



Evaluation Report for the 5-Year Status Review of the Marbled Murrelet in Washington, Oregon, and California

Prepared for:

U.S. Fish and Wildlife Service, Region 1

March 2004

Contract No: 101813C046

Prepared by:

C. McShane, T. Hamer, H. Carter, G. Swartzman, V. Friesen, D. Ainley, R. Tressler, K. Nelson,
A. Burger, L. Spear, T. Mohagen, R. Martin, L. Henkel, K. Prindle, C. Strong, & J. Keany

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ENVIRONMENTAL

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*Cover photographs by T. Hamer (tree climber, forest stand, nest, egg, and chick) and R. MacIntosh (murrelet
at-sea)*

EXECUTIVE SUMMARY

The marbled murrelet (*Brachyramphus marmoratus*) is a small diving seabird that nests mainly in coniferous forests generally within 30 miles (50 km) of the coast and forages in near-shore marine habitats. Its range includes southern Alaska (including the Aleutian Islands, northern Gulf of Alaska, and Southeast Alaska regions), British Columbia, Washington, Oregon, and California. In 1992, the Oregon, Washington, and California population of this species was listed as threatened under the Endangered Species Act (ESA) due to the loss of nesting habitat from logging and urbanization, as well as mortality associated with gill-net fisheries and oil pollution. In 2002, the U.S. Fish and Wildlife Service (Service) was sued, in part over failure to conduct a 5-year status review of the marbled murrelet, as required by the ESA. In 2003 the Service agreed to conduct the status review, which consists of a review of available scientific information plus a regulatory review.

To conduct the scientific review, the Service sought proposals from qualified groups and awarded a contract to EDAW, Inc. (Contract 101813C046) on September 29, 2003. EDAW, with the assistance of Hamer Environmental, assembled a panel of experts to review available scientific information obtained since the marbled murrelet was listed, including documents received from 2 Federal Register requests by the Service in 2003. Working over a 5-month period (October 2003- February 2004), the panel reviewed over 500 documents and prepared this Evaluation Report which summarizes, evaluates, and interprets the biological, ecological, and population information on the marbled murrelet. The report also provides an evaluation of current threats to the species (excluding inadequate regulatory mechanisms) and how these threats may have changed since the listing. Information provided in the Evaluation Report will be used during a separate regulatory review of the murrelet listing status that is being conducted by the Service.

Panelists were assigned various topic areas associated with their expertise and instructed to review all relevant research studies on marbled murrelets. Where information specific to the marbled murrelet was lacking or inadequate, the panelists referred to data from studies on other seabirds, if possible, with clarification on applicability to the marbled murrelet. In general, information on murrelet breeding biology, population size, terrestrial habitat use, and marine habitat use is the most comprehensive, allowing many conclusions to be drawn with a high degree of certainty. Reproductive success, diet, and variation in prey resources are much less well known and more difficult to interpret, requiring greater use of professional judgment to

assess murrelet and other seabird studies within and outside the listed range. Genetics data are available for the Aleutian Islands, Alaska, and California but not for Oregon or Washington, creating some uncertainty in how boundaries between subpopulations should be defined. To estimate future population trends and extinction probabilities, several panelists developed a new demographic model. Future population projections have an inherent degree of uncertainty due to the model's assumptions and the obviously insufficient knowledge of future conditions. However, rates of decline were similar to more simplistic models with fewer assumptions. This new model served as the best possible method of integrating and evaluating available information on current and future population status and trends. The panelists met twice over the course of the review, communicated frequently, and often challenged each other to provide more information, logic, and rationale. Although differing opinions were expressed on certain topics, the content and conclusions presented in this Evaluation Report are supported by the entire expert panel.

The world population size of marbled murrelets is recently estimated at 947,500 birds, with 91% in Alaska, 7% in British Columbia, and 2% in the listed range. While murrelets within the listed range make up only a small fraction of current world population size, this area represents 18% of the linear range of the species and probably supported greater populations historically. Available data on genetic and ecological differences suggest at least 3 primary populations of the species: (1) Aleutian Islands; (2) Alaska Peninsula to Puget Sound; and (3) western Washington to California. Demographic modeling suggests that the population within the listed range will decline over the next 40 years, with largest relative declines in California. While a major decline in near-shore densities of murrelets has been validated only in Oregon since 1992, only very small populations of poorly reproducing birds currently occur in central California (Mendocino and San Mateo/Santa Cruz counties), where local extinction maybe a concern. Population decline within the listed range appears related primarily to the effects of historic and ongoing loss of breeding habitat in old-growth forests, combined with poor reproductive success from relatively high levels of corvid nest predation in remaining forest patches, especially those near human settlements. However, the annual rate of breeding habitat loss and loss of occupied sites due to survey error has been reduced since 1992. Mortality from oil pollution has continued, but mortality from gill-net fishing has been reduced in Washington and eliminated in California. While the murrelet population has continued to decline, rates of decline have likely been reduced since 1992, which greatly benefit the species in the short term. From the available information, long-term survival of the marbled murrelet in Washington, Oregon and California is not certain.

Preparers

This report was prepared primarily by a panel of scientists with expertise in marine ecology, terrestrial ecology, seabird biology, genetics, and seabird population modeling, with contributions from several other scientists. The overall scientific review process, including team coordination, consultation with the Service, and document production, was managed by EDAW, with assistance from Hamer Environmental. Authors and their project roles are listed in the table below.

| Name | Affiliation | Role |
|-----------------------------|--|--|
| Colleen McShane (M.S.) | EDAW, Inc. Seattle, WA USA | Project manager, overall technical editor, contributing author |
| Tom Hamer (M.S.) | Hamer Environmental Mt. Vernon, WA USA | Panelist, terrestrial habitat leader, contributing author, technical editor |
| Harry Carter (M.Sc.) | Independent Consultant Richmond, BC Canada | Panelist, marine habitat leader, contributing author, technical editor |
| Gordie Swartzman (Ph.D.) | University of Washington Seattle, WA USA | Panelist, modeler, contributing author |
| Vicki Friesen (Ph.D.) | Queens University Kingston, ON Canada | Panelist, contributing author |
| David Ainley (Ph.D.) | H.T. Harvey & Associates San Jose, CA USA | Panelist, contributing author |
| Ron Tressler (M.S.) | EDAW, Inc. Seattle, WA USA | Topic area coordinator, contributing author |
| Kim Nelson (M.S.) | Oregon State University Corvallis, OR USA | Panelist, contributing author |
| Alan Burger (Ph.D.) | University of Victoria Victoria, BC Canada | Contributing author |
| Larry Spear (M.S.) | H.T. Harvey & Associates San Jose, CA USA | Contributing author |
| Thomas Mohagen (B.S.) | Hamer Environmental Mt. Vernon, WA USA | Contributing author |
| René Martin (M.Sc.) | Hamer Environmental Mt. Vernon, WA USA | Topic area coordinator, contributing author |
| Laird Henkel (M.S.) | H.T. Harvey & Associates San Jose, CA USA | Contributing author |
| Kirk Prindle (B.S.) | EDAW, Inc. Seattle, WA USA | Topic area coordinator, contributing author |
| Craig Strong (M.S.) | Crescent Coastal Research Crescent City, CA USA | Contributing author |
| Jim Keany (M.S.) | EDAW, Inc. Seattle, WA USA | Topic area coordinator, contributing author |

Other Contributors

Preparation of this report would not have been possible without the contributions and support of the following staff from EDAW, Inc.:

- Peter Carr – Production editor and overall document coordination
- Liza MacKinnon – Graphics, web design and coordination, and Administrative Record maintenance
- Emily Inkpen – Word processing
- Chris Stoll – GIS support

U.S. Fish and Wildlife Service

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External Reviewers

Several sections of the Evaluation Report were reviewed by outside experts. Their review and comment helped clarify and strengthen these sections and greatly contributed to the quality of the report. The panelists and contributing authors wish to express their appreciation to the following individuals for their timely review and constructive comments:

| Reviewer | Affiliation | Sections Reviewed |
|--------------------------------|---|--|
| James Baldwin (M.S.) | Pacific Southwest Research Station, U.S. Forest Service Albany, CA USA | Survey effectiveness and error (Sections 4.2.2 and 4.2.3) |
| George Barrowclough (Ph.D.) | American Museum of Natural History Washington D.C. USA | Morphological and genetic variation and genetic threats (Sections 3.4 and 3.6) |
| Steve Beissinger (Ph.D.) | University of California, Berkeley, CA USA | Demographic modeling (Section 3.5) |
| Glenn Ford (Ph.D.) | Independent Consultant Portland, OR USA | Effects of oil spills and demographic modeling (Sections 5.4.2 and 3.5) |

TABLE OF CONTENTS

| | |
|--|------------|
| 1.0 INTRODUCTION | 1-1 |
| 1.1 Background..... | 1-1 |
| 1.2 Objectives of the 5-Year Status Review | 1-3 |
| 2.0 BIOLOGY AND ECOLOGY | 2-1 |
| 2.1 Species Description and Taxonomy | 2-1 |
| 2.2 General Geographic Distribution | 2-2 |
| 2.3 Food Habits..... | 2-6 |
| 2.4 Foraging Behavior..... | 2-8 |
| 2.5 Reproduction and Nesting Chronology | 2-9 |
| 2.6 Variations in Nesting Chronology..... | 2-11 |
| 2.7 Molt Cycles | 2-11 |
| 2.8 Movement and Dispersal | 2-12 |
| 2.9 Site Fidelity and Natal Dispersal..... | 2-14 |
| 2.10 Mortality | 2-15 |
| 2.10.1 At-Sea Mortality | 2-15 |
| 2.10.2 Nest-Site Mortality..... | 2-16 |
| 2.10.3 Inland Adult Mortality..... | 2-18 |
| 2.10.4 Other Causes of Mortality | 2-19 |
| 2.11 Summary and Conclusions | 2-20 |
| 3.0 POPULATION & DEMOGRAPHICS..... | 3-1 |
| 3.1 Demographic Characteristics | 3-1 |
| 3.1.1 Sex Ratio, Age at First Breeding, and Clutch Size..... | 3-1 |
| 3.1.2 Replacement Eggs..... | 3-1 |
| 3.1.3 Breeding Success | 3-2 |
| 3.1.4 Survivorship | 3-4 |
| 3.1.5 Non-Breeding Adults | 3-5 |
| 3.1.6 Other Characteristics | 3-5 |
| 3.2 Distribution and Densities of At-Sea Populations..... | 3-6 |
| 3.2.1 Alaska..... | 3-8 |
| 3.2.2 British Columbia | 3-10 |
| 3.2.3 Washington | 3-10 |
| 3.2.4 Oregon and California..... | 3-11 |
| 3.2.5 North American Population Size Estimate..... | 3-12 |
| 3.3 Population Trends From Past Studies | 3-14 |
| 3.3.1 Trends in the 3-State Area | 3-14 |
| 3.3.2 Trends in Alaska and British Columbia..... | 3-15 |
| 3.4 Morphological and Genetic Variation | 3-15 |
| 3.4.1 Morphological Variation | 3-16 |
| 3.4.2 Genetic Variation | 3-17 |
| 3.5 Demographic Modeling of Marbled Murrelet Populations | 3-27 |
| 3.5.1 Overview of Leslie Matrix Population Models..... | 3-28 |
| 3.5.2 Development of the Marbled Murrelet Conservation Zone Model | 3-32 |

| | | |
|------------|---|------------|
| 3.5.3 | Zone Population Projections..... | 3-49 |
| 3.5.4 | Sensitivity Analyses | 3-53 |
| 3.5.5 | Summary..... | 3-58 |
| 3.6 | Population and Demographic Threats..... | 3-61 |
| 3.6.1 | Genetic Threats | 3-61 |
| 3.6.2 | Disease | 3-66 |
| 3.7 | Summary and Conclusions | 3-69 |
| 3.7.1 | Demographic Characteristics..... | 3-69 |
| 3.7.2 | Distribution and Densities of At-Sea Populations..... | 3-79 |
| 3.7.3 | Population Trends from Past Studies | 3-70 |
| 3.7.4 | Morphologic and Genetic Variation..... | 3-71 |
| 3.7.5 | Demographic Modeling | 3-71 |
| 3.7.6 | Population and Demographic Threats..... | 3-72 |
| 4.0 | TERRESTRIAL HABITAT | 4-1 |
| 4.1 | Habitat Amount and Distribution..... | 4-1 |
| 4.1.1 | Data Sources and Limitations | 4-2 |
| 4.1.2 | Estimated Suitable Habitat | 4-3 |
| 4.1.3 | Ownership Pattern and Distribution of Habitat | 4-10 |
| 4.1.4 | Estimated Amount of Likely Occupied Habitat..... | 4-14 |
| 4.2 | Inland Detectability | 4-16 |
| 4.2.1 | Survey Methods and Ability to Detect Breeding Sites..... | 4-16 |
| 4.2.2 | Survey Effectiveness | 4-21 |
| 4.2.3 | Error in Classifying Occupied Sites..... | 4-24 |
| 4.3 | Habitat Characteristics | 4-29 |
| 4.3.1 | Habitat Characteristics at the Landscape Level | 4-29 |
| 4.3.2 | Habitat Characteristics at the Stand/Nest Plot Level..... | 4-43 |
| 4.3.3 | Habitat Characteristics at Nest Trees..... | 4-50 |
| 4.3.4 | Habitat Characteristics at Ground Nests..... | 4-58 |
| 4.4 | Marbled Murrelet Densities..... | 4-59 |
| 4.4.1 | Estimated Densities of Marbled Murrelets from Radar Counts | 4-59 |
| 4.4.2 | Estimates of Nest Density Using Intensive Tree-Climbing Methods | 4-60 |
| 4.5 | Terrestrial Threats..... | 4-61 |
| 4.5.1 | Loss of Suitable Nesting Habitat | 4-61 |
| 4.5.2 | Effects of Land Ownership Patterns | 4-70 |
| 4.5.3 | Future Habitat Trend..... | 4-73 |
| 4.5.4 | Effects of Wildfire, Windthrow, and Insect/Disease on Habitat Availability and Habitat Condition | 4-78 |
| 4.5.5 | Effects of Forest Management Practices on Murrelet Habitat | 4-81 |
| 4.5.6 | Fragmentation and Edge Effects in Forest Habitat..... | 4-83 |
| 4.5.7 | Effects of Noise Disturbance at Nest Sites from Human Activities, Including Research and Survey Efforts..... | 4-96 |
| 4.6 | Summary and Conclusions | 4-101 |
| 4.6.1 | Current Amounts of Suitable and Occupied Habitat | 4-102 |
| 4.6.2 | Inland Detectability..... | 4-102 |
| 4.6.3 | Habitat Characteristics..... | 4-103 |
| 4.6.4 | Terrestrial Threats to the Marbled Murrelet | 4-106 |

5.0 MARINE HABITAT 5-1

5.1 Marine Habitat Characteristics.....5-1

5.1.1 Large-Scale Geographic and Temporal Variability in Marine Habitat.....5-1

5.1.2 Small-Scale Geographic and Temporal Variability in Marine Habitat.....5-5

5.2 Prey Abundance and Distribution.....5-6

5.2.1 Geographic Variation in Murrelet Diet.....5-7

5.2.2 Geographic Variation in Prey Distribution5-9

5.3 Variation in Prey Availability Due to Ocean Cycles5-9

5.3.1 Seasonal Variation 5-10

5.3.2 Annual Variation and El Niño 5-11

5.3.3 Decadal and Longer-Term Variation 5-11

5.4 Marine Threats 5-12

5.4.1 Effects of Reduced Prey Availability from Overfishing..... 5-12

5.4.2 Effects of Prey Availability from Oceanographic Variation..... 5-13

5.4.3 Effects of Oil Spills..... 5-14

5.4.4 Effects of By-Catch from Gill-Nets and Other Fisheries..... 5-23

5.4.5 Effects of Marine Contaminants..... 5-35

5.4.6 Effects of Disturbance from Recreational Boating and Research and Monitoring Efforts 5-36

5.5 Summary and Conclusions 5-37

5.5.1 Marine Habitat Characteristics and Prey Availability..... 5-37

5.5.2 Marine Threats..... 5-38

6.0 DISCUSSION AND SUMMARY OF CONCLUSIONS 6-1

6.1 Summary of New Information6-1

6.1.1 Habitat6-1

6.1.2 Overutilization for Commercial, Recreational, Scientific, or Education Purposes 6-10

6.1.3 Predation and Disease 6-10

6.1.4 Other Natural or Manmade Factors Affecting the Murrelet’s Continued Existence..... 6-12

6.1.5 Distinct Population Segment Topics..... 6-17

6.2 Objectives of the 5-Year Status Review 6-27

6.2.1 Does New Information Suggest that the Murrelet Population is Increasing, Declining, or Stable? 6-27

6.2.2 Are Threats Increasing, the Same, Reduced, or Eliminated; or are there New Threats? 6-28

6.3 Final Conclusions..... 6-34

7.0 REFERENCES..... 7-1

7.1 Literature Cited.....7-1

7.2 Personal Communications 7-48

TABLE OF CONTENTS (cont.)

Appendix A - Approximate Rate of Misclassification from Surveying 1,000 Sites for Murrelets with a True Status of Occupied Using the Pacific Seabird Group Survey Protocol Survey Effort Guidelines from 1990 to 1995.

Appendix B - Approximate Rate of Misclassification from Surveying 1,000 Sites for Murrelets with a True Status of Occupied Using the Pacific Seabird Group Survey Protocol Survey Effort Guidelines from 1996/1998 to 2002.

LIST OF TABLES

| | |
|--|------|
| Table 2.5-1. Chronology of breeding for the marbled murrelet based on a limited number of known records, showing approximate dates of each phase of breeding in each state or province | 2-10 |
| Table 3.2-1. At-sea abundance of marbled murrelet during the breeding season at different locations within their pelagic range | 3-9 |
| Table 3.3-1. Summary of studies addressing change in marbled murrelet abundance over the past 30 years | 3-16 |
| Table 3.4-1. Number and locations of marbled murrelets sampled for molecular markers. | 3-19 |
| Table 3.4-2. Estimates of F_{st} or its analog for various species of seabirds, based on either mtDNA or nuclear DNA | 3-20 |
| Table 3.5-1. Estimates of oil mortality of marbled murrelets by year and zone | 3-48 |
| Table 3.5-2. Estimates of gill-net mortality of marbled murrelets by year and zone..... | 3-49 |
| Table 3.5-3. Annual percentage rate of population decline in each zone, assuming 2% annual immigration rate..... | 3-52 |
| Table 3.5-4. Sensitivity of the rate of population decline (average for first 10 years of forecast) in each zone to immigration rate, level of oil spill and gill-net mortality, and fecundity estimates | 3-57 |
| Table 3.6-1. Documented emergent diseases in a variety of seabird species | 3-68 |
| Table 4.1-1. Estimates of suitable and likely to be occupied marbled murrelet habitat in 2003, as summarized from local land managers | 4-5 |
| Table 4.2-1. Summary of protocol definitions, recommendations, and modifications, 1990-2003 | 4-18 |
| Table 4.2-2. Estimates of the probability of detecting probable absence, presence, and occupancy during a single visit from sites with a true annual status of occupied..... | 4-27 |
| Table 4.3-1. Summary of nest stand characteristics..... | 4-48 |
| Table 4.3-2. Mean murrelet nest tree and site characteristics..... | 4-52 |
| Table 4.4-1. Densities of marbled murrelets (birds/ha) estimated from radar counts of birds entering watersheds and areas of habitat derived from GIS..... | 4-60 |

Table 4.5-1. Estimates of old-growth/suitable murrelet habitat within the listed range, 1992-2003 4-62

Table 4.5-2. Loss of suitable murrelet habitat, 1992-2003 based on information from land managers. 4-65

Table 4.5-3. Acres of suitable marbled murrelet habitat anticipated to be removed between 1992 and August 20, 2003, based on Section 7 consultation and CDFG technical assistance on California Forest Practices permits records 4-68

Table 4.5-4. Overall distribution of forest age classes in western Washington and Oregon on National Forest and industrial forestland, 1997 4-77

Table 4.5-5. Number of successful and failed murrelet nests by state and province 4-87

Table 4.5-6. Number of edge and interior nests by state and province..... 4-87

Table 4.5-7. Nest success of active murrelet nests in relation to forest edge (within 50 m) and edge type by state and province 4-90

Table 4.6-1. Threat of habitat loss to murrelets in 1997 compared with 2003..... 4-108

Table 5.2-1. Distribution of major prey taxa in diet of marbled murrelets.....5-8

Table 5.4-1. Summary of oil spill mortality of marbled murrelets in Conservation Zones 1-6, 1977-2003..... 5-18

Table 5.4-2. Summary of estimated oiling mortality of marbled murrelets by Conservation Zone, 1977-2002..... 5-19

Table 5.5-1. Annual mortality from oil spills before and after 1992..... 5-39

LIST OF FIGURES

Figure 2.2-1. Range of the marbled murrelet in the 3-state area2-3

Figure 3.5-1. Initial age distributions used in the Zone Model for Zones 1-4 and
Zones 5-6. 3-36

Figure 3.5-2. Population size forecasts for Zones 1-6 over 40 years (2001-2040),
assuming a 2% annual immigration rate between adjacent zones, high-
end fecundity, and including gill-net and oil spill mortality 3-50

Figure 3.5-3. Forecast of probability of population extinction for Zones 1-6 over
100 years, assuming a 2% annual immigration rate, high-end fecundity,
and including gill-net and oil spill mortality..... 3-50

Figure 3.5-4. Population size forecast for the listed range of the marbled murrelet in
California, Oregon, and Washington, assuming a 2% annual
immigration rate, high-end fecundity, and including gill-net and oil
spill mortality 3-51

Figure 3.5-5. Population size forecasts for Zones 1-6 over 40 years, assuming a 5%
annual immigration rate, high-end fecundity, and including gill-net and
oil spill mortality 3-54

Figure 3.5-6. Probability of population extinction for Zones 1-6 over 100 years,
assuming a 5% annual immigration rate, high-end fecundity, and
including oil spill and gill-net mortality. 3-54

Figure 3.5-7. Population size forecasts for Zones 1-6, assuming a 0.1% annual
immigration rate, high-end fecundity, and including gill-net and oil
spill mortality. 3-55

Figure 3.5-8. Forecast of probability of population extinction for Zones 1-6 over
100 years, assuming a 0.1% annual immigration rate, high-end
fecundity, and including gill-net and oil spill mortality 3-55

Figure 3.5-9. Forecast of population size for Zones 1-6 over 40 years, assuming low
fecundity rates, including oil spill and gill-net mortality and a 2%
annual immigration rate 3-56

Figure 3.5-10. Forecast of murrelet extinction probability for Zones 1-6 over 100
years, assuming low fecundity, including oil spill and gill-net mortality
and a 2% annual immigration rate 3-56

Figure 3.5-11. Forecast of murrelet population for Zones 1-6 over 40 years, assuming
high-end fecundity, no gill-net and oil spill mortalities, and a 2%
annual migration rate 3-59

Figure 3.5-12. Forecast of murrelet extinction probability for Zones 1-6 over 100 years, assuming high-end fecundity, no gill-net and oil spill mortalities, and a 2% annual immigration rate 3-59

Figure 3.5-13. Forecast of murrelet population for Zones 1-6 over 40 years, assuming high-end fecundity, higher oil spill and gill-net mortality rates, and a 2% annual immigration rate..... 3-60

Figure 3.5-14. Forecast of murrelet extinction probability for Zones 1-6 over 100 years, assuming high-end fecundity, higher oil spill and gill-net mortality rates, and a 2% annual immigration rate 3-60

Figure 4.1-1. Marbled murrelet range, Conservation Zone boundaries, and land ownership4-7

Figure 4.1-2 Comparisons of estimates of suitable marbled murrelet habitat summarized from local land managers to estimates of murrelet population size by Conservation Zone4-9

Figure 4.1-3. Critical Habitat Units for the marbled murrelet..... 4-11

Figure 4.2-1. Relationship between the probability of detecting occupancy and increased survey effort using estimates of q from Baldwin (2002) 4-26

Figure 4.2-2. Estimates of q for occupancy along with 95% confidence intervals for each year..... 4-28

Figure 4.5-1. Recent trend in western Washington timber harvest 4-71

Figure 5.4-1. Gill-net fishing effort (in landings) in 1980-2002 for non-treaty and treaty fisheries in: (1) northern Washington (Conservation Zone 1), and (2) western Washington (Conservation Zone 2) 5-31

ACRONYMS AND ABBREVIATIONS

| | |
|--------|--|
| ADFG | Alaska Department of Fish and Game |
| AIC | Akaike's Information Criterion |
| AOU | American Ornithological Union |
| AWA | Administratively Withdrawn Areas |
| BA | Biological Assessment |
| BC | British Columbia |
| BEC | Biogeoclimatic Ecosystem Classification |
| BLM | Bureau of Land Management |
| BO | Biological Opinion |
| bp | base pair |
| CA | California |
| CDC | Center for Disease Control |
| CDF | Coastal Douglas-Fir |
| CDFG | California Department of Fish and Game |
| CESA | California Endangered Species Act |
| CHU | Critical Habitat Unit |
| CI | Confidence Interval |
| COASST | Coastal Observation and Seabird Survey Team |
| CWA | Congressionally Withdrawn Area |
| CWH | Coastal Western Hemlock |
| CZ | Conservation Zone |
| dbh | diameter at breast height |
| EM | Effectiveness Monitoring |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| FEMAT | Forest Ecosystem Management Team |
| FR | Federal Register |
| GIS | geographical information system |
| GPNF | Gifford Pinchot National Forest |
| HAG | Harmful Algal Blooms |
| HCP | Habitat Conservation Plan |
| kJ | kilojoule |
| LIMBS | landscape-level individual murrelet based simulation |
| LSR | Late Successional Reserves |
| MBF | Million board feet |
| MH | Mountain Hemlock |
| MMCA | Marbled Murrelet Conservation Area |
| MOF | Ministry of Forestry |
| mtDNA | mitochondrial DNA |
| MU | management unit |
| NF | National Forest |
| NHP | National Historic Park |
| NM | National Monument |
| NP | National Park |
| NPS | National Park Service |

ACRONYMS AND ABBREVIATIONS (cont.)

| | |
|---------|---|
| NRA | National Recreation Area |
| NWFP | Northwest Forest Plan |
| NWHC | National Wildlife Health Center |
| ODF | Oregon Department of Forestry |
| ODFW | Oregon Department of Fish and Wildlife |
| OR | Oregon |
| PALCO | Pacific Lumber Company |
| PCB | polychlorinated biphenyls |
| PCDD | polychlorierte dibenzo-dioxine |
| PCDF | polychloro-dibenzo-furannes |
| PDO | Pacific Decadal Oscillation |
| PSG | Pacific Seabird Group |
| PVA | Population Viability Analysis |
| RFP | Request for Proposal |
| SD | standard deviation |
| SEIS | Supplemental Environmental Impact Statement |
| SEPA | State Environmental Policy Act |
| Service | U.S. Fish and Wildlife Service |
| TFW | Timber, Fish, and Wildlife |
| USFS | U.S. Forest Service |
| USGS | U.S. Geological Survey |
| WA | Washington |
| WDFW | Washington Department of Fish and Wildlife |
| WDNR | Washington Department of Natural Resources |
| WFPA | Washington Forest Protection Association |
| WNV | West Nile Virus |