

BREEDING SEASON MOVEMENTS OF RADIO-TAGGED MARBLED MURRELETS (*Brachyramphus marmoratus*) IN THE STRAIT OF JUAN DE FUCA, WASHINGTON

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Study Objectives:

- Document patterns of space use by adult Marbled Murrelets (*Brachyramphus marmoratus*) both inland and at-sea during the breeding season,
- Locate active nests, and
- Compare movement patterns between breeders and non-breeders.

Murrelets were captured in the Strait of Juan de Fuca and Hood Canal

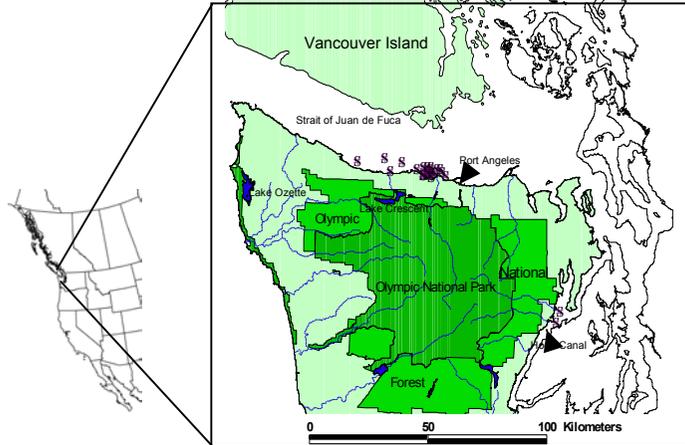


Fig. 1. Twenty-seven Marbled Murrelet capture locations in the Strait of Juan de Fuca and Hood Canal, Washington. Most birds were captured in Freshwater Bay, just west of Port Angeles, WA.

Murrelets were tracked daily by aircraft from the day after tagging until 1 August, 2004. The first bird was tagged on 26 April, however most birds were not tagged until late May - early June. Mean number of at-sea relocations per bird was 24 (range 5-57). Sixteen of 27 murrelets left the study area during mid-breeding season (June - early July), and only five were later found to the west and northwest (Fig. 2).

Tagged murrelets utilized Washington and British Columbia waters

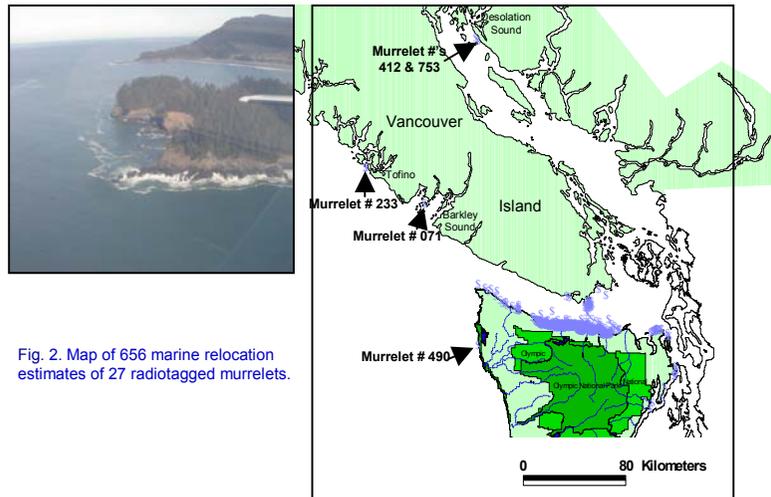


Fig. 2. Map of 656 marine relocation estimates of 27 radiotagged murrelets.



Murrelets that dispersed from the Strait were found up to 220 km away (Lake Ozette area [93 km from Port Angeles], Barkley Sound [151 km], Tofino area [205 km], and near Desolation Sound to the north [2 birds at 220 km]).

Space use of breeding murrelets: Three nests were found by tracking tagged murrelets inland - all of which were in Olympic National Park. They are:

1. Morse Creek - 14 km inland
2. Boulder Creek - 18 km inland
3. Lake Mills - 15 km inland

The tagged individuals from all 3 nests (one from each nest) had relatively confined areas of space use along the shore near their nest (Fig. 3). The inland space use patterns of these birds was generally direct back and forth flights to the nest. The Morse Creek and Boulder Creek birds (male and female, respectively) continued visiting nest areas for up to ten days after nest failure and joined other murrelets in circling behavior above the forest. After successfully fledging young, the Lake Mills male left the study area and was not detected again.

Breeding murrelets foraged relatively close to their nests

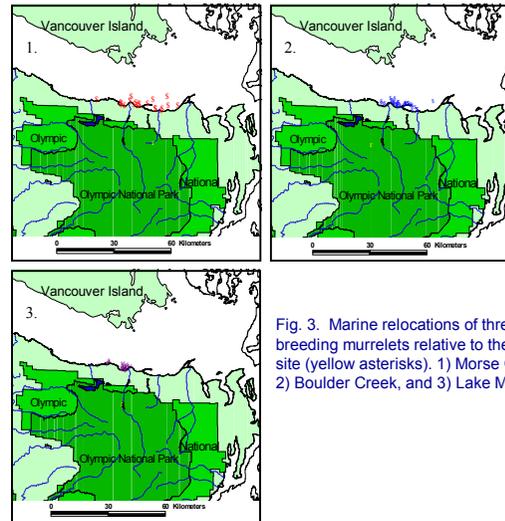


Fig. 3. Marine relocations of three breeding murrelets relative to their nest site (yellow asterisks). 1) Morse Creek, 2) Boulder Creek, and 3) Lake Mills.

Inland relocations of non-breeding murrelets: In addition to the three breeding murrelets, six others were detected inland at least once during early morning hours. Two birds were detected 37 km from sea - deep in Olympic National Park. None of them consistently returned to a specific area indicating an active nest. We suspect that some of these birds may have made a nesting attempt but either failed earlier or had already fledged young by the time we detected them inland.

Non-breeding murrelets also made inland forays at dawn

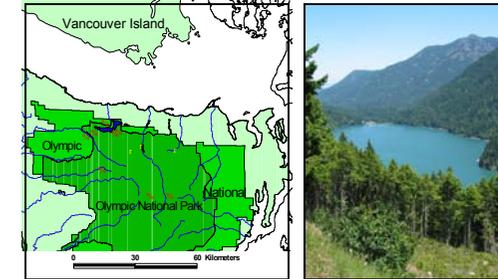
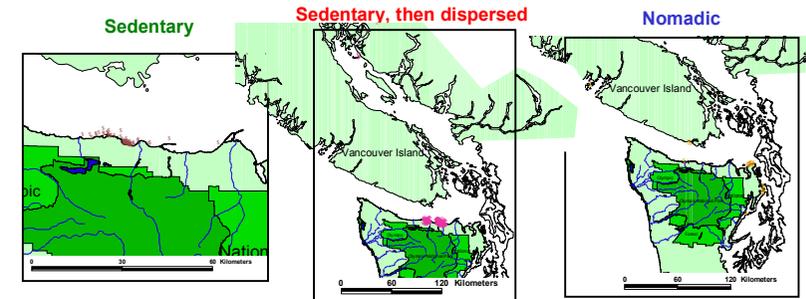


Fig. 4. Inland relocations of six non-breeding murrelets. The three furthest west points are from a single bird who wandered widely during early morning hours in July. Yellow asterisks are the three nest site locations of the breeders for reference.

Marine movement patterns of non-breeding murrelets: Some non-breeders used the marine environment similar to that of breeders - sedentary and in a relatively confined area (e.g. < 50 km of coastline), while others remained sedentary then dispersed mid-season or wandered nomadically throughout the entire breeding period.

Non-breeders exhibited three different movement patterns at-sea



Conclusion: With such a low proportion of tagged murrelets breeding in 2004 it is difficult to make meaningful comparisons between space use of breeders and non-breeders. Additionally, many birds apparently left the study area in mid-season and were not detected again so we have an incomplete understanding of how far non-breeding murrelets travel during the breeding period. Non-breeding murrelets (and birds that have finished breeding) likely travel far beyond the 220 km distance that we detected in 2004. We have conducted line transect surveys in the Strait since 2000 and those results support our telemetry finding that many murrelets leave the area in mid-season (mid-June to mid-July).

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