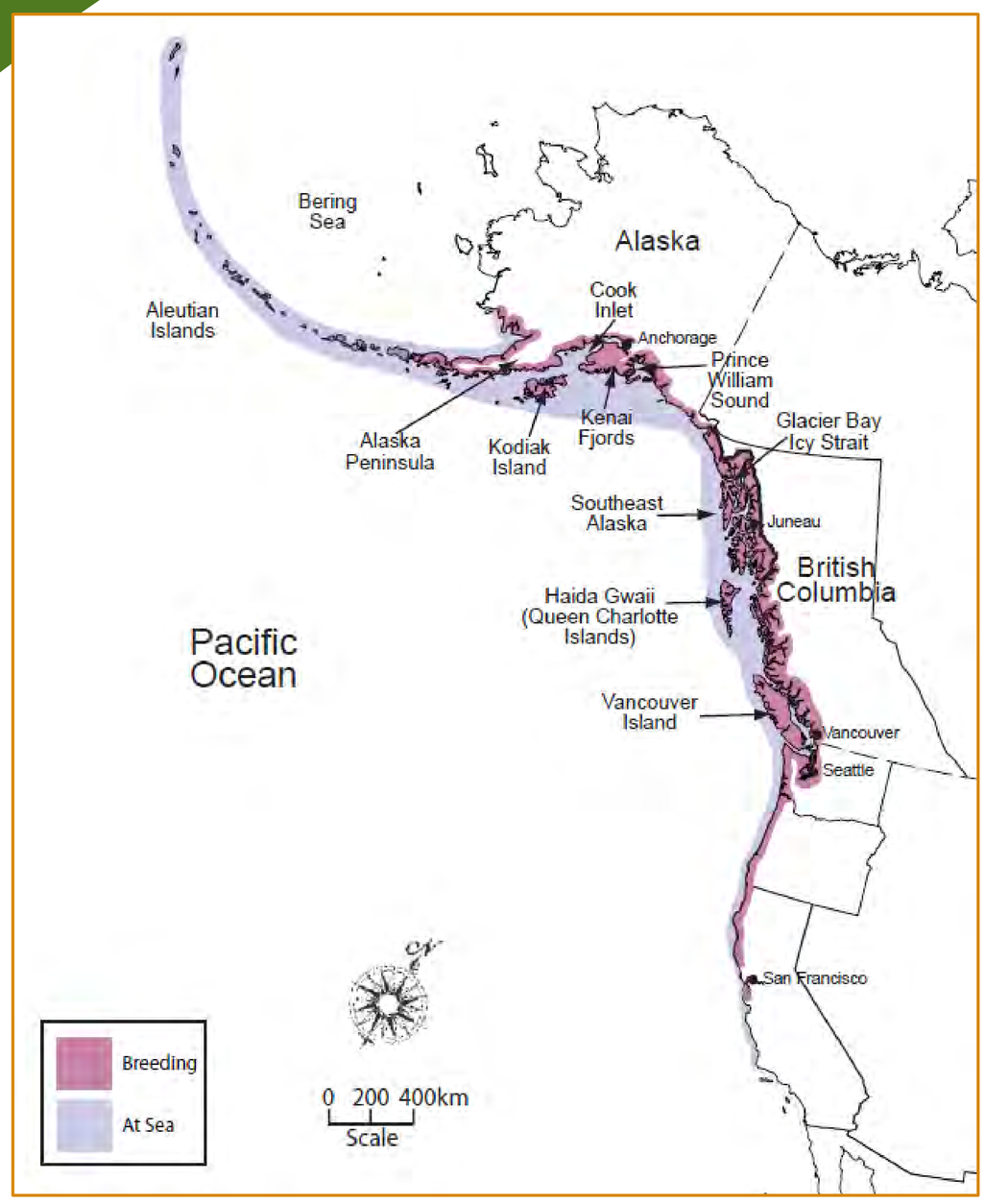
Public Meeting Posters

The following posters were presented at the public meetings for the Long-Term Conservation Strategy for the Marbled Murrelet Draft Environmental Impact Statement

Public meetings were held at four locations:

- Sedro Woolley – January 10, 2017
- Seattle – January 12, 2017
- Port Angeles – January 17, 2017
- Cathlamet – January 19, 2017

Ecology



Range of the Marbled Murrelet

Marbled murrelets spend most of their lives on coastal marine waters from southern Alaska to central California and nest up to 55 miles inland from these waters in mature forests.

Marbled Murrelets at Sea and on Land

Marbled murrelets eat primarily forage fish (for example, sand lance and herring), and may dive up to 30m below the surface for their prey. Birds are largely solitary or found in pairs or small groups. Although they are generally found within 2 – 5 km offshore, they may be found up to approximately 90 km off shore.

Marbled murrelets do not build a typical nest; rather, they lay a single egg on a branch in the live crowns of coniferous trees. They use a variety of tree species, but in Washington, Douglas fir and western hemlock are the primary species. Marbled murrelets have a tendency to return to the same nesting areas. Nesting season is April through September.

Population in Decline

The marbled murrelet was listed as a threatened species under the Endangered Species Act in Washington, Oregon, and California in 1992. The marbled murrelet population is declining in Washington at 4.4 percent per year. Habitat loss has occurred throughout the listed range of the murrelet, with the greatest habitat losses and steepest population declines in Washington. While the direct causes for marbled murrelet population declines are unknown, potential factors include:

- loss of nesting habitat,
- changes in the marine environment reducing the availability and quality of prey, and
- increased densities of nest predators.

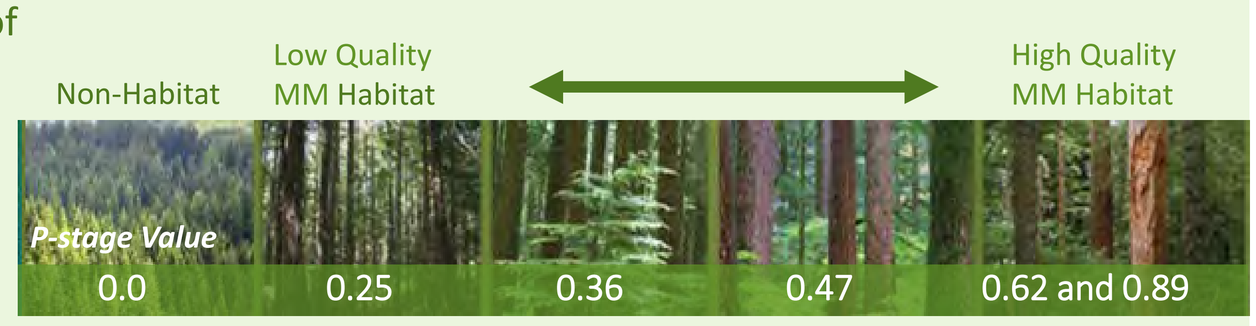
Habitat

What is P-stage?

"P-stage" refers to a habitat model that classifies DNR-managed forestlands based on their **relative value** as nesting habitat, using DNR's forest inventory data. Forestland is classified based on the probability it will be used for nesting by marbled murrelets.

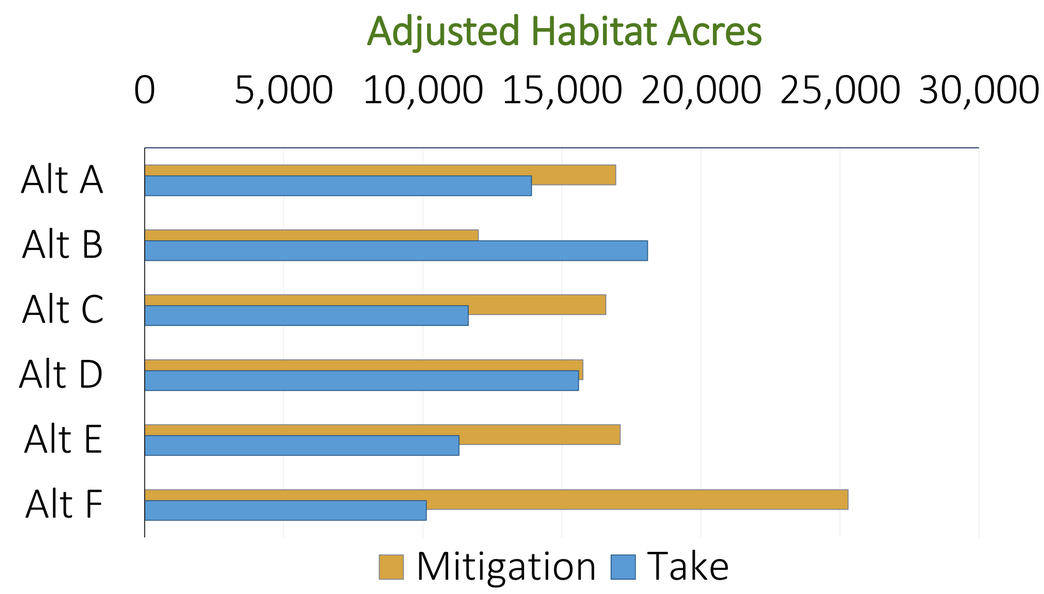
A higher P-stage value means there is a higher probability for nesting. P-stage values are modified by a variety of habitat quality factors, including edge condition (is the habitat next to a recent timber harvest or a road that could bring predators to the nest sites?), location (is it close to marine waters or adjacent to other known habitat?), and timing (is this habitat now or is it expected to develop in the future?).

Using the P-stage habitat classification model, the Joint Agencies (DNR and US Fish and Wildlife Service) were able to identify key habitat throughout DNR-managed lands in the analysis area.



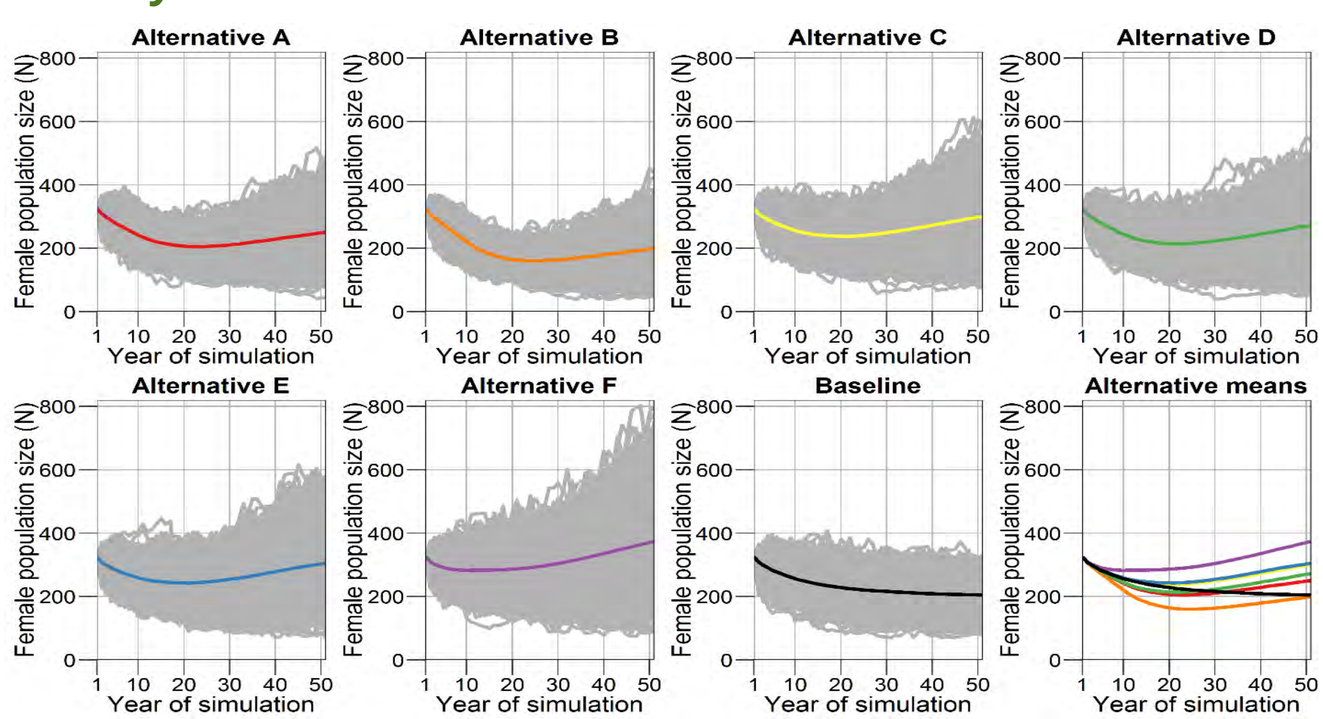
How do Expected Habitat Impacts Stack up Against Proposed Conservation?

Each alternative assumes different levels of harvest of P-stage habitat over time, and also estimates impacts to habitat from forest edges and disturbance through time. These impacts are the "take" under the Incidental Take Permit. Each alternative also proposes different amounts of habitat conservation through the life of the HCP. This conservation is the "mitigation" for that take. Not every acre is worth the same amount to the murrelet, and so different acres are assigned different values, based on their P-stage score and modified by the habitat quality factors listed above.



How is the Murrelet Population Potentially Affected?

The Joint Agencies commissioned population modeling experts to conduct a **population viability analysis** that modeled different scenarios to determine how the alternatives might impact the murrelet population on DNR-managed lands. In the scenario presented here, a modeled female population of marbled murrelets on DNR-lands responds differently depending on assumed levels of habitat conservation and harvest over time, and compared with an assumed baseline rate of population decline (4.4%).



Conservation Areas

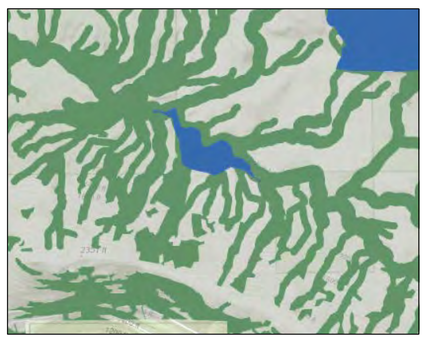
Existing Conservation:
In the range of the murrelet , DNR has already conserved approximately 583,000 acres of DNR-managed forests that contain murrelet habitat or may otherwise support the development and protection of that habitat ("long-term forest cover").

Marbled Murrelet-Specific Conservation:
Each alternative builds on existing conservation by adding one or more types of strategic conservation areas designed and managed for the marbled murrelet.

Habitat Identified Under the Interim Strategy

The interim marbled murrelet strategy in the HCP required DNR to identify higher-quality habitat (called "reclassified habitat") for marbled murrelet habitat surveys to determine occupancy. Habitat surveys were conducted from 1997 to 2002. All reclassified habitat found to be occupied is protected under the interim strategy, as is the majority of unoccupied, reclassified habitat. **Alternative A** is the only alternative that specifically protects reclassified habitat.

Occupied Sites



Occupied sites are areas that were surveyed and showed signs of occupancy by nesting murrelets. **Alternative A** uses occupied sites delineated under the interim strategy. **Alternatives B through F** use an adjusted set of occupied sites delineated in the 2008 Science Team Report.

Occupied Site Buffers

Alternatives A and **C through F** apply a 100-meter buffer to the outer extent of mapped, occupied sites. Under **Alternatives C through E**, buffers are reduced to 50 meters for sites ≥ 200 acres in the OESF. **Alternative B** does not apply any buffers to occupied sites.

High-Quality Habitat Stands

These are existing stands of P-stage habitat in class ≥ 0.47 that are not otherwise identified as occupied sites or as part of the other conservation areas**. Alternatives C and E** designate these habitat stands for conservation in addition to special habitat areas and emphasis areas.

Map Legend

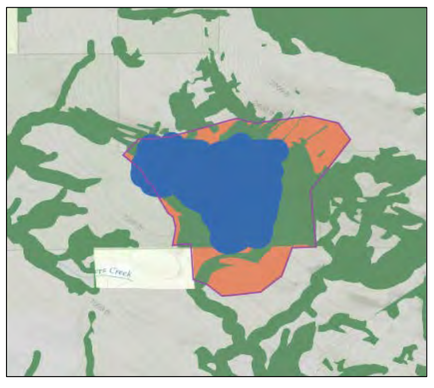
- **Occupied sites and buffers**
- **Long-term Forest Cover (LTFC)**
- **LTFC - Northern Spotted Owl Low Quality Habitat**
- **LTFC – Marbled Murrelet-specific Conservation**
- **Non-LTFC**

Conservation Areas

Existing Conservation:
In the range of the murrelet , DNR has already conserved approximately 583,000 acres of DNR-managed forests that contain murrelet habitat or may otherwise support the development and protection of that habitat ("long-term forest cover").

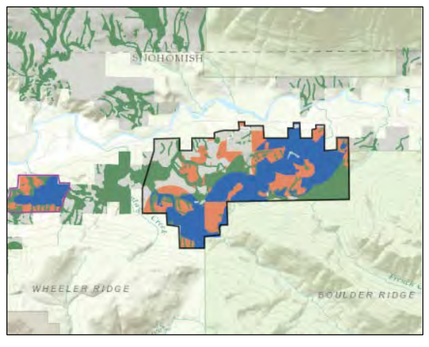
Marbled Murrelet-Specific Conservation:
Each alternative builds on existing conservation by adding one or more types of strategic conservation areas designed and managed for the marbled murrelet.

Special Habitat Areas



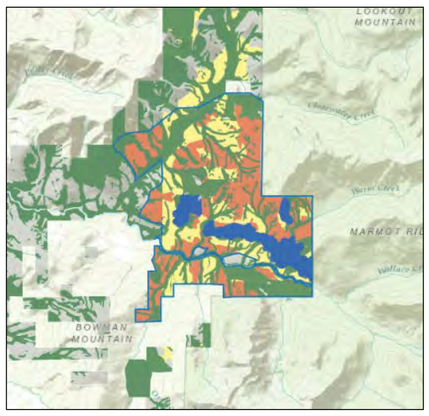
All special habitat areas have at least one marbled murrelet occupied site within their borders. Special habitat areas also include surrounding habitat (P-stage) and non-habitat that may function as security forest. Security forest provides additional protection from disturbances. Special habitat areas rely on the exclusion of active forest management to achieve the goal of reducing edge and fragmentation and growing new habitat. **Alternatives C, D, and E** designate special habitat areas, although size and location of these areas varies. Individual special habitat areas are smaller in size than emphasis areas or marbled murrelet management areas.

Emphasis Areas



Most emphasis areas are built around multiple occupied sites and include both managed and conserved lands. Emphasis areas are generally larger than special habitat areas, and apply expanded (0.5-mile) buffers to occupied sites. All existing P-stage habitat within their borders is protected. Emphasis areas allow some active forest management, including both variable density thinning to facilitate the development of future habitat and variable retention harvest when it does not delay achieving future habitat goals for the emphasis area. **Alternatives C and E** designate emphasis areas.

Marbled Murrelet Management Areas (MMMA)



MMMAs are larger than either special habitat areas or emphasis areas. MMMAs were originally designated in the Science Team Report, in which maps of these areas for four of the six HCP planning units can be found. For this draft environmental impact statement, MMMAs were added for the North Puget planning unit. MMMAs allow thinning that facilitates recruitment of future marbled murrelet habitat. Only **Alternative F** designates MMMAs. Some management activities are allowed in these areas, consistent with habitat development and protection.

Map Legend

- **Occupied sites and buffers**
- **Long-term Forest Cover (LTFC)**
- **LTFC - Northern Spotted Owl Low Quality Habitat**
- **LTFC – Marbled Murrelet-specific Conservation**
- **Non-LTFC**

Marbled Murrelet
Long-Term Conservation Strategy

Alternative A

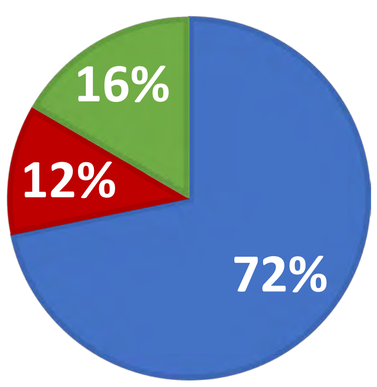
Acres of Added Murrelet-Specific Conservation

- Occupied sites 8,000
- Occupied site buffers 12,000
- Habitat identified under the interim strategy 17,000

TOTAL: 37,000

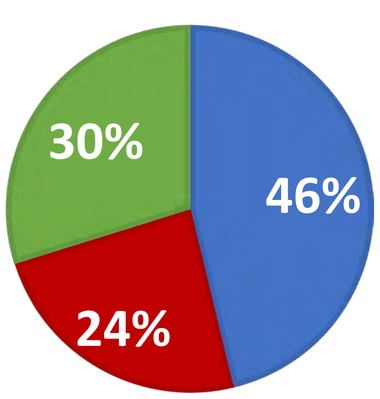
Starting habitat quality (first decade, beginning 2015)

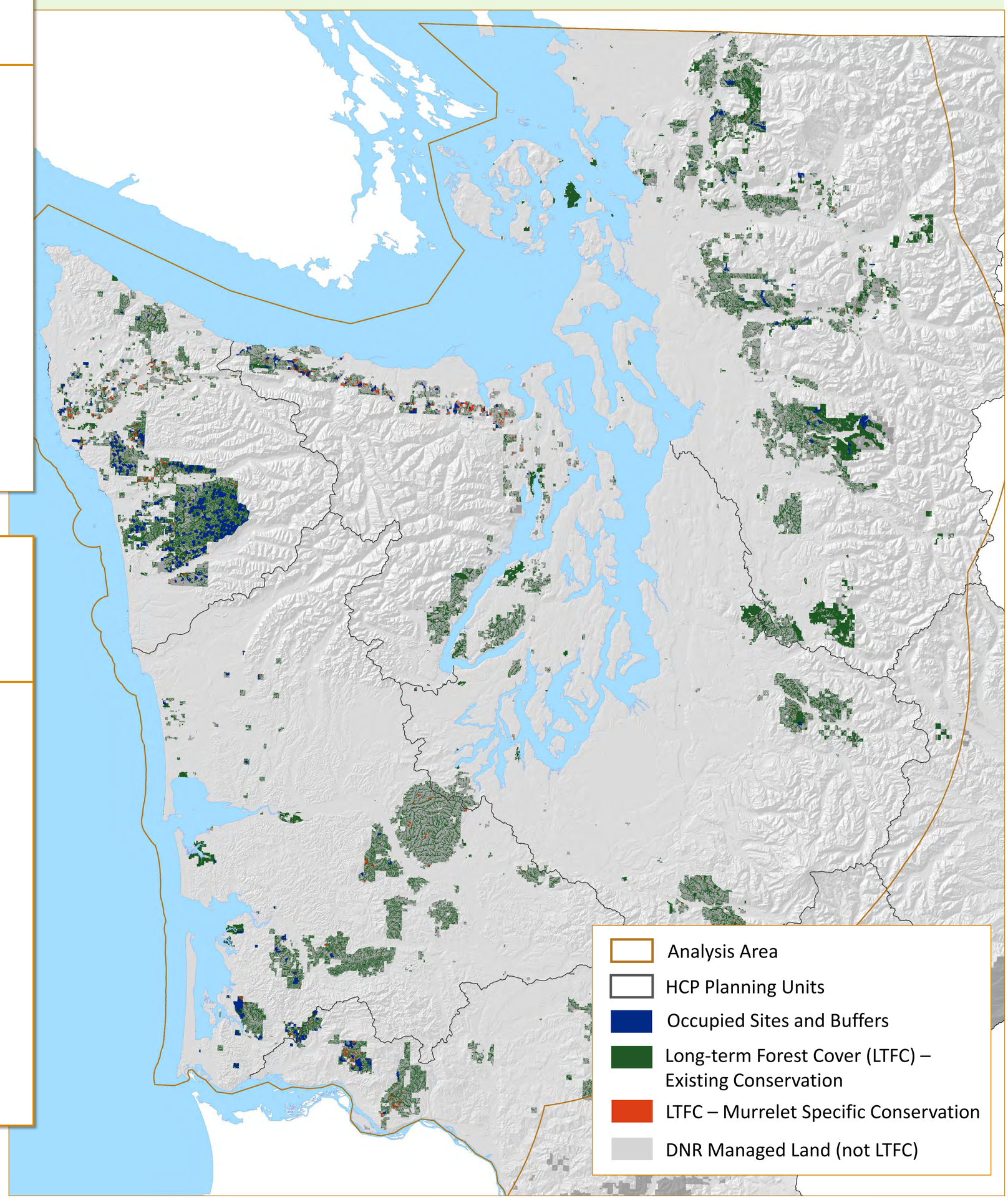
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Marbled Murrelet
Long-Term Conservation Strategy

Alternative B

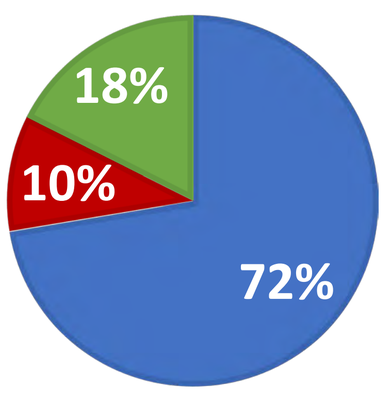
Acres of Added Murrelet-Specific Conservation

- Occupied sites 10,000

TOTAL: 10,000

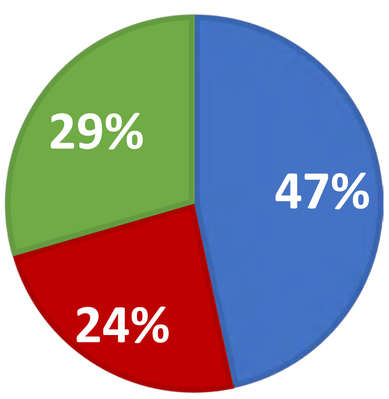
Starting habitat quality (first decade, beginning 2015)

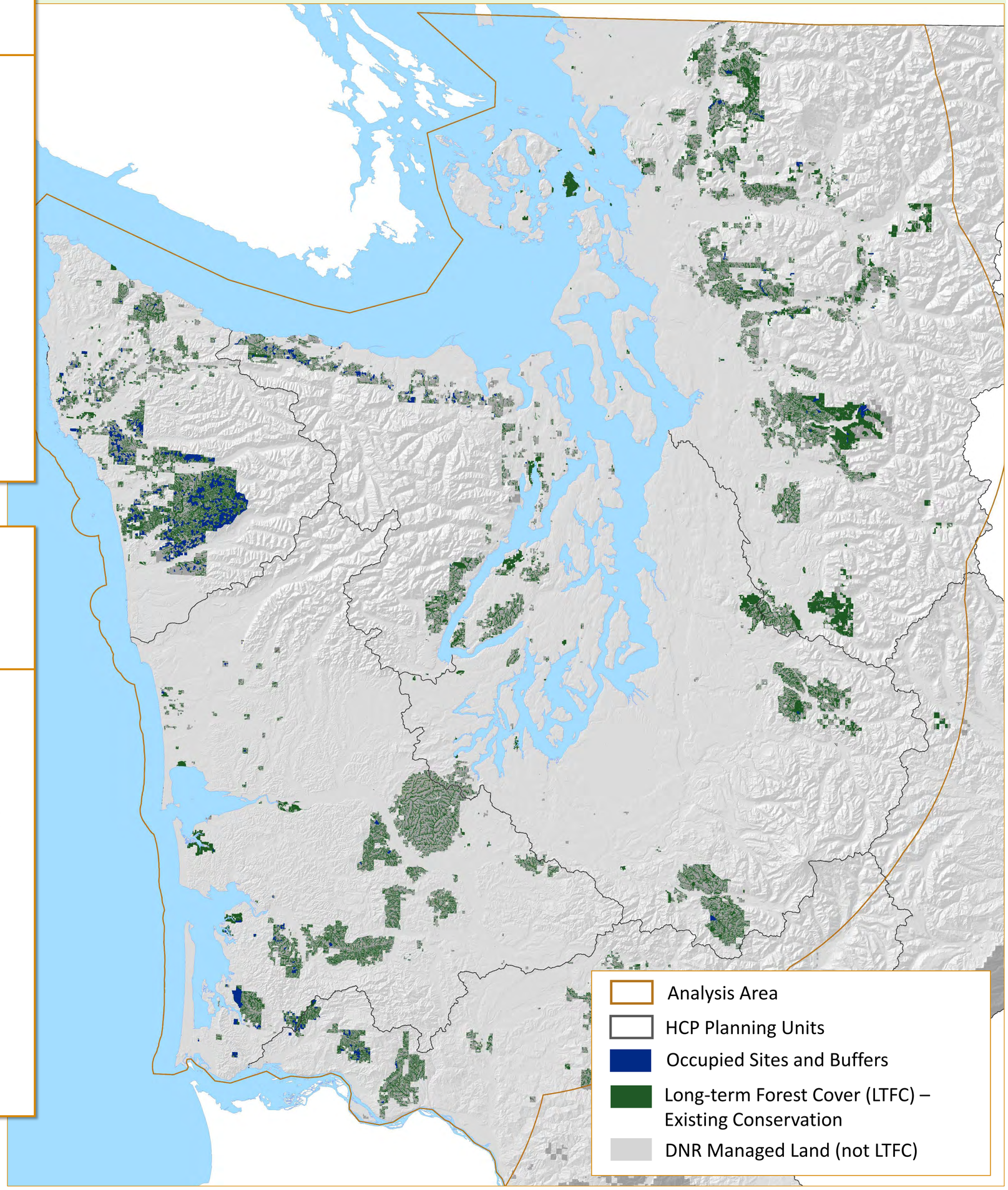
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Marbled Murrelet
Long-Term Conservation Strategy

Alternative C

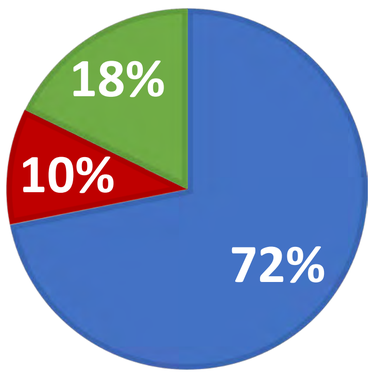
Acres of Added Murrelet-Specific Conservation

- Occupied sites 10,000
- Occupied site buffers 13,000
- Emphasis areas 14,000
- Special habitat areas 9,000
- ≥ 0.47 P-stage 7,000

TOTAL: 53,000

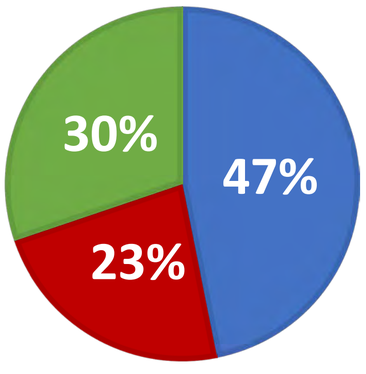
Starting habitat quality (first decade, beginning 2015)

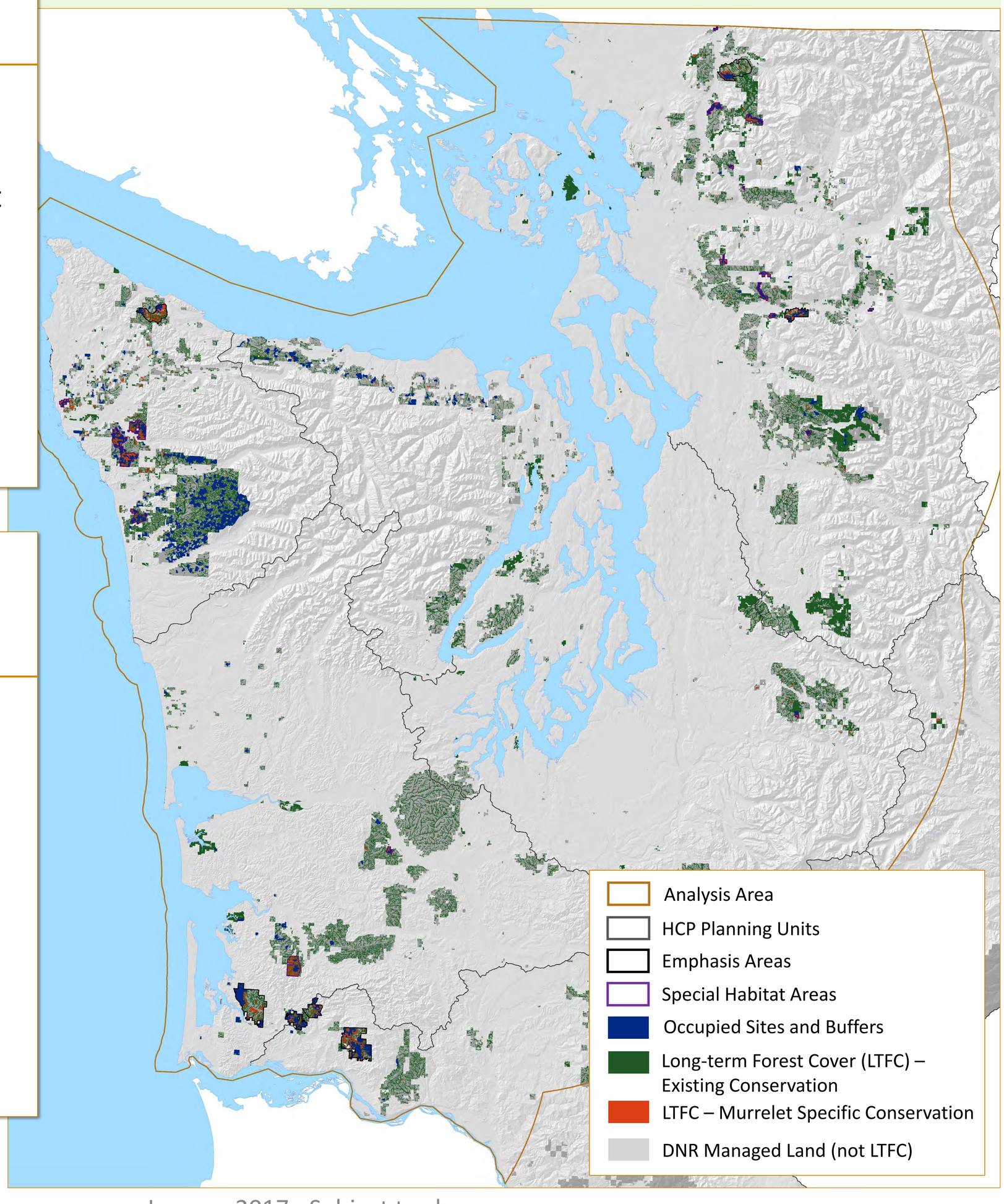
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Marbled Murrelet
Long-Term Conservation Strategy

Alternative D

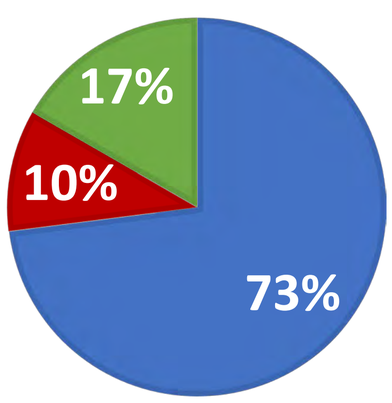
Acres of Added Murrelet-Specific Conservation

- Occupied sites 10,000
- Occupied site buffers 13,000
- Special habitat areas 28,000

TOTAL: 51,000

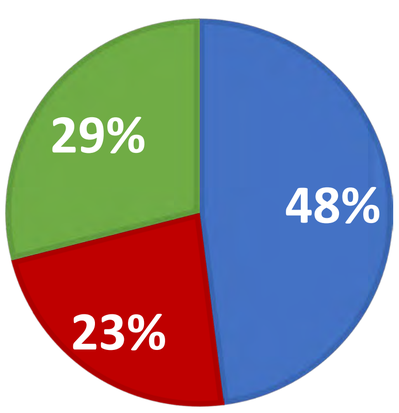
Starting habitat quality (first decade, beginning 2015)

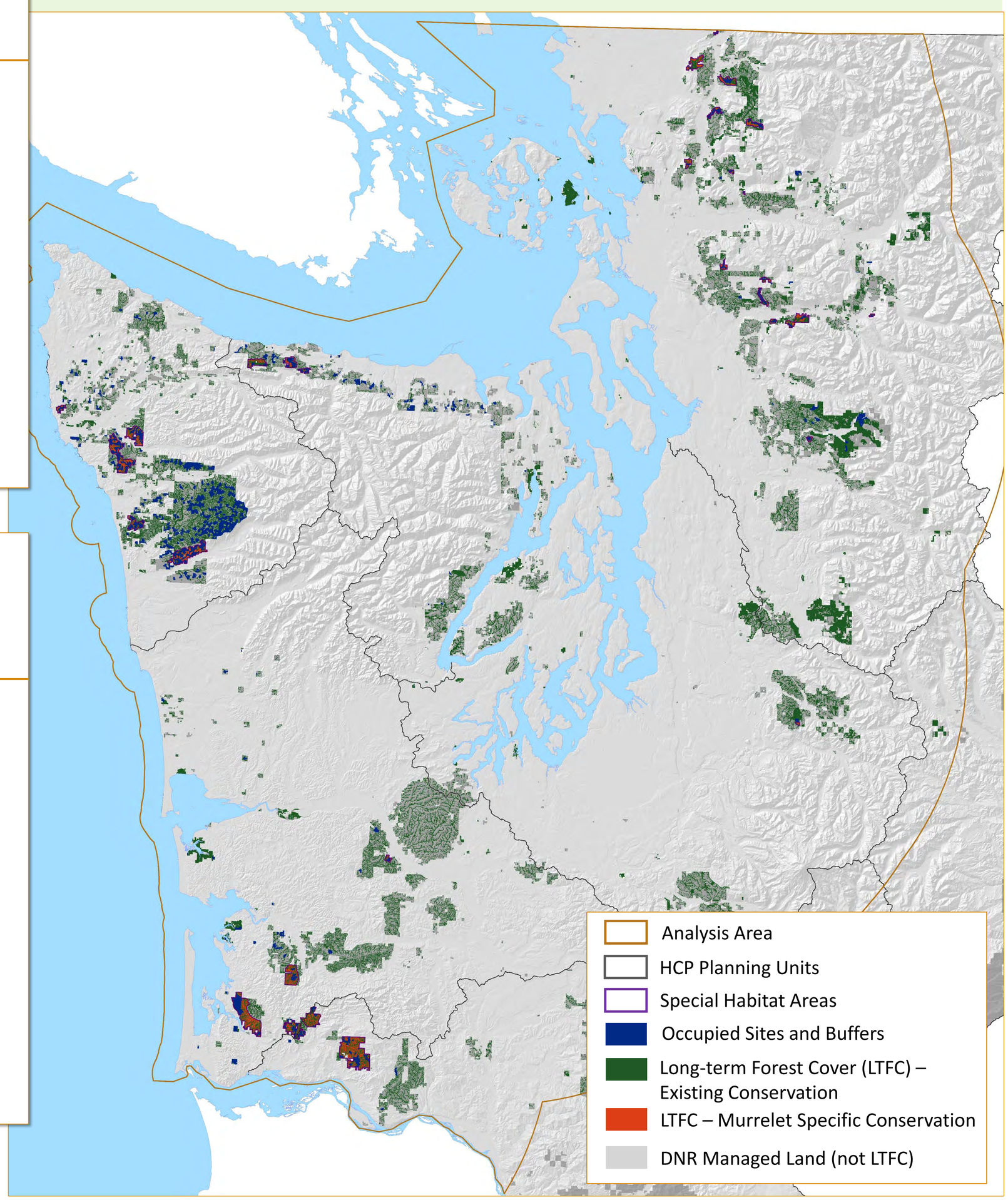
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Marbled Murrelet
Long-Term Conservation Strategy

Alternative E

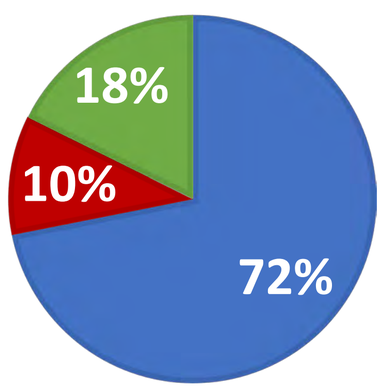
Acres of Added Murrelet-Specific Conservation

- Occupied sites 10,000
- Occupied site buffers 13,000
- Emphasis areas 14,000
- Special habitat areas 13,000
- ≥ 0.47 P-stage 7,000

TOTAL: 57,000

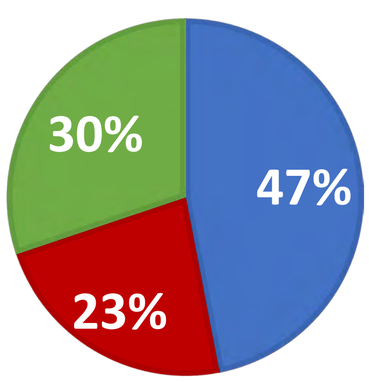
Starting habitat quality (first decade, beginning 2015)

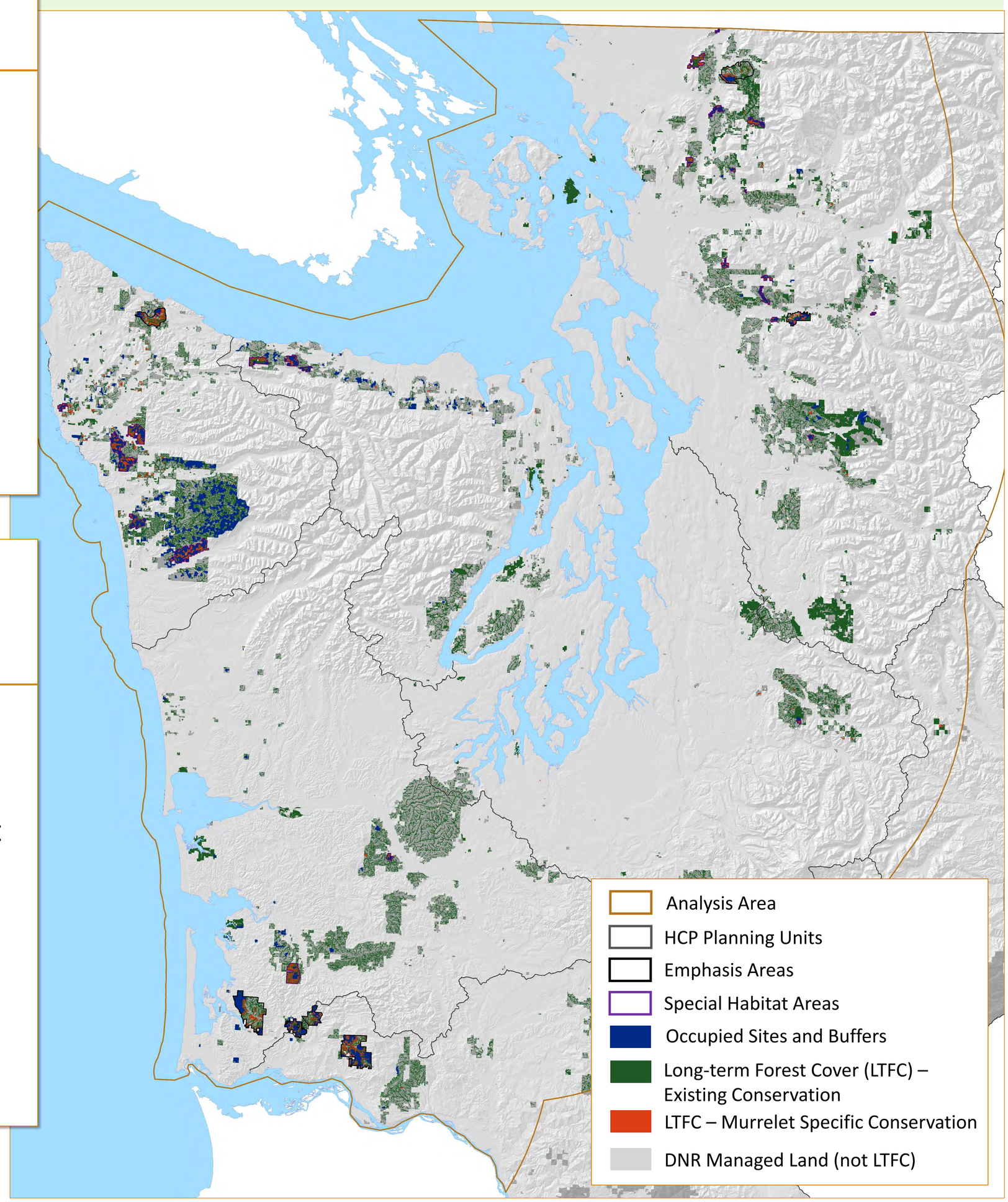
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Marbled Murrelet
Long-Term Conservation Strategy

Alternative F

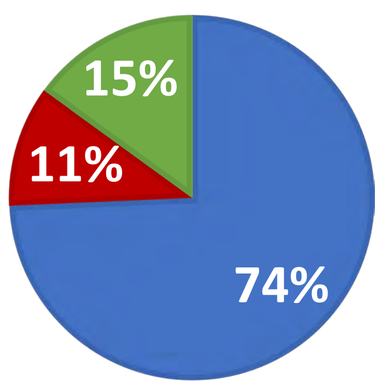
Acres of Added Murrelet-Specific Conservation

- Occupied sites 10,000
- Occupied site buffers 16,000
- Marbled Murrelet Management Area 78,000
- Northern Spotted Owl low-quality habitat 47,000

TOTAL: 151,000

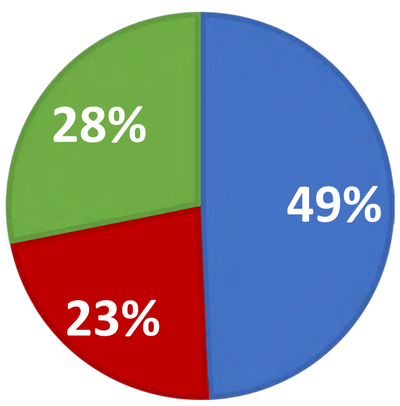
Starting habitat quality (first decade, beginning 2015)

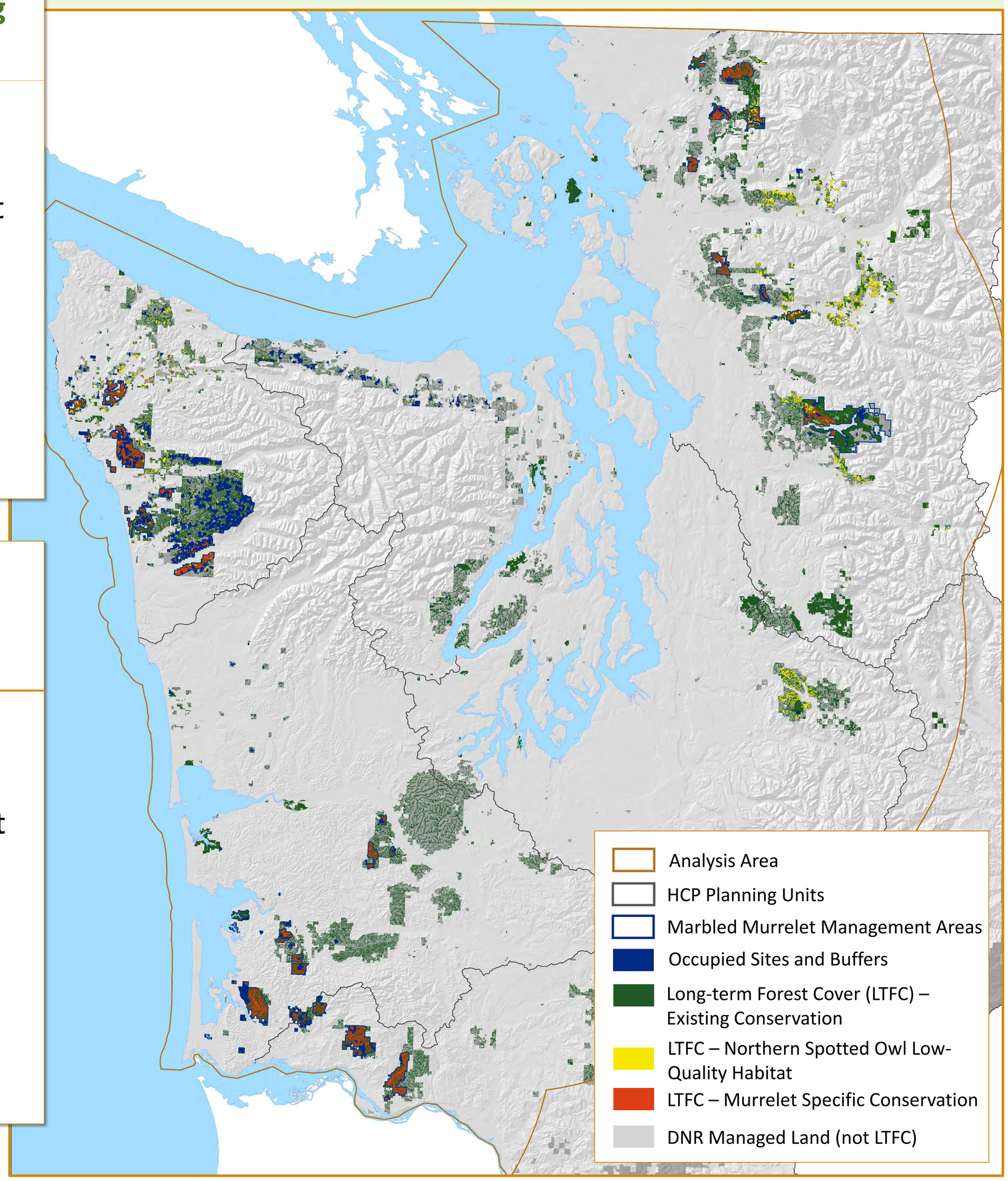
- Non-habitat
- Low-quality habitat
- High-quality habitat



Ending habitat quality (last decade, beginning 2057)

- Non-habitat
- Low-quality habitat
- High-quality habitat





January 2017 - Subject to change

Economic Impacts

Acres Available for Harvest

The economic impacts of a long-term marbled murrelet strategy are primarily tied to changes in the acres available for harvest. Some forestland is currently unavailable for harvest due to existing conservation commitments or other limitations. This would be unchanged by a marbled murrelet strategy. Other land may currently be conserved as murrelet habitat, but would be released for harvest under one or more of the action alternatives.

State Forest Trust land	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
	% change in available acres, compared to Alternative A				
Clallam County	10%	2%	3%	0%	6%
Cowlitz County	0%	0%	0%	0%	0%
Grays Harbor County	2%	2%	2%	2%	2%
Jefferson County	3%	2%	2%	2%	2%
King County	0%	-1%	0%	-1%	-0%
Kitsap County	0%	0%	0%	0%	0%
Lewis County	0%	0%	0%	0%	-5%
Mason County	0%	0%	0%	0%	0%
Pacific County	9%	-13%	-21%	-13%	-23%
Pierce County	0%	0%	0%	0%	-11%
Skagit County	1%	-1%	0%	-1%	-2%
Snohomish County	1%	-2%	-1%	-2%	-2%
Thurston County	1%	1%	1%	1%	1%
Wahkiakum County	20%	-9%	-12%	-9%	-25%
Whatcom County	1%	-3%	-2%	-4%	-22%

The DEIS estimates how the number of acres assumed to be currently available for harvest might change under the action alternatives. Some counties would see no significant change or see a slight increase in the acres available for harvest. Several other counties, particularly Pacific and Wahkiakum, could see notable decreases in acres available for harvest.

Revenue and Employment Impacts

Local reductions or increases in acres available for harvest would result in changes to:

- Trust revenues
- Forest tax revenue
- Sales and local tax revenue
- Timber-related employment.

The DEIS found potential adverse impacts to local revenues under Alternatives C through F for Pacific and Wahkiakum Counties, which are highly timber-dependent.

	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Estimated annual timber sale value change (compared with no action)	$4 million	-$2 million	-$2 million	-$2 million	-$9 million

Estimated change reported here for the analysis area assumes a yield of 32 thousand board feet per acre, a price of $350 per thousand board feet, and a harvest of 1/50 of the available acres each year. These assumptions do not account for all factors that influence potential timber volumes (see the sustainable harvest calculation for more information).