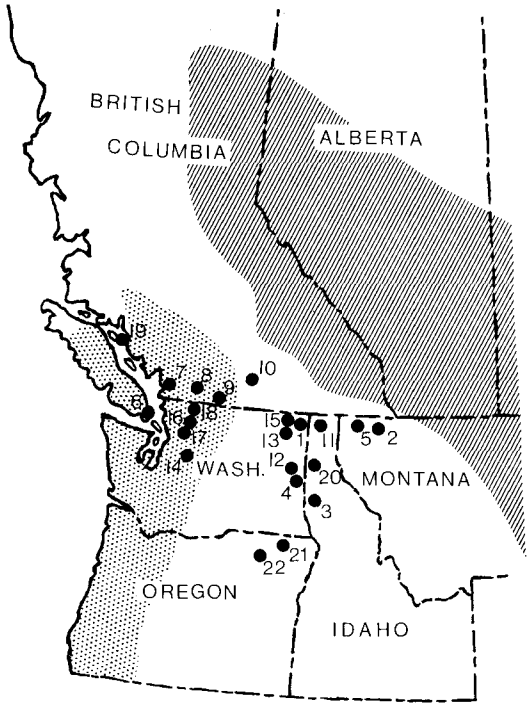

FIGURE 1. Distribution of Barred and Spotted Owls in northwestern North America. Solid dots indicate recent records of Barred Owls outside the previously known range (lined area). Stippled area indicates range of the Spotted Owl. Locations, authorities and dates for numbered Barred Owl records are presented in text.

records, and R. T. Reynolds and K. M. Horn for their help in editing the manuscript. Barred Owl sightings by the senior author in 1974 were made during the course of a study sponsored jointly by NSF Grant No. GY-11433 and Eastern Oregon State College, La Grande, Oregon.

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P.O. Box 675, Heppner, Oregon 97836. Present address of second author: Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon 97331. Accepted for publication 28 May 1975.

POLYGYNY IN THE WESTERN WOOD PEWEE

ROBERT C. ECKHARDT

Although families closely related to the Tyrannidae exhibit diverse breeding systems, simple pair bonding appears to predominate among the tyrant flycatchers. Skutch (Pacific Coast Avifauna 34, 1960) pointed out that while monogamy is the most common breeding system in the tropical representatives of the family, "in a few genera the birds appear never to mate and the males have not been seen to take any interest in nest, eggs, or young . . .". It is thought that, in these few genera males may copulate with more than one nesting female, but form no pair bonds with them and take no part in any other breeding function. Among tropical tyrannids which form permanent or semi-permanent pair bonds, Skutch also noted that no instances of polygyny had been reported.

I know of only two reports of polygynous behavior in temperate flycatchers. Mumford (Misc. Pub. 125, Univ. Michigan Mus. Zool., 1964) observed two polygynous male Acadian Flycatchers (*Empidonax virescens*), both of which tended two nests and two females simultaneously, but only one of which was pressed by circumstances to feed young at both nests during the same period of time. W. J. Smith (pers. comm.) observed a single case of polygyny in the Eastern Wood Pewee (*Contopus virens*) in 1967 near

Philadelphia. The male was not actually seen attending the nest of either female, but was seen with two females who shared his territory during the same period.

In 1974, while studying insectivorous birds in Kawuneeche Valley, Rocky Mountain National Park, Colorado, Ken Rosenberg and I observed a case of polygyny in the Western Wood Pewee (*Contopus sordidulus*). That year we mapped the territories of three male pewees which had settled along the floodplain of the headwaters of the Colorado River. One male who was polygynous occupied a territory of about 1.6 ha. This is nearly the same as the average pewee territory size for that year—1.7 ha—but somewhat larger than the combined 1973–1974 average of 1.2 ha.

Two pewee females shared the territory of the polygynous male. They both constructed nests but in two different, isolated, small stands of trees separated by nearly 50 m of willow scrub. Both females had completed incubation of the eggs and were feeding well-developed nestlings when, on 24 July, the second of the two nests in the territory was discovered. On the following day, and on 27 and 29 July, the male was observed without interruption feeding at one nest, foraging from lodgepole pines, and then feeding at the other nest. By 30 July the young in one nest had fledged and moved into the dense vegetation, precluding any further observations of the male feeding two broods.

The prevalence of polygynous behavior in tyrannids is still an open question. As far as I am aware, this is only the fourth flycatcher reported to exhibit polygyny. Is the rarity of such reports simply indicative of the frequency of occurrence in nature, or is it merely a product of the small number of substantive studies on tyrannids? My experience with the behavior and ecology of certain flycatchers in the Rocky Mountains, and the observations of W. J. Smith (pers. comm.) suggest that polygyny may be more common in this family than we suspect.

Department of Zoology, Murray Hall, University of Maine, Orono, Maine 04473. Accepted for publication 2 March 1976.

CANNIBALISM IN THE PIÑON JAY

RUSSELL P. BALDA
AND
GARY C. BATEMAN

Cannibalism has been observed in an array of vertebrates spanning the gamut from fishes through humans. In cases involving highly predaceous species which normally feed on life forms similar to their own, one might expect to find cannibalism occurring rather regularly since what constitutes normal prey is not markedly different from the prey selected during the cannibalistic act. As an example, Largemouth bass (*Micropterus salmoides*) may eat their young or even other conspecifics of approximately their own size (Minckley 1973:224). One suspects that evolution would favor mechanisms tending to prevent this behavior from becoming rampant.

Reports of cannibalism among raptorial birds are not especially uncommon. Ingram (1959) listed 21 species of hawks and owls having "convincing records" as cannibals. In most cases such cannibalism has been directed towards nestlings (but see Clevenger and Roest 1974) and has been observed post facto (e.g. Heintzelman 1966). The actual factors responsible for the demise and/or disappearance of missing (presumably eaten) individuals are controversial. Armstrong's (1959) caveat is especially pertinent here; he noted that some cases of presumed cannibalism of nestlings may represent instances in which the supposed victims left the area under their own power. It is also possible that such victims may have been eaten by a predator other than the parent.

Kuhk (1969) noted that most described cases of cannibalism among birds involved young being eaten by their siblings or parents; whether they were generally also killed by them is unknown. For this special type of cannibalism he proposed the term "syngenophagy" (relative-eating).

Reports of cannibalism among passerines are extremely scanty in the literature available to us. The only report encountered (Richter 1965) described an incident wherein an adult Gray Jay (*Perisoreus canadensis*) was observed to tear at the body of a road-killed juvenile conspecific and fly away with parts of it. The author speculated that the adult was feeding these remains to the remaining brood members. Actually he gave no evidence that this was a case of syngenophagy.

The event described below occurred on the morning of 1 April 1970, on the colonial breeding grounds of the Piñon Jay (*Gymnorhinus cyanocephalus*) described by Balda and Bateman (1971, 1972). In 1970, the jays began building nests in late February and the mean date of laying the first egg was 9 March ($n = 22$ nests; Balda and Bateman 1972). During 5 years of study, this was the earliest attempt at nesting, and followed the production of a huge crop of piñon pine (*Pinus edulis*) cones and seeds the preceding autumn.

On 31 March temperatures recorded on a Bendix hygrothermograph in a white weather shelter adjacent to the nesting area ranged from a low of –14°C to a high of 1°C ($\bar{x} = -7$°C). During the morning of 1 April the temperatures were as follows: –17°C at 06:00; –11°C at 08:00; and –5°C at 10:00. Snowfall was measured at Flagstaff Pulliam Airport, 21 km southwest of the study site. Snow began falling in the afternoon of 29 March, continued for all of 30 March and subsided in the afternoon of 31 March. The total accumulation for this 3-day period was 36 cm. The breeding grounds were covered with a continuous layer of snow except for small patches of open ground at the base of some of the trees. The litter, duff, and soil were tightly frozen.

At 09:00 on 1 April, nest number 21, situated 3.2 m off the ground in a ponderosa pine (*Pinus ponderosa*), was visited and found to contain three pink, featherless nestlings no older than 1 day of age. At this age, nestlings usually weigh between 5.3 and 9.4 g (Bateman and Balda 1973). The age was determined by the fact that the length of incubation is 17 days (Bateman and Balda 1973), and the third egg was known to have been laid on 14 March. In an attempt to determine the amount and type of food brought to these young, they were fitted with collars made of short pipe cleaners. The female left the nest at our approach but returned to brood within