

Marbled Murrelet



Tom Hamer

Marbled murrelets are robin-sized seabirds that divide their time between the ocean, where they forage, and the forest where they nest. Nests are very hard to detect, so biologists monitor nesting behavior.

THE PLAN'S MARBLED MURRELET strategy was to conserve most marbled murrelet nesting habitat and prevent any loss of occupied habitat on federal lands (fig. 7). At the time of the Plan, Congressionally reserved lands and LSRs encompassed about 2.0 out of the estimated 2.55 million acres of federal lands that were thought to have the characteristics needed for murrelet nesting habitat. On the remaining acres, the Plan required surveys for nesting murrelet behavior before timber harvest, and if nesting behavior was found, additional habitat was protected.

On acres of potential habitat not in reserves, the Plan required surveys for murrelet nesting behavior before timber harvest.

A comprehensive analysis of potential marbled murrelet nesting habitat throughout the Plan area was conducted for the 10-year review. This analysis led to a revised estimate of about 1.9 million acres of potential nesting habitat on federal lands, down

from the original estimate of 2.55 million acres. Of the 1.9 million acres, 81 percent is in reserved land use allocations (see fig. 8). The Olympic Peninsula has about 20 percent of the higher quality potential nesting habitat on federal land, with much of it protected in Olympic National Park.

The loss of marbled murrelet habitat was small on federal lands, an estimated 30,000 acres total for the Plan's first decade. Most of the loss was from stand-replacing timber harvest and wildfires. The acres of forest with trees greater than 20 inches in diameter increased over the past 10 years in the coastal zone, but marbled murrelets generally nest on large branches of trees with diameters of 40 inches or more.

Nonfederal lands in the Plan area were estimated to contain about 2.1 million acres of higher-quality potential murrelet nesting habitat (actual murrelet use is not known). This represents about 52 percent of the higher-quality potential nesting habitat estimated for the entire Plan area. On nonfederal lands, an estimated 249,000 acres (12 percent) of potential nesting habitat were lost to timber harvest over the first 10 years of the Plan.

In Summary

- ▶ Marbled murrelet populations showed no apparent trend between 2000 and 2003, but 4 years is not long enough to detect a trend with confidence.
- ▶ Most marbled murrelet habitat on federal land was conserved, except for losses to fire.

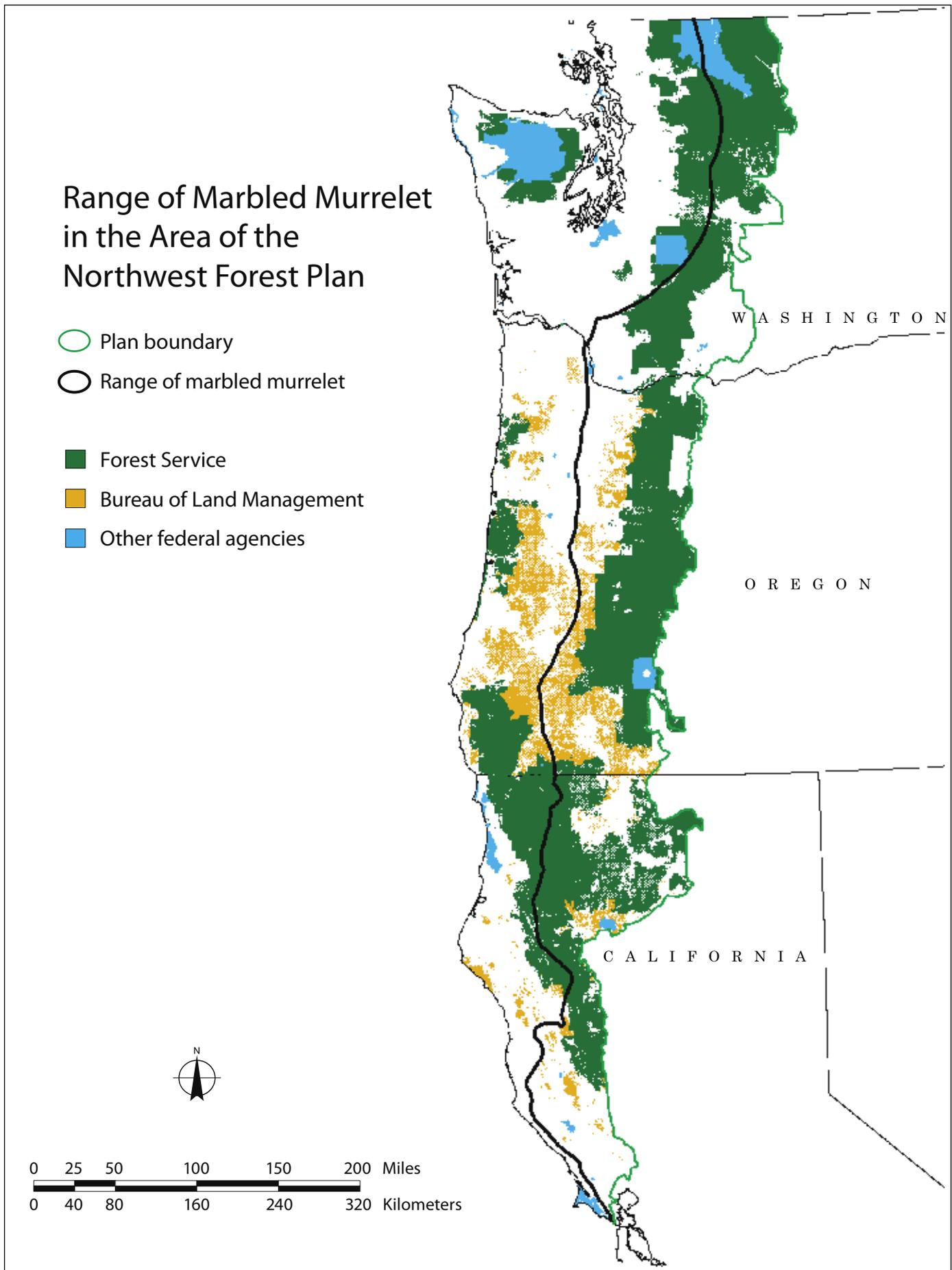


Figure 7—Coastal area that marbled murrelets use for nesting. Within this range, marbled murrelets prefer to nest in marine-influenced old-growth forests in large unfragmented blocks. The inland fringe of their nesting range is less important for murrelet nesting than originally thought.



Marty Raphael

Survey team searches for marbled murrelets in coastal waters.

Independent population models had projected a decline in murrelet populations of about 35 percent over the decade, but the initial population monitoring results, from 2000 to 2003, did not detect a decline of this magnitude. Population monitoring for marbled murrelets did not start until 2000, owing to difficulties in developing statistically reliable survey methods. For the 4 years of monitoring (2000–2003), total marbled murrelet population averaged about 22,000 birds, on any single day, in coastal waters adjacent to the Plan area. The population fluctuated from 18,600 to 23,700, but the 4 years of data were not enough to separate actual trends from normal variations in marbled murrelet populations. Among five

study areas, the highest population of marbled murrelets was found in the Puget Sound and Strait of Juan de Fuca of Washington, and the smallest population was in north-central California.

Favorable ocean conditions may explain the unexpected stability. The Plan’s strategy is effective, so far, in slowing or stopping the loss of marbled murrelet nesting habitat in federal forests.

Although nesting habitat

is necessary, many other factors affect marbled murrelets. These factors include ocean conditions, movement of individual birds to other parts of the murrelet range, and oil spills, which are beyond control of the Plan. Therefore, the long-range trend for marbled murrelets is still uncertain. ■

Key findings from relevant research studies

- ▶ Federal lands provide half of the higher suitability marbled murrelet habitat.
- ▶ Marbled murrelets are unlikely to nest in zone 2, the eastern fringe of their nesting range, except in a few localized areas that may be important.

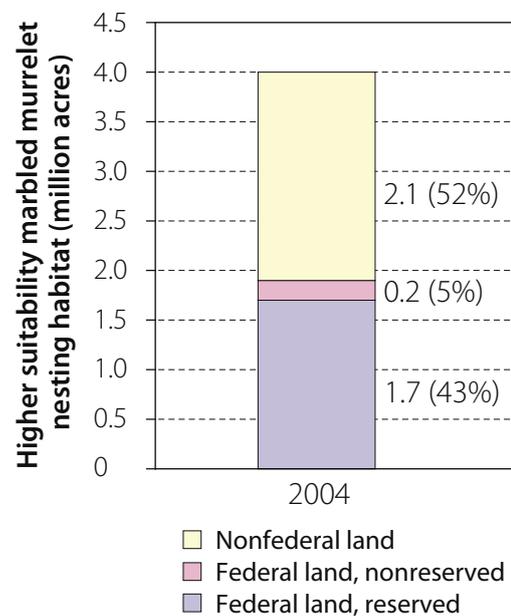


Figure 8—Higher suitability nesting habitat for marbled murrelets is estimated at 4.0 million acres on all lands in the Plan area. It is not known how much of the high-quality habitat is actually used by marbled murrelets for nesting.



Conservation of Other Species Associated With Older Forests

MANY RARE AND little-known species are associated with older forests but not listed under the Endangered Species Act (ESA). These species include amphibians, lichens, mosses, fungi, plants, small animals, and arthropods (insects, spiders, and mites). The Plan included strategies for conservation of these species as well as the listed species.



Steve Tilley

Along with field surveys, new genetic analysis techniques helped scientists to learn more about little-known forest species. Scientists identified several new species including the Scott Bar salamander, found only in northern California and southwestern Oregon.

and included other actions specific to individual species. After an original list of 1,120 species was evaluated, a list of 404 individual species and 4 arthropod species groups

Most species associated with older forests are likely far better conserved.

In Summary

- ▶ The Plan's reserve system provides for the needs of some old-forest-dependent species but cannot be assumed to meet the needs for all such species. Additional strategies or habitat protection may be needed for some species.
- ▶ For other species associated with older forests, many new sites were discovered and protected; for most of these species, population trends are yet unknown.
- ▶ Most species in the survey and manage program were found to be rare (42 percent of the species have been identified at 10 or fewer sites) with many sites outside reserve land allocations.

The Plan's reserve network and standards and guidelines (S&Gs) were expected to meet the needs of most little-known older-forest species. For those species needing additional protection, the Plan protected known sites and habitats outside reserves

and became the starting list for the survey and manage program.

The survey and manage program focused on the inventory and conservation of the 404 species and 4 species groups. Through surveys and studies, much was learned about the abundance and habitat needs of these species. Protection of specific sites and management S&Gs reduced the risk to many species.

Most species associated with older forests are likely far better conserved because of the Plan's conservation of older forests and riparian reserves and protection of known locations in matrix lands.

However, it is still uncertain if the Plan will adequately protect these species in the long term. It also cannot be assumed that the Plan meets the needs for all old-forest-dependent species. ■



Nan Vance

Research into rare species associated with old-growth forests, such as the mountain lady's slipper, resulted in new information on habitat needs and response to fire and other disturbances. Managers can use new findings to revise management recommendations for species.



Watersheds and Streams

The aquatic conservation strategy was designed to maintain healthy watersheds and streams and restore degraded ones.

THE PLAN WAS DESIGNED to protect the long-term health of waterways as well as forests and wildlife. Three fish stocks had been listed as threatened or endangered in 1993, and since then, 23 evolutionarily significant units of Pacific salmon and 3 population segments of bull trout have been listed in the Plan area. Other concerns included water quality, city water supplies from federal forest lands, and other stream-associated species such as amphibians.

The aquatic conservation strategy was designed to maintain healthy watersheds and streams and restore degraded ones. The term “healthy watersheds” describes watersheds with ecological integrity and functioning ecological processes, including high water quality, sufficient instream flows, a connected stream network to protect fish migration and travel of other species, and the full range of stream dynamics such as flood cycles and changes in riparian forests. Habitat was the strategy’s focus, because species such as salmon and steelhead spend only part of their lives in freshwater habitats and are affected by many factors outside federal forest lands.



Tom Iraci

Riparian reserves, a key part of the watersheds strategy, are corridors along streams to provide ecological functions and maintain habitat for stream and riparian life, corridors for terrestrial wildlife to travel between old-forest patches, and connection between stream networks and watersheds.

In Summary

- ▶ Watershed conditions improved slightly in the first decade, as expected. Improvement came in part from less clearcut harvest in streamside (riparian) areas and existing tree growth into larger size classes.
- ▶ Condition scores improved in nearly 70 percent of the key watersheds over the Plan’s first decade, compared to improvement in less than 50 percent of other watersheds. A crucial factor was that twice as many miles of roads were decommissioned in key watersheds as in other watersheds.
- ▶ Few riparian reserve boundaries were modified from the Plan’s standards and guidelines although modifications had been expected.

The aquatic conservation strategy was based on stream networks and watersheds, and integrated with the old forest and wildlife conservation strategies based on forest reserves.

The strategy's short-term goal (10 to 20 years) was to protect watersheds that currently have good habitat and fish populations. Its long-term goal (100 years) is to develop a network of functioning watersheds that support populations of fish and other aquatic and riparian life across the Plan area.

Watershed monitoring results cover the full decade from 1994 to 2003. A set of biological and physical indicators was used to track changes in watershed conditions in the Plan area. The expectation was that 10 years was not long enough for large improvements in watershed conditions, and that, at best, degradation would be slowed or halted, with minor to moderate improvements in watershed conditions. As expected, watershed conditions improved slightly in the first decade under the Plan (see fig. 9), in part from less clearcut harvest in riparian areas and existing tree growth into the category of trees greater than 20 inches in diameter.

Conditions improved in nearly 70 percent of the key watersheds over the Plan's first decade, compared to improvement in less than 50 percent of other watersheds. A crucial factor was that twice as many miles of roads were decommissioned in



The Plan identified 141 tier 1 key watersheds (total of 8.1 million acres) as anchors for fish recovery or with greatest potential for restoration, and 23 tier 2 key watersheds (total of 1 million acres), as additional sources of high-quality water. Key watersheds overlapped or included LSRs as much as possible.

key watersheds as in other watersheds. Several watershed restoration initiatives were successful, but the stream reaches in which habitat was improved or fish passage restored were a small fraction of total stream miles.

Trends in Watershed Conditions

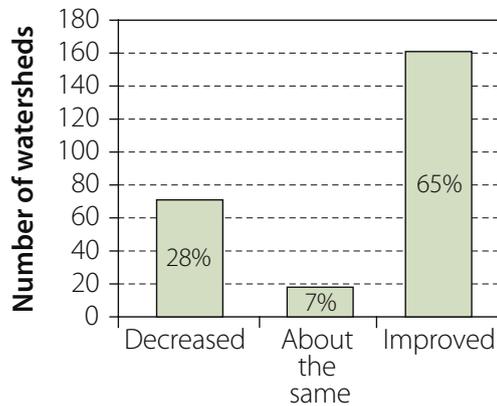


Figure 9—Based on a sample, 65 percent of watersheds showed small positive changes in condition scores. Condition scores declined for about 28 percent of watersheds, and stayed about the same for 7 percent of watersheds.

The Plan's S&Gs set interim boundaries for riparian reserves, based on available science (see fig. 10) with the expectation that these boundaries would be adjusted through watershed analysis. Managers found the burden of proof to be weighty and required procedures difficult, so most riparian reserves were established at the fixed widths of the Plan's original standards.

Restoration work was done on 2.6 percent of the estimated total area of riparian reserves. Precommercial thinning occurred on 1.8 percent of total area of riparian reserves.



Steve Lanigan

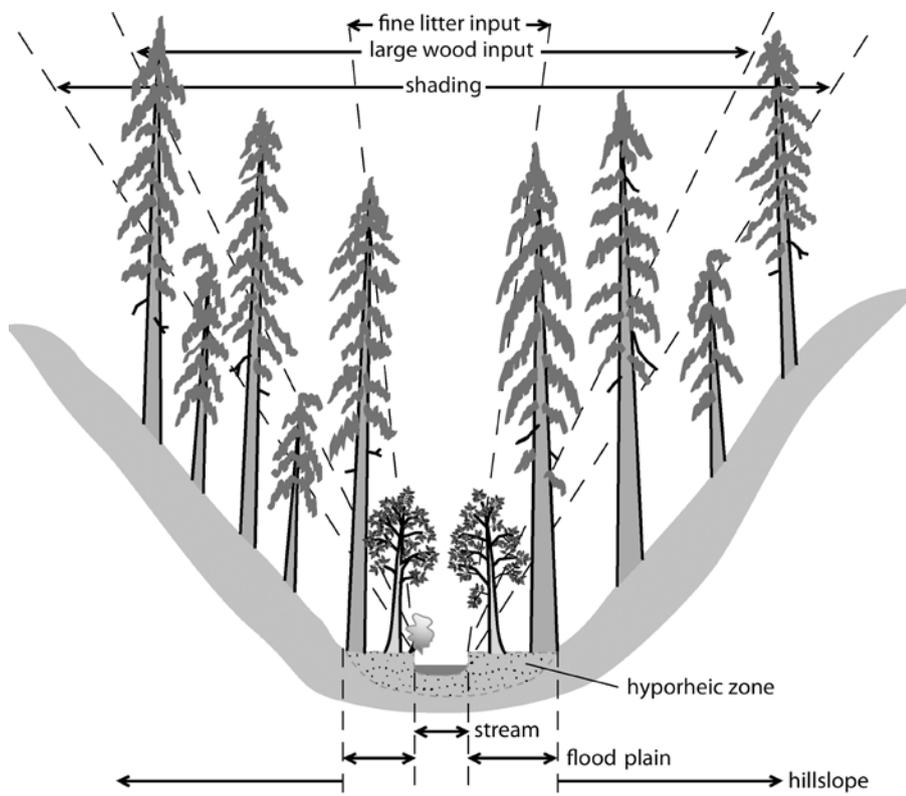


Figure 10—Riparian reserves were based on ecological processes important for streams. Reserve width was based on the height to which a tree could potentially grow (site potential). Minimum reserve widths, for intermittent streams and some streams without fish, protected most ecological processes such as litterfall and shading. Along fishbearing and some other streams, expanded reserves protected additional functions.

Key findings from relevant research studies

- ▶ Streams and watersheds are far more dynamic than was understood previously. Benefits from some fires and landslides are newly recognized in some systems.
- ▶ The natural landscape has a mix of watershed conditions, with individual streams and small watersheds at varying stages of development and complexity at any one time.
- ▶ Small headwater streams provide habitat for amphibians and macroinvertebrates and are sources of nutrients for the downstream food web and large wood and sediment for fish-bearing streams.

The Plan established a common framework for managing streams, riparian areas, and watersheds on federal forests, and it required managers to look at the entire watershed when designing timber sales or other projects.

Scientific findings during the Plan's first decade support the underlying concepts of the aquatic conservation strategy, particularly the dynamics of streams,

ecological importance of headwater streams, retention of streamside forests, and special management considerations for riparian areas.

However, the strategy's focus on stream and watershed dynamics was not well understood. Questions continue to be asked about stream and watershed dynamics as our understanding evolves. ■