

FEATURE ARTICLES

LOCAL SURVIVAL OF ADULT AND JUVENILE MARBLED MURRELETS AND THEIR IMPORTANCE FOR ESTIMATING REPRODUCTIVE SUCCESS
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Abstract. Juvenile ratios estimated using numbers of hatch year (HY) and after-hatch-year (AHY) Marbled Murrelets (*Brachyramphus marmoratus*) counted concurrently during at-sea surveys have been used to estimate fecundity in this species. These “concurrent” juvenile ratios assume that HY birds remain in an area, and are likely biased because they do not account for potential differences in emigration rate of HY and AHY birds. We studied the emigration rates of adult and juvenile Marbled Murrelets marked with radio-transmitters. Juveniles had a high emigration rate compared to adults. The weekly local survival rate (ϕ) of newly radio-tagged HY birds was 27%. AHY local survival was 95% during incubation and early chick rearing, suggesting a resident population during the breeding season. We calculated juvenile ratios from 1996–1998 using (1) HY counts corrected for emigration and mean AHY counts around the breeding season peak, and (2) HY and AHY counts from concurrent at-sea surveys. The average “corrected” juvenile ratio (0.13 ± 0.05 SE) was higher than the “concurrent” juvenile ratio (0.04 ± 0.02 SE) but lower than estimates of fecundity from nest monitoring (0.18–0.22). Low juvenile ratios from at-sea surveys could result either from an unknown proportion of nonbreeding birds in the population, or, more likely, from differences in the at-sea distribution of AHY and HY birds. Fluctuation in the timing of the peak number of AHY birds across years might result in an uncorrectable bias in the counts. Because of biases and potential problems, caution is needed when interpreting juvenile ratios from at-sea surveys.

Key words: Alcidae, *Brachyramphus marmoratus*, British Columbia, juvenile ratio, local survival, Marbled Murrelet, radio-telemetry, seabird.