

PREDATION ON FREE-RANGING COMMON POORWILLS IN SASKATCHEWAN

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Abstract.—Although losses of Common Poorwill (*Phalaenoptilus nuttallii*) nests to predators are common, little is known about predation on adults. Remains of three adults, radio-tagged in Cypress Hills Provincial Park, Saskatchewan, were found. The transmitter of a female was found woven into the base of a Northern Harrier's (*Circus cyaneus*) nest. Telemetry records show that the bird was killed in the daytime, consistent with harrier predation. The wing and transmitter of the female's mate were found on a stump surrounded by a marsh, suggesting avian predation. This male was also killed in the daytime, implicating harrier predation. The decapitated body of a second male was found buried next to a stump. It is speculated that this bird was taken by a coyote (*Canis latrans*) or badger (*Taxidea taxus*) because both are known to bury prey and were often observed in the study area.

DEPREDACIÓN DE *PHALAELOPTILUS NUTTALLII* LIBRES EN SASKATCHEWAN

Sinopsis.—Aunque las pérdidas de nidos de *Phalaenoptilus nuttallii* a depredadores son comunes, se conoce poco sobre la depredación de los adultos. Se hallaron los restos de tres adultos, provistos con radios en el Parque Provincial de Cypress Hills, Saskatchewan. El transmisor de una hembra se halló enhebrado en la base de un nido de *Circus cyaneus*. Registros de telemetría indican que el ave fue muerta de día, algo consistente con la depredación por esta especie. El ala y el transmisor del pareja de la hembra se hallaron en un poste rodeado por una ciénaga, sugiriendo depredación por aves. Este macho también fué muerto de día, lo que indica depredación por el género. El cuerpo decapitado de otro macho se halló enterrado cerca de un poste. Se especula que este ave fue tomada por un *Canis latrans* o por un *Taxidea taxus* ya que se conoce que ambos entierran las presas y se observaron comunmente en el área de estudio.

To understand fully the breeding biology and habitat use of a particular species, knowledge of its natural enemies is required. To date, there have been very few studies of free-ranging goatsuckers (Caprimulgidae), and especially of their natural predators. For Common Poorwills (*Phalaenoptilus nuttallii*), losses of eggs and chicks to predators can be substantial (Csada and Brigham 1994a), but due to the nocturnal activity and cryptic plumage, we know of no records of predation on free-ranging adults, apart from one adult female killed in British Columbia (K. J. Kissner, pers. comm.). Here we report three cases of apparent predation on adult birds in the Cypress Hills (49°34'N, 109°53'W) of southwestern Saskatchewan, near the northern edge of the species' breeding distribution (Csada and Brigham 1992).

Poorwills inhabit semi-arid, open, grassy or shrubby areas on high, rolling prairies (Csada and Brigham 1992). Like other goatsuckers, poorwills feed on large insects caught as birds sally up from a low perch or the ground (Bayne and Brigham 1995, Csada et al. 1992). Nests consist of

two eggs laid on bare ground. Both members of the pair, which are apparently monogamous, incubate eggs, and feed and brood young (Csada and Brigham 1992).

RESULTS AND DISCUSSION

During the summer of 1993, we recovered the remains of three adult poorwills that had been outfitted with temperature-sensitive radio transmitters (2.4 g; Model PD-2T, Holohil Systems, Woodlawn, Ontario) to collect data on activity patterns and habitat use (Permit No.10570 E). Transmitters were affixed using an elastic harness slipped over the wings. Weather permitting, birds carrying tags were tracked on a daily basis to nests and roost sites, and foraging activity was monitored continuously at night through out the season and opportunistically in the daytime.

Two of the birds killed were members of a pair incubating their first clutch. The female (bird 1) and male (bird 2) were outfitted with transmitters on 1 July and 24 June, respectively. On 11 July, the female's transmitter was tracked to a Northern Harrier (*Circus cyaneus*) nest, approximately 1.5 km from the poorwill nest site. Four harrier chicks were present, thus we did not disturb the nest until after the chicks had fledged. On 24 Aug., we recovered the transmitter which had been woven, along with sticks and grasses, into the base of the harrier's nest. We assume that an adult harrier killed the poorwill. Telemetry records support this assumption, as the bird was killed in the daytime.

On 9 July, the transmitter carried by bird 2 was found attached to the remains of the left wing on a white spruce (*Picea glauca*) stump in the middle of a marsh created by beaver (*Castor canadensis*) activity. We can not be certain of the predator's identity, but because the stump was surrounded by water we suggest an avian predator. In the Cypress Hills, the most common raptors likely to prey on birds are harriers and Great Horned Owls (*Bubo virginianus*). Telemetry records indicate that the poorwill was killed between 0930 and 2045 hours, implicating a diurnal predator (e.g., harrier) rather than an owl.

Bird 3 (a male), outfitted with a transmitter on 2 June, helped to incubate and to fledge successfully two chicks. The decapitated carcass, with the transmitter still attached, was found on 19 July buried at the base of a lodgepole pine (*Pinus contorta*) stump, approximately 1.1 km from the nest site. Although tracks were not evident, we speculate that a coyote (*Canis latrans*) or badger (*Taxidea taxus*) preyed on the bird because both are known to bury prey and were frequently observed in the study area. In this instance we do not know if the poorwill was taken at night or in the daytime, but field observations suggest that nocturnal predators do pose risks to poorwills. On two occasions, coyotes approached while we played recorded poorwill calls in an attempt to capture birds. Presumably, the coyotes were attracted to the poorwill calls, suggesting coyotes may hunt poorwills during the night. Similarly, on one occasion, a Great Horned Owl responded to, and perched in, a tree near the tape player.

Incubating or brooding birds may be more vulnerable to predation than non-breeding birds because they are less likely to leave the nest.

Northern Harriers have been known to capture prey, usually small mammals, frogs and birds, from the ground rather than in the air (Schipper *et al.* 1975). The fact that Northern Harriers prey on poorwills is not surprising given their adaptation to detect prey. Their capacity for auditory prey location (their facial feathers form ruffs similar to those of owls; Clark and Stanley 1976) and their habit of foraging by quartering an area at low altitude make harriers more likely predators than most diurnal raptors (Rice 1982). Harriers rely on auditory cues for prey detection, which may facilitate the location and capture of poorwills. Common Poorwills roost during the day and have cryptic plumage, but may make sounds when panting or gular fluttering. Harriers may also detect calling poorwills, active early in the evening, while harriers are still foraging.

We can not completely rule out the possibility that the birds we recovered were scavenged by predators after they had died. Two other potential causes of death are vehicles or the attachment of transmitters using harness. The probability that birds were struck by vehicles was very low as our telemetry data showed that all activity was within 1 km of nests, and the only road was 2–3 km away. The study area is remote, and the only vehicles operating at night were ours. The birds killed during the day could not have been hit by vehicles, because the birds are not active at this time.

We have no direct evidence that transmitters cause mortality. When possible, birds were recaptured at the end of the summer to retrieve transmitters. Of the 25 birds that had transmitters attached (over 4 yr) there was not any indication of irritation from the harness. It is also unlikely that radio transmitters increased the birds susceptibility to predation. As far as we could tell, activity levels of radio-tagged birds were the same on nights just after the tag was attached and on the nights prior to the birds being killed. The transmitters were painted dull brown or black, which did not contrast with the birds' plumage, and they were small (<5% body mass). Further, the rate of predation on tagged adults from 1989 to 1992 was very low (1 out of 47). Of 11 birds (seven males, four females) tagged in 1991 and 1992 at the same study site, none were preyed upon (Csada and Brigham 1994b). In studies in the Okanagan Valley of British Columbia (1989–1992; R. M. Brigham, *pers. comm.*) involving 36 tagged adults (23 males and 13 females), only one bird was killed by a predator. In that instance, the partially eaten carcass was found on the nest with no indication as to the identity of the predator. In 1994, we tagged an additional four birds, all of whom survived through the breeding season. Two of them nested successfully. Why predation on Common Poorwills was so high in 1993 is a mystery.

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