



FORREX—Forest Research Extension Partnership

## Radar a useful tool for managing marbled murrelets

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by Alan E. Burger, University of Victoria

Ever since radar was invented in World War II, researchers have used it to track the movements of birds. In the past decade, radar has increasingly been used in British Columbia for research, monitoring, and management of marbled murrelets. This small seabird feeds in nearshore seas, and nests in old seral forests within about 30 km of the coast. It is listed as “threatened” in Canada, mainly as a result of reduced nesting habitat. Murrelet nests, typically positioned 40 m high in large conifers, are hard to find, making it difficult to estimate the size and distribution of breeding populations. Such information is crucial for planning protected areas for this species and resolving conflicts with timber extraction in the coastal old-growth forests.

Murrelets show up well on radar, and can be identified on the basis of their flight speed, size of radar image, and flight paths (few other birds fly from the ocean into the forests).

Using relatively inexpensive ship's radar, several groups in British Columbia have been building up an inventory of the numbers of murrelets flying into coastal watersheds at dawn, en route from feeding grounds to their nest sites.

The first study was done by University of Victoria and B.C. Ministry of Water, Land and Air Protection biologists in Clayoquot Sound in 1995–1998. Since then, with funding from Forest Renewal BC, Forestry Innovation Investment (FII), the B.C. Ministry of Forests through the Forest Investment Account (FIA), Forest Science Program, and the forest industry, there have been at least 10 independent studies, covering more than 170 watersheds in many parts of the B.C. coast.

Radar works best when the incoming murrelets are channelled into narrow flight paths in fjords, inlets, or steep-sided valleys. Counts of the birds indicate the size of local populations and the importance of various watersheds as nesting areas. Long-term monitoring of selected watersheds will reveal changes that might occur as a result of timber harvesting or changes in food availability due to local ocean conditions.

Murrelet numbers can also be compared with Geographic Information Systems (GIS) estimates of areas of suitable nesting habitat within the watersheds where radar counts are made. This

has allowed landscape-level correlations with available habitat, and revealed some negative effects of past logging. Densities (birds per ha of habitat) can also be calculated and used to estimate the amount of habitat needed to support local populations of murrelets. Regional differences in average densities have been identified (e.g., west coast of Vancouver Is-

land: 0.09 birds/ha; B.C. mainland: 0.05 birds/ha), allowing for more precise management decisions.

Long-term monitoring of marbled murrelets with radar at selected sites, linked with monitoring of changes in the forest and marine habitats of the birds, has been identified by the Marbled Murrelet Recovery Team as the best way to track populations, identify likely threats (including proposed wind turbines on the coast), and assist management of murrelets nesting in the coastal forests of British Columbia. 🌲

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Colleen War photo



Alan Burger photo

Top, adult marbled murrelet. Bottom, UVic student Jenna Cragg records radar detections of marbled murrelets on a tape recorder, southwest Vancouver Island.