western redcedar, or Sitka spruce (Hamer and Nelson 1995b).

Nesting habitat includes the forested areas in which the nest trees are contained. Nesting areas are defined as contiguous forest surrounding potential nest trees with no separations of more than 100 meters (330 feet) wide from adjacent forested areas. Nest trees may be scattered or clumped throughout the area. Nesting areas may contain fewer than one suitable nesting tree per acre. Regardless of the distribution of nest trees, nesting habitat includes the entire contiguous forested area with canopy height of at least one-half the sitepotential tree height. The site-potential tree height is the average maximum height possible for a tree given the local growing conditions. The forested area surrounding the nest tree may provide protection from predators and climatic factors by reducing effects from forest edge.

On a landscape basis, the presence of late-successional forest with canopy closure and canopy height of at least one-half the site-potential tree height contributes to the conservation of the marbled murrelet, even if these forests do not contain potential nest trees. These forests may increase the amount of cover for murrelets in flight to and from the nest, reduce the differences in microclimates associated with forested and unforested areas. and reduce potential for windthrow during storms. Raphael et al. (1995) found that occupied sites have significantly larger proportions of old-growth and large sawtimber in the vicinity.

## Criteria for Identifying Proposed Critical Habitat

Several qualitative criteria were considered in the selection of specific areas as proposed critical habitat. These criteria are generally similar to criteria used in the development of several recent Federal management proposals, such as the Scientific Panel (Johnson *et al.* 1991) and Northwest Forest Plan (USDA and USDI 1994). The following is a description of the criteria considered:

Suitable Nesting Habitat: Proposed critical habitat units include areas with current suitable nesting habitat and other primary constituent elements. Forests that are not currently suitable for nesting, but that are at least one-half the site-potential tree height of the area, are also important in improving habitat conditions through reduced fragmentation and creation of large contiguous forested areas that may reduce the potential for predation.

Survey Data: Information about presence/absence and occupancy were

used to indicate murrelet use areas. Proposed critical habitat units include most of the known sites occupied by marbled murrelets on Federal, State, County, and private lands. However, known occupied sites may represent only a small portion of the population due to the limited coverage of past survey efforts.

Proximity to Marine Foraging Habitat: During the nesting season, marbled murrelets forage in the marine environment and return to the nest at least once daily carrying a prey item to their young. Foraging and nesting habitat areas must be juxtaposed within the flight capabilities and energetic limits of the species. Proposed critical habitat units were designated, taking into account the distance of murrelet detections from the marine environment in a given area.

*Risk of Catastrophic Events:* Proposed critical habitat units include areas where the risk of human-caused catastrophic events such as wildfires is high and high numbers of marbled murrelets are present.

Large, Contiguous Blocks of Nesting Habitat: In response to the problems of fragmentation of suitable habitat, potential increases in predation, and reduced reproductive success, the Service concentrated on defining proposed critical habitat units in terms of large, contiguous blocks of latesuccessional forest. The Service used the Late-Successional Reserve system identified in the Northwest Forest Plan (USDA and USDI 1994) to the extent possible to provide large blocks of habitat. Marbled murrelet locations and habitat were considered in the development of these reserves. State, County, private, and city lands were included where large blocks of Federal reserve areas were insufficient or not available, but critical habitat was crucial to retaining distribution of the species.

Rangewide Distribution: To maintain the current distribution of the species and reduce the impact of catastrophic losses of habitat or murrelets, proposed critical habitat units were identified throughout the range of the species in the three states. With well-distributed critical habitat, the probability of catastrophic wildfires or storm events threatening the survival or recovery of the species in Washington, Oregon, and California would be reduced. Maintaining suitable nesting habitat, and therefore local murrelet concentrations, throughout the range of the species would reduce the effect of potential losses from oil spills or other marine events. Given the intense site fidelity of many alcid species, maintaining rangewide distribution may also provide potential source populations for the recolonization of future habitat.

Adequacy of Existing Protection and Management: The Service considered the existing legal status of lands in proposing areas as critical habitat. Areas with permanent legal protection of wildlife, such as congressionally designated wilderness areas, national parks, and national wildlife refuges are generally not proposed unless specific threats were identified which are not addressed by existing management and protection.

## Proposed Areas Identified by Applying Criteria

Application of the foregoing criteria and consideration of comments and information received as a result of the initial proposal has resulted in a proposed designation of additional areas beyond those in the January 27, 1994, proposal. These additional areas include Federal and non-Federal lands.

The current proposal includes many of the Late-Successional Reserves, as described in the Northwest Forest Plan, on Federal lands within the range of the marbled murrelet in Washington, Oregon, and California. These areas, as managed under the Northwest Forest Plan, will develop into large blocks of suitable murrelet nesting habitat over time. However, the Recovery Team has commented that these areas alone are insufficient to reverse the current population decline in marbled murrelets and maintain a well-distributed population. Portions of Congressionally Withdrawn Areas are proposed where the area provides essential nesting habitat and is subject to external threats because the government does not own the timber rights on some of the land.

The FEMAT report recognized the limited ability of Federal agencies to recover this species on Federal lands alone. "Although the Forest Ecosystem Management Assessment was designed to address only Federal lands within the range of the northern spotted owl, the marbled murrelet is an example of a species whose life history requirements cannot be accommodated only on Federal lands. The marbled murrelet is a seabird that nests inland and therefore is influenced by both the marine and terrestrial environments. Its nesting range in the three-state area includes land that is south of the range of the northern spotted owl. In addition, several areas that are considered key to the recovery of the marbled murrelet involve private and state lands' (FEMAT Report at IV-151 and IV-152, USDA et al. 1993a).