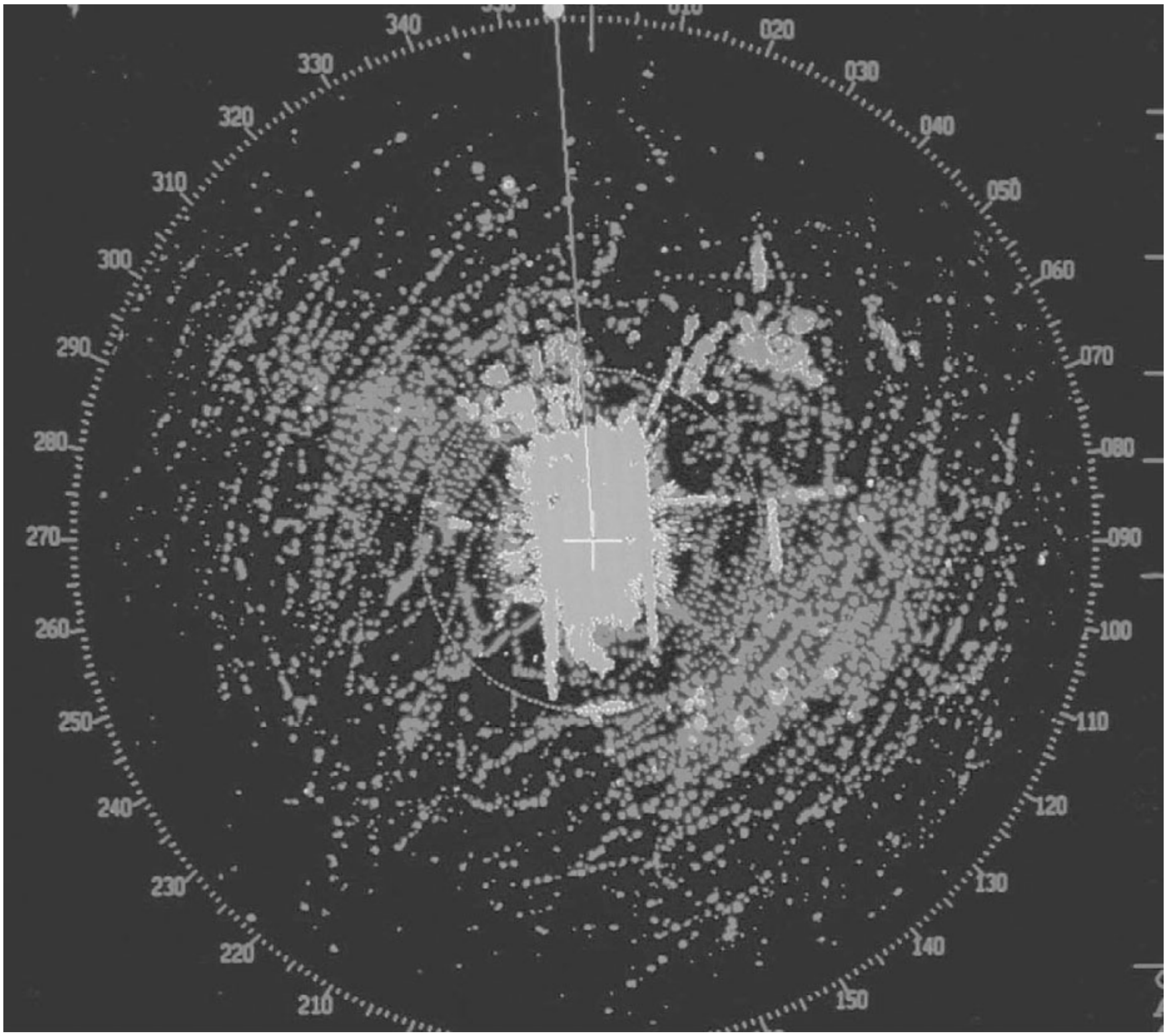
SYMPOSIUM

RADAR ORNITHOLOGY



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Front cover picture: Radar screen showing birds migrating at night. Photo by Todd Mabee

INTRODUCTION TO THE SYMPOSIUM ON RADAR ORNITHOLOGY

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Ever since its invention, radar has been involved with the study of birds. In World War II, when radar first was used, the operators repeatedly saw "angels" that proved not to be fighter planes. Only when they realized that the "angels" moved north *en masse* in the spring and south in the fall did radar operators and scientists realize that the "angels" must be large flocks of migrating birds (Eastwood 1967). Once ornithologists realized that this new technology could be used to look at movements of birds over large areas, radar was used in a variety of ornithological applications, including migration biology, conservation biology, and energetics (Gauthreaux & Belser 2003). This symposium takes radar ornithology a step further, into applications in seabird biology. The symposium "Advances and applications of ornithological radar in seabird studies," which was held at the 31st Annual Meeting of the Pacific Seabird Group in 2004, included eight papers and an additional submitted manuscript, of which four are printed here.

This collection of papers discusses some of the ways in which ornithological radar has been, and can be, used in seabird studies. Unlike studies of high-flying passerines, which often use expensive weather radars, these studies used standard and inexpensive high-frequency marine surveillance radars—the kind used on most oceangoing vessels.

Radar is becoming a standard tool for studying the elusive Marbled Murrelet. Burger *et al.* describe relationships between counts of Marbled Murrelets and landscape-scale habitat characteristics in British Columbia and provide the first large-scale analysis of densities of this declining species in Canada.Harper *et al*. describe the importance of tilting the radar antenna in improving the detection of high-flying Marbled Murrelets.

Ronconi *et al.* describe a method for incorporating radar into an automated hazing system for seabirds. Such a system would be extremely useful in, for example, keeping seabirds away from an oilspill. Day *et al.* used ornithological radar to study environmental effects on movements of migrating eiders in Alaska's Beaufort Sea. This study has implications for improving the existing population-monitoring program, a powerful application of radar.

In addition to the papers presented here, six other talks were presented at the meeting. Day and Cooper described a method for using radar counts to estimate populations of endangered nocturnal tubenoses, many of which probably are best studied with radar, on oceanic islands.

Cooper and Raphael conducted a landscape-scale analysis of the distribution and abundance of Marbled Murrelets and described movement patterns of this endangered species on the US West Coast. Hamer *et al.* discussed the use of radar in determining inland locations of small, isolated breeding populations of Marbled Murrelets in California. Hamer and Schuster used radar for monitoring Xantus's Murrelets on Anacapa Island, while Lank and Lougheed discussed their studies of Marbled Murrelets commuting between the ocean and inland nesting locations at Desolation Sound, BC, and the potential of those data for population monitoring.

These papers represent only a fraction of the potential applications for radar in seabird studies. Future studies that use radar will become critical to the research and conservation of these fascinating but vulnerable species.

REFERENCES

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