

DRAFT Northwest Forest Plan Interagency Regional Monitoring, 20 Year Report Status and Trend of Marbled Murrelet Populations and Habitat

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Background and New Science

Objective: The primary objective is to address the key question of status and trend of marbled murrelet populations and nesting habitat in the Northwest Forest Plan (Plan) area. This information will help assess if implementing current management direction is contributing to the recovery of this federally-listed species by maintaining and restoring potential murrelet nesting habitat and populations on federal lands.

Methods: Population monitoring is based on estimates of the at-sea murrelet population, for the coastal waters adjacent to the area included in the Plan. A team of cooperating scientists have conducted line transect surveys from boats in those waters during the murrelet breeding season, since 2000. Those data are used to generate annual population and trend estimates for each of five zones and for all zones combined.

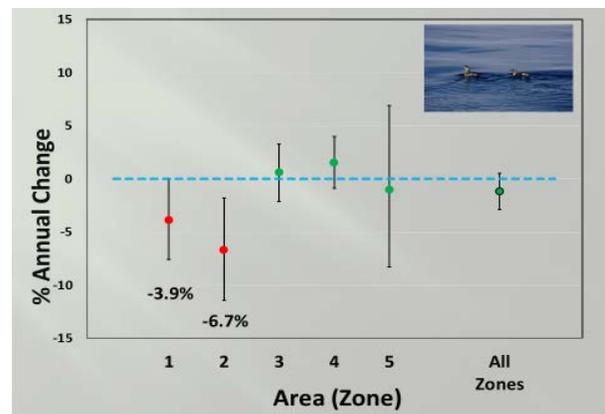
To monitor nesting habitat we used habitat suitability models and map data on vegetation and physical conditions to estimate the amount and distribution of potential murrelet nesting habitat in 1993 (baseline) and 2012 using 4 habitat suitability classes. We estimated net change as the balance between losses and gains of higher suitability habitat (defined as suitability classes 3 plus 4). We then used forest disturbance data provided by LandTrendr and other sources to identify the causes of habitat loss.

New science: In addition to improved Gradient Nearest Neighbor (GNN) map data on forest composition and structure characteristics, new for the 20-year report is an initial “land-sea” analysis of how the combination of marine (foraging/survival) factors and terrestrial (nesting) factors influence murrelet status and trend. This approach can help separate forest management from marine effects on murrelet status and trend.

Key Results

Population monitoring (2000 to 2013 period)

- At the Plan scale, we did not detect a population trend. At finer scales, trends were found.
- At the Conservation Zone scale, population declines were documented for the period in both zones in Washington: Zone 1 (-3.9% decline per year), and Zone 2 (-6.7% per year).
- At the state scale, we found a decline in Washington (Zones 1 plus 2), of about 4.6% per year. No trends were detected for the Oregon or California populations for this period.
- More years of monitoring will be required to reliably test for annual declines of 2 to 3 percent or less at the Zone scale.

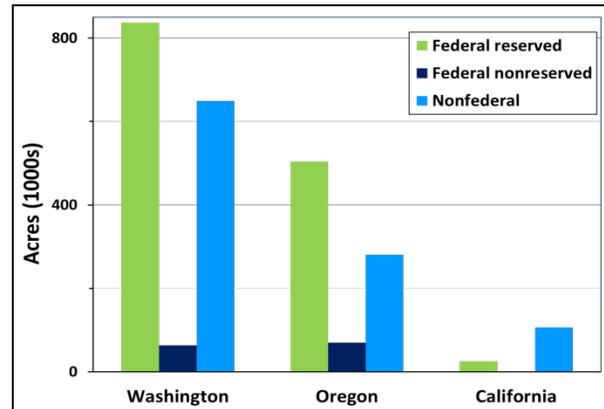


Murrelet population trends, 2000-2013, at the Zone and Plan-wide scales, with annual estimates and 95% confidence intervals. See map below for Zone locations.

Habitat monitoring and Land-Sea analysis

- Federal lands provided the majority (66%, equal to 1.5 million acres) of higher-suitability potential nesting habitat in 2012, mainly in “reserved” land allocations. Federal lands are less important in California, where most coastal forests are in non-federal ownership.

- Federal lands lost about 2% (35,000 acres) of higher-suitability nesting habitat during 1993-2012, with two-thirds due to wildland fire loss, mostly in the 2002 Biscuit fire in Oregon. The remaining third was due mostly to timber harvest and windthrow in WA and OR. On nonfederal lands in the NWFP area, habitat loss was about 27% (276,000 acres), and harvest accounted for 97% of losses.
- About 2 million acres of reserved lands are in lower suitability habitat Class 2. Some of this will eventually develop into higher-suitability nesting habitat and offset losses. Substantial habitat development may take many decades.
- Initial land-sea modeling results indicate that terrestrial factors, particularly the amount and pattern of nearby nesting habitat, best predict at-sea murrelet distribution and trends. Marine conditions were less of a factor, but this result could be due to the lack direct measures of murrelet prey abundance patterns over time.



Distribution of higher-suitability murrelet nesting habitat, by state and land status.

Management Considerations and Next Steps

Results to date highlight the connection between nesting habitat conditions inland, and murrelet population status on coastal waters.

Management considerations include:

- Other than fire losses (largely due to one fire), the Plan reserve system appears to have been effective in protecting nesting habitat on federal lands. In the long-term, the system should further benefit murrelets by increasing nesting habitat, creating larger habitat blocks, and reducing fragmentation of nesting habitat.
- Given the current value of higher-suitability nesting habitat, which takes so long to replace, protection of those habitats by managing risk of fire and other disturbances would likely help achieve management objectives for murrelet.
- Murrelets are affected by habitat conditions on non-federal lands, where habitat losses are a concern. FEMAT anticipated that until new nesting habitat develops on reserved lands, non-federal lands would contribute to murrelet viability.

Next steps

- Further develop “land-sea” models, to help clarify causes for declines, and potential remedies.
- Refine and develop data sources on murrelet prey conditions, to inform future “land-sea” modeling, and that could become part of the murrelet monitoring database. To date, marine forage conditions were represented by indirect measures, such as primary marine (phytoplankton) productivity.
- Continue population monitoring to assess whether existing trends continue in the future.
- Methods are needed to assess the process and timing of nesting habitat development in 2nd-growth.



Distribution of higher-suitability nesting habitat (Classes 3 + 4).