NOTES

FOUR YOUNG FLEDGED BY A PAIR OF CALIFORNIA SPOTTED OWLS

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The Spotted Owl (*Strix occidentalis*) has been studied extensively for the past two decades (Gutiérrez et al. 1995). Two of the key life-history parameters estimated from this research have been clutch and brood size. In the Spotted Owl, broods of one and two are common, while broods of three are rare, and no broods of four have been reported since the turn of the century (Gutiérrez et al. 1995). The only brood of four recorded in the literature was noted by Bendire (1892), who recounted a letter he received describing a Spotted Owl nest with four young, located in southern Arizona. The only four-egg clutch reported in the literature was from Orange County, California (Dunn 1901). A four-egg clutch supposedly of the Spotted Owl, housed at the Western Foundation of Vertebrate Zoology, was collected by Colonel Joseph Hamilton in 1889 from Los Angeles County, California. Measurement of these eggs, however, revealed that they were too large to have been laid by a Spotted Owl and were most likely those of a Great Horned Owl (R. J. Gutiérrez pers. comm.).

The Spotted Owl is a relatively long-lived species with very low reproductive potential (Gutiérrez et al. 1995). Each year, typically about 60% of the pairs attempt to nest and only 50% successfully fledge young (Gutiérrez et al. 1995). Over 95% of the broods are composed of either one or two owlets (Gutiérrez et al. 1995). Thus, information on variation in brood size is important to document. Here I describe a brood of four fledglings near Lake Arrowhead in the San Bernardino Mountains of California.

Research on the demography of the Spotted Owl in the San Bernardino Mountains began in 1987, one of three studies of the demography of the Spotted Owl in California overseen by Humboldt State University. The primary purpose of this research was to estimate a number of the Spotted Owl's demographic parameters, including territory-occupancy rates, sex- and age-based survivorship, and reproduction (LaHaye et al. 1994). We have also addressed a number of other issues including home range size, habitat use, and diet (Verner et al. 1992).

As part of this study, owl reproduction was checked annually by the methods of Forsman (1983) and Franklin et al. (1996). On 26 May 1994 we located a pair of owls with three fledged young and a fourth owlet still in the nest tree. On 17 June 1994, all four fledglings were banded approximately 100 meters east of the nest tree.

This pair formed in 1993 and did not fledge young that year. The following three years, however, they successfully fledged young, four in 1994, one in 1995, and two in 1996.

In 1994 Spotted Owl reproduction was above average in the San Bernardino Mountains. The number of young fledged per pair (0.85) was the highest estimate recorded during the ten years (1987–1996) of this study. Wagner et al. (1996) and Zabel et al. (1996) found a negative correlation between Spotted Owl reproduction and the current winter's rainfall. This relationship did not exist in the San Bernardino Mountains. However, LaHaye et al. (1994) found a positive relationship between Spotted Owl reproduction and the previous winter's rainfall.

In the last 20 years of intensive research on this species, this was the only one of 2592 (0.03%) Spotted Owl broods observed that contained four owlets (Gutiérrez et al. 1995). I suspect that the estimate of rarity of Spotted Owl broods of four generated

from data collected in the last two decades is more reliable than estimates generated from the scant data available prior to the mid 1970s. In either case, broods of four are rare for this species.

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