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# A Technique for Capturing Western Screech-Owls (*Megascops kennicottii*) in Southeast Alaska

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## ABSTRACT

*With little information about Western Screech-Owl (*Megascops kennicottii*) ecology in southeast Alaska, we wanted to radio mark owls to learn about home range, habitat use, and movements. We encountered problems with standard trapping techniques related to the forest and climate of southeast Alaska that required us to refine techniques. We used a mist-net set along roadways with a broadcast and decoy to attract screech-owls to our trap site, and a mouse-decoy to entice the owl to stoop into the net. We captured 11 screech-owls after 28 responses to broadcasts during 40 attempts. This resulted in a capture rate of 33 birds per 100 net-hours (b/100nh) across all attempts, and 44 b/100nh after the initial response. We discuss some issues we encountered when using this technique and offer suggestions to make this a useful method to capture small shy owls in locales with thick, moist forest and dense understory.*

## INTRODUCTION

Little information exists describing distribution and abundance of owls in southeast Alaska, leading to concerns about their population statuses (Alaska Department of Fish and Game 2006). The Western Screech-Owl (*Megascops kennicottii*) is a species of special interest because it is closely associated with riparian habitats (Hayward and Garton 1988, Cannings and Angell 2001), is a year-round resident (Cannings and Angell 2001), and has suffered population declines in other locations (COSEWIC 2002, Elliott 2006). Our initial objective was to develop a survey protocol to monitor populations of Western Screech-Owls in southeast Alaska and to gather information on their biology and habitat requirements. During development of the survey protocol, we grew concerned that detections histories of Western Screech-Owls at each survey station were not independent. This would violate a critical assumption of the occupancy estimation techniques we intended to use (MacKenzie et al. 2006). To address this concern, we needed to capture Western Screech-Owls to equip them with radio-transmitters.

Most techniques used to capture small owls start with either knowing the location of a nest area or broadcasting a conspecific call to attract the owl to the trapping location (Bloom et al. 2007). Once the owl is located (either aurally or visually), standard techniques for capturing small owls include: placing a bal-chatri beneath a perched owl (Bub 1995, Smith 1999), luring the owl into a mist net (Smith and Walsh 1981, Reynolds and Linkhart 1984), placing a net over the cavity opening (Reynolds and Linkhart 1984), and grabbing the bird on a perch with a telescoping noose pole (Reynolds and Linkhart 1984).

The coastal, temperate rainforest of southeast Alaska presented problems for trapping Western Screech-Owls that required us to adapt existing techniques. The relatively low volume calls of Western Screech-Owls can be challenging to hear in these dense forests, making it difficult to attract owls, unless broadcasting from close ( $\leq 400$  m) to a nesting area. Unlike many locales where Western Screech-Owls have been studied [e.g., southwestern Idaho] (Ellsworth and Belthoff 1999, Herting and Belthoff 2001), the forests of southeast Alaska are extensive and Western Screech-Owls occur at naturally low numbers, so finding owls to trap and selecting trapping sites requires considerable time and effort. After a Western Screech-Owl is located, the bird may leave the trap vicinity before a trap is set up. The densely vegetated forest floor and complex terrain of decaying logs and tipped-up root wads (Schoen et al. 1988) makes setting up and moving mist nets challenging and difficult to approach an owl stealthily enough to place a bal-chatri trap beneath it without disturbing it. Therefore, we set out to develop a technique that was useful to capture Western Screech-Owls in the dense rainforests of southeast Alaska.

## METHODS

**Study area** - We attempted to capture Western Screech-Owls near three locations in southeast Alaska: Juneau on the mainland ( $58^{\circ}18'N$ ,  $134^{\circ}25'W$ ), Petersburg on Mitkof Island ( $56^{\circ}48'N$ ,  $132^{\circ}56'W$ ), and Sitka on Baranof Island ( $57^{\circ}08'N$ ,  $135^{\circ}27'W$ ). The landscape of southeast Alaska is naturally fragmented by mountainous terrain, wetlands, and forest patches of various sizes. The forests are a coastal, temperate rainforest dominated by western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*), that occur at low elevations as a mosaic with muskegs and other wetlands. A cool and wet maritime climate characterizes the region, with average annual precipitation of 288 cm evenly distributed throughout the year.

**Capture** - We attempted to capture Western Screech-Owls during breeding season when they were defending territories, specifically from 14 Mar to

15 May 2005-2007. We located owls during broadcast surveys being conducted as part of a larger study or by broadcasting in areas we thought would be good screech-owl habitat. In areas with known owl territories, we set up the mist net prior to attracting the owl. In places with suspected but not confirmed territories, we waited to set up the net until after getting a response to avoid spending time setting up and taking down the net at sites with no owl response.

To attract owls to the general trap location, we used the main territorial call of Western Screech-Owls, the bouncing ball [BB] (Feusier 1989, Cannings and Angell 2001). All trapping attempts began at least 30 min after sunset and lasted an average of 50 min (range = 2-150 min). We broadcast the BB call with a handheld megaphone (PA Genie Amplifier APM-760, Fanon Courier, Irvine, CA) and a portable CD player (CD Walkman D-NS505, Sony Electronics Inc., Park Ridge, NJ). At first, we would hold the megaphone in hand, play a series of three segments of calls, and then listen for a response. Each segment consisted of 30 sec of the BB call, followed by 60 sec of silence. If we did not hear an owl after two minutes, we would play the three segments again. After four to six repeats of this sequence and no response from an owl, we put the CD player on repeat of a track that was set up in advance to play a 30 sec segment of BB and 60 sec of silence repeated. We would place the megaphone and CD player on the ground and wait quietly nearby to detect the responding owl as soon as it came into hearing range.

To capture birds, we used a mist net (61-mm mesh, 12-m length, 2.6-m height, four shelves, black nylon; Association of Field Ornithologists) strung between poles (set contains three 1.2-m sections of 2.5-cm diameter aluminum poles) stuck into two 22-liter buckets filled with sand. Most trapping attempts were made on the edge of a roadway or off the road near the forest edge. All trapping occurred on small forest roads with little night traffic (< 1 car per hour), or if along more heavily traveled roads, in pull-outs > 100 m from the road to avoid attracting the owl into the roadway. Once the net was set up,

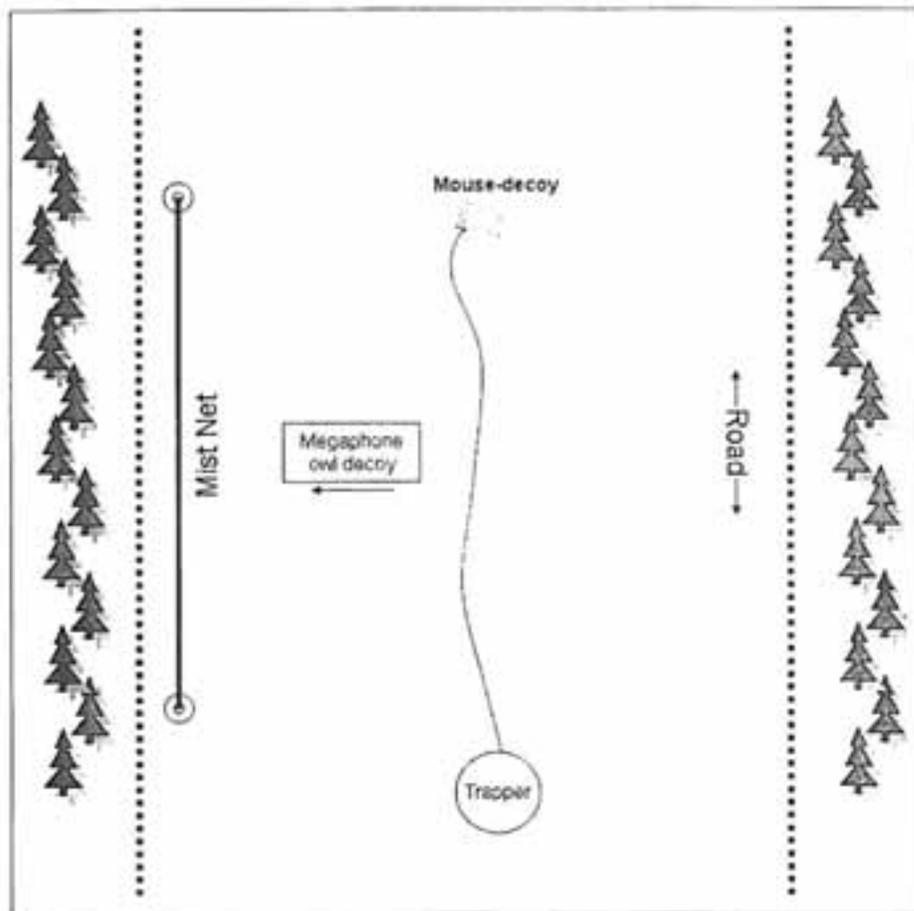


Fig. 1. Schematic drawing of trapping site showing mist-net placement relative to road edge, megaphone, and owl decoy relative to mist-net, and mouse decoy relative to mist-net used to trap Western Screech-Owls in southeast Alaska, 2005-2006.

we placed the megaphone and CD player on or near the ground, centered in the net (Fig. 1). We used a small, stuffed-animal owl decoy on top of the megaphone to draw the attention of the owl.

If the owl did not attempt to stoop the owl-decoy (which was usually the case), we deployed the mouse-decoy. The mouse-decoy consisted of a small (nine cm) cat-toy mouse attached to a long (10-m) piece of dark twine (Evergrip Hanging Twine, Redden Marine Supply, Inc., Bellingham, WA) or a fishing pole with 9 kg (20 lb) test line. We would throw the mouse across the face of the net, parallel to the length of the net (Fig. 1), so that it was 1-2 m behind the net (opposite the net from the forest where the owl was presumably perching). We dragged the mouse-decoy along the road slowly so that it made a scratchy noise in the gravel, much like a small rodent scratching in the dirt. We would drag the mouse-decoy across the face of the net until

it was one to two m away from us, collect it in hand, and throw it again. In most cases, the owl would stop calling once it detected the mouse-decoy and often move to get into a better position to see the mouse. When this happened, we changed the pace of pulling the decoy, letting it sit for a few seconds then pulling it rapidly for 15 – 30 cm before letting it sit again. If the owl did not attempt to stoop the mouse-decoy, we used a small flashlight to illuminate the mouse-decoy as we pulled it along the ground. This almost always elicited a stoop. Typically, we continued broadcasting the conspecific call throughout the trapping event.

Once captured, we removed owls from the nets and placed them in a cotton bird bag for weighing and began processing. We measured wing chord (natural and flat), tail length, bill length, and mass (Pyle 1997). We noted plumage characteristics and prepared molt cards of both primary and secondary

feathers. Each captured owl was banded with a US Fish and Wildlife Service band. We equipped birds with backpack-mounted radio transmitters (Biotrack, Ltd., model # TW-4) using Teflon ribbon. While capturing and handling owls, we followed animal care and use guidelines from the Ornithological Council (Gaunt et al. 1997).

We report captures in several different ways. First, we report them as the number of captures per attempt and captures per owl response. Second, we report capture rate as the number of birds caught per 100 net-hours (b/100nh); a net-hour is defined as one 12-m net under favorable weather conditions during one nighttime hour. Finally, when we got a response from an owl at a site, we labeled that response based on the site. We tallied those responses over the trapping season, counting responses at the same site as from the same owl. We then report the percent of owls we captured as number caught over the number of owls that responded.

## RESULTS

During 31 trapping nights, we made 40 attempts (defined as setting up the net either after a screech-owl response during a survey or at a place with a previous screech-owl response) and had 28

responses (i.e., screech-owls approaching the trapping area in response to our broadcast while trapping; Table 1).

On seven nights we failed to have a response at all. Other nights where we initially failed to get a response, we moved to a new location and were then able to elicit a response. From the 28 responses, Western Screech-Owls stooped the decoy and/or hit the net 21 times, resulting in 11 captures (eight males, three females). Time spent per attempt averaged 50 min (range = 2 – 150 min) overall, but successful attempts (i.e., captures) averaged only 32 min (range = 2 – 102 min). Across all years, we had a capture rate of 33 b/100nh. After the initial response of the target owl occurred, the rate increased to 44 b/100nh, emphasizing the time required to attract the owl to the trap site.

In total, we captured 65% (11 of 17) of the Western Screech-Owls we attempted to capture. In 2005, we captured owls at two locations but missed owls at three other locations (thus caught 40% of owls attempted). Our main objective in 2005 was to conduct owl surveys, not capture owls. We attempted captures as a pilot effort to determine the feasibility of capture and radio tagging Western Screech-Owls in southeast Alaska. In 2006, when capturing Western Screech-Owls was our main

**Table 1. Summary of statistics for Western Screech-Owl trapping conducted in Southeast Alaska, 14 Mar - 15 May, 2005-2007**

Year	Nights	Attempts	Responses	Stoops	Captures	Captures/Attempt <sup>a</sup>	Captures/Response <sup>b</sup>
2005	10	11	6	4	2	0.18	0.33
2006	20	28	21	16	8	0.29	0.38
2007	1	1	1	1	1	1.00	1.00
Total	31	40	28	21	11	0.28	0.39

<sup>a</sup> Attempt defined as setting up the net either after a Western Screech-Owl response during a survey or at a place with a previous screech-owl response.

<sup>b</sup> Trapping response defined as a screech-owl approaching the trapping area in response to our broadcast while trapping.

objective, we captured 73% (8 of 11) of the owls we targeted. At one territory we failed to capture an owl entirely. We tried repeatedly at this location, getting the owl to respond to the broadcast and approach the trap site but could never catch it. At two other locations in 2006, we attempted to capture the mate of a female owl we had captured previously that year.

Both of these birds were very shy, and we exerted relatively little effort trying to capture them, instead focusing on catching owls in unique territories.

## DISCUSSION

Techniques to capture owls have been rather standardized for years (Bub 1995, Bloom et al. 2007). We found a unique set of circumstance in the forest of southeast Alaska that required refining some of the existing techniques. A mouse-decoy has been used to attract Great Gray Owls (*Strix nebulosa*) close enough to capture with a dip-net (R. Nero in Bull 1987). We adapted this technique by using a broadcast and owl-decoy to attract owls in a territorial response, followed by presentation of a mouse-decoy to generate a predatory response. The result was a useful method to capture Western Screech-Owls in southeast Alaska and potentially other locales with thick, moist forest and dense understory. The technique could easily be adapted for other small owls.

One of the most critical considerations was where to place the net. On several occasions, there were opportunities for the owl to perch close to the ground and/or very close to the net, so when the bird dove for the mouse-decoy, it hit the net low and was able to escape. We had a few instances where the owl approached the trap site from the opposite side of the road from which we set the net. This was problematic because the owls were usually very tentative to cross the open road, plus they could reach the decoy without hitting the net. Another problem was setting the net in an area with no vegetation close to it for perching (i.e., only larger trees with lowest branches well above the net top). In this case, the owl approached as close as it could

but seemed reluctant to enter the open space near the net and, therefore, was not captured. By anticipating where the best perch opportunities are for the owl to approach the megaphone and decoy before attracting the owl, the best placement of the net can be achieved (Fig. 1).

It was important to have the mouse-decoy at the right distance (approximately 1.5 m) from the net, so that when the owl stooped at the decoy, it hit the net in the second (or higher) panel; if the mouse-decoy was too far from the net, the bird simply flew over the net to stoop the decoy. We had several attempts foiled when the owl hit the net in the bottom panel but ended up perched on the ground because the net was set such that the owl could not fly beneath the bottom panel. As we approached, it jumped off the ground and was able to clear the netting and escape. The obvious solution was to make sure the bottom panel was high enough that it did not reach the ground, but then there was a risk that the bird would stoop under the net.

We found that a defensive or curious owl usually became silent once the mouse-decoy was presented to it. This appeared to signify a change to predatory behavior and was often accompanied with slight changes in the bird's location evaluated based on noises heard when owl moved perches. On several dark moonless nights, an owl seemed interested in the mouse-decoy, signified by a change from defensive to predatory behavior, but would not stoop the decoy. Once the mouse-decoy was illuminated with a headlamp, the owl stooped almost immediately.

We attempted to trap some owls, such as mates of radio tagged females within their nest stand. We set up the mist net upon locating the owl at a roost. The dense understory in the forest made this difficult and usually resulted in tangled nets. We did not try shorter nets, but these could have helped to avoid excess tangling in thick underbrush. The mouse-decoy usually got tangled in the brush and did not attract the owl's attention. Often, the owl would begin to leave the area before we could get the net set up or seemed shy and disturbed by our presence

and would not approach the trap site. We attempted to put a bal-chatri baited with a live mouse beneath perched owls. The dense understory seemed to conceal the prey enough from the owl that we never had an owl stoop one of these traps. These problems resulted in us spending most of our trapping time along the roadside.

In all cases, we used the BB call to attract the owl to the trap locations. However, in some cases, once the owl arrived, it was silent for several minutes, not attempting to "duel" with the decoy-owl and broadcaster. In those cases, we suspected the responding bird was a female and we changed the call to the "double trill" [DT] (Herting and Belthoff 2001). The BB was usually more of a defensive call and often used by males. The DT seemed to be a communication call between mates (Ritchison et al. 1988, Herting and Belthoff 2001) and often enticed females to fly into the net. In one case where it was light enough to see, we attracted an owl with the BB. We thought it was a female, so we switched the DT call. Soon, this bird began responding very softly in her own DT for several minutes before beginning to stoop high over the decoy, avoiding the net but apparently attempting to alert the decoy-owl to her presence. She eventually hit the net but escaped when we approached to remove her. She left the capture area immediately (or became silent), and we never got another attempt at her.

One caution is to be aware if a larger owl (e.g., Barred Owl [*Strix varia*] or Great Horned Owl [*Bubo virginianus*]) responds to the broadcast of the smaller owl and approaches the capture site. Every time we had a larger owl approach our capture site, any screech-owl that was responding immediately ceased calling and presumably left the area. For this reason, it is important to watch the net closely, without disturbing the target owl, in the event that a larger owl is perched nearby, presumably attracted to the broadcast call. Both Barred Owl and Great Horned Owl are known predators of smaller owls (Houston et al. 1998, Mazur and James 2000).

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