



Using Tape Playback of the Staccato Song to Document Boreal Owl (*Aegolius funereus*)
Reproduction

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Abstract.—Tape playback of the staccato song of the Boreal Owl (*Aegolius funereus richardsoni*) proved useful in attracting fledglings of both North American *Aegolius* species. No Boreal Owl nests were found in 8 hours of daytime searches. However, six Boreal Owls, including three to four fledglings at two locations, one Northern Saw-whet Owl (*A. acadicus*) fledgling, and an unidentified *Aegolius* responded to tape playback in 16 hours of systematic surveys during the post-fledging period (15 July to 30 August) of 1992 and 1993 in habitat known to be occupied by Boreal Owls. This method is considerably less costly than other means of documenting breeding by this species and may prove useful for other owl species as well.

Boreal Owls (*Aegolius funereus*) were long thought to be denizens of circumpolar northern forests (AOU 1957, Mikkola 1983), but in the past 4 decades have been found in suitable habitat in the mountains of the Pacific Northwest (Whelton 1989) and throughout the Rocky Mountains (Hayward and Hayward 1993). Recently, their southern North American distributional limits in the Rocky Mountains of New Mexico were described (Stahlecker and Duncan 1996).

Although their North American range is now mostly defined, documentation of Boreal Owl breeding activity has proven more difficult to obtain. Boreal Owls are relatively secretive birds, nesting in cavities in forests that include numerous potential nest trees. During an intensive study in central Idaho, 17 of 21 nests in natural cavities were found because the female (14) or male (3) was radio-tagged (Hayward and Garton 1983, Hayward et al. 1993). Only four natural nests (2 consecutive years for one site) were found in another intensive study in north-central Colorado (Palmer and Ryder 1984, Ryder et al. 1987). Hayward et al. (1993) utilized > 300 nest boxes in Idaho to monitor breeding populations in managed forests, and in the process extended the area in Idaho with documented nesting locations. Another large

nest box array (> 400) was used to document Boreal Owl nesting in western Colorado (Schulz and Holland, in review). Nest boxes are also extensively used to study Tengmalm's Owl (*A. f. funereus*) in Europe (Mikkola 1983, Korpimäki 1984). Chance encounters with fledgling Boreal Owls in Montana (D. Shea in Rogers 1973), Washington (Batey et al. 1980), northern Colorado (Baldwin and Koplin 1966), and southern Colorado (Rawinski et al. 1993) have also documented reproduction in those areas. Throughout much of its North American range, however, proof of breeding by the Boreal Owl is lacking, though inferred from the presence of singing males (Hayward et al. 1987, Stahlecker and Rawinski 1990).

During Boreal Owl distribution studies in New Mexico, I wanted to locate active nests to prove breeding in the state. In June 1987 and 1992 I attempted to locate active cavity nests of Boreal Owls near trees where males sang spontaneously in April of the same years. Two of us spent approximately 2 hours searching each site, walking slowly through the forest looking for cavities, then knocking softly in imitation of a foraging woodpecker in an effort to elicit a response from a nesting owl. No Boreal Owl nests were found.

On 13 August 1992, while conducting distribution surveys for Boreal Owls with tape playback (Palmer and Rawinski 1986) in the Gila Wilderness Area of southwestern New Mexico, two fledgling Northern Saw-whet Owls (*Aegolius*

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academicus) followed us for > 800 m and 45 min, appearing each time I played (four times for 5 minutes) the Boreal Owl staccato song (Bondrup-Nielson 1984). I finally had to suspend surveys to escape from these two curious birds. Their continued responsiveness suggested that naive juvenile Boreal Owls might be just as curious.

Less than a week later (19 August 1992) near Cumbres Pass on the New Mexico/Colorado border, I attracted a family group of two fledglings and one unidentified (probable adult) Boreal Owls with tape playback of the staccato song. The two young remained perched within 10 m for 25 min, offering ample time for careful examination of plumage characteristics. Subsequently, on 4 nights (28-29 July and 2-3 August 1993) of surveys with tape playback in northern New Mexico mountains, I attracted three Boreal Owls, one Northern Saw-whet Owl fledgling, and an unidentified *Aegolius* with tape playback. I saw two of the Boreal Owls; one was a fledgling accompanied by an unseen Boreal Owl. In total, six Boreal Owls, including three to four fledglings at two locations, responded to tape playback in 16 hours of systematic surveys in occupied Boreal Owl habitat. Locations of responding Boreal Owls were previously reported (Stahlecker and Duncan 1996).

A branching/fledgling Boreal Owl is distinctly plumaged; most of the body, including the facial disks, is chocolate brown, including both top and back of head (Mikkola 1983, Hayward and Hayward 1993). Primaries, secondaries, and wing coverts are brown with white spots, and the primaries are not molted until after reaching 1 year in age (Hornfeldt et al. 1988). Adults are streaked brown or gray on breast and belly with mostly white facial disks outlined in black. The top and back of the head are also black and flecked with smaller white spots than the wings and back (Mikkola 1983, Hayward and Hayward 1993). Neither intermediate plumages nor the molt rate are described.

Rawinski et al. (1993:57-58) described a southern Colorado Boreal Owl photographed on 2 September 1992 (fig. 1) as "subadult" because, unlike the adult plumage, this bird lacked the distinct black facial disk edge and also lacked the brown streaks on the breast. The breast was light brown to gray, and showed a downy appearance, suggesting a transition phase between the chocolate brown breast feathers of



Figure 1.—Post-fledging juvenile Boreal Owl (*Aegolius funereus*) near Creede, Colorado, 2 September 1992.

the juvenile and the streaked brown and white breast feathers of the adult."

The two young Boreal Owls that I observed on 19 August 1992 had streaked brown breasts and bellies, gray-black faces with distinct gray "lambchops" adjacent to the pale bill, and a clearly chocolate head and nape. One was also solid chocolate on the throat and upper chest. The juvenile observed on 2 August 1993 was 8 m up in a tree. It did not have distinct facial disk borders, though disks were mostly white. Gray down protruded profusely from the head and upper body and the belly was streaked with brown and white. The nape and back of the head were not visible from directly below.

Northern Saw-whet Owls are also likely to respond to the Boreal Owl tape (Palmer and Rawinski 1986). In my experience, they are noticeably smaller, rustier in all plumages, and their "skiew" and "chuck" calls, though similar to those of Boreal Owls (Bondrup-Nielson 1984), are noticeably weaker than those of their congeners.



Tape playback in Boreal Owl surveys was initially used primarily during the breeding season (Hayward et al. 1987, 1993), but Palmer and Rawinski (1986) found that owls were also responsive during autumn (September -October). There is the added benefit that tape playback does not interfere with breeding activity (Palmer and Rawinski 1986). They recommended playing the staccato song for 5-min intervals from calling stations 200-800 m apart with two observers watching and listening for responding owls. Surveying with moonlight increased visibility of silent, flying owls and made backcountry travel easier. It was also important to call from a small clearing so that owls could approach closely from any direction, yet overflying owls could be seen against the moonlit sky. I recommend no change in that protocol, but suggest moving forward from autumn (September -October) into mid-summer (15 July -30 August) to increase the likelihood of attracting juveniles while they are still readily discernible from adults and still likely to be in the natal area. It may also be possible to attract the more easily identified chocolate brown fledglings even earlier in the summer (15 June-15 July), particularly at more southern locales, but I have not attempted systematic surveys that early.

Detection rates for singing Boreal Owls can vary year-to-year by up to several orders of magnitude (Hayward and Hayward 1993, Palmer 1987). Though it is not known how directly singing rates are correlated with nesting success, it seems logical that efforts to locate fledglings with this method would be most successful in years when the number of singing males in the region was high.

The most efficient means of locating Boreal Owl nests, with telemetry or through large nest box arrays, are expensive and time consuming. Hayward et al. (1992) reported material costs of \$12-18/nest box and 220 person-hours/year to monitor 300 nest boxes with an average occupancy rate of 4.2 per cent. Costs of telemetry studies are not reported. Agencies with time or budget constraints may not be able to devote the resources necessary to find active Boreal Owl nests. However, if they follow standardized protocol (Palmer and Rawinski 1986) for tape playback surveys and concentrate their efforts during mid-summer in areas already known to be occupied by Boreal Owls, recently fledged juveniles may be attracted

within close range for identification and photographic documentation. This method may also be useful for documenting breeding locations for other species of owls.

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