

**Huff****MONITORING MARBLED MURRELET NESTING HABITAT ON FEDERAL LANDS USING A SYSTEMATIC GRID SAMPLING**

Mark H. Huff<sup>1</sup>, Martin G. Raphael<sup>2</sup>, Sherri L. Miller<sup>3</sup>, S. Kim Nelson<sup>4</sup>, Jim Baldwin<sup>5</sup>, Richard Young<sup>1</sup>, Martin Brown<sup>6</sup>, and Diane Evans Mack<sup>2</sup>

The Marbled Murrelet (*Brachyramphus marmoratus*), because of its strong association with late-successional and old-growth forest, and because it is listed as Threatened under the Endangered Species Act, was singled-out in the Northwest Forest Plan (Plan) for specific habitat management provisions and for additional research and monitoring. Our monitoring objectives are (1) determine habitat attributes that are associated with nesting of Marbled Murrelets and (2) estimate the amount of nesting habitat on U.S. Forest Service and Bureau of Land Management lands in the Plan area. By accomplishing these short-term objectives, changes and trends in the amount of potential nesting habitat and the effectiveness of the Plan can be assessed over time. Using the murrelet survey data, we developed logistic regression equations to predict nesting occupancy. We then coupled data from the logistic equations to attributes from inventory plots that cover Forest Service and Bureau of Land Management lands in the Plan area. Using these equations, we estimated the odds ratio of the inventory plot locations as nesting habitat. The odds for each plot on the systematic grid were referenced to the odds calculated from the means of habitat information from sites occupied by murrelets. Using the odds ratios, we developed a suitability index for murrelet nesting habitat and estimated the amount of nesting habitat along this index for different geographic areas or allocations. Our models predicted that murrelet occupancy is more likely at sites with the following set of attributes: closer to the sea, relatively flat terrain, topographically cooler (lower solar radiation index), low conifer density above pole size (>10 in dbh), high basal area of trees above pole size, and high basal area of larger-diameter trees (>30 in dbh). Our models predicted that most Federal lands in the Plan area have a low likelihood of being suitable nesting habitat for Marbled Murrelets relative to locations known to have murrelets. Oregon had the most nesting habitat with a high value of suitability, and California the least. At the province scale, the Oregon Coast Range, Oregon Klamath Mountains, and Olympic Peninsula had the most nesting habitat with a high value of suitability. Nearly all the nesting habitat with large odds ratios occurred in Marbled Murrelet Inland Zone 1, and most was in a reserved land-use allocation.

**STATUS & TREND REPORTS CONCURRENT SESSIONS- Marbled Murrelet**

<sup>1</sup>U.S. Fish and Wildlife Service, Science Support, 911 N.E. 11<sup>th</sup> Avenue, Portland, OR

<sup>2</sup>USDA Forest Service, Pacific Northwest Research Station, 3625 93<sup>rd</sup> Ave. SW, Olympia, WA

<sup>3</sup>USDA Forest Service, Pacific Southwest Research Station, Redwood Sciences Laboratory, 1700 Bayview Dr., Arcata, CA

<sup>4</sup>Oregon State University, Oregon Cooperative Fish and Wildlife Research Unit, 104 Nash Hall, Department of Fisheries and Wildlife, Corvallis, OR

<sup>5</sup>USDA Forest Service, Pacific Southwest Research Station 800 Buchanan Street, West Annex Building, Albany, CA

<sup>6</sup>Synthesis Research & Analysis, 5826 SE Hawthorne Blvd, Portland, OR