



# SUMMARY

This page intentionally left blank.

# Summary

This revised draft environmental impact statement (RDEIS) is a joint document produced by the Washington Department of Natural Resources (DNR) and U.S. Fish and Wildlife Service (USFWS) (referred to as the “Joint Agencies”). This document is intended to satisfy the requirements of the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA) for environmental review. The proposed action under review is an amendment to DNR’s *State Trust Lands Habitat Conservation Plan* (1997 HCP). The amendment will replace the interim conservation strategy for the marbled murrelet (*Brachyramphus marmoratus*) with a long-term conservation strategy. The amendment is limited to this subject and does not change other conservation strategies of the 1997 HCP.

## 1. Proposed Action: Need, Purpose, and Objectives

### ■ Need

#### *DNR*

DNR needs to obtain long-term certainty for timber harvest and other management activities on forested state trust lands, consistent with commitments in the 1997 HCP and DNR’s fiduciary responsibility to the trust beneficiaries as defined by law.

#### *USFWS*

USFWS’ need is to fulfill its legal obligations under Section 10(a)(1)(B) of the Endangered Species Act in response to DNR’s request to amend its incidental take permit for the marbled murrelet long-term conservation strategy.

### ■ Purpose and Objectives

#### *DNR*

The purpose of the proposed action is to develop a long-term conservation strategy for marbled murrelets on forested state trust lands in DNR’s six west-side HCP planning units, subject to DNR’s fiduciary responsibility to the trust beneficiaries as defined by law, which achieves all of the following objectives:

- **Objective 1, Trust Mandate:** Generate revenue and other benefits for each trust by meeting DNR’s trust management responsibilities. Those responsibilities include making state trust lands productive, preserving the corpus of the trust, exercising reasonable care and skill in managing the trust, acting prudently with respect to trust assets, acting with undivided loyalty to trust beneficiaries, and acting impartially with respect to current and future trust beneficiaries.
- **Objective 2, Marbled Murrelet Habitat:** Provide forest conditions in strategic locations on forested state trust lands that minimize and mitigate incidental take of marbled murrelets resulting from DNR’s forest management activities. In accomplishing this objective, DNR expects to make a significant contribution to maintaining and protecting marbled murrelet populations.
- **Objective 3, Active Management:** Promote active, innovative, and sustainable management on state trust lands.
- **Objective 4, Operational Flexibility:** Provide operational flexibility to respond to new information and site-specific conditions.
- **Objective 5, Implementation Certainty:** Adopt feasible, practical, and cost-effective actions that are likely to be successful and can be sustained throughout the life of the 1997 HCP.

## USFWS

USFWS’ purposes are to ensure that Endangered Species Act permit issuance criteria are met; the amendment complies with all other applicable Federal laws and regulations; and, consistent with USFWS’ legal authorities, the incidental take permit and implementation of the 1997 HCP amendment achieve long-term species and ecosystem conservation objectives at ecologically appropriate scales.

## 2. Changes Between the 2016 DEIS and RDEIS

The Joint Agencies added two new alternatives to the RDEIS, in addition to Alternatives A through F originally analyzed in the 2016 DEIS.

- **Alternative G**, which is primarily responsive to comments received on the 2016 DEIS from the U.S. Environmental Protection Agency (USEPA) and Washington Department of Fish and Wildlife (WDFW).
- **DNR’s preferred alternative (Alternative H)**, which DNR developed with direction from the Board of Natural Resources (board) and which is responsive to comments received on the 2016 DEIS. DNR intends to submit Alternative H to USFWS in the form of an HCP amendment in support of an amendment to DNR’s incidental take permit.

USFWS will specify their preferred alternative in the FEIS.

In addition to the two new alternatives, the RDEIS includes both new analysis and updated analysis of Alternatives A through F using updated data. The analyses contained in the 2016 DEIS were based on data generated in 2015. DNR has updated its data, primarily due to an updated forest inventory and updates to its large data overlay, current as of January 2018 (the large data overlay is a complex GIS model). Using the updated data, DNR produced new acreages for timber harvest and conservation. Tables and Figures in the RDEIS have been updated to reflect these new calculations. Refer to Appendix O for a description of data updates.

In Chapter 2, the descriptions of the alternatives were altered to include information on marbled murrelet habitat growth over time.

Revisions also were made to some of the conservation measures in the RDEIS, with some measures being specific to Alternative H and others applying to all action alternatives.

Changes made based on comments received on the 2016 DEIS include the following:

- Two special habitat areas were added near the Strait of Juan de Fuca in Clallam County under Alternative H.
- Special habitat areas in Wahkiakum and Pacific counties were made smaller to reduce adverse socioeconomic impacts under Alternative H.
- A section called “Alternatives Considered but not Analyzed in Detail” was added to Chapter 2. This section addresses the alternatives submitted by commenters.
- A jobs analysis was added to the socioeconomic section of Chapter 4.

Also, the marbled murrelet sections of Chapters 3 and 4 have been updated to reflect strategic locations, which will be described in the following section of this summary.

Finally, a change was made to the population viability analysis in Chapter 4. In this RDEIS, just as it was in the 2016 DEIS, a P-stage value of 1 indicates an occupied site. This value was assigned in the P-stage model to all acres within an occupied site, regardless of the forest condition of those acres. For example, some occupied sites may include areas of non-habitat. For the population viability analysis in this RDEIS, Dr. Zach Peery and Gavin Jones modeled the actual P-stage value of all acres within occupied sites, instead of simply assigning the entire occupied site a value of 1. They also modeled the growth of forests in occupied sites over the analysis period. The Joint Agencies believe these methods result in a more accurate representation of marbled murrelet habitat and more accurately reflect an increase in nesting carrying capacity over the analysis period.

## 3. The Alternatives

For the 2016 DEIS, the Joint Agencies worked together to develop six alternatives to analyze, including the no action alternative. The Joint Agencies carried these alternatives forward into this RDEIS and also added two new alternatives (G and H).

These alternatives represent a range of approaches to long-term marbled murrelet habitat conservation. The alternatives differ in the amount and location of DNR-managed forestland designated for long-term conservation and also include a combination of conservation measures proposed to protect marbled murrelet habitat.

These forestlands all occur within 55 miles of marine waters. This 55-mile line is the same as was used in the *Northwest Forest Plan* and is used by USFWS as an estimate of the inland range of the marbled murrelet in Washington. The total acreage of DNR-managed lands within this analysis area is approximately 1.38 million acres.

Acres proposed for continued conservation include lands already protected as long-term forest cover by DNR, such as old-growth forests, high-quality owl habitat, riparian areas, natural areas, and other conservation commitments of the 1997 HCP and *Policy for Sustainable Forests*. These areas provide conservation benefits to the marbled murrelet either by supplying current and/or future nesting habitat or by providing security to that habitat from predation, disturbance, and other threats. The alternatives also delineate additional forestlands with specific importance for marbled murrelet conservation. The range of acres proposed for conservation under the alternatives is summarized in Table S.3.1.

**Table S.3.1. Summary of Conservation Acres Proposed Under Each Alternative (Alt.)**

	Alt. A (no action)	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F	Alt G	Alt H
<b>Acres of existing conservation under the 1997 HCP, <i>Policy for Sustainable Forests</i>, and Washington State Law</b>	567,000	567,000	567,000	567,000	567,000	567,000	567,000	567,000
<b>Acres of additional, marbled murrelet-specific conservation<sup>1</sup></b>	33,000	9,000	50,000	51,000	55,000	176,000	76,000	43,000
<b>Total approximate acres</b>	600,000	576,000	617,000	618,000	622,000	743,000	643,000	610,000

All of the alternatives release certain amounts of marbled murrelet habitat for timber harvest. These acres are not part of the conservation acres shown in Table S.3.1 and will continue to be managed under the 1997 HCP and *Policy for Sustainable Forests*. The total acres released is shown in Table S.3.2.

<sup>1</sup> Acres reported here are those which do not overlap other existing conservation lands.

Table S.3.2. Estimated Acres of Marbled Murrelet Habitat Released for Harvest, by Alternative

	Alt. A (no action)	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F	Alt. G	Alt. H
Estimated marbled murrelet habitat released	37,000	47,000	34,000	40,000	33,000	24,000	25,000	38,000

## ■ Marbled Murrelet Conservation Areas

Marbled murrelet conservation areas include all of the occupied sites currently protected under the interim strategy, additional occupied site acreage based on recommendations from the 2008 *Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy* (Science Team Report) (Alternatives B through H), and a variety of areas proposed specifically for strategic marbled murrelet conservation under different alternatives. These proposed marbled murrelet conservation areas are summarized in Table S.3.3 and mapped in Appendix F.

Table S.3.3. Summary of Marbled Murrelet-Specific Conservation Areas Proposed Under Each Alternative

Alternative	Conservation areas
Alt. A (no action)	<ul style="list-style-type: none"> <li>Existing occupied sites (not including those recommended for addition by the Science Team Report)</li> <li>Occupied site buffers (328 feet [100 meters])</li> <li>Habitat identified under the interim strategy</li> </ul>
Alt. B	<ul style="list-style-type: none"> <li>Occupied sites (including those delineated in the Science Team Report)</li> </ul>
Alt. C	<ul style="list-style-type: none"> <li>Occupied sites (including those delineated in the Science Team Report)</li> <li>Occupied site buffers (328 feet [100 meters]), except in the Olympic Experimental State Forest (OESF) HCP Planning Unit, where sites 200 acres or larger have 164-foot [50-meter] buffers)</li> <li>Special habitat areas: Discrete areas of marbled murrelet habitat and adjacent security forest within which active management and other land uses are restricted</li> <li>Emphasis areas: Enhanced (0.5-mile) buffers on occupied sites within the emphasis area, current and future marbled murrelet habitat, and areas of active management</li> <li>Isolated stands of high-quality marbled murrelet habitat</li> </ul>
Alt. D	<ul style="list-style-type: none"> <li>Occupied sites (including those delineated in the Science Team Report)</li> <li>Occupied site buffers (328 feet [100 meters]), except in OESF, where sites 200 acres or larger have 164-foot [50-meter] buffers)</li> <li>Special habitat areas: Discrete areas of marbled murrelet habitat and adjacent security forest within which active management and other land uses are restricted</li> </ul>

Alternative	Conservation areas
<b>Alt. E</b>	<ul style="list-style-type: none"> <li>• Occupied sites (including those delineated in the Science Team Report)</li> <li>• Occupied site buffers (328 feet [100 meters], except in OESF, where sites 200 acres or larger have 164-foot [50-meter] buffers)</li> <li>• Emphasis areas (as described under Alternative C), in which both habitat protection and active management area are allowed</li> <li>• Special habitat areas in which active management and other land uses are restricted; there are fewer acres of special habitat areas proposed under Alternative E than under Alternative D</li> <li>• Isolated stands of high-quality marbled murrelet habitat</li> </ul>
<b>Alt. F</b>	<ul style="list-style-type: none"> <li>• Occupied sites (including those delineated in the Science Team Report)</li> <li>• Occupied site buffers (328 feet [100 meters])</li> <li>• Marbled Murrelet Management Areas (MMMAs) as delineated in the Science Team Report and additional MMMA in the North Puget planning unit; these areas allow some management activities consistent with habitat development and protection</li> </ul>
<b>Alt. G</b>	<ul style="list-style-type: none"> <li>• Occupied sites (including those delineated in the Science Team Report)</li> <li>• Occupied site buffers (328 feet [100 meters])</li> <li>• All habitat with a P-stage value of 0.47 or higher throughout the analysis area</li> <li>• In the OESF HCP Planning Unit, all current habitat (P-stage greater than zero in decade zero)</li> <li>• Emphasis areas as designated under Alt. C</li> <li>• Special habitat areas as designated under Alt. D</li> <li>• Habitat identified by Washington Department of Fish and Wildlife during the 2016 DEIS comment period</li> <li>• Four MMMA in the North Puget Planning Unit (Spada Lake/Morningstar, Whatcom, Middle Fork Hazel/Wheeler Ridge, Marmot Ridge) and the MMMA in the Elochoman block, as drawn for Alternative F, managed as an emphasis area</li> </ul>
<b>Alt. H</b>	<ul style="list-style-type: none"> <li>• Occupied sites (including those delineated in the Science Team Report)</li> <li>• Occupied site buffers (328 feet [100 meters])</li> <li>• Special habitat areas in which active management and other land uses are restricted</li> </ul>

For alternatives C through H, DNR-managed lands were segregated into two types of landscapes: high value landscapes and marginal landscapes. The high value landscapes were further separated into strategic locations and other high value landscapes.

Strategic locations are geographic areas within Washington that the Joint Agencies view as having a disproportionately high importance for murrelet conservation. These areas are important for one or more of the following reasons:



- Proximity to marine waters (within 40 miles), including proximity to marine “hotspots” (Raphael et al. 2015), which are areas with higher-than-average murrelet density
- Proximity to known occupied sites
- Abundance of habitat
- Abundance and distribution of occupied sites
- Capacity for developing future habitat based on forest types
- Protection from disturbance
- Proximity to federal lands

The strategic locations are as follows:

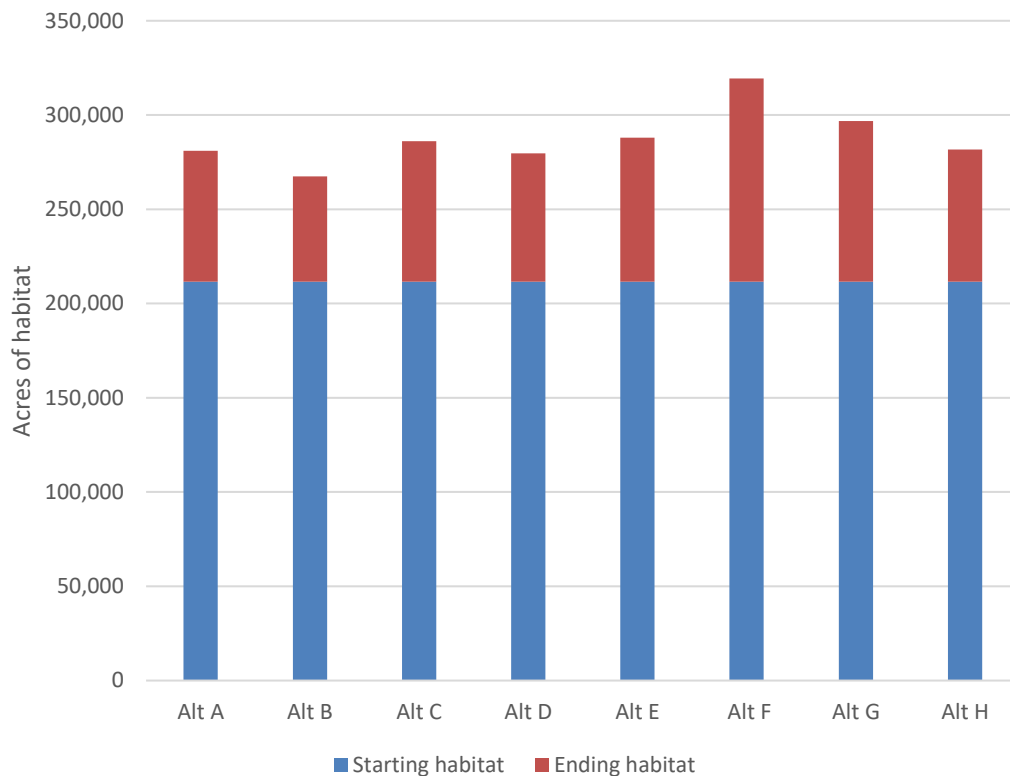
- Southwest Washington
- OESF and Straights (west of the Elwha River)
- North Puget

Strategic locations were identified based on the specific characteristics of each geographic location:

- The Southwest Washington strategic location captures areas that are in close proximity to marine waters, but where federal ownership is lacking.
- The OESF and Straits west of the Elwha River strategic location contains an abundance of high quality habitat, is in close proximity to marine waters, and also is close to areas identified by Raphael and others (2015) as “marine hot spots.”
- The North Puget strategic locations provides forested landscapes within commuting distance to nest sites from marine foraging areas around the San Juan Islands, which were identified by Raphael and others (2015) as “hot spots” due to heavy murrelet use and prey availability.

Under all alternatives, marbled murrelet habitat within these proposed conservation areas and throughout long-term forest cover is expected to increase over the life of the long-term conservation strategy (through 2067), as illustrated in Figure S.3.1.

Figure S.3.1. Growth of Habitat Through Time, by Alternative (Acres Not Adjusted for Habitat Quality)



## 4. Conservation Measures

The action alternatives establish conservation measures that would be added to the 1997 HCP to minimize impacts from new or expanded forest management and land use activities within marbled murrelet habitat. These measures are based on current understanding about activities that could disturb nesting murrelets and/or result in habitat loss. The measures limit harvest within long-term forest cover, limit thinning activities within and near habitat, prohibit or limit road construction in marbled murrelet conservation areas, apply daily timing restrictions to potentially disturbing management activities such as road construction or aerial operations during nesting season, limit development of new or expanded recreational facilities in marbled murrelet conservation areas, and minimize the impacts of other non-timber harvest activities.

## 5. How the Proposed Long-Term Strategy Relates to Other DNR Conservation Commitments

Many of the existing 1997 HCP conservation strategies, such as the riparian and northern spotted owl conservation strategies, provide conservation benefits to the marbled murrelet. In addition, the *Policy for Sustainable Forests* provides for protection of old-growth forests and conservation of forestland for wildlife diversity, genetic resources, uncommon habitats, and other specific conservation objectives. The action alternatives are intended to work in concert with these strategies and policies. Where proposed conservation areas overlap areas conserved for other reasons (for example, an occupied site within a riparian management zone), the most protective management policy or measure would apply.

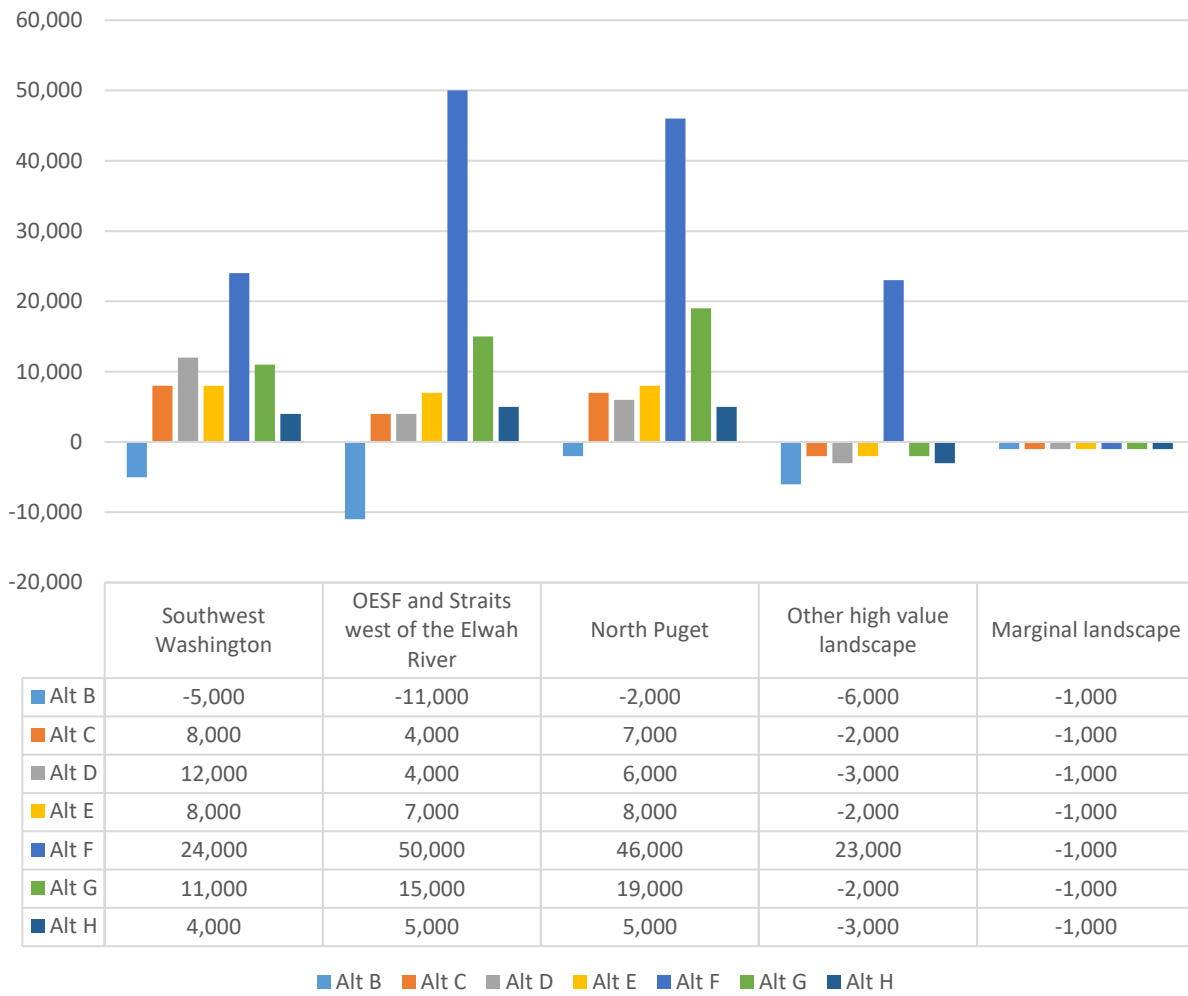
## 6. Summary of Potential Impacts to Elements of the Environment

Impacts evaluated in this RDEIS relate primarily to the acres of long-term forest cover provided by each action alternative and the proposed conservation measures (for example, measures proposed for thinning, recreation, and road construction).

Compared to the no action alternative, Alternative B would decrease the area of long-term forest cover by 24,000 acres (approximately 2 percent of DNR-managed forestland in the analysis area). Alternatives C through E would increase long-term forest cover by 17,000 to 22,000 acres, Alternative F would increase this area by 142,000 acres, Alternative G would increase long-term forest cover by 43,000 acres and Alternative H would increase it by 10,000 acres.

Figure S.6.1 provides a summary of how these acres change from Alternative A (no action), reported by alternative and landscape.

Figure S.6.1. Estimated Change in Long-term Forest Cover Acres From Alternative A (No Action), by Alternative and Landscape



## ■ Natural Environment: Earth, Climate, Aquatic Resources, Vegetation, Wildlife, and Marbled Murrelets

Forests within long-term forest cover are expected to become more structurally complex through time and experience less active management. Elements of the natural environment are not expected to be adversely impacted by these changes. Soil resources and areas subject to landslide hazards would continue to be protected by existing DNR policies and procedures. The alternatives are not expected to exacerbate climate change impacts on any element of the environment, and carbon sequestration is expected to be greater than emissions under all alternatives.

Existing riparian protection strategies remain in place under all the alternatives, and aquatic functions are expected to be maintained or enhanced under all alternatives. Minor, localized impacts to microclimate are possible under Alternative B.

Some limitations on thinning (Alternatives C, D, and E) could delay some riparian or natural areas from meeting their restoration objectives within a shorter time frame. However, overall management objectives of the 1997 HCP, *OESF HCP Planning Unit Forest Land Plan*, and natural areas management plans are not impacted.

Many wildlife and plant species would benefit from an increase in structurally complex forest that will occur in long-term forest cover over the planning period. Wildlife diversity is likely to increase over time with all alternatives. Some local changes in habitat conditions may temporarily affect some species, but overall abundance and distribution of species, including listed and sensitive species (not including the marbled murrelet), would remain stable or increase on DNR-managed lands.

In areas where land would be “released” from its current conservation status, the existing framework of regulations, policies, and procedures designed to minimize the environmental impacts from active management would remain in place.

## ■ Impacts to Marbled Murrelet Habitat and Populations

Between 2001 and 2016, the marbled murrelet population declined at an average annual rate of 3.9 percent in Washington.<sup>2</sup> While the direct causes for ongoing marbled murrelet population declines are not completely known, the USFWS Recovery Implementation Team identified the most likely primary factors as the loss of inland habitat, including additive and time-lag<sup>3</sup> effects of inland habitat losses over the past 20 years; changes in the marine environment, reducing the availability and quality of prey; and increased densities of nest predators (USFWS 2012, Falxa and others 2016). Recent analysis indicates that the amount and distribution of higher suitability habitat are the primary factors influencing the abundance and trends of murrelet populations. Habitat loss has occurred throughout the listed range of the murrelet, with the greatest losses documented in Washington, where the steepest declines of murrelet populations occurred (Raphael and others 2016).

The final HCP amendment must meet the Section 10 issuance criteria for issuing an incidental take permit. Part of the analysis undertaken by USFWS when issuing an incidental take permit is to consider whether an alternative jeopardizes the continued existence of a species. “Jeopardize the continued existence” is defined in 50 CFR §402.02 as “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.” This

---

<sup>2</sup> Due to reduced sampling efforts starting in 2014, statewide trend estimates for Washington are only available up to the year 2016 (Pearson and others 2018). This population trend is different than that used in the population viability analysis (a decline of 4.4 percent). The population viability analysis is described in this chapter and Appendix C.

<sup>3</sup> Time lag means a population response that occurs many years after the loss of inland habitat.

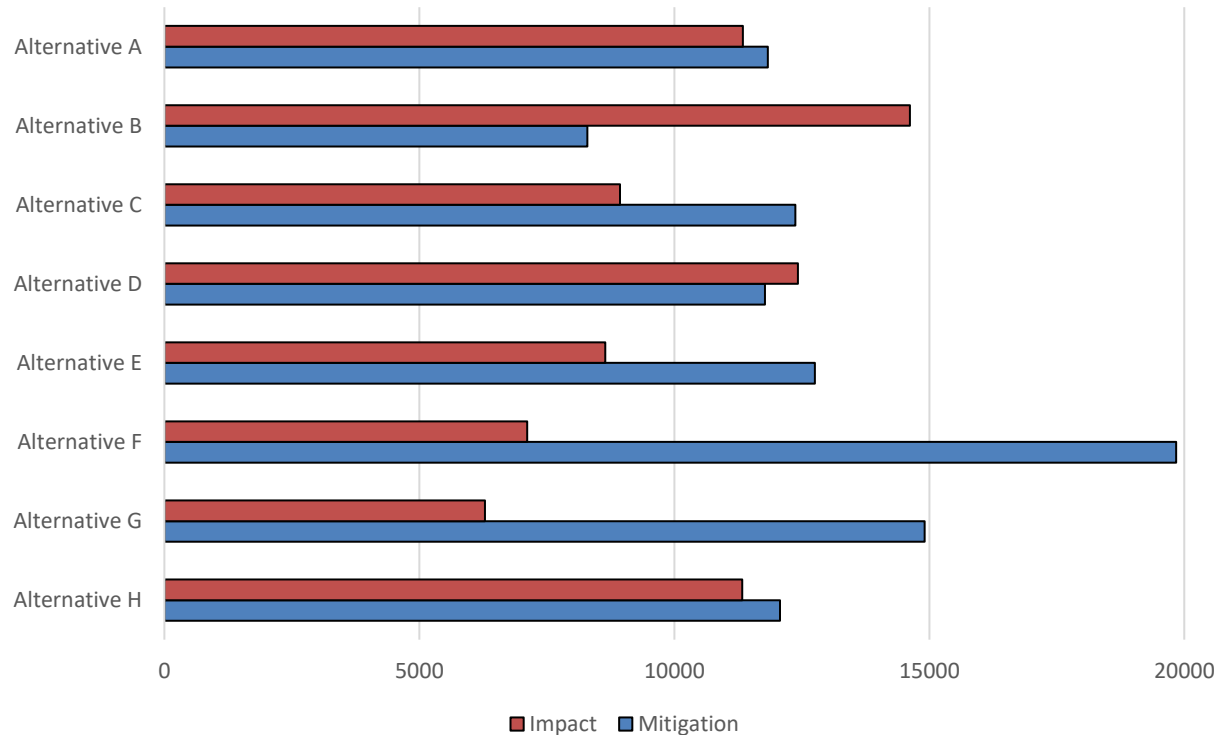
determination is made when USFWS completes a biological opinion on the issuance of the take permit for the HCP amendment.

The Joint Agencies recognize the importance of protecting existing occupied marbled murrelet habitat and recruiting additional habitat in specific areas. The alternatives vary by providing differing levels of habitat protection and recruitment, coupled with some short-term habitat loss. The intent is to improve current population trends through conservation and recruitment of additional nesting habitat on DNR-managed lands.

Two analytical approaches were used to evaluate the effects of the proposed alternatives on marbled murrelet habitat and populations. The acreage, quality (as influenced by stand condition and edge effects), and timing of habitat harvested and developed under each alternative provide a relatively direct measure of impacts. Potential consequences of each alternative relative to one other on the Washington murrelet population were evaluated with a population viability analysis model. This model explores two scenarios, both based on the assumption that habitat is the main influence on current population declines: 1) other factors compound the negative effects of insufficient habitat, making it difficult for murrelet populations to respond to increases in habitat availability (risk scenario), and 2) murrelet survival and reproduction are sufficient to allow for population growth as habitat increases (enhancement scenario).

For alternatives A through E, habitat loss in the short term (the first decade of the planning period, due to harvest of habitat outside of long-term forest cover) is expected to be mitigated over time by the recruitment of more and higher-quality habitat and an increase in interior habitat in strategic locations within long-term forest cover. However, impacts are not fully mitigated in all alternatives. When the acres of this habitat are adjusted for quality and timing, the cumulative adverse impacts expected to marbled murrelet habitat are exceeded by the mitigation expected under every proposed alternative except Alternatives B and D (Figure S.6.2). Alternatives F through H are designed to have no net loss of habitat capacity.

**Figure S.6.2. Acres of Habitat Loss (Impact) and Gain (Mitigation) by the End of the Planning Period, by Alternative and Adjusted for Quality**



The following section summarizes data for the alternatives on population size, reproduction, and distribution of marbled murrelet. This section does not replace analysis in the biological opinion produced by USFWS as part of issuing an incidental take permit.

### **Population Size**

The population viability analysis shows that alternatives C, E, F, G and H could result in a larger murrelet population than under Alternative A. These differences were distinguishable at the scale of DNR-managed land. The population viability analysis showed little distinction between alternatives at the statewide scale, in term of population size or quasi-extinction probability.

In summary, the population viability analyses suggest that relative to the other alternatives, Alternative B results in the highest risk of local declines and the smallest projected local population sizes during the modeled planning period. Alternatives F and G are projected to result in the lowest risk of local declines, and Alternative F has the largest projected local population sizes, with intermediate results projected under Alternative A and Alternatives C through E, G and H.

## Reproduction

Successful reproduction is required to maintain marbled murrelet populations. In addition to the quality and quality of habitat available in the forest environment, reproduction also is impacted by predation and disturbance. The alternatives support marbled murrelet reproduction by reducing disturbance. Alternatives F, G, and H provide 328-foot (100-meter) buffers around all occupied sites to reduce the risk of predation and natural disturbance. Alternative A also has 328-foot (100-meter) buffers, but around smaller occupied sites. Alternatives, C, D, and E have 328-foot (100-meter) buffers around most occupied site, but applies 164-foot (50-meter) buffers on occupied sites over 200 acres in the OESF HCP Planning Unit. Alternative B does not include buffers, which could result increased predation and disturbance of occupied sites. Conservation measures described in Chapter 2 reduce disturbance from management activities and recreation.

In addition to occupied site buffers, special habitat areas, emphasis areas, and marbled murrelet management areas all are intended to provide security forest surrounding murrelet habitat. Each type of conservation area takes a slightly different approach to supporting murrelet reproduction by reducing the likelihood of predation and natural disturbances. In alternatives C, D, E, and G, special habitat areas are also intended to reduce anthropogenic disturbances. Alternatives A and B do not include any of these strategies. Alternative F includes marbled murrelet management areas; alternatives D and H include special habitat areas; alternatives C and E include special habitat areas and emphasis areas, and Alternative G includes all three strategies.

## Distribution

Under all alternatives except Alternative B, there are more acres of raw habitat, adjusted habitat, and interior forest habitat in Decade 5 than current conditions in all landscapes. Additional analysis at the watershed scale shows that in Decade 5, adjusted habitat acres will increase in most watersheds in the analysis area under alternatives C, D, E, F, G and H. However, all alternatives include net declines in habitat in some watersheds. In Alternative F, these declines affect only a few isolated watersheds, whereas in Alternative B, large clusters of watersheds are projected to experience habitat declines in all three of the strategic locations.

However, impacts exceeds mitigation in some strategic locations under some alternatives. Notably, impacts exceed mitigation in the North Puget strategic location under alternatives A, C, E, and H (even though mitigation exceeds impacts in these alternatives at the analysis area scale).<sup>4</sup> The reason is the time it takes for habitat to develop as mitigation in this strategic location. Therefore, there will be a period of time, up to several decades, when there will be less habitat available in North Puget than there is now. Only Alternatives B and D result in greater impacts than mitigation in OESF and the Straits west of the Elwha, and only Alternative B shows greater impacts than mitigation in Southwest Washington.

---

<sup>4</sup> Impacts exceeds mitigation in both the North Puget strategic location and the analysis area as a whole under alternatives B and D.



At a smaller scale, alternatives vary in their conservation of specific areas such as the Clallam area in OESF and the Straits, the Elochoman area in Southwest Washington, and areas to the west of federal lands in North Puget. Alternatives A and B include no conservation areas (emphasis areas, MMMA, or special habitat areas) in these areas. Alternatives C, E, G, and H provide conservation areas for the Clallam area. Alternatives F, G, and H provide conservation areas for the Elochoman area. West of federal lands in North Puget, only Alternatives C and H include conservation areas. In order from least to most acreage in conservation areas in North Puget, the alternatives are C, H, D, E, G, and F.

## ■ Human Environment: Recreation, Forest Roads, Public Services and Utilities, Environmental Justice, Cultural Resources, and Socioeconomics

Some localized impacts to these elements of the human environment are expected as a result of increasing the acres of marbled murrelet conservation and implementing proposed conservation measures. Cumulatively, these impacts are expected to be minor for all elements of the human environment except socioeconomics (refer to the following section), considering the scale of the analysis area and the availability of other DNR-managed lands for these land uses. Impacts are similar across all action alternatives.

Compared with the no action alternative, adding acres of marbled murrelet conservation would result in local reductions in the land available for new or expanded recreation facilities or non-timber leases/ or easements, shifting demand to lands elsewhere within the analysis area. Existing facilities, easements, leases, and land uses would largely remain unaffected, although the timing of some maintenance activities could be impacted.

Where conservation measures limit road development, compensatory increases in road miles may occur nearby, but overall road density in the analysis area is unlikely to increase as a result of the alternatives. Increased road abandonment in conservation areas likely would occur, which in turn could affect recreational use and access within these areas. Continued access to and use of cultural resources is unlikely to be significantly affected, however, and existing DNR policies and procedures for tribal consultation and cultural resource protection will remain in place.

No environmental justice impacts under any alternative are anticipated from this conservation strategy, although local economic impacts in two counties could be adverse (as discussed in the next section).

### **Socioeconomic Impacts**

NEPA requires an examination of socioeconomic impacts of the proposed action. Socioeconomic impacts in this analysis concern the relationship of DNR-managed land to local economies, including county revenues, state trust revenues, employment, and local tax generation. These impacts were measured both qualitatively, by considering how activities on DNR-managed land contribute broadly to the local

economy, and quantitatively, by attributing assumed values to the acres that would be available for harvest under each alternative.

The change in the value of operable acres was found to be relatively small at the scale of the entire analysis area. The overall change in operable acres ranges from a 3 percent increase under Alternative B to a decrease of between 1 and 5 percent for Alternatives C through H.

Federally granted trusts (trusts supported by State Lands) would experience gains in operable acres under Alternative B (increases between 1 and 7 percent) and reductions under alternatives C through H. Reductions vary by alternative and trust but are under 10 percent with two exceptions. First, operable acres are reduced on the University Trust by more than 10 percent under alternatives C through H, with a maximum reduction of 20 percent under Alternative D. Second, operable acres are reduced on the Scientific School Trust by 16 percent under Alternative F.

On State Forest Transfer and State Forest Purchase lands, which benefit counties, operable acres remain stable or increase under Alternative B. Under the other alternatives, operable acres remain stable, increase or decrease depending on the county. The largest changes in operable acres are on the State Forest Purchase Trust in Pacific County, with declines of 23 to 42 percent under alternatives C through H. The largest changes in operable acres are on State Forest Transfer Lands in Wahkiakum County, where operable acres decrease 10 to 27 percent under alternative C through G. Under Alternative H, operable acres on State Forest Transfer Lands in Wahkiakum County increase 7 percent. State Forest Transfer Lands in Pacific County decline by 2 to 17 percent under the action alternatives. Under Alternative F, operable acre declines of greater than 10 percent are expected on State Forest Transfer Land in Pierce and Whatcom counties.

Alternative B, by increasing the number of operable acres available for harvest as compared with Alternative A, is expected to result in stable or increased harvests levels on all trusts and in all counties in the analysis area, stable or increased revenue for all trust beneficiaries with lands within the analysis area, and stable or increased tax revenue and employment in counties within the analysis area.

Alternatives C through H, by decreasing the number of operable acres available for harvest, are expected to result in stable or decreased harvest levels on most trusts and in all counties in the analysis area, stable or decreased revenue for most trust beneficiaries with lands within the analysis area, and stable or decreased tax revenue and employment in counties within the analysis area.

Pacific County is most likely to be adversely impacted by Alternatives C through H. Wahkiakum County is most likely to be adversely impacted by alternatives C through G. These counties are more heavily dependent on timber harvest for local government revenue and have below average economic diversity, compared with other counties in the analysis area. The economies of Pacific and Wahkiakum counties are therefore less able to tolerate the reduction in harvest volume anticipated under Alternatives C through G, and Alternative H for Pacific County only, because of their low socioeconomic resiliency.

Some of the adverse economic effects due to reduced timber supply in the near term could be offset over time by the cumulative benefits of improved efficiencies and effectiveness in forest management, additional opportunities for thinning (which is more labor intensive), more regulatory certainty under the

Endangered Species Act, and potential use of the State Forest Trust Land Replacement Program in Pacific and Wahkiakum counties.

## ■ Impacts on DNR Operations

The establishment of discrete marbled murrelet conservation areas under the action alternatives will improve operational certainty (for example, in 1997 HCP implementation, harvest planning, road construction, leasing, and recreation planning) as compared with the no action alternative, which includes operational uncertainty about the exact location and extent of protected habitat. The conservation measures largely acknowledge the need for most DNR routine operations to continue to occur within long-term forest cover and limit restrictions or prohibitions to within specific marbled murrelet habitat areas. Thus active management of forest resources can largely continue, following clear parameters for seasonal timing restrictions and disturbance buffers. For four types of operations within long-term forest cover (thinning, roads, blasting, and recreation), the conservation measures differ among alternatives, with some limiting DNR management activities more than others. Site-specific consultation with USFWS is expected under the proposed conservation measures for some forest management activities.