

TABLE OF CONTENTS
VOLUME I

1 PURPOSE AND NEED OF PROPOSED ACTION..... 1-1

1.1 INTRODUCTION..... 1-1

1.2 BACKGROUND..... 1-5

1.2.1 WHY THE NAVY TRAINS 1-5

1.2.2 TACTICAL TRAINING THEATER ASSESSMENT AND PLANNING (TAP) PROGRAM..... 1-6

1.2.3 THE STRATEGIC IMPORTANCE OF THE EXISTING NWTRC..... 1-7

1.3 OVERVIEW OF THE NWTRC 1-8

1.3.1 MISSION 1-8

1.3.2 PRIMARY COMPONENTS..... 1-8

1.3.2.1 Offshore Area..... 1-8

1.3.2.2 Inshore Area..... 1-9

1.3.3 SHORTFALLS OF THE NWTRC 1-10

1.4 PURPOSE AND NEED FOR THE PROPOSED ACTION 1-10

1.5 SCOPE AND CONTENT OF THE EIS/OEIS..... 1-11

1.6 THE ENVIRONMENTAL REVIEW PROCESS..... 1-11

1.6.1 THE NATIONAL ENVIRONMENTAL POLICY ACT 1-11

1.6.2 GOVERNMENT-TO-GOVERNMENT CONSULTATIONS 1-13

1.6.3 REGULATORY AGENCY BRIEFINGS..... 1-13

1.6.4 JURISDICTIONAL CONSIDERATIONS (EO 12114)..... 1-13

1.6.5 COASTAL ZONE MANAGEMENT ACT 1-14

1.6.5.1 Washington Coastal Zone 1-15

1.6.5.2 Oregon Coastal Zone 1-16

1.6.5.3 California Coastal Zone 1-17

1.6.6 NATIONAL MARINE SANCTUARIES ACT 1-17

1.6.7 MARINE MAMMAL PROTECTION ACT..... 1-17

1.6.8 ENDANGERED SPECIES ACT 1-18

1.6.9 OTHER ENVIRONMENTAL REQUIREMENTS CONSIDERED 1-18

1.7 RELATED ENVIRONMENTAL DOCUMENTS 1-19

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES 2-1

2.1 DESCRIPTION OF THE NWTRC STUDY AREA 2-1

2.1.1 NORTHWEST TRAINING RANGE COMPLEX OFFSHORE AREA OVERVIEW 2-2

2.1.1.1 Air Space..... 2-2

2.1.1.2 Sea Space 2-4

2.1.1.3 Undersea Space..... 2-4

2.1.2 NWTRC INSHORE AREA OVERVIEW 2-4

2.2 NAVY SONAR SYSTEMS 2-9

2.2.1 WHAT IS SONAR? 2-9

2.2.2 WHY THE NAVY TRAINS WITH SONAR 2-10

2.2.3 SONARS USED IN THE NWTRC..... 2-11

2.3 PROPOSED ACTION AND ALTERNATIVES 2-13

2.3.1 ALTERNATIVES DEVELOPMENT 2-13

2.3.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION 2-14

2.3.2.1 Alternative Range Complex Locations 2-14

2.3.2.2 Simulated Training..... 2-15

| | | |
|---------|---|------|
| 2.3.2.3 | Reduction in the Level of Current Training in the Northwest Training Range Complex | 2-16 |
| 2.3.3 | PROPOSED ACTION AND ALTERNATIVES CONSIDERED | 2-16 |
| 2.4 | NO ACTION – CURRENT TRAINING ACTIVITIES WITHIN THE NWTRC | 2-16 |
| 2.4.1 | DESCRIPTION OF CURRENT AND FUTURE TRAINING ACTIVITIES WITHIN THE NWTRC | 2-17 |
| 2.4.1.1 | Anti-Air Warfare (AAW) Training | 2-17 |
| 2.4.1.2 | Anti-Surface Warfare (ASUW) Training | 2-19 |
| 2.4.1.3 | Anti-Submarine Warfare (ASW) Training | 2-20 |
| 2.4.1.4 | Electronic Combat (EC) Training | 2-21 |
| 2.4.1.5 | Mine Warfare (MIW) Training | 2-21 |
| 2.4.1.6 | Naval Special Warfare, Explosive Ordnance Disposal, and Search and Rescue Training | 2-22 |
| 2.4.1.7 | Strike Warfare (STW) Training | 2-23 |
| 2.4.1.8 | Support Activities | 2-23 |
| 2.5 | ALTERNATIVE 1 – INCREASE TRAINING ACTIVITIES AND ACCOMMODATE FORCE STRUCTURE CHANGES | 2-25 |
| 2.5.1 | REVISED LEVEL OF ACTIVITIES | 2-25 |
| 2.5.2 | FORCE STRUCTURE CHANGES | 2-25 |
| 2.5.2.1 | New Platforms/Vehicles | 2-26 |
| 2.5.2.2 | New Weapons Systems | 2-27 |
| 2.5.2.3 | Relocation of Forces | 2-28 |
| 2.5.2.4 | New Instrumentation Technology | 2-28 |
| 2.6 | ALTERNATIVE 2 – INCREASE TRAINING ACTIVITIES, ACCOMMODATE FORCE STRUCTURE CHANGES, AND IMPLEMENT RANGE ENHANCEMENTS | 2-28 |
| 2.6.1 | REVISED LEVEL OF ACTIVITIES | 2-28 |
| 2.6.2 | NWTRC ENHANCEMENTS | 2-29 |
| 2.6.2.1 | New Electronic Combat (EC) Threat Simulators/Targets | 2-29 |
| 2.6.2.2 | Development of the Portable Undersea Tracking Range | 2-29 |
| 2.6.2.3 | Development of Air Target Services | 2-30 |
| 2.6.2.4 | Development of Surface Target Services | 2-31 |
| 2.6.2.5 | Small Scale Underwater Training Minefield | 2-32 |
| 2.6.3 | RANGE ACTIVITY SUMMARY TABLES | 2-32 |

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES..... 3-1

| | | |
|---------|---|--------|
| 3.0 | GENERAL APPROACH TO ANALYSIS | 3-2 |
| 3.0.1 | STRESSORS | 3-2 |
| 3.0.2 | DATA SOURCES | 3-7 |
| 3.1 | GEOLOGY AND SOILS | 3.1-1 |
| 3.1.1 | AFFECTED ENVIRONMENT | 3.1-1 |
| 3.1.1.1 | Existing Conditions | 3.1-1 |
| 3.1.1.2 | Current Requirements and Practices | 3.1-7 |
| 3.1.2 | ENVIRONMENTAL CONSEQUENCES | 3.1-7 |
| 3.1.2.1 | Approach to Analysis | 3.1-7 |
| 3.1.2.2 | No Action Alternative | 3.1-9 |
| 3.1.2.3 | Alternative 1 | 3.1-11 |
| 3.1.2.4 | Alternative 2 (Preferred Alternative) | 3.1-13 |
| 3.1.3 | MITIGATION MEASURES | 3.1-13 |
| 3.1.4 | SUMMARY OF EFFECTS BY ALTERNATIVE | 3.1-13 |

| | | |
|---------|---|--------|
| 3.2 | AIR QUALITY | 3.2-1 |
| 3.2.1 | AIR QUALITY STANDARDS..... | 3.2-2 |
| 3.2.2 | POLLUTANT EMISSIONS | 3.2-3 |
| 3.2.2.1 | Greenhouse Gas Emissions..... | 3.2-4 |
| 3.2.3 | AFFECTED ENVIRONMENT | 3.2-5 |
| 3.2.3.1 | Existing Conditions..... | 3.2-5 |
| 3.2.3.2 | Current Requirements and Practices | 3.2-5 |
| 3.2.4 | ENVIRONMENTAL CONSEQUENCES..... | 3.2-6 |
| 3.2.4.1 | Approach to Analysis..... | 3.2-6 |
| 3.2.4.2 | No Action Alternative..... | 3.2-9 |
| 3.2.4.3 | Alternative 1..... | 3.2-10 |
| 3.2.4.4 | Alternative 2 (Preferred Alternative)..... | 3.2-11 |
| 3.2.4.5 | Mitigation Measures | 3.2-12 |
| 3.2.5 | SUMMARY OF EFFECTS | 3.2-12 |
| 3.3 | HAZARDOUS MATERIALS..... | 3.3-1 |
| 3.3.1 | AFFECTED ENVIRONMENT | 3.3-1 |
| 3.3.1.1 | Hazardous Materials | 3.3-7 |
| 3.3.1.2 | Current Requirements and Practices..... | 3.3-15 |
| 3.3.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.3-16 |
| 3.3.2.1 | Approach to Analysis..... | 3.3-16 |
| 3.3.2.2 | No Action Alternative..... | 3.3-21 |
| 3.3.2.3 | Alternative 1..... | 3.3-37 |
| 3.3.2.4 | Alternative 2 (Preferred Alternative)..... | 3.3-41 |
| 3.3.3 | MITIGATION MEASURES | 3.3-45 |
| 3.3.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.3-45 |
| 3.4 | WATER RESOURCES | 3.4-1 |
| 3.4.1 | AFFECTED ENVIRONMENT..... | 3.4-1 |
| 3.4.1.1 | Ocean Water Resources | 3.4-1 |
| 3.4.1.2 | Nearshore Water Resources..... | 3.4-10 |
| 3.4.1.3 | Other Factors that Influence Marine Water and Sediment Quality..... | 3.4-17 |
| 3.4.1.4 | Freshwater Resources | 3.4-18 |
| 3.4.1.5 | Current Requirements and Practices..... | 3.4-20 |
| 3.4.2 | ENVIRONMENTAL CONSEQUENCES | 3.4-21 |
| 3.4.2.1 | Approach to Analysis..... | 3.4-21 |
| 3.4.2.2 | No Action Alternative..... | 3.4-28 |
| 3.4.2.3 | Alternative 1..... | 3.4-46 |
| 3.4.2.4 | Alternative 2 (Preferred Alternative)..... | 3.4-51 |
| 3.4.3 | MITIGATION MEASURES | 3.4-56 |
| 3.4.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.4-56 |
| 3.5 | ACOUSTIC ENVIRONMENT (AIRBORNE)..... | 3.5-1 |
| 3.5.1 | INTRODUCTION..... | 3.5-1 |
| 3.5.2 | SOUND CHARACTERISTICS..... | 3.5-1 |
| 3.5.2.1 | Sound Fundamentals..... | 3.5-1 |
| 3.5.2.2 | Sound Propagation | 3.5-4 |
| 3.5.2.3 | Noise-Related Environmental Stressors..... | 3.5-4 |
| 3.5.3 | AFFECTED ENVIRONMENT | 3.5-4 |
| 3.5.3.1 | Pacific Northwest OPAREA..... | 3.5-6 |

| | | |
|---------|--|--------|
| 3.5.3.2 | Nearshore and Onshore Airborne Noise, and Sensitive Receptors..... | 3.5-10 |
| 3.5.3.3 | Current Requirements and Practices..... | 3.5-14 |
| 3.5.4 | ENVIRONMENTAL CONSEQUENCES..... | 3.5-14 |
| 3.5.4.1 | Approach to Analysis..... | 3.5-14 |
| 3.5.4.2 | No Action Alternative..... | 3.5-15 |
| 3.5.4.3 | Alternative 1..... | 3.5-16 |
| 3.5.4.4 | Alternative 2 (Preferred Alternative)..... | 3.5-17 |
| 3.5.5 | MITIGATION MEASURES..... | 3.5-17 |
| 3.5.6 | SUMMARY OF EFFECTS..... | 3.5-18 |
| 3.6 | MARINE PLANTS AND INVERTEBRATES..... | 3.6-1 |
| 3.6.1 | AFFECTED ENVIRONMENT..... | 3.6-1 |
| 3.6.1.1 | Open Ocean Pelagic Habitats..... | 3.6-1 |
| 3.6.1.2 | Open Ocean Deepwater Benthic Habitats..... | 3.6-2 |
| 3.6.1.3 | Nearshore Habitats..... | 3.6-6 |
| 3.6.1.4 | Invertebrate Hearing Overview..... | 3.6-13 |
| 3.6.1.5 | Federally Protected Areas..... | 3.6-14 |
| 3.6.1.6 | Current Requirements and Practices..... | 3.6-15 |
| 3.6.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.6-17 |
| 3.6.2.1 | Approach to Analysis..... | 3.6-17 |
| 3.6.2.2 | No Action Alternative..... | 3.6-20 |
| 3.6.2.3 | Alternative 1..... | 3.6-26 |
| 3.6.2.4 | Alternative 2 (Preferred Alternative)..... | 3.6-29 |
| 3.6.3 | MITIGATION MEASURES..... | 3.6-31 |
| 3.6.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.6-31 |
| 3.7 | FISH..... | 3.7-1 |
| 3.7.1 | AFFECTED ENVIRONMENT..... | 3.7-1 |
| 3.7.1.1 | Existing Conditions..... | 3.7-1 |
| 3.7.1.2 | Socioeconomic Value of Northwest Training Range Complex Fish..... | 3.7-6 |
| 3.7.1.3 | Essential Fish Habitat..... | 3.7-6 |
| 3.7.1.4 | Threatened and Endangered Species and Species of Concern..... | 3.7-11 |
| 3.7.1.5 | Hearing in Fish..... | 3.7-24 |
| 3.7.1.6 | Current Requirements and Practices..... | 3.7-30 |
| 3.7.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.7-31 |
| 3.7.2.1 | Approach to Analysis..... | 3.7-31 |
| 3.7.2.2 | Assessment Methods..... | 3.7-33 |
| 3.7.2.3 | No Action Alternative..... | 3.7-42 |
| 3.7.2.4 | Alternative 1..... | 3.7-65 |
| 3.7.2.5 | Alternative 2 (Preferred Alternative)..... | 3.7-78 |
| 3.7.3 | MITIGATION MEASURES..... | 3.7-90 |
| 3.7.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.7-91 |
| 3.8 | SEA TURTLES..... | 3.8-1 |
| 3.8.1 | AFFECTED ENVIRONMENT..... | 3.8-2 |
| 3.8.1.1 | Species Accounts and Life History..... | 3.8-2 |
| 3.8.1.2 | Sea Turtle Hearing..... | 3.8-6 |
| 3.8.1.3 | Current Requirements and Practices..... | 3.8-7 |
| 3.8.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.8-7 |
| 3.8.2.1 | Approach to Analysis..... | 3.8-7 |
| 3.8.2.2 | No Action Alternative..... | 3.8-12 |

| | | |
|----------|--|---------|
| 3.8.2.3 | Alternative 1..... | 3.8-18 |
| 3.8.2.4 | Alternative 2 (Preferred Alternative)..... | 3.8-22 |
| 3.8.3 | MITIGATION MEASURES | 3.8-26 |
| 3.8.4 | SUMMARY OF EFFECTS BY ALTERNATIVE | 3.8-26 |
| 3.9 | MARINE MAMMALS | 3.9-1 |
| 3.9.1 | AFFECTED ENVIRONMENT | 3.9-1 |
| 3.9.1.1 | Threatened and Endangered Marine Mammal Species..... | 3.9-6 |
| 3.9.1.2 | Non-Listed Marine Mammals..... | 3.9-27 |
| 3.9.1.3 | Current Requirements and Practices..... | 3.9-53 |
| 3.9.2 | ENVIRONMENTAL CONSEQUENCES | 3.9-54 |
| 3.9.2.1 | Approach to Analysis..... | 3.9-54 |
| 3.9.2.2 | Current Protective Measures..... | 3.9-94 |
| 3.9.2.3 | Olympic Coast National Marine Sanctuary Regulations and Navy Compliance..... | 3.9-96 |
| 3.9.2.4 | No Action Alternative..... | 3.9-96 |
| 3.9.2.5 | Alternative 1..... | 3.9-133 |
| 3.9.2.6 | Alternative 2 (Preferred Alternative)..... | 3.9-154 |
| 3.9.3 | IMPACTS TO MARINE MAMMAL SPECIES OR STOCKS | 3.9-177 |
| 3.9.4 | MITIGATION MEASURES | 3.9-178 |
| 3.9.4.1 | Alternative Mitigation Measures Considered but Eliminated..... | 3.9-178 |
| 3.9.5 | SUMMARY OF ENVIRONMENTAL EFFECTS..... | 3.9-179 |
| 3.9.5.1 | Endangered Species Act..... | 3.9-179 |
| 3.9.5.2 | Marine Mammal Protection Act | 3.9-180 |
| 3.9.5.3 | National Environmental Policy Act and Executive Order 12114 | 3.9-180 |
| 3.10 | BIRDS..... | 3.10-1 |
| 3.10.1 | AFFECTED ENVIRONMENT | 3.10-1 |
| 3.10.1.1 | Birds and Their Habitats | 3.10-2 |
| 3.10.1.2 | Federally Endangered or Threatened Species | 3.10-11 |
| 3.10.1.3 | Bald and Golden Eagle Protection Act Species | 3.10-18 |
| 3.10.1.4 | Hearing in Birds..... | 3.10-19 |
| 3.10.2 | CURRENT REQUIREMENTS AND PRACTICES | 3.10-20 |
| 3.10.2.1 | Standard Operating Procedures and Best Management Practices..... | 3.10-20 |
| 3.10.2.2 | Olympic Coast National Marine Sanctuary Regulations and Navy Compliance..... | 3.10-20 |
| 3.10.3 | ENVIRONMENTAL CONSEQUENCES | 3.10-21 |
| 3.10.3.1 | Approach to Analysis..... | 3.10-21 |
| 3.10.3.2 | No Action Alternative | 3.10-26 |
| 3.10.3.3 | Alternative 1..... | 3.10-45 |
| 3.10.3.4 | Alternative 2 (Preferred Alternative)..... | 3.10-54 |
| 3.10.4 | MITIGATION MEASURES | 3.10-64 |
| 3.10.5 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.10-66 |
| 3.11 | TERRESTRIAL BIOLOGICAL RESOURCES | 3.11-1 |
| 3.11.1 | AFFECTED ENVIRONMENT | 3.11-1 |
| 3.11.1.1 | Vegetation..... | 3.11-1 |
| 3.11.1.2 | Threatened, Endangered, and Sensitive Plant Species..... | 3.11-3 |
| 3.11.1.3 | Wetlands | 3.11-3 |
| 3.11.1.4 | Wildlife | 3.11-5 |
| 3.11.2 | ENVIRONMENTAL CONSEQUENCES | 3.11-9 |
| 3.11.2.1 | Approach to Analysis..... | 3.11-9 |
| 3.11.2.2 | No Action Alternative..... | 3.11-12 |

| | | |
|----------|---|---------|
| 3.11.2.3 | Alternative 1..... | 3.11-22 |
| 3.11.2.4 | Alternative 2 (Preferred Alternative)..... | 3.11-26 |
| 3.11.3 | MITIGATION MEASURES..... | 3.11-29 |
| 3.11.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.11-29 |
| 3.12 | CULTURAL RESOURCES..... | 3.12-1 |
| 3.12.1 | AFFECTED ENVIRONMENT..... | 3.12-2 |
| 3.12.1.1 | Cultural Resources in the Northwest Coastal Region..... | 3.12-2 |
| 3.12.1.2 | Cultural Resources at Specific Study Area Sites..... | 3.12-9 |
| 3.12.1.3 | Government-to-Government Consultations..... | 3.12-16 |
| 3.12.1.4 | Current Requirements and Practices..... | 3.12-16 |
| 3.12.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.12-18 |
| 3.12.2.1 | Approach to Analysis..... | 3.12-18 |
| 3.12.2.2 | No Action Alternative..... | 3.12-23 |
| 3.12.2.3 | Alternative 1..... | 3.12-25 |
| 3.12.2.4 | Alternative 2 (Preferred Alternative)..... | 3.12-27 |
| 3.12.3 | MITIGATION MEASURES..... | 3.12-28 |
| 3.12.4 | SUMMARY OF EFFECTS..... | 3.12-28 |
| 3.12.4.1 | No Action Alternative..... | 3.12-28 |
| 3.12.4.2 | Alternative 1..... | 3.12-29 |
| 3.12.4.3 | Alternative 2..... | 3.12-29 |
| 3.13 | TRAFFIC..... | 3.13-1 |
| 3.13.1 | DEFINITION OF RESOURCE..... | 3.13-1 |
| 3.13.1.1 | Air Traffic..... | 3.13-1 |
| 3.13.1.2 | Special Use Airspace..... | 3.13-1 |
| 3.13.1.3 | Marine Traffic..... | 3.13-3 |
| 3.13.2 | AFFECTED ENVIRONMENT..... | 3.13-4 |
| 3.13.2.1 | Existing Conditions – Offshore Area..... | 3.13-4 |
| 3.13.2.2 | Existing Conditions – Inshore Area..... | 3.13-8 |
| 3.13.2.3 | Current Requirements and Practices..... | 3.13-9 |
| 3.13.3 | ENVIRONMENTAL CONSEQUENCES..... | 3.13-10 |
| 3.13.3.1 | Approach to Analysis..... | 3.13-10 |
| 3.13.3.2 | No Action Alternative..... | 3.13-11 |
| 3.13.3.3 | Alternative 1..... | 3.13-12 |
| 3.13.3.4 | Alternative 2 (Preferred Alternative)..... | 3.13-13 |
| 3.13.4 | MITIGATION MEASURES..... | 3.13-14 |
| 3.13.5 | UNAVOIDABLE ENVIRONMENTAL EFFECTS..... | 3.13-14 |
| 3.13.6 | SUMMARY OF EFFECT BY ALTERNATIVE..... | 3.13-14 |
| 3.14 | SOCIOECONOMICS..... | 3.14-1 |
| 3.14.1 | AFFECTED ENVIRONMENT..... | 3.14-1 |
| 3.14.1.1 | Offshore Area..... | 3.14-1 |
| 3.14.1.2 | Inshore Area..... | 3.14-5 |
| 3.14.2 | ENVIRONMENTAL CONSEQUENCES..... | 3.14-9 |
| 3.14.2.1 | Approach to Analysis..... | 3.14-9 |
| 3.14.2.2 | No Action Alternative..... | 3.14-9 |
| 3.14.2.3 | Alternative 1..... | 3.14-10 |
| 3.14.2.4 | Alternative 2 (Preferred Alternative)..... | 3.14-11 |
| 3.14.3 | MITIGATION MEASURES..... | 3.14-12 |
| 3.14.4 | SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.14-13 |

| | |
|--|------------|
| 3.15 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN | 3.15-1 |
| 3.15.1 ENVIRONMENTAL JUSTICE..... | 3.15-1 |
| 3.15.2 PROTECTION OF CHILDREN..... | 3.15-1 |
| 3.15.3 AFFECTED ENVIRONMENT | 3.15-1 |
| 3.15.3.1 Offshore Area..... | 3.15-1 |
| 3.15.3.2 Inshore Area..... | 3.15-1 |
| 3.15.4 ENVIRONMENTAL CONSEQUENCES | 3.15-4 |
| 3.15.4.1 Approach to Analysis..... | 3.15-4 |
| 3.15.4.2 No Action Alternative..... | 3.15-4 |
| 3.15.4.3 Alternative 1..... | 3.15-4 |
| 3.15.4.4 Alternative 2 (Preferred Alternative)..... | 3.15-5 |
| 3.15.5 MITIGATION MEASURES | 3.15-6 |
| 3.15.6 SUMMARY OF EFFECTS BY ALTERNATIVE..... | 3.15-6 |
| | |
| 3.16 PUBLIC SAFETY | 3.16-1 |
| 3.16.1 AFFECTED ENVIRONMENT | 3.16-1 |
| 3.16.1.1 Offshore Area..... | 3.16-1 |
| 3.16.1.2 Inshore Area..... | 3.16-1 |
| 3.16.1.3 Current Requirements and Practices | 3.16-4 |
| 3.16.2 ENVIRONMENTAL CONSEQUENCES | 3.16-7 |
| 3.16.2.1 Approach to Analysis..... | 3.16-7 |
| 3.16.2.2 No Action Alternative..... | 3.16-9 |
| 3.16.2.3 Alternative 1..... | 3.16-16 |
| 3.16.2.4 Alternative 2 (Preferred Alternative)..... | 3.16-17 |
| 3.16.3 MITIGATION..... | 3.16-18 |
| 3.16.4 SUMMARY OF EFFECTS | 3.16-19 |
| | |
| 4 CUMULATIVE IMPACTS | 4-1 |
| 4.1 PRINCIPLES OF CUMULATIVE IMPACTS ANALYSIS | 4-1 |
| 4.1.1 IDENTIFYING GEOGRAPHICAL BOUNDARIES FOR CUMULATIVE IMPACTS ANALYSIS..... | 4-2 |
| 4.1.2 PROJECTS AND OTHER ACTIVITIES ANALYZED FOR CUMULATIVE IMPACTS..... | 4-2 |
| 4.1.2.1 Past, Present, and Reasonably Foreseeable Future Actions..... | 4-2 |
| 4.1.3 OTHER ACTIVITIES..... | 4-8 |
| 4.1.3.1 Fishing..... | 4-8 |
| 4.1.3.2 Commercial and Recreational Marine Traffic | 4-9 |
| 4.1.3.3 Wave/Tidal Energy Plants | 4-9 |
| 4.1.3.4 Ocean Pollution..... | 4-10 |
| 4.1.3.5 Coastal Development..... | 4-11 |
| 4.1.3.6 Regional Growth Management (Provincial Legislation) | 4-11 |
| 4.1.3.7 Scientific Research..... | 4-12 |
| 4.1.3.8 Commercial and General Aviation | 4-13 |
| 4.1.3.9 Air Quality Factors | 4-13 |
| 4.1.4 HABITATS OF MIGRATORY MARINE ANIMALS | 4-13 |
| 4.2 CUMULATIVE IMPACT ANALYSIS..... | 4-14 |
| 4.2.1 GEOLOGY AND SOILS | 4-14 |
| 4.2.2 AIR QUALITY..... | 4-14 |
| 4.2.2.1 Criteria Pollutants | 4-14 |
| 4.2.2.2 Greenhouse Gases..... | 4-15 |
| 4.2.3 HAZARDOUS MATERIALS..... | 4-16 |

| | | |
|----------|--|------------|
| 4.2.4 | WATER RESOURCES | 4-18 |
| 4.2.5 | ACOUSTIC ENVIRONMENT (AIRBORNE)..... | 4-18 |
| 4.2.6 | MARINE PLANTS AND INVERTEBRATES | 4-20 |
| 4.2.7 | FISH..... | 4-21 |
| 4.2.8 | SEA TURTLES | 4-22 |
| 4.2.9 | MARINE MAMMALS | 4-23 |
| 4.2.9.1 | Natural Stressors | 4-23 |
| 4.2.9.2 | Anthropogenic Stressors | 4-25 |
| 4.2.10 | BIRDS..... | 4-34 |
| 4.2.11 | TERRESTRIAL BIOLOGICAL RESOURCES..... | 4-34 |
| 4.2.12 | CULTURAL RESOURCES | 4-35 |
| 4.2.13 | TRAFFIC (AIRSPACE) | 4-36 |
| 4.2.14 | SOCIOECONOMICS..... | 4-36 |
| 4.2.15 | ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN | 4-36 |
| 4.2.16 | PUBLIC SAFETY..... | 4-37 |
| 5 | MITIGATION MEASURES | 5-1 |
| 5.1 | CURRENT REQUIREMENTS AND PRACTICES..... | 5-1 |
| 5.1.1 | GEOLOGY AND SOILS | 5-1 |
| 5.1.2 | AIR QUALITY..... | 5-1 |
| 5.1.3 | HAZARDOUS MATERIALS..... | 5-2 |
| 5.1.4 | WATER RESOURCES | 5-2 |
| 5.1.5 | ACOUSTIC ENVIRONMENT (AIRBORNE)..... | 5-4 |
| 5.1.6 | MARINE PLANTS AND INVERTEBRATES | 5-5 |
| 5.1.7 | FISH..... | 5-5 |
| 5.1.8 | BIRDS | 5-5 |
| 5.1.9 | TERRESTRIAL BIOLOGICAL RESOURCES | 5-6 |
| 5.1.10 | CULTURAL RESOURCES | 5-7 |
| 5.1.11 | TRAFFIC | 5-8 |
| 5.1.12 | SOCIOECONOMICS..... | 5-8 |
| 5.1.13 | ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN | 5-8 |
| 5.1.14 | PUBLIC SAFETY..... | 5-8 |
| 5.1.14.1 | Aviation Safety | 5-8 |
| 5.1.14.2 | Submarine Safety | 5-8 |
| 5.1.14.3 | Surface Ship Safety | 5-9 |
| 5.1.14.4 | Missile Exercise Safety | 5-9 |
| 5.2 | MITIGATION MEASURES | 5-9 |
| 5.2.1 | SEA TURTLES AND MARINE MAMMALS | 5-10 |
| 5.2.1.1 | General Maritime Measures..... | 5-11 |
| 5.2.1.2 | Measures for Specific Training Events..... | 5-12 |
| 5.2.1.3 | Conservation Measures | 5-19 |
| 5.2.1.4 | Coordination and Reporting..... | 5-23 |
| 5.2.1.5 | Alternative Mitigation Measures Considered but Eliminated..... | 5-23 |
| 5.3 | MMPA REQUIRED MITIGATION, MONITORING, AND REPORTING..... | 5-37 |
| 5.3.1 | REQUIREMENTS FOR MITIGATION (50 CFR §218.173) MONITORING AND REPORTING (50 CFR §218.174) | 5-37 |
| 5.4 | ESA PROTECTIVE MEASURES..... | 5-37 |
| 5.4.1 | REASONABLE AND PRUDENT MEASURES FROM USFWS BO | 5-38 |
| 5.4.1.1 | Bull Trout and Marbled Murrelets | 5-38 |
| 5.4.2 | TERMS AND CONDITIONS FROM USFWS BO..... | 5-38 |

5.4.2.1 Bull Trout.....5-38
 5.4.2.2 Marbled Murrelet5-39
 5.4.3 TERMS AND CONDITIONS FROM NMFS BO.....5-40

6.. OTHER CONSIDERATIONS REQUIRED BY THE NATIONAL ENVIRONMENTAL POLICY ACT 6-1

6.1 CONSISTENCY WITH OTHER FEDERAL, STATE, AND LOCAL PLANS, POLICIES, AND REGULATIONS 6-1
 6.1.1 COASTAL ZONE MANAGEMENT ACT COMPLIANCE.....6-5
 6.1.2 OLYMPIC COAST NATIONAL MARINE SANCTUARY.....6-6
 6.1.2.1 Olympic Coast National Marine Sanctuary Environmental Impact Statement/Management Plan..
6-6
 6.1.2.2 Olympic Coast National Marine Sanctuary Prohibited Activities6-6
 6.1.2.3 Navy Compliance.....6-6
 6.2 RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN’S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY6-7
 6.3 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES6-7
 6.4 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES AND MITIGATION MEASURES6-7
 6.5 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL OF VARIOUS ALTERNATIVES AND MITIGATION MEASURES6-8

7 LIST OF PREPARERS..... 7-1

8 REFERENCES..... 8-1

LIST OF FIGURES

1 PURPOSE AND NEED OF PROPOSED ACTION..... 1-1

FIGURE 1-1: NWTRC EIS/OEIS STUDY AREA 1-2
 FIGURE 1-2: PUGET SOUND TRAINING AREAS OF THE NWTRC 1-3

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES 2-1

FIGURE 2-1: NWTRC OFFSHORE AREA 2-3
 FIGURE 2-2: NWTRC PROPOSED ACTION AREA, INCLUDING INSHORE AREA 2-5
 FIGURE 2-3: NWTRC INSHORE AREA (PUGET SOUND)..... 2-6
 FIGURE 2-4: PRINCIPLE OF AN ACTIVE SONAR 2-10
 FIGURE 2-5: NWTRC INSHORE AREA (INDIAN ISLAND) 2-24

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES..... 3-1

There are no figures in this section

3.1 GEOLOGY AND SOILS3.1-1

FIGURE 3.1-1: PUGET SOUND 3.1-2
 FIGURE 3.1-2: WHIDBEY ISLAND..... 3.1-3
 FIGURE 3.1-3: INDIAN ISLAND AND SURROUNDING FEATURES..... 3.1-5
 FIGURE 3.1-4: NBK-BANGOR AND HOOD CANAL 3.1-6

3.2 AIR QUALITY3.2-1

There are no figures in this section

| | |
|---|--------------|
| 3.3 HAZARDOUS MATERIALS | 3.3-1 |
| FIGURE 3.3-1: 2007-2008 MARINE DEBRIS SURVEY TOW LOCATIONS | 3.3-11 |
| 3.4 WATER RESOURCES..... | 3.4-1 |
| FIGURE 3.4-1: BATHYMETRY OF THE NWTRC EIS/OEIS STUDY AREA | 3.4-3 |
| FIGURE 3.4-2: PACIFIC NORTHWEST SUBMARINE CANYONS | 3.4-4 |
| FIGURE 3.4-3: STRAIT OF JUAN DE FUCA AND PUGET SOUND | 3.4-6 |
| FIGURE 3.4-4: NBK-BANGOR AND HOOD CANAL | 3.4-13 |
| FIGURE 3.4-5: INDIAN ISLAND AND SURROUNDING FEATURES..... | 3.4-15 |
| FIGURE 3.4-6: AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE | 3.4-25 |
| 3.5 ACOUSTIC ENVIRONMENT (AIRBORNE) | 3.5-1 |
| FIGURE 3.5-1: SOUND LEVELS OF TYPICAL AIRBORNE NOISE SOURCES AND ENVIRONMENTS | 3.5-3 |
| FIGURE 3.5-2: TARGET DRONE LAUNCH | 3.5-9 |
| FIGURE 3.5-3: COMPARISON BETWEEN EXISTING 2003 DNL CONTOURS AND PROJECTED 2013 NOISE CONTOURS OVER LAND USE | 3.5-11 |
| 3.6 MARINE PLANTS AND INVERTEBRATES | 3.6-1 |
| FIGURE 3.6-1: LOCATIONS OF DEEPWATER BENTHIC COMMUNITIES IN THE NWTRC | 3.6-3 |
| FIGURE 3.6-2: CASCADIA ABYSSAL PLAIN AND OCEANIC PLATES IN THE NWTRC..... | 3.6-5 |
| FIGURE 3.6-3: MIXED MACROALGAE, SARGASSUM, AND KELP – PACIFIC COAST AND PUGET SOUND | 3.6-8 |
| FIGURE 3.6-4: SURFGRASS AND EELGRASS BEDS – PACIFIC COAST AND PUGET SOUND..... | 3.6-10 |
| FIGURE 3.6-5: LOCATION OF OLYMPIC COAST NATIONAL MARINE SANCTUARY WITHIN THE NWTRC | 3.6-16 |
| FIGURE 3.6-6: 2007-2008 MARINE DEBRIS SURVEY TOW LOCATIONS | 3.6-22 |
| 3.7 FISH..... | 3.7-1 |
| FIGURE 3.7-1: HABITAT AREAS OF PARTICULAR CONCERN WITHIN THE PACNW STUDY AREA | 3.7-9 |
| FIGURE 3.7-2. CRITICAL HABITAT FOR CHINOOK SALMON IN THE PACNW STUDY AREA | 3.7-15 |
| FIGURE 3.7-3. CRITICAL HABITAT FOR COHO SALMON IN THE PACNW STUDY AREA..... | 3.7-17 |
| FIGURE 3.7-4. CRITICAL HABITAT FOR CHUM SALMON IN THE PACNW STUDY AREA | 3.7-18 |
| FIGURE 3.7-5. CRITICAL HABITATS FOR STEELHEAD TROUT IN THE PACNW STUDY AREA..... | 3.7-20 |
| FIGURE 3.7-6. CRITICAL HABITAT FOR BULL TROUT IN THE PACNW STUDY AREA | 3.7-21 |
| FIGURE 3.7-7. PROPOSED CRITICAL HABITAT FOR GREEN STURGEON IN THE PACNW STUDY AREA | 3.7-22 |
| FIGURE 3.7-8: 2007-2008 MARINE DEBRIS SURVEY TOW LOCATIONS | 3.7-41 |
| 3.8 SEA TURTLES..... | 3.8-1 |
| FIGURE 3.8-1: LOCATION OF THE PACIFIC LEATHERBACK CONSERVATION ZONE OFF THE COASTS OF CALIFORNIA AND OREGON | 3.8-3 |
| FIGURE 3.8-2: THE GENERALIZED MIGRATION OF LEATHERBACK TURTLES IN THE NORTHERN PACIFIC OCEAN ... | 3.8-5 |
| 3.9 MARINE MAMMALS..... | 3.9-1 |
| FIGURE 3.9-1: CRITICAL HABITAT FOR SOUTHERN RESIDENT KILLER WHALE | 3.9-19 |
| FIGURE 3.9-2: STELLER SEA LION CRITICAL HABITAT FOR EASTERN STOCK..... | 3.9-23 |
| FIGURE 3.9-3: ANALYTICAL FRAMEWORK FOR EVALUATING SONAR EFFECTS TO MARINE MAMMALS..... | 3.9-61 |
| FIGURE 3.9-4: RELATIONSHIPS OF PHYSIOLOGICAL AND BEHAVIORAL EFFECTS TO LEVEL A AND LEVEL B HARASSMENT CATEGORIES | 3.9-70 |
| FIGURE 3.9-5: RELATIONSHIP OF TTS AND PTS RECOVERY CHARACTERISTICS | 3.9-71 |
| FIGURE 3.9-6: RISK FUNCTION CURVE FOR ODONTOCETES (EXCEPT HARBOR PORPOISES) (TOOTHED WHALES) AND PINNIPEDS..... | 3.9-79 |
| FIGURE 3.9-7: RISK FUNCTION CURVE FOR MYSTICETES (BALEEN WHALES)..... | 3.9-79 |
| FIGURE 3.9-8: APPROXIMATE PERCENTAGE OF BEHAVIORAL HARASSMENTS FOR EVERY 5-DEGREE BAND OF RECEIVED LEVEL FROM THE 53C..... | 3.9-83 |
| FIGURE 3.9-9: CHARACTERISTICS OF SOUND TRANSMISSION THROUGH AIR-WATER INTERFACE..... | 3.9-102 |

3.10 BIRDS.....3.10-1
 FIGURE 3.10-1: IMPORTANT BIRD AREAS IN THE NWTRC STUDY AREA..... 3.10-8
 FIGURE 3.10-2: WESTERN SNOWY PLOVER CRITICAL HABITAT WITHIN THE NWTRC STUDY AREA 3.10-14
 FIGURE 3.10-3: NORTHERN SPOTTED OWL AND MARBLED MURRELET CRITICAL HABITAT WITHIN THE NWTRC STUDY AREA 3.10-15

3.11 TERRESTRIAL BIOLOGICAL RESOURCES.....3.11-1
 FIGURE 3.11-1 GRIZZLY BEAR RECOVERY AREA IN THE PACNW OPAREA 3.11-7
 FIGURE 3.11-2 LYNX CRITICAL HABITAT IN THE PACNW OPAREA..... 3.11-8

3.12 CULTURAL RESOURCES3.12-1
 FIGURE 3.12-1: TRIBAL FISHERY GROUNDS IN THE PACIFIC NORTHWEST OPAREA AND VICINITY 3.12-6
 FIGURE 3.12-2: SHIPWRECKS IN THE PACIFIC NORTHWEST OPAREA 3.12-11
 FIGURE 3.12-3: SHIPWRECKS IN THE PUGET SOUND STUDY AREA AND VICINITY 3.12-12

3.13 TRAFFIC3.13-1
 FIGURE 3.13-1: AIR ROUTES IN VICINITY OF NWTRC..... 3.13-2
 FIGURE 3.13-2: MARINE TRAFFIC IN VICINITY OF NWTRC 3.13-6
 FIGURE 3.13-3: MARINE TRAFFIC IN VICINITY OF THE PUGET SOUND 3.13-7

3.14 SOCIOECONOMICS3.14-1
 FIGURE 3.14-1: DIVE SITES, PARKS, AND RECREATION IN THE NWTRC 3.14-8

3.15 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN.....3.15-1
 There are no figures in this section

3.16 PUBLIC SAFETY3.16-1
 FIGURE 3.16-1: NWTRC OPERATING AREAS, ALERT AREAS, AND RESTRICTED AREAS 3.16-2
 FIGURE 3.16-2: RECREATIONAL DIVE SITES AND STATE PARK ACCESS WITHIN THE NEARSHORE OPAREAS ... 3.16-12

4 CUMULATIVE IMPACTS 4-1
 FIGURE 4-1: HUMAN THREATS TO WORLD-WIDE SMALL CETACEAN POPULATIONS 4-26
 FIGURE 4-2: DABOB BAY RANGE COMPLEX PREFERRED SITE EXTENSION ALTERNATIVE..... 4-32
 FIGURE 4-3: QUINALT UNDERWATER TRACKING RANGE PREFERRED RANGE EXTENSION ALTERNATIVE..... 4-33

5 MITIGATION MEASURES 5-1
 There are no figures in this section

6 OTHER CONSIDERATIONS REQUIRED BY NEPA..... 6-1
 There are no figures in this section

7 LIST OF PREPARERS..... 7-1
 There are no figures in this section

8 REFERENCES..... 8-1
 There are no figures in this section

LIST OF TABLES

| | |
|--|--------------|
| 1 PURPOSE AND NEED OF PROPOSED ACTION..... | 1-1 |
| TABLE 1-1: PUBLIC SCOPING COMMENT SUMMARY..... | 1-12 |
| TABLE 1-2: GEOGRAPHICAL OCCURRENCE OF CURRENT TRAINING AND RDT&E ACTIVITIES..... | 1-15 |
| 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES | 2-1 |
| TABLE 2-1: SUMMARY OF THE AIR, SEA, UNDERSEA, AND LAND SPACE | 2-2 |
| TABLE 2-2: NWTRC OFFSHORE AREAS..... | 2-2 |
| TABLE 2-3: NWTRC INSHORE AREAS | 2-7 |
| TABLE 2-4: INSHORE AREA AIRSPACE SUMMARY | 2-8 |
| TABLE 2-5: ACOUSTIC SYSTEMS QUANTITATIVELY ANALYZED | 2-12 |
| TABLE 2-6: ACOUSTIC SYSTEMS NOT QUANTITATIVELY ANALYZED..... | 2-12 |
| TABLE 2-7: IMPACT OF RANGE ENHANCEMENTS ON ANNUAL LEVEL OF ACTIVITIES..... | 2-32 |
| TABLE 2-8: ACTIVE SONAR SYSTEMS AND PLATFORMS | 2-33 |
| TABLE 2-9: CURRENT AND PROPOSED ANNUAL LEVEL OF ACTIVITIES | 2-34 |
| TABLE 2-10: ANNUAL ORDNANCE AND EXPENDABLES USE | 2-37 |
| 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES..... | 3-1 |
| TABLE 3-1: SUMMARY OF POTENTIAL STRESSORS | 3-4 |
| TABLE 3-2: PHYSICAL AND BIOLOGICAL RESOURCES THAT COULD BE AFFECTED BY STRESSORS ASSOCIATED WITH THE ALTERNATIVES..... | 3-7 |
| 3.1 GEOLOGY AND SOILS | 3.1-1 |
| TABLE 3.1-1: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS TO SOILS..... | 3.1-8 |
| TABLE 3.1-2: SIZE AND NUMBER OF DTR DETONATIONS PER YEAR – NO ACTION ALTERNATIVE | 3.1-9 |
| TABLE 3.1-3: BYPRODUCTS OF C-4 DETONATION – 1.25-POUND CHARGE..... | 3.1-10 |
| TABLE 3.1-4: NUMBER OF EXERCISES AND PERSONNEL ANNUALLY – NO ACTION ALTERNATIVE | 3.1-10 |
| TABLE 3.1-5: SIZE AND NUMBER OF DTR DETONATIONS ANNUALLY – ALL ALTERNATIVES..... | 3.1-11 |
| TABLE 3.1-6: NUMBER OF TRAINING EXERCISES ANNUALLY – ALL ALTERNATIVES | 3.1-12 |
| TABLE 3.1-7: NUMBER OF TRAINING PERSONNEL ANNUALLY – ALL ALTERNATIVES..... | 3.1-13 |
| TABLE 3.1-8: SUMMARY OF EFFECTS – GEOLOGY AND SOILS..... | 3.1-14 |
| 3.2 AIR QUALITY | 3.2-1 |
| TABLE 3.2-1: NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS | 3.2-2 |
| TABLE 3.2-2: SUMMARY OF PROPOSED TRAINING ACTIVITIES AND EMISSION SOURCES | 3.2-8 |
| TABLE 3.2-3: SUMMARY OF ANNUAL AIR EMISSIONS FOR THE NO ACTION ALTERNATIVE | 3.2-9 |
| TABLE 3.2-4: SUMMARY OF ANNUAL AIR EMISSIONS FOR ALTERNATIVE 1 | 3.2-11 |
| TABLE 3.2-5: SUMMARY OF ANNUAL AIR EMISSIONS ALTERNATIVE 2..... | 3.2-12 |
| TABLE 3.2-6: SUMMARY OF EFFECTS – AIR QUALITY | 3.2-13 |
| 3.3 HAZARDOUS MATERIALS | 3.3-1 |
| TABLE 3.3-1: NUMBER OF ACTIVITIES OR TRAINING ITEMS EXPENDED ANNUALLY – ALL ALTERNATIVES..... | 3.3-2 |
| TABLE 3.3-2: CHEMICAL BYPRODUCTS OF UNDERWATER DETONATIONS..... | 3.3-8 |
| TABLE 3.3-3: FAILURE AND LOW-ORDER DETONATION RATES OF MILITARY ORDNANCE | 3.3-8 |
| TABLE 3.3-4: HAZARDOUS MATERIAL COMPONENTS OF TRAINING MATERIALS | 3.3-9 |
| TABLE 3.3-5: WATER SOLUBILITY OF COMMON EXPLOSIVES AND DEGRADATION PRODUCTS | 3.3-15 |
| TABLE 3.3-6: SELECTED HAZARDOUS MATERIALS DISCHARGE RESTRICTIONS FOR NAVY VESSELS..... | 3.3-17 |
| TABLE 3.3-7: STATE OF CALIFORNIA LAWS RELATED TO HAZARDOUS MATERIALS..... | 3.3-19 |
| TABLE 3.3-8: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS OF HAZARDOUS MATERIALS | 3.3-20 |
| TABLE 3.3-9: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.3-21 |
| TABLE 3.3-10: TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.3-22 |
| TABLE 3.3-11: CHEMICAL COMPOUNDS ASSOCIATED WITH MISSILE LAUNCHES..... | 3.3-23 |

| | |
|--|--------------|
| TABLE 3.3-12: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.3-23 |
| TABLE 3.3-13: TYPES AND NUMBER OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.3-24 |
| TABLE 3.3-14: MAJOR COMPONENTS OF CHAFF..... | 3.3-25 |
| TABLE 3.3-15: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.3-29 |
| TABLE 3.3-16: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE | 3.3-29 |
| TABLE 3.3-17: THRESHOLD VALUES FOR SAFE EXPOSURE TO SELECTED METALS | 3.3-30 |
| TABLE 3.3-18: DETONATION BYPRODUCTS FROM EXPLOSIVE SONOBUOYS..... | 3.3-32 |
| TABLE 3.3-19: MATERIALS EXPENDED DURING MINE COUNTERMEASURE TRAINING – NO ACTION ALTERNATIVE | 3.3-33 |
| TABLE 3.3-20: BYPRODUCTS OF UNDERWATER DETONATION OF RDX | 3.3-34 |
| TABLE 3.3-21: SIZE AND NUMBER OF DTR DETONATIONS PER YEAR – NO ACTION ALTERNATIVE | 3.3-35 |
| TABLE 3.3-22: BYPRODUCTS OF C-4 DETONATION – 1.25-POUND CHARGE..... | 3.3-36 |
| TABLE 3.3-23: AIRCRAFT SORTIES PER YEAR – NO ACTION ALTERNATIVE..... | 3.3-36 |
| TABLE 3.3-24: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.3-37 |
| TABLE 3.3-25: TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.3-37 |
| TABLE 3.3-26: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1..... | 3.3-38 |
| TABLE 3.3-27: SUMMARY OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.3-39 |
| TABLE 3.3-28: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.3-39 |
| TABLE 3.3-29: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1..... | 3.3-40 |
| TABLE 3.3-30: SIZE AND NUMBER OF DTR DETONATIONS PER YEAR – ALL ALTERNATIVES | 3.3-41 |
| TABLE 3.3-31: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.3-42 |
| TABLE 3.3-32: TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.3-42 |
| TABLE 3.3-33: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2..... | 3.3-43 |
| TABLE 3.3-34: SUMMARY OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2..... | 3.3-43 |
| TABLE 3.3-35: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2..... | 3.3-44 |
| TABLE 3.3-36: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2..... | 3.3-45 |
| TABLE 3.3-37: SUMMARY OF EFFECTS – HAZARDOUS MATERIALS..... | 3.3-46 |
| 3.4 WATER RESOURCES..... | 3.4-1 |
| TABLE 3.4-1: CONCENTRATIONS OF SELECTED ELEMENTS IN SEAWATER..... | 3.4-9 |
| TABLE 3.4-2: WASTE DISCHARGE RESTRICTIONS FOR NAVY VESSELS | 3.4-22 |
| TABLE 3.4-3: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON WATER RESOURCES..... | 3.4-27 |
| TABLE 3.4-3: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON WATER RESOURCES (CONTINUED)... | 3.4-28 |
| TABLE 3.4-4: NUMBER OF ACTIVITIES OR TRAINING ITEMS EXPENDED ANNUALLY – ALL ALTERNATIVES..... | 3.4-29 |
| TABLE 3.4-5: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.4-33 |
| TABLE 3.4-6 TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.4-34 |
| TABLE 3.4-7: PROPELLANT IN SELECTED MISSILES..... | 3.4-34 |
| TABLE 3.4-8: ORDNANCE CONSTITUENTS OF CONCERN..... | 3.4-35 |
| TABLE 3.4-9: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE | 3.4-36 |
| TABLE 3.4-10: TYPES AND NUMBER OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.4-36 |
| TABLE 3.4-11: MAJOR COMPONENTS OF CHAFF..... | 3.4-37 |
| TABLE 3.4-12: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE..... | 3.4-39 |
| TABLE 3.4-13: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE | 3.4-39 |
| TABLE 3.4-14: THRESHOLD VALUES FOR SAFE EXPOSURE TO SELECTED METALS | 3.4-40 |
| TABLE 3.4-15: DETONATION BYPRODUCTS FROM EXPLOSIVE SONOBUOYS..... | 3.4-42 |

| | |
|--|--------------|
| TABLE 3.4-16: AIRCRAFT OVERFLIGHTS PER YEAR – NO ACTION ALTERNATIVE | 3.4-43 |
| TABLE 3.4-17: SUMMARY OF TRAINING MATERIALS EXPENDED ANNUALLY – NO ACTION ALTERNATIVE | 3.4-44 |
| TABLE 3.4-18: ANNUAL MINE COUNTERMEASURE TRAINING – NO ACTION ALTERNATIVE | 3.4-45 |
| TABLE 3.4-19: BYPRODUCTS OF UNDERWATER DETONATION OF RDX | 3.4-46 |
| TABLE 3.4-20: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-46 |
| TABLE 3.4-21: TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-47 |
| TABLE 3.4-22: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-47 |
| TABLE 3.4-23: TYPES AND NUMBER OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-48 |
| TABLE 3.4-24: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-49 |
| TABLE 3.4-25: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-49 |
| TABLE 3.4-26: SUMMARY OF TRAINING MATERIALS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 1 | 3.4-50 |
| TABLE 3.4-27: TYPES AND NUMBER OF BOMBS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-51 |
| TABLE 3.4-28: TYPES AND NUMBER OF NAVAL GUNSHELLS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-51 |
| TABLE 3.4-29: TYPES AND NUMBER OF MISSILES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-52 |
| TABLE 3.4-30: TYPES AND NUMBER OF TARGETS AND COUNTERMEASURES EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-53 |
| TABLE 3.4-31: TYPES AND NUMBER OF SMALL CALIBER ROUNDS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-54 |
| TABLE 3.4-32: TYPES AND NUMBER OF SONOBUOYS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-54 |
| TABLE 3.4-33: SUMMARY OF TRAINING MATERIALS EXPENDED ANNUALLY – NO ACTION AND ALTERNATIVE 2 | 3.4-55 |
| TABLE 3.4-34: SUMMARY OF EFFECTS – WATER RESOURCES | 3.4-56 |
| | |
| 3.5 ACOUSTIC ENVIRONMENT (AIRBORNE) | 3.5-1 |
| TABLE 3.5-1: WARFARE AREAS AND NOISE-RELATED ENVIRONMENTAL STRESSOR IN THE NWTRC | 3.5-5 |
| TABLE 3.5-2: REPRESENTATIVE AIRCRAFT AND ORDNANCE SOUND SOURCES IN THE NWTRC | 3.5-7 |
| TABLE 3.5-3: TRAINING EVENTS UTILIZING EXPLOSIVES IN THE NWTRC | 3.5-10 |
| TABLE 3.5-4: SOUND LEVELS NEAR DTR SEAPLANE BASE | 3.5-12 |
| TABLE 3.5-5: IMPULSE NOISE GUIDELINES | 3.5-13 |
| TABLE 3.5-6: UNWEIGHTED PEAK NOISE MEASUREMENTS (dBp) 2,000 FEET FROM DTR NASWI | 3.5-13 |
| TABLE 3.5-7: FAVORABLE AND UNFAVORABLE DETONATION CONDITIONS | 3.5-18 |
| TABLE 3.5-8: SUMMARY OF EFFECTS – ACOUSTIC ENVIRONMENT (AIRBORNE) | 3.5-19 |
| | |
| 3.6 MARINE PLANTS AND INVERTEBRATES | 3.6-1 |
| TABLE 3.6-1: OFFSHORE ACTIVITIES AND REQUIREMENT TO CONSULT WITH OCNMS | 3.6-17 |
| TABLE 3.6-2: WARFARE AREAS, STRESSORS, AND POTENTIAL OF EFFECTS – MARINE PLANTS AND INVERTEBRATES | 3.6-19 |
| TABLE 3.6-3: TRAINING MATERIALS EXPENDED ANNUALLY IN THE PACNW OPAREA – NO ACTION ALTERNATIVE | 3.6-23 |
| TABLE 3.6-4: MATERIALS EXPENDED ANNUALLY DURING MINE COUNTERMEASURE TRAINING – ALL ALTERNATIVES | 3.6-25 |
| TABLE 3.6-5: TRAINING MATERIALS EXPENDED ANNUALLY IN THE PACNW OPAREA – NO ACTION AND ALTERNATIVE 1 | 3.6-27 |
| TABLE 3.6-6: TRAINING MATERIALS EXPENDED ANNUALLY IN THE PACNW OPAREA – NO ACTION AND ALTERNATIVE 2 | 3.6-29 |
| TABLE 3.6-7: SUMMARY OF EFFECTS – MARINE PLANTS AND INVERTEBRATES | 3.6-32 |
| | |
| 3.7 FISH | 3.7-1 |
| TABLE 3.7-1: THE FISH AND INVERTEBRATE SPECIES WITH EFH DESIGNATED IN THE PACIFIC NORTHWEST OPAREA AND PUGET SOUND STUDY AREA | 3.7-7 |
| TABLE 3.7-2: STATUS OF SOUTH PUGET SOUND GROUND FISH STOCKS (2002) | 3.7-12 |

| | |
|---|---------------|
| TABLE 3.7-3: ESA DESIGNATED FISH SPECIES WITH KNOWN OR POTENTIAL OCCURRENCE IN THE NORTHWEST TRAINING RANGE STUDY AREA | 3.7-13 |
| TABLE 3.7-4: MARINE FISH HEARING SENSITIVITIES | 3.7-26 |
| TABLE 3.7-5: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON FISH..... | 3.7-34 |
| TABLE 3.7-6: MINE COUNTERMEASURE TRAINING ACTIVITIES UNDER THE NO ACTION ALTERNATIVE..... | 3.7-44 |
| TABLE 3.7-7: DISTANCES FROM DETONATION RESULTING IN NO INJURY OR 1% MORTALITY TO FISH | 3.7-44 |
| TABLE 3.7-8: APPROXIMATE DISTANCES FROM DETONATION RESULTING IN NO INJURY OR 90% SURVIVAL TO BULL TROUT | 3.7-45 |
| TABLE 3.7-9: NUMBER OF ACTIVE SONAR EVENTS IN THE NWTRC..... | 3.7-47 |
| TABLE 3.7-10: SUMMARY OF NO ACTION ALTERNATIVE PATHWAYS ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA..... | 3.7-57 |
| TABLE 3.7-11: SUMMARY OF NO ACTION ALTERNATIVE PCE ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA..... | 3.7-58 |
| TABLE 3.7-12: SUMMARY OF ALTERNATIVE 1 PATHWAY ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA..... | 3.7-70 |
| TABLE 3.7-13: SUMMARY OF ALTERNATIVE 1 PCE ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA | 3.7-71 |
| TABLE 3.7-14: SUMMARY OF ALTERNATIVE 2 PATHWAYS ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA..... | 3.7-83 |
| TABLE 3.7-15: SUMMARY OF ALTERNATIVE 2 PCE ANALYSIS OF PROPOSED NWTRC ACTIVITIES ON FISH HABITAT ELEMENTS WITHIN OR IN THE VICINITY OF THE NWTRC STUDY AREA | 3.7-83 |
| TABLE 3.7-16: SUMMARY OF EFFECTS – FISH AND ESSENTIAL FISH HABITAT | 3.7-91 |
| 3.8 SEA TURTLES..... | 3.8-1 |
| TABLE 3.8-1: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON SEA TURTLES..... | 3.8-8 |
| TABLE 3.8-2: SUMMARY OF CRITERIA AND ACOUSTIC THRESHOLDS FOR UNDERWATER DETONATION IMPACTS TO MARINE MAMMALS BUT ALSO USED FOR SEA TURTLES BECAUSE NO OTHER CRITERIA EXISTS | 3.8-10 |
| TABLE 3.8-3: SUMMARY OF EFFECTS – SEA TURTLES..... | 3.8-26 |
| 3.9 MARINE MAMMALS..... | 3.9-1 |
| TABLE 3.9-1: SUMMARY OF MARINE MAMMAL SPECIES FOUND IN THE NWTRC STUDY AREA | 3.9-3 |
| TABLE 3.9-2: SOUND PRODUCTION AND HEARING CAPABILITIES OF MARINE MAMMALS IN THE PACIFIC NORTHWEST OPAREA AND PUGET SOUND | 3.9-7 |
| TABLE 3.9-3: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON MARINE MAMMALS..... | 3.9-59 |
| TABLE 3.9-4: HARASSMENTS AT EACH RECEIVED LEVEL BAND FROM 53C | 3.9-82 |
| TABLE 3.9-5: EFFECTS ANALYSIS CRITERIA AND THRESHOLDS FOR IMPULSIVE SOUNDS | 3.9-88 |
| TABLE 3.9-6: REPRESENTATIVE SINKEX WEAPONS FIRING SEQUENCE..... | 3.9-93 |
| TABLE 3.9-7: OFFSHORE ACTIVITIES AND REQUIREMENT TO CONSULT WITH OCNMS | 3.9-96 |
| TABLE 3.9-8: NO ACTION ALTERNATIVE ANNUAL UNDERWATER DETONATION EXPOSURES SUMMARY | 3.9-108 |
| TABLE 3.9-9: NUMBER OF PASSIVE AND ACTIVE SONAR EVENTS IN THE NWTRC..... | 3.9-109 |
| TABLE 3.9-10: NO ACTION ALTERNATIVE ANNUAL SONAR EXPOSURES SUMMARY..... | 3.9-110 |
| TABLE 3.9-11: ALTERNATIVE 1 ANNUAL UNDERWATER DETONATION EXPOSURES SUMMARY | 3.9-135 |
| TABLE 3.9-12: ALTERNATIVE 1 ANNUAL SONAR EXPOSURES SUMMARY | 3.9-137 |
| TABLE 3.9-13: ALTERNATIVE 2 ANNUAL UNDERWATER DETONATION EXPOSURES SUMMARY | 3.9-156 |
| TABLE 3.9-14: ALTERNATIVE 2 ANNUAL SONAR EXPOSURES SUMMARY | 3.9-158 |
| TABLE 3.9-15: SUMMARY OF THE NAVY’S DETERMINATION OF EFFECT FOR FEDERALLY LISTED MARINE MAMMALS THAT MAY OCCUR IN THE NWTRC STUDY AREA – NO ACTION ALTERNATIVE, ALTERNATIVE 1, AND ALTERNATIVE 2 (PREFERRED ALTERNATIVE)..... | 3.9-181 |
| TABLE 3.9-16: SUMMARY OF EFFECTS – MARINE MAMMALS | 3.9-182 |
| 3.10 BIRDS..... | 3.10-1 |
| TABLE 3.10-1: REPRESENTATIVE BIRDS KNOWN TO OCCUR IN THE NWTRC STUDY AREA | 3.10-3 |
| TABLE 3.10-2: OFFSHORE ACTIVITIES AND REQUIREMENT TO CONSULT WITH OCNMS | 3.10-21 |
| TABLE 3.10-3: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON BIRDS..... | 3.10-25 |
| TABLE 3.10-4: SUMMARY OF NAVAL AIRCRAFT BIRD STRIKES 2002 TO 2004..... | 3.10-29 |

| | |
|---|---------------|
| TABLE 3.10-5: CALCULATED SOUND LEVEL FOR SELECTED AIRCRAFT AT A DISTANCE OF 4 NM | 3.10-38 |
| TABLE 3.10-6: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN OKANOGAN MOA – NO ACTION..... | 3.10-39 |
| TABLE 3.10-7: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN OKANOGAN MOA – ALTERNATIVE 1 | 3.10-50 |
| TABLE 3.10-8: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN OKANOGAN MOA – ALTERNATIVE 2..... | 3.10-59 |
| TABLE 3.10-9: SUMMARY OF EFFECTS – BIRDS..... | 3.10-68 |
| 3.11 TERRESTRIAL BIOLOGICAL RESOURCES | 3.11-1 |
| TABLE 3.11-1: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON TERRESTRIAL BIOLOGICAL RESOURCES | 3.11-11 |
| TABLE 3.11-2: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN SELECTED MOAS – NO ACTION..... | 3.11-16 |
| TABLE 3.11-3: CALCULATED SOUND LEVEL FOR SELECTED AIRCRAFT AT A DISTANCE OF 4 NM | 3.11-18 |
| TABLE 3.11-4: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN SELECTED MOAS – ALTERNATIVE 1..... | 3.11-24 |
| TABLE 3.11-5: SUMMARY OF AIRCRAFT TYPES AND SORTIES IN SELECTED MOAS – ALTERNATIVE 2..... | 3.11-27 |
| TABLE 3.11-6: SUMMARY OF ENVIRONMENTAL EFFECTS – TERRESTRIAL BIOLOGICAL RESOURCES..... | 3.11-30 |
| 3.12 CULTURAL RESOURCES | 3.12-1 |
| TABLE 3.12-1: WARFARE AREAS, STRESSORS, AND POTENTIAL EFFECTS ON CULTURAL RESOURCES | 3.12-21 |
| TABLE 3.12-2: SUMMARY OF EFFECTS – CULTURAL RESOURCES | 3.12-30 |
| 3.13 TRAFFIC | 3.13-1 |
| TABLE 3.13-1: SUMMARY OF EFFECTS – TRAFFIC | 3.13-15 |
| 3.14 SOCIOECONOMICS | 3.14-1 |
| TABLE 3.14-1: ANNUAL COMMERCIAL LANDED CATCH AND VALUE WITHIN WASHINGTON WATERS (2007)..... | 3.14-3 |
| TABLE 3.14-2: SUMMARY OF EFFECTS – SOCIOECONOMICS..... | 3.14-13 |
| 3.15 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN..... | 3.15-1 |
| TABLE 3.15-1: POPULATION AND RACE FOR THE NWTRC INSHORE AREA..... | 3.15-2 |
| TABLE 3.15-2: FAMILIES AND INDIVIDUALS AT THE POVERTY LEVEL WITHIN THE INSHORE AREA | 3.15-2 |
| TABLE 3.15-3: AGE DISTRIBUTION BY PERCENTAGE FOR THE NWTRC PUGET SOUND OPAREAS | 3.15-3 |
| TABLE 3.15-4: SUMMARY OF EFFECTS – ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN | 3.15-7 |
| 3.16 PUBLIC SAFETY | 3.16-1 |
| TABLE 3.16-1: NWTRC OPERATING AREAS, ALERT AREAS, AND RESTRICTED AREAS..... | 3.16-3 |
| TABLE 3.16-2: POTENTIAL STRESSORS ASSOCIATED WITH PUBLIC SAFETY | 3.16-8 |
| TABLE 3.16-3: SUMMARY EFFECTS – PUBLIC SAFETY | 3.16-19 |
| 4 CUMULATIVE IMPACTS | 4-1 |
| TABLE 4-1: GEOGRAPHIC AREAS FOR CUMULATIVE IMPACTS ANALYSIS | 4-2 |
| TABLE 4-2: PAST, PRESENT, AND PLANNED FUTURE PROJECTS IN THE OFFSHORE AREA..... | 4-3 |
| TABLE 4-3: PAST, PRESENT, AND PLANNED FUTURE PROJECTS IN THE INSHORE AREA..... | 4-4 |
| TABLE 4-4: EMISSIONS ESTIMATES | 4-14 |
| TABLE 4-5: ANNUAL GHG EMISSIONS..... | 4-15 |
| TABLE 4-6: MARINE MAMMAL UNUSUAL MORTALITY EVENTS IN THE PACIFIC ATTRIBUTED TO OR SUSPECTED FROM NATURAL CAUSES 1978-2005..... | 4-23 |
| TABLE 4-7: ESTIMATED ANNUAL MMPA LEVEL B EXPOSURES FOR INSHORE AREA - DBRC SITE | 4-30 |
| TABLE 4-8: ESTIMATED ANNUAL MMPA LEVEL B EXPOSURES FOR OFFSHORE AREA - QUTR SITE..... | 4-31 |
| 5 MITIGATION MEASURES | 5-1 |
| TABLE 5-1: WASTE DISCHARGE RESTRICTIONS FOR NAVY VESSELS | 5-3 |
| TABLE 5-2: FAVORABLE AND UNFAVORABLE DETONATION CONDITIONS | 5-4 |
| TABLE 5-3. RANGE TO EFFECTS FOR SHIPBOARD MID-FREQUENCY ACTIVE SONAR | 5-10 |

6 OTHER CONSIDERATIONS REQUIRED BY NEPA..... 6-1
TABLE 6-1: SUMMARY OF ENVIRONMENTAL COMPLIANCE FOR THE PROPOSED ACTION 6-1
TABLE 6-2: OFFSHORE ACTIVITIES AND REQUIREMENT TO CONSULT WITH OCNMS 6-6

7 LIST OF PREPARERS..... 7-1

8 REFERENCES..... 8-1

VOLUME II

- Appendix A: Notice of Intent**
- Appendix B: Cooperating Agency Correspondence**
- Appendix C: Air Quality Emissions Summary**
- Appendix D: Marine Mammal Modeling**
- Appendix E: Cetacean Stranding Report**
- Appendix F: Public Participation**
- Appendix G: Public Comments**

VOLUME III

- Appendix H: Written Comments**
- Appendix I: Public Hearing Transcripts**
- Appendix J: Coastal Zone Management Act Compliance**