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Lewis's Woodpeckers (*Melanerpes lewis*) provision their young with nestling passerines

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ABSTRACT—Most examples of woodpeckers preying on vertebrates are thought to be opportunistic, and the wider role that some woodpeckers play as nest predators of other birds has not been appreciated until recently. To date, predation on nestling birds has been documented in at least 10 woodpecker species, including 5 of the 6 species of *Melanerpes* that nest in the United States. From 2018 to 2020, we documented 57 instances in which adult Lewis's Woodpeckers (*Melanerpes lewis*) provisioned young with nestling passerines (11.9% of 480 food deliveries), which constitutes the first verification of nest predation in this species. Among picids, nest predation is considered to be a widespread and typical foraging strategy only in the Red-bellied Woodpecker (*M. carolinus*) and Great Spotted Woodpecker (*Dendrocopos major*). We suggest that additional research will reveal that other woodpecker species routinely prey on nestling birds. *Received 12 December 2020. Accepted 22 February 2021.*

Key words: Montana, nesting biology, nestling predation, novel diet.

El carpintero *Melanerpes lewis* aprovisiona a sus crías con polluelos de paserinas

RESUMEN (Spanish)—Se piensa que la mayoría de los ejemplos de carpinteros depredando vertebrados son oportunistas y el papel más amplio que algunos carpinteros juegan como depredadores de nidos de otras aves no ha sido apreciado sino recientemente. A la fecha, la depredación de polluelos se ha documentado en al menos 10 especies de carpinteros, incluidas 5 de las 6 especies de *Melanerpes* que anidan en los Estados Unidos. De 2018–2020, documentamos 57 incidentes en los cuales los adultos de *Melanerpes lewis* aprovisionaron a sus crías con polluelos de paserinas (11.9% de 480 entregas de alimento), lo que constituye la primera verificación de depredación de nidos por esta especie. Entre los pícidos, la depredación de nidos se considera una estrategia típica y ampliamente distribuida únicamente en los carpinteros *M. carolinus* y *Dendrocopos major*. Sugerimos que investigaciones adicionales revelarán que otras especies de carpinteros depredan rutinariamente aves anidantes.

Palabras clave: biología de la anidación, depredación de polluelos, dieta novedosa, Montana.

Much has been published on Lewis's Woodpeckers (*Melanerpes lewis*), but key aspects of their biology remain poorly known (Vierling et al. 2020). Unlike many other picids, Lewis's Woodpeckers lack anatomical specializations that enable them to excavate efficiently in wood (Vierling et al. 2020). Their main foods consist of invertebrates that they capture in midair and glean from vegetation, and various nuts and soft-bodied fruits that they obtain from vegetation, the ground, and at bird feeders (Bock 1970, Hadow 1973, Vierling et al. 2020). Vertebrates have not been documented in the diet with certainty, but Sherwood (1927) described an apparent case of predation on a bird egg, and Gillihan (2003: p. 187) reported an instance in which an adult brought to its nest what he believed was "a mass of vertebrate flesh, possibly a nestling." Here, we report multiple instances over 3 years in which Lewis's Woodpeckers provisioned their young with nestling passerines.

Methods

All observations were made by CG, who photographed the adults each year from 2018 to 2020 as they provisioned young at a nest in a narrowleaf cottonwood (*Populus angustifolia*) snag along Bridger Creek, Sweet Grass County, Montana (45°34′N, 109°49′W; elevation 1,695 m). The nest tree was 9.45 m tall, had a dbh of 72 cm, and contained multiple cavities. The woodpeckers nested in 2 cavities during this period, which were 8.69 m and 8.99 m above the ground. Because the adults were not marked, we do not know whether the same individuals nested at the site each year. In 2018, 3 adults provisioned the young in an apparent case of cooperative breeding (cf. Vierling et al. 2020).

CG photographed at the nest for 2 d in 2018 and 7 d each in 2019 and 2020; photos were taken 50–100 m from the nest tree without the use of a blind.

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Table 1. Food brought to 3 Lewis's Woodpecker nests in Sweet Grass County, Montana, from 2018 to 2020. Data are number of food items (%).

	2018	2019	2020	Total
Nestling passerines	6 (15.4)	29 (9.0)	22 (18.8)	57 (11.9)
Lepidopterans[a]	18 (46.2)	26 (8.0)	9 (7.7)	53 (11.0)
Other invertebrates[b]	7 (17.9)	183 (56.5)	54 (46.2)	244 (50.8)
Fruits	5 (12.8)	36 (11.1)	23 (19.6)	64 (13.3)
Unknown[c]	3 (7.7)	50 (15.4)	9 (7.7)	62 (12.9)
Total	39	324	117	480

[a] Mostly adult western sheep moths (*Hemileuca eglanterina*).
[b] Mostly spiders, ants, and orthopterans.
[c] Small food items that could not be identified in photos.

Daily observation periods lasted 89–389 min (3,171 min total) and were conducted during the last week of the nestling period in 2018 and 2019 and during the last 3 weeks of the nestling period in 2020. CG obtained photos of each food delivery that occurred in her presence. All photos were taken with a Canon EOS-1D X Mark II or a Canon EOS-1D X Mark III DSLR camera with focal lengths ranging from 500 mm to 1200 mm. CG obtained more than 40,000 images of the adults as they arrived at the nest with food, and shot up to 17 frames per s. Thus, multiple images were obtained for each food delivery, but each delivery was tallied only once. Foods were identified from photographs and classified as nestling passerines, lepidopterans (mostly adult western sheep moths [*Hemileuca eglanterina*]), other invertebrates (mostly spiders, ants, and orthopterans), fruits, and unknown (Table 1).

Results

CG photographed 39 food deliveries in 2018, 324 in 2019, and 117 in 2020 (Table 1). In total, 57 of the food items were nestling passerines (Fig. 1a, b), which constituted 9–19% of the food items identified each year and 11.9% of all food items photographed (Table 1). Nestling birds captured by woodpeckers were naked or nearly so, and thus were no more than a week old (e.g., Johnson and Best 1980, Murphy 1981). Because the toe arrangement of these nestlings appeared to be anisodactyl in each case where the feet were clearly visible in photographs, the nestlings were not woodpeckers and almost certainly were passerines.

When the young woodpeckers were small (i.e., more than 2 weeks from fledging), adults arriving with nestling prey sometimes flew to a solid surface atop a snag, set the prey item down, and hammered it into smaller pieces, which they then fed to their young (Fig 1c). We could not identify nestling prey to species, but Eastern Kingbirds (*Tyrannus tyrannus*), Tree Swallows (*Tachycineta bicolor*), and American Robins (*Turdus migratorius*) nested near the woodpeckers each year, often mobbed the adults as they flew to the nest with food, and may have been among the species whose nests the woodpeckers plundered. Both adults that attended the nest in 2019 and 2020 provisioned the young with nestling birds, as did at least 2 of the 3 adults that attended the nest in 2018 (Fig. 1d).

Discussion

Up until the mid-2000s, woodpeckers were not widely considered to be nest predators (Hazler et al. 2004, Ojeda and Chazarreta 2006), but that perception has changed as additional evidence of their predatory behavior has been obtained and disseminated. Accounts of Red-headed Woodpeckers (*Melanerpes erythrocephalus*) taking eggs and nestlings of passerines date back to the mid-1880s (Bendire 1895). Since then, predation on nestling birds has been documented in at least 9 other picids in addition to our report for Lewis's Woodpecker: Acorn Woodpecker (*M. formicivorus*; Fajer et al. 1987), Gila Woodpecker (*M. uropygialis*; Edwards and Schnell 2020), Golden-fronted Woodpecker (*M. aurifrons*; Boyd and Ellison 2004), Red-bellied Woodpecker (*M. carolinus*; Hazler et al. 2004, Auer et al. 2013), Great Spotted Woodpecker (*Dendrocopos major*;

Figure 1. (a, b) Typical nestling passerines fed to Lewis's Woodpecker nestlings. (c) Adult hammering nestling passerine into smaller pieces for delivery to its nestlings. (d) Pair members sometimes arrived at the nest simultaneously with nestling passerines. Photos by Cindy Goeddel.

Weidinger 2009), Syrian Woodpecker (*D. syriacus*; Gorman 2004), Magellanic Woodpecker (*Campephilus magellanicus*; Ojeda and Chazarreta 2006), Greater Yellownape (*Chrysophlegma flavinucha*; Winkler and Christie 2020), and Pileated Woodpecker (*Dryocopus pileatus*; Loftin and Leeds 1981). In most of these reports, the predation events were considered to be opportunistic rather than a regular foraging strategy. In addition, a White-fronted Woodpecker (*M. cactorum*) recently was documented killing nestling White-barred Piculets (*Picumnus cirratus*), although it did not consume them and thus was not preying on them in the strictest sense (Núñez Montellano 2020).

To our knowledge, in addition to the Lewis's Woodpecker, predation on nestling birds by adult woodpeckers to feed their own nestlings has been documented once in the Great Spotted Woodpecker (Hodgetts 1943) and 14 times in 1 study of the Magellanic Woodpecker (Ojeda and Chazarreta 2006). In the latter case, nestlings made up 1.6% of 852 prey items delivered to woodpecker nestlings over 2 years (Ojeda and Chazarreta 2006), which is considerably lower than the proportion of nestling foods that we documented at Lewis's Woodpecker nests over 3 years (11.9% of 480 food items). Because Lewis's and Magellanic woodpeckers provisioned their young with nestling passerines over multiple years, we suggest that the behavior is a regular foraging strategy for some individuals of these species.

Among the 11 woodpecker species in which nestling predation has been documented, the behavior appears to be widespread and fairly common only for the Red-bellied Woodpecker (Hazler et al. 2004, Auer et al. 2013, and references therein) and the Great Spotted Wood-

pecker (Gorman 2004), both of which have been observed preying on nestlings in tree cavities and in open cup nests. We suggest that Lewis's Woodpeckers and several other woodpecker species also are regular nest predators on a wider geographic scale than presently reported.

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