSD (ESOH) 2006	Assistant Deputy Under Secretary of Defense (Environment, Safety, and Occupational Health) Memo, *Memorandum Outlining an INRMP Template for New and Revised INRMPs*, 14 August 2006.
Bailey 1995	Bailey, R. G. 1995. *Descriptions of the Ecoregions of the United States*. Second Edition. Pub. No. 1391 (rev.). Washington, D.C.: USDA Forest Service. 1995.
Berzin 2008	Berzin, A. A. 2008. *The Truth About Soviet Whaling*. Marine Fisheries Review Vol. 70, No. 2, 2008.
Cascadia 2003	*Watershed Management Plan for the Quilcene-Snow Water Resource Inventory Area (WRIA 17)*, 28 October 2003. Cascadia Consulting Group for Jefferson County (WA) Natural Resources Division.
DOD 2002	U.S. Department of Defense (DOD). 2002. *Department of Defense Partners in Flight Strategic Plan*. http://www.dodpif.org.
DOD 2005	U.S. Department of Defense (DOD). 2005. *Resources for INRMP Implementation: A Handbook for the DOD Natural Resources Manager*, September 2005.
DOD 2011	U.S. Department of Defense (DOD). 2011. *Department of Defense Instruction 4715.03, Natural Resources Conservation Program*, 2011.
DOE 1998	Final 1998 Section 303(d) List -WRIA 15. http://www.ecy.wa.gov/programs/wq/303d/2008/index.html
DON 2014a	Department of Navy (DON). 2007. Chief of Naval Operational Instructions (OPNAV) M-5090.1 *Navy Environmental and Natural Resources Program Manual. Chapter 2: Funding*, January 20014

DON 2014b — Department of Navy (DON). 2007. Chief of Naval Operational Instructions (OPNAV) M-5090.1 *Navy Environmental and Natural Resources Program Manual. Chapter 12: Natural Resources Conservation,* January 2014.

DON-SBB 2000 — The Department of the Navy Submarine Base at Bangor (DON-SBB). 2000. *Assessment of Factors Limiting Salmon Production in Devil's Hole Creek, Final Report, Bangor, Washington*, December 2000.

Dunagan 2008 — *Pollution Study Sets Path Toward Cleanup of Kitsap Inlets*. The Kitsap Sun, 23 February 2008. http://www.kitsapsun.com/news/2008/feb/23/pollution-study-sets-path-toward-cleanup-of/

DUSD (ES) 1994 — Deputy Under Secretary of Defense (Environmental Security) Memo, *Implementation of Ecosystem Management in the DOD*, 8 August 1994.

DUSD (I&E) 2002 — Deputy Under Secretary of Defense (Installations and Environment) Memo, *Implementation of the Sikes Act Improvement Act: Updated Guidance*, 10 October 2002.

DUSD (I&E) 2004 — Deputy Under Secretary of Defense (Installations and Environment) Memo, *Memorandum providing policy on scope of INRMP review, public comment on INRMP review, and Endangered Species Act consultation on INRMPs*, 1 November 2004.

DUSD (I&E) 2005a — Deputy Under Secretary of Defense (Installations and Environment) Memo. *Memorandum providing policy on the applicability of the Sikes Ace INRMP requirements for DOD lands leased to a non-DOD party*, 17 May 2005.

DUSD (I&E) 2005b — Deputy Under Secretary of Defense (Installations and Environment) Memo. *Best practices for Integrated Natural Resources Management (INRMP) Implementation,* August 2005

EO 11990 1977 — Executive Order 11990. *Protection of Wetlands*, as amended by Executive Order 12608. 1997.

EPA 2000 — Puget Sound Naval Shipyard Project ENVVEST http://www.epa.gov/ProjectXL/puget2/index.htm

EPA 2000a — *Project XL: Encouraging Innovation, Delivering Results Office of Policy, Economics, and Innovation*, EPA100-K-00-001. September 2000. www.epa.gov/environmentalinnovation/pdf/xlbooklet.pdf

EPA 2009 — *Impaired Waters and Total Maximum Daily Loads*. http://www.epa.gov/owow/tmdl/

Falcone et al. 2005 — Falcone, E., Calambokidis, J., Steiger, G., Malleson, M., and Ford, J., 2005. *Humpback Whales in the Puget Sound/Georgia Strait Region*. Oral presentation at the 2005 Puget Sound/Georgia Basin Research Conference, Seattle, Washington and published in the Proceedings (2005).

Federal Register: 23 October, 2000 — U.S. Navy, US EPA, and Washington State Department of Ecology 2000. September 25, 2000 [Federal Register: October 23, 2000 (Volume 65, Number 205)].

Foster Wheeler 2000 — *Subtidal Marine Survey Adjacent to the Naval Hospital- Jackson Park Housing Complex*. Bremerton, Washington. Prepared for Foster Wheeler Environmental Corporation, Poulsbo, Washington. Prepared by Kenneth M. Brooks, Ph.D., Aquatic Environmental Sciences. Port Townsend, Washington.

Fresh et al. 2003 — Fresh, K.L., Small, D.J., Kim, H., Waldbillig, C., Mizell, M., and Carr, M.I., 2003. *Juvenile Salmon Use of Sinclair Inlet, Washington in 2001 and 2002*. Washington Department of Fish and Wildlife, Olympia, Washington.

GAO 2014 — United States Government Accountability Ofice, Report to Congressional Requesters. May 2014. *Climate Change Adaptation: DOD Can Improve Insfrastructure Planning and Processes to Better Account for Potential Impacts.*

Garling et al. 1965 — Garling, M.E., Molenaar, D., et. al. 1965. *Water Resources and Geology of the Kitsap Peninsula and Certain Adjacent Islands*, Washington State Division of Water Resources, Water Supply Bulletin No. 18.

Goetz et al. 2004 — Goetz, F.A, Jeanes, E., Beamer, E., Hart, G., Morello, C., Canby, M., Ebel, C., Conner, E., and Berge, H., 2004. *Bull Trout in the Nearshore*. Preliminary draft report. U.S. Army Corps of Engineers. Seattle, Washington.

Goetz et al. 2005 — Goetz, F.A, Jeanes, E., Beamer, E., Hart, G., Ebel, C., Conner, E.. 2005. *Puget Sound Bull Trout; the Unrecognized Anadromous Salmonid of the Pacific Northwest*. Oral presentation at the 2005 Puget Sound/Georgia Basin Research Conference, Seattle, Washington.

Hart Crowser Inc. 2000 — Hart Crowser Inc. 2000. *Final -First Base-Wide Five-Year Review of Records of Decision Naval Submarine Base, Bangor Silverdale, Washington*. 20 September 2000.

Hart Crowser Inc. 2011 — Hart Crowser Inc. 2011. *Macrovegetation Survey Results P-990, Explosives Handling Wharf #2 (EHW-2) Project,* Silverdale, Washington.

JLUS 2013 — Joint Land Use Study (JLUS) for Naval Base Kitsap and Naval Magazine Indian Island Kitsap, Jefferson, and Mason Counties, Washington. November 5, 2013. Kitsap County Department of Community Development, Environmental Programs Division.

Johnston et al 2008 — Johnston, R.K., Wang, P.F., Loy, E.C., Blake, A.C., Richter, K.E., Brand, M.C, Skahill, B.E., May, C.W., Cullinan, V., Choi, W., Whitney, V.S., Leisle, D.E., and Beckwith, B., 2008. *An Integrated Watershed and Receiving Water Model for Fecal Coliform Fate and Transport in Sinclair and Dyes Inlets, Puget Sound, Washington*. Space and Naval Warfare Systems Center, Technical Report 1977, Dec. 2, 2008. (approved for public release; in press).

May 2005 — May, C.W. et al. 2005. *An Analysis of Microbial Pollution in the Sinclair-Dyes Inlet Watershed*. http://www.ecy.wa.gov/programs/wq/tmdl/sinclair-dyes_inlets/reports-documents.html

NAVFAC Northwest 2008 — NAVFAC Northwest. 2008. *CVN Maintenance Wharf Mitigation Plan*, NAVBASE Kitsap at Bremerton, Bremerton, Washington. June 2008.

Navy 2007 — Navy 2007. *NAVBASE Kitsap Bangor Base History and Events*. (Accessed 16 April 2007; last updated 23 March 2007). https://www.NAVBASE Kitsap.navy.mil/html/history.htm

Navy, EPA, and WDOE 2000 — *Project ENVVEST: Phase I Final Project Agreement for the Puget Sound Naval Shipyard*, 25 September 2000 [Federal Register: 23 October, 2000 (Volume 65, Number 205)]. http://www.epa.gov/ProjectXL/puget2/fpasigned.pdf

NMFS 2005 — NMFS. March 2005. Preliminary draft. *Conservation Plan for Southern Resident Killer Whales* (*Orcinus orca*). NOAA NMFS, Northwest Region, 7600 Sand Point Way N.E., Seattle, Washington, 98115.

NOAA 2008 — *Potential Deterrence Methods for Pacific Harbor Seals & California Sea Lions*. January 2008.

NOAA 2009 — *Northwest Marine Mammal Stranding Network Handbook*. 2009.

Popper 2003 — Popper, A. N., 2003. *Effects of Anthropogenic Sounds on Fishes*. Fisheries. Volume 28, No. 10, pp. 24-31. October 2003. American Fisheries Society online journal.

PSSRP 2007 — Puget Sound Salmon Recovery Plan (PSSRP). 2007. *Shared Strategy for Puget Sound*. Chapter 5. Dated 19 January 2007. Accessed 5 August 2009, available online. http://www.sharedsalmonstrategy.org/plan/toc.htm

Rieman and McIntyre 1993 — Reiman, B. E., and McIntyre, J. D., 1993. *Demographic and Habitat Requirements for Conservation of Bull Trout*. Gen. Tech. Rep. INT-302. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Boise, Idaho. 38 p.

SAIC 2001 — Science Applications International Corporation (SAIC). 2001. *Biological Assessment, Naval Magazine Indian Island Ammunition Wharf Piling Replacements, Indian Island, Port Hadlock, Washington*. Prepared for Naval Magazine Indian Island, Port Hadlock, Washington.

SAIC 2005a — SAIC. 2005. *Habitat's Survey along the NAVBASE Kitsap Bangor Shorelines*. Field Survey Report. 30 September 2005.

SAIC 2005b — SAIC. 2005. *Summer Fish Presence and Habitat Use along the NAVBASE Kitsap at Bangor Shorelines: Phase I Field Survey Report*. 30 September 2005.

SAIC 2006 — SAIC. 2006. *Water Quality 2005 and 2006 Field Survey Report at NAVBASE Kitsap-Bangor*. 30 September 2006.

SAIC 2007 — SAIC. 2007. *Sediment Quality Investigation NAVBASE Kitsap-Bangor Sampling and Analysis Plan*. July 2007.

SAIC 2008 — SAIC. 2008. *NAVBASE Kitsap at Bangor: 2008 Marine Mammal Survey Report*. 24 June 2009.

SAIC 2009 — SAIC. 2009. *Sediment Quality Investigation Report at NAVBASE Kitsap Bangor*. January 2009.

URS 1999 — URS 1999. *Sinclair Inlet Existing Conditions Data Compilation*. URS Greiner, Inc. 13 January 1999.

USACE 1987 — U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers *Wetland Delineation Manual*. Technical Report Y-87-1.

USDA-NRCS 1975 — USDA-NRCS 1975, Fred McCreary. *Soil Survey of Jefferson County Area, Washington*. Available online at www.or.nrcs.usda.gov/pnw_**soil**/**wa**_reports.html

USDA-NRCS 1980 — USDA-NRCS. 1980. Carl McMurphy. *Soil Survey of Kitsap County Area, Washington*. Available online http://soildatamart.nrcs.usda.gov/Manuscripts/WA635/0/wa635_text.pdf

USDA-SCS 1994 — U.S. Department of Agriculture-Soil Conservation Service (USDA-SCS). 1994. *Natural Resources Management Plan for Puget Sound Naval Shipyard*, February 1994.

USFWS 2009 — USFWS. 2009. *Threatened and Endangered Species of Washington State*. Accessed 3 August 2009, available online. http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=WA&status=listed

USGS 1998 — USGS 1998. *Water-Resources Investigations Report: 1998 Hydrogeology of Naval Submarine Base Bangor and Vicinity, Kitsap County, Washington*. Report: 97-4060. Pg. 107.

USGS 2002 — USGS 2002. *Water-Resources Investigations Report: Simulation of the Ground-Water Flow System at Naval Submarine Base Bangor and Vicinity, Kitsap County, Washington*. Report: 02-4261. Pg. 153.

USGS and USDA-NRCS 2009 — USGS and U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS). 2009. *Federal Guidelines, Requirements, and Procedures for the National Watershed Boundary Dataset: U.S. Geological Survey Techniques and Methods*, 11–A3, 55 pages. 2009.

USN 1974 — USN. 1974. *A Biological Survey of Selected Sites on Indian Island, Washington*. Marine Environmental Management Office, Naval Undersea Center. San Diego, California. August 1974.

USN 1994 — USN 1994. *Natural Resource Management Plan for Puget Sound Naval Shipyard*. U.S. Navy, Puget Sound Naval Shipyard, Bremerton, WA. February 1994.

USN 2000a Jackson Park Housing Complex Naval Hospital Bremerton (JPHC NBC). 2000. *Final Biological Assessment on Remedial Action at Sites 101, 101A, and 103*. Bremerton, Washington. 21 January 2000.

USN 2000b USN. 2000. *Jackson Park Housing Complex at Naval Hospital Bremerton Appendix 3 of Biological Assessment*. February 2000.

USN 2001a USN 2001a. *Integrated Natural Resource Management Plan, Naval Submarine Base Bangor*. March 2001.

USN 2001b USN 2001b. Naval Undersea Warfare Center (NUWC), Division Keyport. 2001. *Integrated Natural Resource Management Plan-Environmental Assessment*. 2 May 2001.

USN 2002a USN 2002a. *Jackson Park Housing Complex Naval Hospital Bremerton Final Remedial Action Closure Report on Remedial Action at Operable Unit 1 Sites 101, 101A, 103, and 110*. Bremerton, Washington.
28 October 2002.

USN 2004a U.S. Navy 2004. *An Analysis of Stream Culvert Fish Passage on the Navy Railroad Line between Bremerton and Shelton, Washington*. Puget Sound Naval Shipyard and Intermediate Maintenance Facility. February 2004.

USN 2004b *Pest Management Plan, NAVBASE Kitsap-Bangor*. 2004.

USN 2004c *Wellhead Protection Plan, NAVBASE Kitsap-Bangor*. 2004.

USN 2005 *Integrated Pest Management Plan, Bremerton Naval Complex*. 2005.

USN 2006a USN 2006. *Hydrodynamic Study August 2006 Field Data Report*. Science Application International Corporation. 27 December 2006.

USN 2006b USN 2006. *Integrated Natural Resources Management Plan Guidance for Navy Installations: How to Prepare, Implement, and Revise INRMPs*. April 2006.

USN 2007a — USN 2007. *Provisional Environmental Condition of Property, Camp Wesley Harris. Bremerton, Washington*. September 2007. Naval Facilities Engineering Command Northwest. Silverdale, Washington.

USN 2007b — USN 2007. *Candidate, Threatened, and Endangered Species and Survey of Associated Habitats at Naval Hospital Bremerton*. 21 September 2007.

USN 2007c — USN 2007. *Integrated Natural Resources Management Plan for the Navy Region Northwest*. June 2007.

USN 2007d — *Memorandum from the Assistant Secretary of the Navy, Department of the Navy Low Impact Development (LID) Policy for Storm Water Management*. November 2007.

USN 2008a — USN 2008a. *Environmental Assessment, CVN Maintenance Wharf, Puget Sound Naval Shipyard, and Intermediate Maintenance Facility*. 21 April 2008.

USN 2008b — USN 2008b. *Sustaining our Environment, Protecting our Freedom.* April 2008.

USN 2008c — USN 2008c. *Draft Environmental Impact Statement, Swimmer Interdiction Security System (SISS)*. December 2008.

USN 2009a — USN 2009. *Stormwater Pollution Prevention Plan*. NAVBASE Kitsap Keyport. May 2009.

USN 2009b — USN 2009. *Jackson Park Navy Housing Area Pilot Study Pier Area Munitions Removal, Biological Evaluation*. June 2009.

USN 2009c — USN 2009. *Final Environmental Impact Statement, Swimmer Interdiction Security System*. September 2009.

USN 2013 — USN 2013. *Final Envirionmental Assessment, Privatization of Family Housing at Jackson park Housing Complex Bremerton, WA*. June 2013.

Washington Department of Health 2003 — WDOH 2003. *Shellfish Harvesting Opens in Northern Dyes Inlet*, News Release Oct. 31, 2003. http://www.ecy.wa.gov/programs/wq/tmdl/sinclair-dyes_inlets/progress.html

WDFW 1998 — WDFW 1998. *Ecology of Bald Eagles in Western Washington with an Emphasis on the Effects of Human Activity*. Olympia, Washington.

WDFW 2000 — WDFW 2000. *Assessment of Factors Limiting Salmon Production in Devil's Hole Creek*. Accessed November 2011, available online. http://wdfw.wa.gov/publications/00094/wdfw00094.pdf

WDFW 2005 — WDFW 2005. *Washington's Comprehensive Wildlife Conservation Strategy* (WCWCS). Final Draft. 19 September 2005.

WDFW 2006 — WDFW. 2006. *South Puget Sound Wildlife Area Management Plan*. Accessed June 2009, available online. http://wdfw.wa.gov/publications/00540/

WDFW 2009 — WDFW 2009. *Washington's Conservation Strategy and Wildlife Action Plan*., Accessed 13 April 2009, available online. http://wdfw.wa.gov/wlm/cwcs/

WDNRS 2009 — Washington Department of Natural Resources Sciences (WDNRS) 2009. *Cooperative Extension-Department of Natural Resources Sciences Extension-Forest Health-Annosus Root Disease (Heterobasidion annosum, Fomes annosus)*. Accessed August 2009, available online. http://ext.nrs.wsu.edu/forestryext/foresthealth/notes/annosusrootdisease.htm

WDOE 2006 — WDOE 2006. *Washington State Wetland Rating System for Western Washington*, Revised. Ecology Publication # 04-06-025. August 2006.

WDOE 2007 — WDOE 2007. *Facts About Washington's Retreating Glaciers and Declining Snow Pack*. Accessed 19 June 2009, available online. http://www.b-sustainable.org/natural-environment/annual-spring-snowpack/0711016.pdf

WDOE 2008 — *Sinclair/Dyes Inlet Water Quality Improvement Project*, Available online. http://www.ecy.wa.gov/programs/wq/tmdl/sinclair-dyes_inlets/.

Washington Sea Grant 2009 — Washington Sea Grant, 2009. *Protection of Marine Riparian Functions in Puget Sound, Washington*. Accessed 20 November 2011, available online. http://wdfw.wa.gov/publications/pub.php?id=00693

This Page Intentionally Left Blank

APPENDIX A: ACRONYMS AND ABBREVIATIONS

AE	Ammunition Ship
AOE	Fast Combat Support Ship
APHIS	Animal and Plant Health Inspection Service
ATFP	Anti-Terrorism/Force Protection
BASH	Bird Aircraft Strike Hazard
BCC	Birds of Conservation Concern
BMP	Best Management Practice
BOSC	Base Operational Support Contractors
BUMED	Navy Bureau of Medicine and Surgery
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGN	Guided Missile Cruiser, Nuclear Powered
CH	Critical Habitat
CIA	Controlled Industrial Area
cm/sec	cm per second
CNIC	Commander, Naval Installation Command
CNO	Chief of Naval Operations
CNRNW	Commander, Navy Region Northwest
CSL	Cleanup Screening Level
CVN	Aircraft Carrier, Nuclear Powered
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DBH	Diameter Breast Height
DO	Dissolved Oxygen
DOD	Department of Defense
DODINST	Department of Defense Instructions
DOE	Department of Energy
DON	Department of the Navy
DON-SBB	Department of the Navy Submarine Base at Bangor
DPS	Distinct Population Segment
DUSD (ES)	Deputy Under Secretary of Defense (Environmental Security)
DUSD (I&E)	Deputy Under Secretary of Defense (Installations and Environment)
EA	Environmental Assessment
EFH	Essential Fish Habitat
EHW	Explosive Handling Wharf
EIS	Environmental Impact Statement

EISA	Energy Independence and Security Act
ENVVEST	Environment Investment
EO	Executive Order
EPA	Environmental Protection Agency
EPRWeb	Navy Environmental Program Requirements Web Database
EQR	Environmental Quality Report
ERL	Environmental Readiness Level
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
EU	Ecological Unit
°F	Fahrenheit
FISC	Fleet and Industrial Support Center
FR	Federal Register
ft	Feet
FY	Fiscal Year
FYDP	Future Year Defense Plan
GAO	Government Accountability Office
GIS	Geographic Information System
GPS	Global Positioning System
GRX	Geographic Readiness Exchange
HQ	Headquarters
ICO	Installation Commanding Officer
IEPD	Installation Environmental Program Director
IHA	Incidental Harassment Authorization
iNFADS	Internet Naval Facilities Assets Data Store
INRMP	Integration Natural Resources Management Plan
IPM	Integrated Pest Management
IPMC	Integrated Pest Management Coordinators
JAG	Judge Advocate General
km	kilometer
LID	low impact development
LOA	Letter of Authorization
m	meter
MBTA	Migratory Bird Treaty Act
mg/L	milligrams per liter
MHHW	Mean higher high water
mi	mile
MILCON	Military construction
MLLW	mean lower low water
MMP	Marine Mammal Program

MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
mph	miles per hour
MWR	Morale, Welfare, and Recreation
NAD	Naval Ammunition Depot
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Command
NAVFAC HQ	Naval Facilities Engineering Command Headquarters
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRM	Natural Resources Manager
NTU	Nephelometric turbidity units
NUWCDIV	Naval Undersea Warfare Center Division
NUWES	Naval Undersea Warfare Engineering Station
O&MN	Operations and Maintenance, Navy
OGC	Office of the General Counsel
OPNAV	Chief of Naval Operations
OPNAVINST	Chief of Naval Operational Instructions
OSD	Office of the Secretary of Defense
PAH	Polycyclic Aromatic Hydrocarbons
PAO	Public Affairs Office
PARC	Partners in Amphibian and Reptile Conservation
PCB	Polychlorinated Biphenyls
PIF	Partners in Flight
PL	Public Law
PMP	Pest Management Plan
PNW	Pacific Northwest
POM	Program Objectives Memoranda
PPBES	Planning, Programming, Budget, and Execution System
PPV	Public-Private Venture
PSAMP	Puget Sound Ambient Monitoring Program
PSB	Port Security Barrier
PSNS & IMF	Puget Sound Naval Shipyard and Intermediate Maintenance Facility
PWO	Public Works Officer
QRP	Qualified Recycling Program
RCW	Revised Code of Washington
RSIMS	Regional Shore Installation Management System

SAIA	Sikes Act Improvement Act
SBB	Submarine Base at Bangor
SCA	Sanitary Control Area
SEAFAC	Southeast Alaska Acoustic Measurement Facility
SEA Program	Shorelands & Environmental Assistance Program
SECNAV	Secretary of the Navy
SECNAVINST	Secretary of the Navy Instruction
SERDP	Strategic Environmental Research and Development Program
SISS	Swimmer Interdiction Security System
SPCC	Spill Prevention, Control, and Countermeasures
SQS	Sediment Quality Standards
SRKW	Southern Resident Killer Whales
SVOC	Semi Volatile Organic Compound
SWFPAC	Strategic Weapons Facility, Pacific
T&E	Threatened and Endangered
TES	Threatened and Endangered Species
TMDL	Total Maximum Daily Load
TOT	Time of Travel
U.S.	United States
USC	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDA-NRCS	U.S. Department of Agriculture – Natural Resources Conservation Service
USDA-SCS	U.S. Department of Agriculture – Soil Conservation Service
USDA APHIS-WS	U.S. Department of Agriculture – Animal and Plant Health Inspection Service - Wildlife Services
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USN	U.S. Navy
USNS	U.S. Naval Ship
USS	U.S. Ship
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WBD	Watershed Boundary Dataset
WCWCS	Washington Comprehensive Wildlife Conservation Strategy
WDFW	Washington State Department of Fish and Wildlife
WDOE	Washington State Department of Ecology
WHPA	Well Head Protection Areas
WHPP	Well Head Protection Plan

WRIA	Water Resource Inventory Area
WS	Wildlife Services

This Page Intentionally Left Blank

APPENDIX B: TERMS AND DEFINITIONS

Action. A program, activity, project, official policy (such as a rule or regulation), or formal plan directly carried out by a Federal agency (EO 13186.)

Agricultural outleasing. Agricultural outleasing is the use of non-excess DoD lands under a lease to an agency, organization, or person generally for growing crops or grazing domestic animals. The term "agriculture" includes activities related to producing, harvesting, processing, or marketing an agricultural, aquaculture, maricultural, or horticultural commodity, including the breeding, raising, shearing, feeding, caring for, training, and management of livestock, bees, poultry, fish, shellfish, and fur-bearing animals and wildlife, and the planting, cultivating for harvest, or processing short rotation (less than 15 years) forest products (OPNAV M-5090.1, Chapter 12).

Alien species (see also Exotic species). With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem (EO 13112). According to USDA, an alien species is "a species introduced and occurring in locations beyond its known historical range. Synonyms for alien species include exotic, non-native, non-indigenous, and introduced species. Of the thousands of plants that have been introduced to the United States intentionally for cultivation or by accident, approximately 4,000 of these alien plant species now occur outside of cultivation 400 of these are considered problematic with respect to adverse effects on agricultural or our native biota." (*Example:* Saltmarsh Cordgrass, native to eastern North American estuaries, has been introduced to western North American shoreline habitats and is considered an alien in these western habitats, where it adversely impacts native habitats and displaces native plant species.)

Annual increment. An INRMP addendum addressed annually, to facilitate implementation of the INRMP. Each installation must establish and maintain regular communications with the appropriate U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agency offices to address issues concerning natural resources management that are not addressed in the INRMP. At a minimum, this includes annual coordination with all cooperating offices. In addition, each installation will invite annual feedback from the appropriate USFWS and state fish and wildlife agency offices on the effectiveness of the INRMP (Per Deputy Under Secretary of Defense (I&E) Memorandum, 10 October 2002, Implementation of Sikes Act Improvement Act: Updated Guidance).

Best management practices (BMPs). BMPs are resources management decisions based on the latest professional and technical standards for the protection, enhancement, and rehabilitation of natural resources. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, treatment requirements, operating procedures, control practices, and other management practices to prevent or reduce pollution (OPNAV M-5090.1, Chapter 12).

Biodiversity. Biodiversity is the variety of life forms and the ecological processes that sustain it, including living organisms; the genetic differences among them; the communities and ecosystems in which they

occur; and the ecological and evolutionary processes which keep them functioning, yet ever changing and adapting, for a given geographic area (OPNAV M-5090.1, Chapter 12).

Biological Assessment (BA). The information prepared by or under the direction of a Federal agency concerning proposed or listed species, as well as proposed or designated critical habitat that may present in the action area and the evaluation potential effects of the action on such species and habitat during consultation under the ESA (16 U. S. C. 1531 *et seq.*). The purpose of the BA is to determine whether or not the proposed action is likely to (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species proposed for listing; or (3) adversely modify proposed critical habitat (Per 50 CFR Part 02).

Bird/Animal Aircraft Strike Hazard (BASH) Prevention Program. An integrated program, based on a BASH Plan, to support the Navy's flying mission. This program promotes land management practices to minimize bird and other animal attractants, and safety procedures to recognize, control, and avoid hazardous bird concentrations. Due to the potential impact on natural resources by a command's BASH Program, natural resources managers shall provide biological expertise to assist naval air installations, air operations, and aviation safety officers in preparing and implementing BASH plans where necessary. BASH plans should be reviewed to ensure consistency and compliance with installation INRMPs and applicable natural resources laws and regulations (OPNAV M-5090.1, Chapter 12).

Candidate species. Plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA (16 U. S. C. 1531 *et seq.*), but for which development of a listing regulation is precluded by other higher-priority listing activities. The most current list of candidate species can be found at http://endangered.fws.gov/candidates/index.html (Section 4 of the ESA (16 U. S. C. 1531 *et seq*)).

Coastal zone. The coastal zone is the coastal waters (including lands lying in coastal waters and submerged there under and adjacent shore lands) within the meaning of section 304(1) of reference (a) and as more fully defined and described in each coastal state's federally approved CMP. Excluded from the coastal zone is any Navy facility or real estate owned, held in trust, or used by Navy in performance of its mission (OPNAV M-5090.1, Chapter 14).

Conservation. Conservation is the planned management, use, and protection of natural resources that best reflect sustainable use and continued benefit for present and future generations, and the prevention of exploitation, destruction, waste, and neglect (OPNAV M-5090.1, Chapter 12).

Consistent to the Maximum Extent Practicable. The Navy is required by the CZMA to ensure its activities affecting any coastal use or resource to the "maximum extent practicable," which is defined in Section 930.32(a)(1) of 15 CFR Part 930.58(a) (2006), as amended, (71 Fed. Reg. 787-831, 828 (January 5, 2006)), "Coastal Zone Management Act Federal Consistency Regulations" as "fully consistent" with the enforceable policies of the CMP unless Navy compliance is prohibited by law.

The Navy action proponent will not use a general claim of lack of funding or insufficient funds or failure to include the cost of being fully consistent in the federal budget and planning process as a basis for not being consistent to the maximum extent practicable with an enforceable policy of a federally approved state CMP. The presidential exemption described in CZMA is the only circumstance in which the Navy action

proponent may rely on a lack of funding as a limitation on full consistency with an enforceable policy (OPNAV M-5090.1, Chapter 14).

Consultation under Section 7 of the Endangered Species Act (16 U. S. C. 1531 *et seq.*).

a) *Formal*. Formal consultation is a process between the USFWS or NMFS and the Federal agency that commences with the Federal agency's written request for consultation under Section 7(a) (2) of the ESA and concludes with the USFWS or NMFS issuance of a Biological Opinion under Section 7(b) (3) of the ESA (50 CFR Part 402).
b) *Informal*. Informal consultation is an optional process that includes all discussions, correspondence, etc., between the USFWS or NMFS and the Federal agency or the designated non-Federal representative prior to formal consultation, if required (Per 50 CFR Part 402).

Control. Eradicating, suppressing, reducing, or managing invasive species populations, preventing the spread of invasive species from areas where they are present, and taking steps, such as restoration of native species and habitats, to reduce the effects of invasive species and to prevent further invasions (EO 13112, as appropriate).

Cooperative agreement. A cooperative agreement is an assistance vehicle used to acquire goods or services or stimulate an activity undertaken for the public good. Cooperative agreements assume substantial involvement between the Federal agency and recipient during performance of the activity. They may be used to accomplish work identified in the INRMP, and may be entered into with states, local governments, non-governmental organizations, and individuals to provide for the maintenance and improvement of natural resources, or to benefit natural resources research on DoD installations (OPNAV M-5090.1, Chapter 12).

Critical habitat (CH). These are the "(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. (B) Critical habitat may be established for those species now listed as threatened or endangered species for which no critical habitat has heretofore been established as set forth in subparagraph (A) of this paragraph. (C) Except in those circumstances determined by the Secretary, critical habitat must not include the entire geographical area that can be occupied by the threatened or endangered species." (Per ESA (16 U. S. C. 1531 *et seq.*)

DoD Partners in Flight (PIF). DoD lands represent a critical network of habitats for neotropical migratory birds, offering these birds migratory stopover areas for resting and feeding, and suitable sites for nesting and rearing their young. DoD has, therefore, developed a policy to promote and support a partnership role in the protection and conservation of resident and migratory birds by protecting vital habitats, enhancing biodiversity, and maintaining healthy and productive natural systems on our lands consistent with the military mission. See the DoD PIF Strategic Plan at http://www.dodpif.org/strategic_plan/index.htm .

Ecological risk assessment. Ecological Risk Assessment is an evaluation of whether adverse ecological effects could occur or have occurred from exposure to one or more stressors (OPNAV M-5090.1, Chapter 42).

Ecosystem. An ecosystem is a dynamic and natural complex of living organisms interacting with each other and their associated physical environment (OPNAV M-5090.1, Chapter 12).

Endangered species. Any species in danger of extinction throughout all or a significant portion of its range, other than a species of the Class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under ESA provisions would present an overwhelming and overriding risk to man (ESA (16 U. S. C. 1531 *et seq.*)).

Endangered or Threatened species. A species of fauna or flora that has been listed by USFWS or NMFS for special protection and management under the ESA (16 U. S. C. 1531 *et seq.*).

Environmentally and economically beneficial landscaping. Landscaping, construction, and design practices that support EO 13148, Greening the Government through Leadership in Environmental Management.

Essential fish habitat (EFH). The water and substrates necessary to fish for spawning, feeding, or growth to maturity. (Per the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801-1883)

Exotic species (see also Alien species). All species of plants and animals not naturally occurring, either now or historically, in any ecosystem of the United States. (EO 11987) Those species occurring outside their native ranges in a given place as a result of actions by humans. (USDA) "Exotic," "alien," "introduced," "non-indigenous," and "non-native" are all synonyms for species that humans intentionally or unintentionally introduced into an area outside of a species' natural range.

Facility. Any building, installation, structure, land, and other property owned or operated by, or constructed or manufactured and leased to, the Federal Government, where the Federal Government is formally accountable for compliance under environmental regulation (e.g., permits, reports/records and/or planning requirements) with requirements pertaining to discharge, emission, release, spill, or management of any waste, contaminant, hazardous chemical, or pollutant. This includes a group of facilities at a single location managed as an integrated operation, as well as Government-owned contractor-operated facilities (EO 13148).

Federal agency. An executive department or agency that does not include independent establishments, as defined by 5 USC § 104.

Feral: Animals that have escaped from domestication and become wild". Introduced or non-native animals are those that have becomes established outside their natural range.

Fish and wildlife. Any member of the animal kingdom, including without limitation any mammal, fish, bird (including migratory, non-migratory, or endangered bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod, or other invertebrate, and any part, product, egg, or offspring, thereof, or the dead body or parts thereof (ESA (16 U. S. C. 1531 *et seq.*).

Floodplain. The lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a 1 - percent or greater chance of flooding in any given year. (EO 11988) (NOTE: This is the 100-year floodplain reference, not the 500-year floodplain.) Adverse impacts on floodplains are avoided when possible. The direct or indirect support of floodplain development must be avoided where there is a practicable alternative (DoD Instruction 4715.03).

Forest products. Forest products are those items produced from a forest such as sawtimber, veneer logs, poles, piles, posts, pulpwood, pine straw, stumpwood, bark and other mulch, cones, seeds, mistletoe, firewood, and wood chips (OPNAV M-5090.1, Chapter 12).

Geographic information system (GIS). GISs are an organized collection of computer hardware, software, and geographic data designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced data (OPNAV M-5090.1, Chapter 12).

Grounds. Grounds are all land areas not occupied by buildings, structures, pavements, and other facilities. Depending on the intensity of management, grounds may be classified as improved (as those near buildings), semi-improved, or unimproved (OPNAV M-5090.1, Chapter 12).

Habitat. Habitat is an area where a plant or animal species lives, grows, and reproduces, and the environment that satisfies its life requirements (OPNAV M-5090.1, Chapter 12).

Introduction. The intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity (EO 13112).

Invasive species. An alien (exotic, non-native, non-indigenous, or introduced) species whose introduction does or is likely to cause economic or environmental harm or harm to human health (EO 13112).

Jeopardize the continued existence (or Jeopardy). To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR Part 402).

Land management. Land management are programs and techniques to manage lands, wetlands, and water quality, including soil conservation; erosion control and non-point source pollution; surface and subsurface waters; habitat restoration; control of noxious weed and poisonous plants; agricultural outleasing; range management; identification and protection of wetlands, watersheds, floodplains management, landscaping, and grounds maintenance (OPNAV M-5090.1, Chapter 12).

Listed species. Any species of a fish, wildlife, or plant that has been determined to be endangered or threatened under Section 4 of the ESA (16 U. S. C. 1531 *et seq.*) (50 FR Prt 402) Listed species are found in 50 CFR 17.11-17.12.

Marine environment. Areas of coastal and ocean waters, the Great Lakes, and their connecting waters, and submerged lands there under, over which the United States exercises jurisdiction, consistent with international law (EO 13158).

Migratory bird. A bird with a seasonal and somewhat predictable pattern of movement. (A general definition.) Any bird, whatever its origin and whether or not raised in captivity, which belongs to a species

listed in 50 CFR 10.13, or which is a mutation or a hybrid of any such species, including any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof. (The Migratory Bird Treaty Act (16 U. S. C. 703 *et seq.*) Any of the over 800 species listed in 50 CFR 10.13, including many common ones like Canada geese, barn swallows, and two kinds of starling (EO 13186).

Migratory bird resources. Migratory birds and the habitats upon which they depend (EO 13186).

Mitigation. Lessening the adverse effects an undertaking may cause relative to natural or cultural resources. Mitigation can include limiting the magnitude of the action; repairing, rehabilitating, or restoring the affected resource; avoiding the effect altogether; reducing or eliminating the effect over time by preservation and maintenance operations during the life of the action; and/or compensating for the effect by providing substitute resources or environments (DoD Instruction 4715.03).

Mitigation banking, Actions taken to compensate for future adverse effects of undertakings by providing substitute resources or environments in advance of any specific undertaking (DoD Instruction 4715.03).

Native species. All species of plants and animals naturally occurring, either currently or historically, in any U.S. ecosystem (EO 11987). With respect to a particular ecosystem, species that other than as a result of an introduction historically occurred or currently occurs in that ecosystem (EO 13112).

Natural resources. Natural resources are all elements of nature and their environments of soils, sediments, air, and water. They consist of earth resources (nonliving resources such as minerals and soil components) and biological resources (living resources such as plants and animals) (OPNAV M-5090.1, Chapter 12).

Natural Resources Manager/Coordinator. A natural resources manager is an individual assigned the responsibility of managing installation natural resources on a regular basis and who keeps the chain of command informed of natural resources issues (OPNAV M-5090.1, Chapter 12).

Near Shore Areas. Waters and submerged lands adjoining the installation from the mean high water mark (i.e., the line on the shore established by the average of all high tides) to the boundaries of installation waterfront activities where Navy controls access, and that are subject to the immediate authority of the installation Commanding Officer or tenant command. (OPNAVINST M-5090.1)

No net loss of military mission. Each INRMP must, to the extent appropriate and applicable, and consistent with the use of the installation to ensure the preparedness of the Armed Forces, provide for "no net loss in the capability of military installation lands to support the military mission of the installation." (Per Section 101(b)(1)(I) of the SAIA). INRMPs are intended principally to help installation commanders manage natural resources more effectively so as to ensure that installation lands remain available and in good condition to support the installation's military mission, i.e., ensure "no net loss in the capability of military installation lands to support the military mission of the installation." Furthermore, appropriate management objectives to protect mission capabilities of installation lands should be clearly articulated in the planning process and should be high in INRMP resourcing priorities. Mission requirements and priorities identified in the INRMP will, where applicable, be integrated in other environmental programs and policies. It is not the intent that natural resources are to be consumed by mission requirements, but sustained for the use of mission requirements. To achieve this, environmental programs and policies must have the goal of

preserving the environment for the purpose of the mission (Deputy Under Secretary of Defense (I&E) Memorandum, 10 October 2002, Implementation of Sikes Act Improvement Act: Updated Guidance).

Noxious weeds. Noxious weeds are plant species identified by Federal or state agencies as requiring control or eradication (OPNAV M-5090.1, Chapter 12).

Outdoor recreation. Outdoor recreation is a program, activity, or opportunity dependent on the natural environment, including picnicking, bird-watching, hiking, wild and scenic river use, hunting, fishing, and primitive camping that will not impair or degrade natural resources (OPNAV M-5090.1, Chapter 12).

Plant. Any member of the plant kingdom, including seeds, roots, and other parts thereof (ESA (16 U. S. C. 1531 *et seq.*).

Proposed species. Any species of fish, wildlife, or plant proposed in the Federal Register to be listed under Section 4 of the ESA (16 U. S. C. 1531 *et seq.*).

Recovery of a listed species. The improvement in the status of a listed species to the point at which listing is no longer appropriate under the criteria set out in Section 4(a)(1) of the ESA (16 U. S. C. 1531 *et seq.*) (50 CFR Part 402).

Soil. A natural body comprised of solids (minerals and organic matter), liquid, and gases that occurs on the land surface, occupies space, and is characterized by one or both of the following; horizons, or layers, that are distinguishable from the initial material as a result of additions, losses, transfers, and transformations of energy and matter or the ability to support rooted plants in the natural environment (As defined in *Soil Taxonomy, A Basic System of Soil Classification for Making and Interpreting Soil Surveys* (USDA, Natural Resources Conservation Service, 1999

Species. A group of organisms, all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms (EO 13112).

Species of concern. Species listed in the periodic report, "Migratory Nongame Birds of Management Concern in the United States," priority migratory bird species as documented by established plans (such as Bird Conservation Regions in the North American Bird Conservation Initiative or Partners in Flight physiographic areas), and those species listed in 50 C.F.R. 17.11 (EO 13186). Technically is an informal term, not defined in the federal Endangered Species Act. Commonly refers to species that are declining or appear to be in need of concentrated conservation actions.

State or Territory Listed Species. A state or territory listed species is any species of fish, wildlife, or plant protected by an appropriate state agency as issued in a state's or U.S. territory's endangered species law and other pertinent regulations (OPNAV M-5090.1, Chapter 12).

Stewardship. Stewardship is the responsibility to inventory, manage, conserve, protect, and enhance the natural resources entrusted to one's care in a way that enhances the resources and their benefits for present and future generations (OPNAV M-5090.1, Chapter 12).

Submerged Aquatic Vegetation Areas. "Rooted, vascular, flowering plants that, except for some flowering structures, which live and grow below the water surface. Because of their requirements for

sufficient sunlight, seagrasses are found in coastal areas of all Atlantic coast states, with the exception of Georgia and South Carolina, where freshwater inflow, high turbidity, and tidal amplitude combine to inhibit their growth." (The Atlantic States Marine Fisheries Commission, *Submerged Aquatic Vegetation Policy*, June 1997).

Sustainable yield. Sustainable yield is managing renewable natural resources to provide an annual or periodic yield of goods, services, and direct and indirect benefits into perpetuity. This may include, but is not limited to, maintaining economic benefits, ecological processes and functions, and biodiversity. (OPNAV M-5090.1, Chapter 12).

Synoptic. The synoptic scale (also known as large scale or cyclonic scale) in meteorology is a horizontal length scale on the order of 1000 kilometers (620 miles) or more.

Take of listed species. To harass, hunt, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct, per the ESA (16 U. S. C. 1531 *et seq.*), of which Section 9 prohibits "take."

a) *Harass*, in the definition of "take," means an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.
b) *Harm*, in the definition of "take," means an act that actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.

Taking, killing, or possessing migratory birds. It is unlawful to pursue, hunt, take, capture, kill; attempt to take, capture, or kill; possess, offer for sale, sell offer to barter, barter offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported; deliver for transportation, transport, or cause to be transported; carry or cause to be carried; or receive for shipment, transportation, carriage, or export any migratory bird, any part, nest, or egg of any such bird or any part, nest or egg, thereof. To "take" is to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shoot, wound kill, trap, capture, or collect (Migratory Bird Treaty Act (16 USC § 706 et seq.). Furthermore, both "intentional" and "unintentional" take are defined in 50 CFR 10.12:

Intentional take. Take that is the purpose of the activity in question. (As defined in EO 13186.)

Unintentional take. Take that results from, but is not the purpose of, the activity in question (As defined in EO 13186). The list of migratory birds protected under the Migratory Bird Treaty Act can be found in 50 CFR Section 10.13. Violations can result in a misdemeanor conviction and a fine up to $15,000.

Threatened species. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (Per the ESA (16 U. S. C. 1531 *et seq*).

Watershed. A watershed is a geographic area of land, water, and biota within the confines of a drainage divide (OPNAV M-5090.1, Chapter 12).

Wetlands. Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, such as swamps, marshes, and bogs. Jurisdictional wetlands are those that meet criteria established by the U.S. Environmental Protection Agency regulations and U.S. EPA and Department of the Army guidance (OPNAV M-5090.1, Chapter 12).

This Page Intentionally Left Blank

APPENDIX C: RELEVANT LAWS, REGULATIONS, POLICIES, GUIDANCE, INSTRUCTIONS, AND ORDERS

Federal Laws, Regulations, and Executive Orders

American Indian Religious Freedom Act of 1978 (42 USC 1996)
Anadromous Fish Conservation Act (16 USC 757)
Animal Damage Control Act (7 USC 426 et seq.)
Anti-Deficiency Act (31 USC 1341 et seq.)
Antiquities Act of 1906 (16 USC 431 et seq.)
Archaeological Resource Protection Act Regulations (18 CFR 1312)
Archeological and Historical Preservation Act of 1974 (16 USC 469 et seq.)
Archeological Resources Protection Act of 1979 (16 USC 470 et seq.)
Bald and Golden Eagle Protection Act (16 USC 668 et seq.)
Base Closure and Realignment Act (Part A of title XXIX of Public Law 101-510; 10 USC 2687)
Clean Air Act, as amended (42 USC 7401 et seq.)
Clean Water Act (33 USC 1251 et seq.)
Coastal Barrier Resources (16 CFR 3501)
Coastal Barriers Resources Act (16 USC 1451 et seq.)
Coastal Zone Act Reauthorization Amendments (16 USC 1451 et seq.)
Coastal Zone Management Act of 1972 (16 USC 1451-1456)
Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 USC 9601 et seq.)
Conservation and Rehabilitation Program on Military and Public Lands (16 USC 670 et seq.)
Conservation and Rehabilitation Programs on Military and Public Lands (Public Law 93-452)

- Cooperative Conservation (Executive Order 13352)
- Council on Environmental Quality Regulations on Implementing NEPA Procedures (40 CFR 1500-1508)

Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79)
Defense Environmental Restoration Program (10 USC 2701)
Department of Defense Appropriation Act of 1991 (PL 102-393)
Determination of Eligibility for Inclusion in the National Register of Historic Places (36 CFR 63)
Dredge and Fill Nationwide Permit Program (33 CFR 330)
Endangered and Threatened Wildlife and Plants (50 CFR 17)
Endangered Species Act of 1973, as amended (16 USC 1531 et seq.)

Entering Military, Naval, or Coast Guard Property (18 USC 1382)
Environmental Effects in the United States of Department of Defense Actions (32 CFR 188)
EPA Guidelines for Resource Recovery Facilities (40 CFR 245)
EPA National Drinking Water Regulations (40 CFR 141-143)
EPA National Pollutant Discharge Elimination System Permit Regulations (40 CFR 122)
EPA Regulations Designating Areas for Air Quality Planning (40 CFR 81)
EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods (40 CFR 53)
EPA Regulations for Pesticide Programs (40 CFR 150-186)
EPA Regulations Implementing the Resource Conservation and Recovery Act (40 CFR 260-270)
EPA Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System (40 CFR 125)
EPA Regulations on Discharge of Oil (40 CFR 110)
EPA Regulations on Disposal Site Determination under the CWA (40 CFR 231)
EPA Regulations on Implementation of NEPA Procedures (40 CFR 6)
EPA Regulations on Insecticide, Fungicide, and Rodenticide Use (40 CFR 162)
EPA Regulations on Land Disposal Restrictions (40 CFR 268)
EPA Regulations on National Primary and Secondary Ambient Air Quality Standards (40 CFR 50)
EPA Regulations on Regional Consistency under the Clean Air Act (40 CFR 56)
EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans (40 CFR 51-52)
EPA Requirements for Water Quality Planning and Management (40 CFR 130)
EPA Special Exemptions from Requirements of the Clean Air Act (40 CFR 69)
Erosion Protection Act (33 USC 426)
Estuary Protection Act (16 USC 1221)
Farmland Protection Act (7 USC 4201 et seq.)
Federal Compliance with Pollution Control Standards (42 USC 4321)
Federal Consistency with Approved Coastal Management Programs (15 CFR 930)
Federal Facilities Compliance Act of 1992 (42 USC 6961)
Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 USC 136 et seq.)
Federal Land Policy and Management Act (43 USC 1701)
Federal Noxious Weed Act (7 USC 2801 et seq.)
Federal Plant Pest Act (7 USC 150aa et seq.)
Federal Water Pollution Control Act (Clean Water Act) (33 USC 1251 et seq.)
Fish and Wildlife Conservation Act (16 USC 2901 et seq.)
Fish and Wildlife Coordination Act (16 USC 661 et seq.)
Fish and Wildlife Service List of Endangered and Threatened Wildlife (50 CFR 17)

Fishery Conservation and Management Act of 1976 (16 USC 1801 et seq.)
Floodplain Management (Executive Order 11988, as amended by Executive Order 12148 and 13286)
Forest Resources Conservation and Shortage Relief Act (16 USC 620 et seq.)
Historic Sites Act of 1935 (16 USC 461 et seq.)
Hunting and Fishing on Federal Lands (10 USC 2671 et seq.)
Implementation of Section 311 of the Federal Water Pollution Control Act of 18 October, 1972, as amended, and the Oil Pollution Act of 1990 (Executive Order 12777, as amended by Executive Order 13286)
Interagency Cooperation Endangered Species Act of 1973(50 CFR 402)
Invasive Species (Executive Order 13112)
Lacey Act (16 USC 701) and Lacey Act Amendments of 1981 (16 USC 3371–3378)
Land and Water Conservation Act of 1965 (16 USC 4601 et seq.)
Legacy Resource Protection Program Act (PL 101–511)
Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801)
Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
Marine Protected Areas (Executive Order 13158)
Marine Protection, Research, and Sanctuaries Act of 1972 (33 USC 1401 et seq.)
Migratory Bird Conservation Act (16 USC 715 et seq.)
Migratory Bird Treaty Act (16 USC 703–711)
Migratory Birds List (50 CFR 10.13)
Military Construction Authorization Act of 1956 - Leases; non-excess property (10 USC 2667)
Military Construction Authorization Act of 1956 - Sale of Certain Interests in Lands; Logs (10 USC 2665)
Military Construction Authorization Act of 1956- Military Reservations and Facilities: Hunting, Fishing, and Trapping (10 USC 2671)
Military Construction Authorization Act of 1975 (10 USC 2665)
Military Reservation and Facilities: Hunting, Fishing and Trapping (10 USC 2671)
Multiple-Use Sustained Yield Act (16 USC 528)
National Defense Authorization Act for Fiscal Year 1999 (PL 105-261)
National Defense Authorization Act for Fiscal Year 2003 (PL 107-314)
National Defense Authorization Act for Fiscal Year 2004 (PL 108-136)
National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq.)
National Heritage Policy Act of 1979 (16 USC 470)
National Historic Landmarks Program (36 CFR 65)
National Historic Preservation Act of 1966 (16 USC 470 et seq.)
National Historic Preservation Act Regulations for the Protection of Historic Properties (36 CFR 800)
National Oceanic and Atmospheric Administration Coastal Zone Management Program Development and Approval Regulation (15 CFR 923)
National Register of Historic Places (36 CFR 60)

National Register of Historic Places, current edition (36 CFR 60 78, 79, 800, and 1228)
National Trails System Act of 1968 (16 USC 1271)
Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3013)
Natural Resources Management Program (32 CFR 190)
Neotropical Migratory Bird Conservation Act (16 USC 6101 et seq.)
Nonindigenous Aquatic Nuisance Prevention and Control Act as amended (16 USC 4701et seq.)
North American Wetlands Conservation Act (16 USC 4401 et seq.)
Noxious Plant Control Act (43 USC 1241.
Ocean Dumping Regulations and Criteria (40 CFR 220, 227)
Off-Road Vehicles Use on Public Lands (Executive Order 11989)
Oil Pollution Control Act of 1990 (33 USC 2701 et seq.)
Outdoor Recreation - Federal/State Program Act (16 USC 4601 et seq.)
Outer Continental Shelf Air Regulations (40 CFR 55)
Partners for Fish and Wildlife Act (16 USC 3771 et seq.)
Plant Quarantine Act (7 USC 151-167)
Pollution Prevention Act (42 USC 13101 et seq.)
Protection and Enhancement of Environmental Quality (Executive Order 11514, as amended by Executive Order 11541 and 11991)
Protection and Enhancement of the Cultural Environment (Executive Order 11593)
Protection of Wetlands (Executive Order 11990, amended by Executive Order 12608)
Recreational Fisheries (Executive Order 12962, as amended by Executive Order 13474)
Regulations Concerning Marine Mammals (50 CFR 10)
Regulations Concerning Marine Mammals (50 CFR 18, 216, 228)
Resource Conservation and Recovery Act (42 USC 6901 et seq.)
Responsibilities of Federal Agencies to Protect Migratory Birds (Executive Order 13186)
Rivers and Harbors Act of 1889 (33 USC 403 et seq.)
Safe Drinking Water Act (42 USC 300(f) et seq.)
Sales of Forest Products on Federal Lands (10 USC 2665 et seq.)
Salmon and Steelhead Conservation and Enhancement Act (16 USC 3301-3345)
Sikes Act Improvement Act of 1997 (16 USC 670a et seq.)
Soil and Water Conservation Act (16 USC 2001 et seq.)
Soil Conservation (16 USC 5901)
Strengthening Federal Environmental, Energy, and Transportation Management (Executive Order 13423)
Water Pollution Prevention and Control (33 USC 1251 et seq.)
Wetland Resources (16 USC 3901)
Wild and Scenic River Act (16 USC 1274)
Youth Conservation Corps Act of 1972 (16 USC 1701)

Federal Guidelines and Memorandums

Cooperative Agreement between the Department of Defense and The Nature Conservancy for Assistance in Natural Resources Inventory

Memorandum of Agreement for Federal Neotropical Migratory Bird Conservation Program and Addendum (Partners in Flight-Aves De Las Americas) among the Department of Defense, through Each of the Military Services, and Over 110 Other Federal and State Agencies and Nongovernmental Organizations

Memorandum of Agreement for Professional and Technical Assistance Conducting Biological Surveys, Research and Related Activities between the Department of Defense and the National Biological Service of the Department of the Interior

Memorandum of Understanding between Department of Defense, U.S. Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resources Management Program on Military Installations

Memorandum of Understanding between the Environmental Protection Agency and the Department of Defense with Respect to Integrated Pest Management

Memorandum of Understanding for Watchable Wildlife Programs

USACE *1987 Wetland Delineation Manual*

Department of Defense Policy, Regulations, and Guidance

Department of Navy Procedures for Implementing NEPA (32 CFR 775)
Deputy Under Secretary of Defense Memorandum, *Integrated Natural Resource Management Plan Template*
DOD Directive 3200.15, *Sustainment of Ranges and Operating Areas*
DOD Directive 4001.1, *Installation Management*
DOD Directive 4140.1, *Material Management Policy*
DOD Instruction 4150.7, *DOD Pest Management Program*
DOD Directive 4165.57, *Air Installations Compatible Use Zones*
DOD Directive 4165.59, *DOD Implementation of the Coastal Zone Management Act*
DOD Directive 4165.61, *Intergovernmental Coordination of DOD Federal Development Programs and Activities*
DOD Directive 4700.2, *Secretary of Defense Award for Natural Resources and Environmental Management*
DOD Directive 4700.4, *Natural Resources Management Program*
DOD Directive 4705.1, *Management of Land-Based Water Resources in Support of Joint Contingency Operations*
DOD Directive 4710.1, *Archaeological and Historic Resources Management*
DOD Directive 4715.1, *Environmental Security*
DOD Directive 4715.03, *Natural Resources Conservation Program*
DOD Directive 4715.4, *Pollution Prevention*
DOD Directive 4715.6, *Environmental Compliance*
DOD Directive 4715.7, *Environmental Restoration Program*
DOD Directive 4715.9, *Environmental Planning and Analysis*
DOD Directive 4751.DD-R, *Draft Integrated Natural Resources Management in the Department of Defense*
DOD Directive 5030.41, *Oil and Hazardous Substance Pollution Prevention and Contingency Program*
DOD Directive 6050.1, *Environmental Effects in the U.S. of DOD Actions*
DOD Directive 6050.15, *Prevention of Oil Pollution from Ships Owned or Operated by DOD*
DOD Directive 6050.2 (as amended), *Use of Off-Road Vehicles on DOD Lands*
DOD Directive 6050.4, *Marine Sanitation Devices for Vessels Owned or Operated by DOD*
DOD Directive 6050.5, *DOD Hazard Communication Program*
DOD Directive, 6050.2, *Use of Off-Road Vehicles on DOD Lands*
DOD Directive 4150.7, *DOD Pest Management Program*
DOD INRMP Handbook, *Resources for INRMP Implementation*
DOD Instruction 5000.13, *Natural Resources - The Secretary of Defense Natural Resource Conservation Award*
DOD Instruction 6055.6, *DOD Fire and Emergency Services Program*
DOD Memorandum on Implementation of Ecosystem Management in DOD
DOD Urban Forestry Manual

Emergency Consultations under the Endangered Species Act
NAVFAC P-73, *Real Estate Manual P-73*
NAVFACINST 11010.45, *Regional Shore Infrastructure Planning*
NAVFACINST 11012.111A, *Land Use Conservation Planning*
NAVFACINST 6250.3H, *Applied Biology Program Services, and Training*
OPNAVINST 11000.17, *National Preservation Act Consultations Related to Base Realignment and Closure Actions*
OPNAVINST 11010.20F, *Facilities Projects Manual*
OPNAV M-5090.1, *Environmental Readiness Program Manual*
OPNAVINST 5750.13, *Historical Properties of the Navy*
OPNAVINST 6250.4B, *Pest Management Program*
OPNAVINST 8000.16, *Environmental Security Management*
OPNAVINST 8026.2A, *Navy Munitions Disposition Policy*
SECNAVINST 4000.35, *Department of the Navy Cultural Resources Program*
SECNAVINST 5090.8, *Policy for Environmental Protection, Natural Resources, Cultural Resources Program*
SECNAVINST 6240.6E, *Implementation of DOD Directives under DOD Instruction 4700.4*

Applicable State and Local Regulation

Aquatic lands -- Beds of navigable waters (RCW 79.130)
Aquatic lands -- Easements and rights-of-way (RCW 79.110)
Aquatic lands – Harbor Areas (RCW 79.115)
Aquatic lands -- Oysters, geoducks, shellfish, other aquacultural uses, and marine aquatic plants (RCW 79.135)
Aquatic lands -- Tidelands and shorelands (RCW 79.125)
Ballast Water Management (RCW 77.125)
Community and Urban Forestry (RCW 76.15)
Construction Projects in State Waters (RCW 77.55)
Control of Spartina and Purple Loosestrife (RCW 17.26)
Cooperative Forest Management Services Act (RCW 76.52)
Fish and Wildlife Enforcement Code (RCW 77.15)
Fishways, Flow, and Screening (RCW 77.57)
Forest Insect and Disease Control (RCW 76.06)
Integrated Pest Management (RCW 17.15)
Management of Natural Resources (RCW 77.110.030)
Marine Fin Fish Aquaculture Programs (RCW 77.125)
Natural Resources Code – Aquatic Land Management (WAC 332-30)
Natural Resources Code – Forest Protection (WAC 332-24)
Natural Resources Code – State Environmental Protection Act Policies and Procedures (WCA 332-41)
Noxious Weed Control on Federal and Tribal Lands (RCW 17.10.201)
Obstructions in Navigable Waters (RCW 88.28)
Puget Sound Fish Other than Salmon (WAC 220-48)
Puget Sound Salmon (WAC 220-47)
Puget Sound Water Quality Protection (RCW 90.71)
River and Harbor Improvements (RCW 88.32)
Salmon Recovery (RCW 77.85)
Shellfish (RCW 77.60)
Shellfish (WAC 220-52)
Shoreline Management Act of 1971 (RCW 90.58)
Stewardship of Nonindustrial Forests and Woodlands (RCW 73.13)
Vessel Oil Spill Prevention and Response (RCW 88.46)
Washington Environmental Policy Act (WAC 220-100)
Washington Fish and Wildlife Regulations – Aquatic Nuisance Species (WAC 232-12-01701)
Washington Fish and Wildlife Regulations – Bald Eagle Protection Rules (WAC 232-12-292)
Washington Fish and Wildlife Regulations – Endangered, Threatened, and Sensitive Wildlife Species (WAC 232-12-297)
Washington Fish and Wildlife Regulations – Nonnative Aquatic Species (WAC 232-12-016)
Washington Hydraulic Code – Aquatic Plant Dredging (WCA 220-110-337)
Washington Hydraulic Code – Dredging in Saltwater Areas (WCA 220-110-320)

Washington Hydraulic Code – Prohibited Work Times in Saltwater Areas (WCA 220-110-271)
Washington Hydraulic Code – Saltwater Habitats of Special Concern (WCA 220-110-250)
Washington Natural Resources Conservation Areas (RCW 79.71)
Washington Pesticide Application Act (RCW 17.21)
Washington Wild Salmonid Policy (RCW 77.65.420)
Water Resource Management (RCW 90.42)
Water Resources Act of 1971 (RCW 90.54)
Water Rights of United States (RCW 90.40)

This Page Intentionally Left Blank

APPENDIX D: INRMP PROJECTS, SCHEDULES, AND IMPLEMENTATION TABLE

The following table contains natural resources projects proposed for NAVBASE Kitsap, and includes a natural resources management area (program management, education and outreach, terrestrial habitat, water resources, or fish and wildlife management), a corresponding law or regulation, project driver, and proposed fiscal year for implementing each recommendation.

The projects presented strive to enhance natural resources on NAVBASE Kitsap, without impacting other installation plans and activities. Achieving these recommendations will require development to be conducted in an environmentally sensitive way and requires cooperation between, installation environmental offices, facilities, tenants, and operations. Any future changes in mission, training activity, or technology should be analyzed to assess their impact on natural resources. As new installation plans and DON guidance and regulations are developed, they should be integrated with the goals and management actions in this INRMP.

Table D-1: NAVBASE Kitsap INRMP Projects and Implementation Table

All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 USC 1341 et seq.).

APPENDIX E: SPECIES THAT MAY OCCUR AT NAVBASE KITSAP

This Page Intentionally Left Blank

APPENDIX F: INSTALLATION RESTORATION SITES

This Page Intentionally Left Blank

APPENDIX G: FORESTRY PRESCRIPTIONS

This Page Intentionally Left Blank

APPENDIX H: NORTHWEST MARINE MAMMAL STRANDING NETWORK HANDBOOK

This Page Intentionally Left Blank

APPENDIX I: NATURAL RESOURCES METRICS AND DESIGNATION LETTERS

This Page Intentionally Left Blank