

FEATURE ARTICLES

**ABUNDANCE AND PRODUCTIVITY OF WARBLING VIREOS ACROSS AN
ELEVATIONAL GRADIENT IN THE SIERRA NEVADA**

KATHRYN L. PURCELL¹

*USDA Forest Service, Pacific Southwest Research Station, Sierra Nevada Research Center,
2081 E. Sierra Avenue, Fresno, CA 93710*

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¹ E-mail: kpurcell@fs.fed.us

Abstract. Recent studies have shown that Warbling Vireos (*Vireo gilvus*) are declining in California and that these trends are due to low reproductive success. Brood parasitism by Brown-headed Cowbirds (*Molothrus ater*) has been implicated in the low productivity. I explored two hypotheses related to population dynamics of Warbling Vireos along an elevational gradient: (1) potential source populations exist at high elevations where cowbirds are rare, and (2) potential source populations occur in the center of the elevational distribution with less productive populations at upper and lower elevations. From 1985 through 2002 I studied the abundance and productivity of Warbling Vireos over an elevational gradient in the southern Sierra Nevada. Warbling Vireos were most abundant in mid elevation mixed conifer sites, less abundant in lower elevation ponderosa pine sites and upper elevation true fir sites, and rare in upper elevation lodgepole pine sites. Likewise, daily survival rates of nests were highest at mid elevations (~1800 m) and gradually decreased at both higher and lower elevations. Compared to other populations studied in California, nest success in mixed conifer habitat was high (60%, $n = 58$). Although rates of brood parasitism were high enough to be of concern in low-elevation ponderosa pine forests, cowbird parasitism was not observed in mid- to upper-elevation forests. Warbling Vireos were most productive where they were most abundant. The hypothesis that potential source populations exist at upper elevations did not appear to hold at the upper bounds of the elevational distribution. The results of this study provide support for the hypothesis that potential source populations occur in the center of the elevational distribution, with less productive populations at both lower and higher elevations.

Key words: abundance, brood parasitism, elevational gradient, nest success, productivity, *Vireo gilvus*, *Warbling Vireo*.