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WINTER OCCURRENCE OF THREE MERLIN SUBSPECIES IN SOUTHWESTERN IDAHO, U.S.A.

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Merlins (*Falco columbarius*) are present in Idaho throughout the year, but their numbers are limited at all times and subspecific identification is uncertain. An uncommon and inconspicuous migrant and winter resident, they are even more rare as breeders, with only 10 nest sites documented between 1885 and 2010 (Craig and Renn 1977, Craig and Craig 1989, B. Haak unpubl. data). Three Merlin subspecies inhabit western North America (Warkentin et al. 2005), and sighting and nest records in Idaho indicate that the Taiga Merlin (*F. c. columbarius*) is the most common, followed by Richardson's Merlin (*F. c. richardsonii*), and the Black Merlin (*F. c. suckleyi*; Craig and Craig 1989).

North American Merlin populations are increasing and adapting to urban environments (Snyder and Snyder 1991, Warkentin et al. 2005), and the breeding range of the Taiga Merlin has expanded south from New England (Paxton et al. 2008, Boone et al. 2008) to West Virginia (Rucker 2009). In Idaho, the Merlin is a Species of Greatest Conservation Need due to a lack of population estimates and trend data, and uncertainties about the effects of environmental pollutants on this population (Craig and Craig 1989, Idaho Department of Fish and Game 2005). The purpose of this study was to determine the relative abundances of subspecies, sexes, and age classes of Merlins wintering in southwestern Idaho.

STUDY AREA

The Boise River Valley extends from Boise (867 m asl) approximately 65 km west to Parma (669 m asl) near the Oregon border. Average precipitation is 30.4 cm, occurring mostly during winter, with an average daytime high in January of -1°C . Topography is generally flat, with some rolling hills and benches. It includes the Boise-Nampa metropolitan area and 14 small towns. Within the study area (2207 km²) are 1498 km² of cropland/pasture (68%), 206 km² of urban development (9%), over 50 dairies, and scattered feedlots. Due to urban sprawl, agricultural areas are now interspersed with housing developments.

METHODS

From late December to mid-March, for four winters beginning in December 2006, I observed and captured Mer-

lins during road surveys on 130 d; observations averaged 4 hr/d for a total 520 hr. Binoculars and spotting scopes were used to locate individuals and identify them to age, sex, and subspecies. Surveys were conducted throughout the study area. I initially attempted to visit all cover types at approximately the same level, and thereafter more frequently visited cover types where Merlins were more likely to be encountered. Merlin subspecies interbreed (Wheeler 2003, Warkentin et al. 2005) and this can make positive identification of subspecies difficult in the field: individuals were assigned to subspecies based on plumage characteristics (Temple 1972b, Wheeler 2003, Warkentin et al. 2005, Pyle 2008). Consequently, all subspecies identifications were made by the author to maintain uniformity and consistency in the data collected. In addition, 60 Merlins were captured to confirm subspecies identification, age and sex. Black Merlins were identified by the criteria presented by Hamilton and Schmitt (2000) and photos of suspected *F. c. suckleyi* were sent to C.M. White and N.J. Schmitt for subspecies confirmation. Individuals were captured using hoop, dho-gaza, and bal-chatri traps (Bloom et al. 2007). Statistical tests were performed using SigmaPlot 11.0.

RESULTS

During the four winters, I visually inspected 80 Merlins and captured 60 Merlins for study in the hand ($n = 140$). For the "observed only" Merlins, multiple observations in one winter of apparently the same bird in the same area were counted as one individual. With the exception of five Merlins with intermediate plumage characteristics, 75 individuals could be assigned to subspecies. Based on plumage characteristics, Taiga Merlins were the most common, followed by Black Merlins and Richardson's Merlins (Table 1).

Of the 60 Merlins captured, Taiga Merlins were the most common, followed by Black Merlins, and Richardson's Merlins, respectively (Table 1). Of the 135 observed and captured Merlins that could be assigned to subspecies, 68.9% ($n = 93$) were Taiga Merlins, 23.7% ($n = 32$) were Black Merlins, and 7.4% ($n = 10$) were Richardson's Merlins. There was no significant difference in proportions of the three subspecies between birds observed and those captured and identified in hand ($\chi^2 = 2.774$, $df = 2$, $P = 0.25$). Seventy of the 80 "observed only" Merlins were inspected well enough to identify their sex with a high degree of confidence. Of these, 74% were judged to be females and 26% males (Table 2). Similar proportions of females and

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