



Marbled Murrelet

*The ancient
mossy trees in
which these
birds nest are
disappearing.*





Why are Marbled Murrelets at risk?

The Marbled Murrelet, a small, north Pacific seabird, needs coastal old-growth trees in which to nest. In British Columbia, and elsewhere in the murrelet's breeding range, these ancient, mossy giants are disappearing. Much of the low and middle-elevation forest has already been cut and murrelet populations have probably already declined from historic levels. As logging spreads into more remote coastal valleys, populations are likely to decline in proportion to the amount of nesting habitat that is lost. Original forest is replaced with second-growth that mostly will be harvested every 80 to 100 years, never allowing the trees to reach the age, size and form that murrelets depend on for nesting. Fragmented old-growth stands and isolated patches are believed to provide poor murrelet habitat because nests in them are vulnerable to predators like ravens, and to wind and other disturbances.

In recent years, oil spills and drowning in gill nets set for salmon have caused some murrelet deaths on the British Columbia coast. Although large numbers of birds were not involved, even low levels of human-caused mortality are of concern for a species like the murrelet that produces only one young each year. A major oil spill could be catastrophic.

Human activities are undoubtedly having an adverse impact on the

The Canadian population was designated Threatened by COSEWIC in 1990.

Marbled Murrelet in British Columbia. Because this trend is likely to continue for some time, the species is clearly at risk.

What is their status?

The Marbled Murrelet lives along the Pacific coast of North America from the Aleutian Islands to central California. The bulk of the population is found in Alaska, with populations estimated at 220 000 birds. Based on extrapolation from a few surveys at sea, the British Columbia population has been estimated at 45-50 000 birds. About 5500 are present in Washington, 15-20 000 in Oregon, and 6500 in California, for a total population of 280-300 000.

The Marbled Murrelet is defined as a "Migratory Non-game Bird" under the federal Migratory Birds Convention Act. This protects the birds, their nests and eggs from wilful damage throughout Canada and the United States. The British Columbia Wildlife Act, and various state laws, give similar protection.

The Canadian population, confined entirely to British Columbia, was assigned Threatened status by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1990. This national designation is applied to any species "that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed." This status was based on loss of nesting habitat and on additional threats posed by oil spills and fishing nets. The Marbled Murrelet is on British Columbia's Red List of species being considered for legal designation as Endangered or Threatened.

The combined Washington-Oregon-California population was listed as federally Threatened by the United States Fish and Wildlife Service in 1992. Individual states have also applied their

own designations: Threatened in Washington; Sensitive in Oregon; Endangered in California. Forest harvesting has apparently caused serious murrelet declines in the Pacific Northwest states.

In British Columbia, some nesting habitat is protected in national and provincial parks, recreation areas and ecological reserves. However, the bulk of the murrelet population nests in forests having little or no protection from future logging. The British Columbia Wildlife Act provides protection for active nest trees, but not for the surrounding forest. Very few nests have been located and finding more promises to be a very difficult and laborious process. Since murrelets seldom re-use a nest or nest tree, they require a wide selection of potential nest sites to maintain a viable population.

What do they look like?

The Marbled Murrelet (*Brachyramphus marmoratus*) is a small, plump seabird, about 25 centimetres long, belonging to the auk family or Alcidae. When swimming, its slender black bill and stubby tail are usually tipped upward. In its rather drab breeding season plumage, the top of the head, back and wings are dark brown, while the throat, chest and abdomen are brown flecked with white and cinnamon, giving a mottled or "marbled" appearance. The winter plumage is black above and white below. Males and females have similar colouring. In British Columbia, the only other seabird of similar size and shape is the Ancient Murrelet. In summer this species is black and white and not likely to be confused with its marbled relative. In winter, when both are black and white, the Marbled Murrelet can be distinguished by its white throat and a horizontal white strip above the folded wing.

When airborne, the stubby wings of the murrelet beat very rapidly,



and its zigzag flight over the water has prompted some observers to liken it to “an oversized bumblebee.” Murrelets have small feet, webbed like those of a duck, that they use to paddle on the water surface. When diving, they essentially “fly” underwater, using their muscular wings as flippers and their feet only for steering. They demonstrate great speed and agility during bouts of underwater fishing. Murrelets are well adapted for life in cold north-Pacific waters. Their dense waterproof feathers provide excellent insulation.

The characteristic call of the Mar-

The bulk of the murrelet population nests in forests having little protection from future logging.

used to determine the relative abundance and probable nesting sites of murrelets in forested valleys during the nesting season.

What makes them unique?

The mysterious Marbled Murrelet has fascinated ornithologists for decades. Tantalising clues to its nesting habits, such as the discovery of fledglings or eggshell fragments on the forest floor miles from the sea, accumulated for years without anyone finding an actual nest. This meagre evidence suggested that despite being marvellously adapted for life at sea, this species nested far inland in ancient forests. Recent nest discoveries have confirmed this rather radical departure from the habits of other seabirds. But some puzzles remain. Why would a bird that must carry fish to its chick at dawn and dusk, nest 60 or more kilometres inland, when apparently suitable sites occur closer to the sea? Whatever the explanation, such behaviour must be beneficial.

All the other members of the auk family nest in burrows in dense colonies on small offshore islands and are adapted for this lifestyle. The Marbled Murrelet's brown breeding season plumage and greenish-tinted egg, both unusual among alcids, appear to be adaptations for nesting in the forest. This cryptic colouring provides camouflage and reduces the risk of being spotted by predators. However, forest fragmentation can open the forest to new predators that are more adept at detecting murrelets and their eggs.

This species differs from most forest-nesting birds in that it does not nest in cavities or build a nest among branches. Most murrelets nest on a thick, mossy platform on a thick limb or on some kind of broad deformity on a trunk. Only old trees provide these types of sites, which greatly limits the murrelet's choices of places to nest.

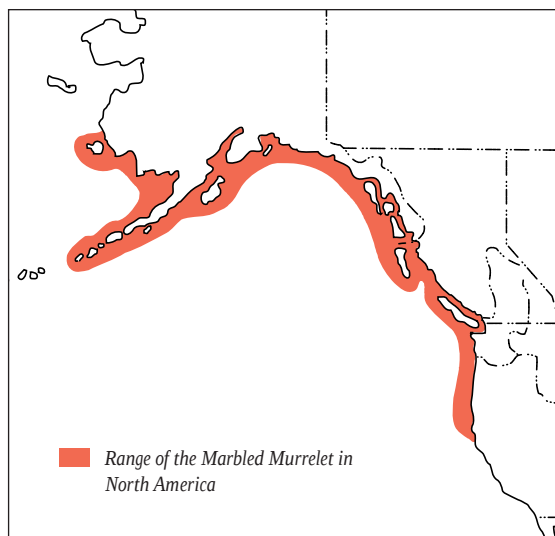
Due to its dependence on old-growth trees for nesting, at least from British Columbia southward, the Marbled Murrelet has become a focal point in the conflict between logging

and old-growth preservation. This has resulted in it becoming the subject of much research activity by biologists and naturalists, and brought it to the attention of foresters, loggers and the general public. Naturalists, particularly from inland areas, now place this bird high on their list of sought-after species.

How do they reproduce?

The nesting habits of the Marbled Murrelet, until recently one of the great enigmas of ornithology, are still poorly known. Although the species is commonly seen on coastal waters during its breeding season, only about 50 nests had been found in British Columbia as of 1997. Fewer than 10 of these were observed while in active use. A few ground nests have been located in western Alaska where trees are scrubby or absent, but all nests found from British Columbia to California have been in trees. Nests may be far inland, requiring long flights to and from the sea by adults as they exchange incubation duties or bring fish to feed their chick.

The murrelet nest is very simple – a shallow, mossy depression on a large, horizontal tree limb, usually near the trunk. No nesting materials are added. So far, nests found in British Columbia have been in Sitka spruce, yellow cedar, Douglas-fir, western hemlock and mountain hemlock trees judged to be 300 to 800 years old or older. Nest trees were at elevations of 170 to 1100 metres above sea level and distances of 10 to 17 km from the ocean. The nests were 17 to 42 m above the ground. Re-use of nests or nest trees may occur in remnant habitat where options are limited, but does not



appear to be common where the birds have a greater selection of nest sites.

Only one egg is laid, but it is large for such a small bird – about the size of a large chicken egg! The egg

Despite being marvellously adapted for life at sea, this species nests far inland in ancient forests.

is pale greenish-yellow or greenish-buff with brown, blue or grey spotting. Marbled Murrelets have a lengthy nesting season in British Columbia. Eggs are probably laid from early May to late June and most nestlings are raised from early June to late July. A few pairs

may not finish nesting until September. Incubation, shared by both adults, is estimated to take 30 days. The nestling period of about 28 days is long compared to that of other alcids. However, young Marbled Murrelets must be fully developed and capable of sustained flight before they leave the nest. Their first flight must take them directly to sea or, occasionally, to a lake along their route. Juveniles are sometimes found on the forest floor, where they are likely to perish since they cannot readily take off from land.

Once safely at sea, juveniles usually join other murrelets, but must forage for themselves. They probably do not breed until at least two or three years of age.

Most natural mortality results from predation on eggs and nestlings, and from loss of fledglings that do not make it to the sea. Like other birds with a low reproductive rate, survival and longevity of individuals reaching adulthood are expected to be good.

Marbled Murrelets are frequently seen in pairs in all seasons, suggesting that they mate for life.

What do they eat?

Marbled Murrelets feed mostly on fish up to 8 or 9 cm in length and on shrimp-like crustaceans such as euphausiids and mysids. In British Columbia, schools of juvenile Pacific sandlance and herring are an important source of food, particularly in spring and summer. Other marine foods include small seaperch, rockfish, anchovy, capelin and squid. Juvenile salmon are sometimes caught by murrelets in lakes near the coast. The sandlance appears to be the fish most often carried to nestlings.

Marbled Murrelets normally feed in nearshore marine waters, including shallow bays, channels and fjords. Although groups of up to 100 murrelets may be attracted to sites where fish are concentrated by tidal currents, they feed as individuals. Fish and crustaceans are caught by underwater pursuit, for which the murrelet's torpedo-shaped body and flipper-like wings are well suited. Most dives for food last less than 30 seconds and most fish, other than those carried to the nest, are swallowed underwater. A frequent feeding method is to drive a school of fish to the surface and hold

it there with repeated shallow dives. During these dives the fish are picked off one at a time. The “boiling” action of these fish on the sea surface often attracts other seabirds, particularly gulls which are unable to dive for their food.

At a nest near Sechelt, British Columbia, investigators reported that the chick was fed by both parents beginning shortly after 5 a.m. each day. Adults usually arrived alone, with one 7 to 8-cm sandlance held crossways in the bill. Fish were always offered to the young murrelet headfirst, after which the adult made a hasty departure. Sometimes both parents arrived at the same time and one had to wait its turn to feed the nestling. On many days the chick received seven fish – five in the morning and two in the evening.

Where do they live?

The Marbled Murrelet is the most widely distributed alcid in British Columbia. In summer it is common along the entire coast. In winter it occurs sparsely along the north coast, but is relatively abundant in sheltered waters to the south, particularly in Georgia Strait and adjacent fjords. Some birds probably move south of British Columbia in winter. In spring, an influx of murrelets has been noted at several coastal locations, from early April to early May.

In contrast to most alcids, Marbled Murrelets prefer waters within 2 km of land and are often found in channels and fjords along the inner coast. They also frequent exposed coastlines like the west coast of Vancouver Island, but there too, are usually close to shore. Though widespread, this species has a clumped distribution pattern that is determined during all seasons by the availability of food, and in summer by



MARBLED MURRELET IN OLD-GROWTH FOREST.
Mark Hobson photo

both food and nesting habitat. Important foraging sites include tidal rips through narrow passages, shelves at the mouths of inlets, and shallow banks. Large feeding concentrations have been reported at Sechelt Inlet, Cortes Island, Flores Island, Barkley Sound, Clayoquot Sound and off the West Coast Trail.

Marbled Murrelets are believed to nest along the entire British Columbia coast, usually within 20 km of saltwater, but possibly much further inland, as happens elsewhere in their range. Nesting occurs on large coastal islands; whether small forested islands are also used is not known. Most nesting is in the Coastal Western Hemlock zone, but a nest was recently discovered in the subalpine Mountain Hemlock zone. Although it is possible, particularly in northern British Columbia, that murrelets might nest on the ground in alpine or subalpine habitats, there is no evidence of this at present. In British Columbia, nests have been found in the forests of Desolation and Clayoquot sounds, the Carmanah-Walbran area of southwest Vancouver Island, the Sechelt Peninsula and Haida

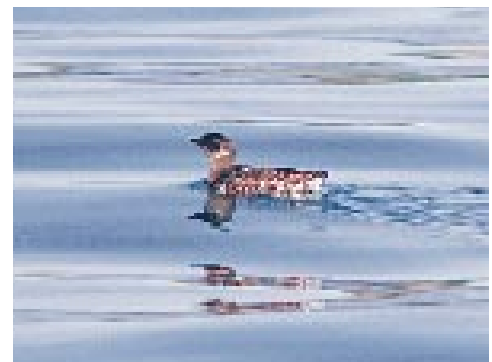
Gwaii. Records of nestlings found on the forest floor and observations of adults flying up valleys and into the forest canopy, indicate that most coastal watersheds are used for nesting. Exceptions include heavily logged areas like the southeast coast of Vancouver Island.

Marbled Murrelets may also been seen on coastal lakes, mainly in summer, but occasionally in winter. Most lakes where they have been observed are within 20 km of the sea, but some, like Cultus and Harrison lakes, are up to 75 km inland. The preferred lakes are rearing areas for juvenile salmon.

What can we do?

The plight of the Marbled Murrelet is now widely recognised and the species has been legally designated as Threatened or Endangered in all jurisdictions south of Alaska. A 1993 Recovery Plan prepared by the Marbled Murrelet Recovery Team describes the programs and funding needed to protect Marbled Murrelets in Canada “... by reducing threats to their nesting habitat and reducing risks faced by birds at sea.” But plans on their own do not save wildlife. Strong public support is needed, particularly to save suitable old-growth nesting habitat in British Columbia.

Murrelets probably nest in most large, unlogged areas along the British



MARBLED MURRELET IN SUMMER PLUMAGE AT SEA. *Mark Hobson photo*



MARBLED MURRELET EGG ON NEST BRANCH.
BCCF Marbled Murrelet Project, Tom Ainsworth photo



JUVENILE MURRELET IN NEST.
SFU Marbled Murrelet Research Project, John Kelson photo



YELLOW CEDAR USED BY MARBLED MURRELETS AS A NEST TREE.
SFU Marbled Murrelet Research Project, Ross Vennessland photo

Columbia coast. Key nesting habitats must be located, described and mapped so they can be protected. A landscape-level approach to habitat conservation is clearly required. A start has been made, with several co-operative inland and at-sea surveys involving provincial and federal wildlife agencies, the BC Ministry of Forests, logging companies, universities and conservation groups. The Identified Wildlife Management Strategy, Biodiversity Guidelines and other habitat conservation measures being developed under the Forest Practices Code will

undoubtedly protect some critical nesting habitat.

More field studies and detailed surveys are still required to determine how to integrate the needs of this species with those of other wildlife. This will allow resource managers to establish unharvested forest networks that will accommodate spawning salmon, Grizzly Bears, Roosevelt Elk, Spotted Owls, Northern Goshawks and other wildlife, as well as Marbled Murrelets.

Conservation agencies and the public must also remain alert to the threat of oil spills and ensure that shipping regulations and clean-up capabilities are sufficient to prevent serious mortality of murrelets and other marine species. Improved inventory of the seasonal distribution and abundance of

murrelets in coastal waters is required for mapping of regional sensitivity to oil spills. Although significant mortality of murrelets due to drowning in gill nets may be rare and localised, continued monitoring is needed to ensure the problem is properly controlled. British Columbia should be encouraged to maintain the current ban on the use of monofilament nets, as these are known to kill seabirds.

Interested naturalists can provide invaluable assistance by reporting any nests, or evidence of nesting, to the nearest BC Wildlife Branch office. The public is urged to become more familiar with this threatened seabird and to support the research, inventory and habitat protection programs needed to save it. 

FOR MORE INFORMATION ON MARBLED MURRELETS, CONTACT:

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