

CHACE & CRUZ

Foraging Ecology of the Western Wood-pewee  
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Study



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Nesting Success of the Western Wood-Pewee  
In City of Boulder Open Space  
And Boulder County Parks  
And Open Space Areas

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**Report submitted to the  
City of Boulder Open Space Department**

**Nesting Success of the Western Wood-Pewee  
in City of Boulder Open Space and Boulder  
County Parks and Open Space Areas**

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Although the Western Wood-pewee (*Contopus sordidulus*) has a large western distribution, little is known about the reproductive biology of this species. Here we provide information on the nest-site characteristics and nesting success of the Western Wood-pewee in the ponderosa pine (*Pinus ponderosa*) foothills of Colorado.

Western Wood-pewee nests were located in the foothills and adjacent grassland riparian corridors in Boulder County, Colorado (40° 00' N, 105° 20' W). Nests were found in 1990 (n = 15) and 1992 (n = 11) during different stages of reproduction and observed every three to five days until the nest was successful or failed. Nests were observed directly or by mirror-pole, and the contents were recorded. The cause of nest failure was determined by examining nest contents and condition, and was categorized as predation, parasitism, weather, or unknown. Nesting success was determined by using the Mayfield method (1961 and 1975). Measurements of nest height, distance to trunk and distance to the outer edge of foliage were taken.

Most pewee nests were successful in fledging at least one young (81.8%, N = 22), three nests were preyed upon and one failed after a hail storm. All nests observed from incubation (n = 9) had a clutch of three eggs, and hatching success was 81.5%. There was a mean of 2.76 (SE ± 0.09, n = 21) nestlings and 2.66 (SE ± 0.11, n = 18) fledglings per nest. Fledgling success per egg laid (n = 27) was 76.2% and per nestling (n = 58) was 82.7%. The probability of a pewee egg surviving to hatch (16 days) was 0.89, and a nestling surviving to fledge (14 days) was 0.76. Using the Mayfield method a pewee nest was calculated to have a 66.4% chance of surviving 30 days of exposure, at a 0.013 mortality rate per day, to fledge at least one young.

Nest site characteristics were measured for 26 nests. Most nests were located in ponderosa pine trees (84.6%), three nests were found in narrow-leaf cottonwood, and one nest in a willow tree (*Salix* sp.). Nests were typically built in the upper half

of the tree (mean nest height,  $7.20 \text{ m} \pm \text{SE } 0.78$ ), and were located on a medium sized branch usually closer to the outer edge of the foliage (distance to foliage,  $1.33 \pm 0.15 \text{ m}$ ) than to the trunk (distance to trunk,  $2.05 \pm 0.21 \text{ m}$ ).

Western Wood-pewee nest placement is similar to that of other Tyrant flycatchers in North America. With the exception of the Yellow-bellied Flycatcher (*Empidonax flaviventris*) all Tyrannids place their nests greater than 2.0 m above the ground (Murphy 1983). Nests of the Western Wood-pewee, Eastern Wood-pewee (*C. virens*), and *Tyrannus* kingbirds are typically placed closer to the foliage than to the trunk, which has been shown to be an important strategy in reducing nest failure in Eastern Kingbirds (*T. tyrannus*) (Murphy 1983).

Success of the Western Wood-pewee nests in this study was higher than that found for all other tyrannid flycatchers reviewed by Murphy (1983). The shorter number of nest days may account for the higher success, because when adjusted the mortality per day (1.3%) the Western Wood-pewee is similar to the mortality of other tyrannids reviewed by Murphy (1983).

Western Wood-pewee nests had a much lower frequency of predation and cowbird parasitism than was found when compared to other open-nesting species in the ponderosa pine forest of Boulder County. Depredated pewee nests (13.6%) occurred much less frequently than predation on Solitary Vireo (*Vireo solitarius*) nests (49.4 %,  $n= 81$ , 1993-1994, Chace 1995). Brown-headed Cowbirds (*Molothrus ater*) did not successfully parasitize any pewee nest in this study, while within the same study area 47% ( $n= 132$ ) of Solitary Vireo nests were parasitized during the years 1984-1986, 1992-1993 (Chace et al. *in press*). The Western Wood-pewee is not considered to be a frequent host of the cowbird (Friedmann 1971), however with the lack of experimental evidence it is uncertain whether the peweeps remove cowbird eggs, drive cowbirds from the nest site, or cowbirds do not choose pewee nests to parasitize. The low rate of failure due to predation in an area where such losses are

common suggests that a combination of nest placement and nest defense may increase the nesting success of the Western Wood-pewee.

Adult defense of the nest may contribute to the high nest success in this species. Tyrannids are well known for their aggressiveness (Bent 1942, MacKenzie and Sealy 1981). While the Western Wood-pewee has been observed to drive jays from the nest area (Bent 1942), we observed that when approached the incubating adult would flush silently and perch a short distance away. Discovery of a pewee nest by a predator or cowbird maybe difficult since the nest is cryptic and the adults are secretive around the nest site (Uyehara and Narins 1995). An aggressive response may be a beneficial behavior in situations where the intruder is not near the nest. A combination of nest placement and secretive behavior may increase the nesting success of pewees over other open-nesting passerines within the ponderosa pine forest.

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