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USE OF MIST NETS AND A LIVE GREAT HORNED OWL TO CAPTURE BREEDING AMERICAN KESTRELS

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Many studies require that territorial adult raptors be captured safely and cost-effectively during the breeding season. Bloom (1987) and Bloom et al. (1992) reported that a dho-gaza with a great horned owl (*Bubo virginianus*) placed near the nest is the most effective way to trap small raptors during the nesting season. Mist nets have been used to capture American kestrels (*Falco sparverius*) and other raptors during migration (Clark 1970), but there have been no reports of their effectiveness for trapping breeding American kestrels. In 1993, we initiated a study of site fidelity at nest boxes in southwestern Idaho. Because we caught 75% of the adult females and only 19% of the adult males in 48 boxes during nest checks, we decided to evaluate mist nets as an alternative technique to capture breeding male kestrels.

METHODS

We tested the effectiveness of mist nets placed within 20 m (usually in front) of a nest box, with a live great horned owl tethered behind the nets (Fig. 1). We set up two 2-ply nylon 110 denier nets (6-cm mesh) at occupied nest boxes. Nets were 2.1 m high and were arranged in a v-shape around the tethered owl; one net was 5.5 m long, and the other was 9.1 m long. At one site we used a single net because various structures prevented us from using a v-shaped configuration. The lure owl was tethered with a swivel and short leash to a stake in the ground, about 1 m from the nets. Where possible, we set the trap near trees to provide shade for the nets and to minimize potential heat stress to the lure owl. We played tape recordings of a great horned owl's 5-note territorial hoot during seven of 23 trapping attempts. After setting up the nets, we watched the trap from a vehicle parked approximately 100–200 m away until a bird was caught. We trapped from 26 May to 14 July 1993 and only trapped at boxes with young >5 d of age. Nestlings were aged with a photographic aging key (Griggs and Steenhof 1993).

RESULTS AND DISCUSSION

We captured 20 adult kestrels (13 males and seven females) during 23 trapping attempts at 19 boxes. The lower number of female captures was probably related to our study goals. Because we were primarily interested in capturing males (both sexes were targets at only three of 19 boxes), we usually suspended trapping immediately after the male was caught. Males were the first birds captured in 11 successful trapping attempts, and females were caught first in five attempts. These proportions did not differ significantly from random proportions (G^2_1 = 1.17, $P = 0.279$). Both members of the pair were captured during three trapping attempts. The male was caught first at one site, the female was caught first at another, and both birds were caught almost simultaneously at the third Only six of 23 trapping attempts (26%) failed to catch any birds; two of these were at the same box (1 wk apart). One trapping failure occurred at the site where we set up only one of the two nets. We returned to four sites where the target bird was not captured during the initial attempt and trapped the target birds during two (50%) of our follow-up attempts. By the end of the season, we had captured at least one of our target birds at 14 of the 19 occupied boxes.

The time from when traps were set to when birds were captured ranged from 1–38 min and averaged 8.5 min (SD = 12.3) during the 10 successful trapping attempts when we recorded this information. Total time to set up, trap and process birds, and disassemble nets at a trapping site averaged 74 min (SD = 30) during 17 trapping efforts Time spent at 12 successful trapping attempts ranged from 25–130 min and averaged 70 min. We spent an average of 85 min at five of the six boxes where we did not capture our target bird.

Probability of capturing an adult was not related to the

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age of its young (Mann-Whitney $U = 44$, $P = 0.623$). Ages of nestlings during successful trapping attempts ranged from 6–26 d ($\bar{x} = 16$ d), and ages during failed trapping attempts ranged from 14–28 d ($\bar{x} = 18$ d). Young fledged from all of the nests where we trapped.

Capture rates were lower ($G^2_1 = 4.78$, $P = 0.029$) for trapping attempts with the tape playback than for trapping attempts without the tape. Only three of seven trapping attempts with the playback tape resulted in captures, whereas at least one kestrel was trapped in 14 of 16 trapping attempts without the tape. We used taped playbacks primarily at sites where we anticipated a low probability of success (e.g., at sites where earlier trapping attempts had failed). We believe the tape probably had no influence on whether kestrels were captured.

Most (21 of 23) of our trapping attempts occurred before noon (MDT), but both afternoon trapping attempts captured birds. Five of the six unsuccessful trapping attempts were before 0800 H, and only four of 20 birds were captured before 0800 H. We avoided trapping in the afternoon because we suspected that winds and lighting conditions would make nets more conspicuous; we also did not want to subject the lure owl to heat stress.

Only one non-target species, a western kingbird (*Tyrannus verticalis*), was captured during our trapping efforts. Swainson's hawks (*Buteo swainsoni*), eastern kingbirds (*Tyrannus tyrannus*), black-billed magpies (*Pica pica*), and long-billed curlews (*Numenius americanus*) also mobbed the lure owl.

The mist nets employed in this study were firmly attached to net poles and did not detach as dho-gaza nets do. One possible advantage of using mist nets over dho-gazas with kestrels is that nets do not need to be reset if the bird encounters the net and escapes (i.e., "bounces out") or if the dho-gaza triggers prematurely (e.g., by wind). The process of resetting a dho-gaza can disturb the target birds and may reduce the likelihood of capture. Although we did not record the number of cases that birds bounced out of our nets, it occurred only rarely during our study. When it did occur, mist nets were still in place, and kestrels were caught later during the same trapping session. The advantage of using mist nets may be nullified for larger hawks because of the increased probability that larger hawks will bounce out or escape from mist nets.

Mist nets seem to be an effective and efficient technique for capturing male American kestrels during the breeding season. Our approach eliminates the need for repeated checks of the box and probably minimizes disturbance to eggs or chicks. A live owl might be more effective than a stuffed owl because the kestrels seemed to respond to the owl's movements. Tapes of owl vocalizations did not enhance trapping success in our study. We recommend that trapping be deferred until after young are capable of thermoregulation (approximately 8 d; Balgooyen 1976) so that trapping does not keep adults from tending eggs or vulnerable young.

RESUMEN.—Usamos redes de niebla con *Bubo virginianus* como señuelos vivos, con el fin de capturar *Falco sparverius* en el suroeste del Idaho. Atrapamos 13 machos y siete hembras en 23 intentos distribuidos en 19 cajas de de captura dispuestas durante 1993. El éxito de captura no estuvo relacionado con la edad de los pollos, tiempo del día o si se usó vocalizaciones grabadas de *B. virginianus* Las redes de niebla con señuelos vivos parecen ser una efectiva técnica para capturar *F. sparverius* durante la estación reproductiva.

[Traducción de Ivan Lazo]

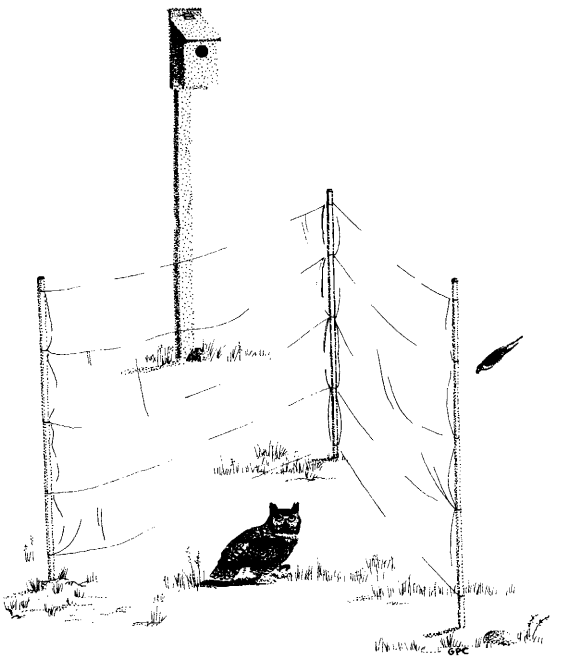

Figure 1. Configuration and placement of mist nets used to capture American kestrels in southwestern Idaho, 1993.

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