North American Bird Bander

Volume 32 | Issue 3 Article 2

2007

Field Procedures for Netting Bachman's Sparrows

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ABSTRACT

We describe procedures that efficiently net male Bachman's Sparrows during the breeding season. The procedures make use of playback recordings that include an assortment of vocalizations and a portable netting system that can be used by a single person or small groups. The procedures can yield 10 captures per morning (ca. 4 hours of field time) for groups of three and four captures for a single person. If off-road vehicles are available, additional modifications can yield capture rates of ca. 15 males per morning.

INTRODUCTION

Populations of Bachman's Sparrow (*Aimophila aestavalis*) have declined in recent decades in many parts of the species' range (Dunning 1993). Accordingly, Bachman's Sparrows have been designated a *Species of Special Management Concern* by the U.S. Fish and Wildlife Service (Dunning 1993) and have been considered for listing under the federal endangered species act (Dunning 1993). Studies utilizing banding techniques could improve our understanding of the ecology, life history, and management requirements of this declining species (e.g., Cox and Jones 2007), but few such studies exist in part because of the perceived difficulty of netting Bachman's Sparrow (Dunning 1993). Dunning (1993) estimated an average of only 3.5 birds had been banded each year since 1956, while Haggerty (1988) banded <50 adults during an intensive two-year study conducted in Arkansas.

We describe equipment and field procedures that efficiently net large (>100) numbers of male Bachman's Sparrows during the breeding season. Our procedures are based on modifications of (1) procedures described by York et al. (2003) regarding the use of recorded vocalizations to attract targeted species to mist nets, and (2) portable poles and nets described by Castrale and Karr (1981) and Delany et al. (1992). Our methods have been used to provide new information on demography and site fidelity for Bachman's Sparrows (Cox and Jones 2007), and we believe the techniques could help in banding studies of other ground-dwelling sparrows where trees, shrubs, and other vegetation pose problems for other methods (e.g., rope flushing).

METHODS

Net and Pole System - Poles were constructed by cutting 1.3 cm (0.5 in) electrical conduit into 1.2 m (4 ft) lengths (Castrale and Karr 1981). Poles were painted flat black to reduce glare. A base pole was constructed by drilling small holes in the conduit and attaching a metal fence post using mechanical screws (Fig. 1). Fence posts allow the base pole to be set firmly in the ground (Fig. 2) in a manner similar to the step-insertion poles proposed by Delaney et al. (1992), but welding is not needed for our base poles. A set-screw coupler is fastened to the top of the base pole and will be used to hold the top pole (Castrale and Karr 1981).

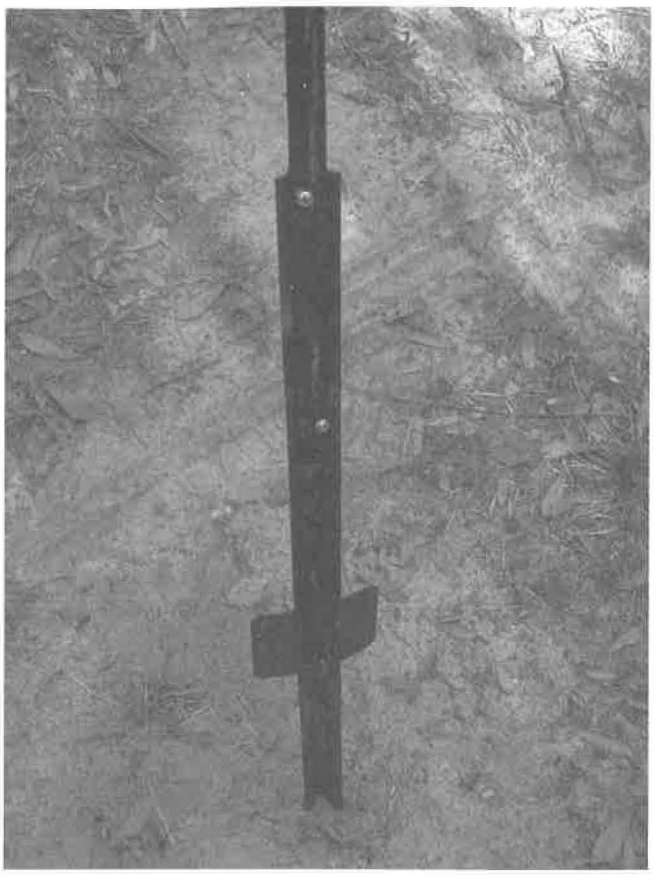

Fig. 1. Base pole showing painted conduit attached to a fence post using mechanical screws.

Fig. 2. The base pole is set while holding top poles and nets in the other hand. Nets are wrapped in plastic grocery bags when transported or stored.

The top trammel line of a 12-m mist net is fixed to tops of two poles using elastic hair bands or tape, and the remaining trammels are free to slide up and down so nets can be deployed/furled easily. We also attach a hair band to the bottom trammel line and wrap this band around the top line when nets are furled to prevent net lines from sliding along poles. We store nets in plastic bags (Blackshaw 1993) and tie bag handles to the top poles (Fig. 2). The top half of each netting system thus forms a single unit held together by plastic bags when nets are transported or stored.

Nets are deployed by placing a base pole in the ground, inserting a top pole into the coupler, and then walking away with the furled net, grocery bag, and poles. Unlike the procedures outlined by Blackshaw (1993) for removing nets from plastic bags, we hold bag and poles in one hand and use the other hand to pull nets gently from the bag while walking. Obviously it is important to maintain tension on the net at this phase to prevent entanglement in vegetation. Once the end of the net is reached, the second base is set in the ground, the hair band is removed so that the net can be opened, the top pole is inserted in the coupler, and the remaining trammel lines are lowered. We then return to the first set of poles, pull the top pole out of the coupler, and lower the trammel lines. We also make slight adjustments to the placement of the poles at this point to achieve proper tension. Unless the net is tangled or falls in the vegetation, setup usually takes one to two minutes.

Playback and Netting Procedures - We use a recording containing the primary and excited songs and aggressive "chitter" notes of Bachman's Sparrows (Dunning 1993). Our recording is available on-line (http://www.talltimbers.org/research/vecobsp.htm) and was developed from recordings collected on our study areas or available on the Internet. In our first year of study, we used a recording that featured just the primary song. Addition of excited songs and aggressive notes elicited more aggressive responses from sparrows and increased capture rates. We have broadcast sparrow vocalizations using cassette and CD players, but an MP3 player with a portable speaker (e.g., Kensington FX 300) is easiest to use in the field.

Netting individuals is similar to the approach described in Delany et al. (1992). We walk through suitable habitat listening for singing males, and once located, we play the recording to assess the individual's aggressiveness. Most males often fly within a few meters, at which point we shut off the playback and begin to set up one to two nets. Many males drop to the ground seeking cover when the playback is halted, and we try to set up nets <15 m from the spot where the bird was last seen. If the male does not respond aggressively toward the playback, we walk further into the individual's territory and play the recording again, or we move to another individual.

When two nets are used, we angle the nets slightly ("V" shape rather than straight line) to improve chances of catching birds flushed from the ground (see below). Once nets are set, we turn the playback device on and set it in the middle of the net array and then walk quickly to the sides of the net (left and right if two people are present). We typically walk about 10 m parallel to the net array before turning back in the direction the bird was last seen and walking until we are behind the bird (i.e., bird is between us and the nets). Some sparrows fly into nets while we are moving into position, but others remain low and counter-sing or utter aggressive chip notes. Once we are behind these less aggressive birds, we walk forward and flush them into nets.

RESULTS AND DISCUSSION

We have netted >450 Bachman's Sparrows using these techniques, and we recently banded 60 individuals during six mornings of work in late August (end of breeding season). These numbers are four to five times the number that Haggerty (1988) banded (<50) in two years of study in Arkansas and the 111 sparrows netted by Krementz and Christie (1999) in >20,000 net hr. "Sparrow herding," where long net lines are set in treeless grasslands and sparrows are flushed by dragging ropes, yield numbers comparable to ours (M. Korosy, pers. comm.), but long ropes are difficult to use in many of the forest settings where Bachman's Sparrows occur (e.g., Fig. 2).

A single person can carry a net, poles, MP3 player, and banding equipment (using a backpack) and can net three individuals in a morning. A three-person netting crew produces the highest catches per day (10+ per morning) because the crew can guide birds into nets and one person can take down nets and start moving toward other singing males while other personnel measure and band birds.

We adapted this system for use with off-road vehicles by fixing base poles to the front and rear of the vehicle's frame (Fig. 3). Two nets are then set up fore and aft of the vehicle and the CD or MP3 player is played on the seat of the vehicle (Fig. 3). This system enables crews to cover very large areas efficiently and can yield captures of 15 males per morning. We do not use off-road vehicles in areas where disturbance of native ground cover is a concern.

Fig. 3. Off-road vehicle with base poles attached to the front frame. Another base pole is attached to the tailgate but is not deployed in this picture. The white object in the seat is a CD player, and the plastic grocery bag used to store nets is wrapped around the front net pole in this picture.

Banding opportunities are limited to the breeding season when males respond most aggressively, but the breeding season for Bachman's Sparrows extends from mid March through late August in our region, with some nesting continuing into September (J. Cox, unpubl. data). Week-long banding efforts conducted in specified areas in March and then again in August (i.e., six months apart) thus could yield estimates of seasonal as well as annual survival rates.

Bachman's Sparrows also respond to playback recordings during winter months (Cox and Jones 2007), but we have not devised a method for netting birds efficiently at this time of year. Individuals scurry quickly on the ground, escape down burrows (Dean and Vickery 2003) and beneath logs, and generally are reluctant to flush. Bachman's Sparrows appear to maintain winter territories (Dean and Vickery 2003, Cox and Jones 2007), and some of the sparrow vocalizations given in winter pre-dawn and at dusk seem distinctive to us. Better recordings of these vocalizations might improve capture rates in winter.

ACKNOWLEDGMENTS

We thank Mr. and Mrs. Jeptha Wade, III, and the Pebble Hill Foundation for allowing us to work on their properties. Funding was provided by the Nongame Wildlife Grants Program of the Florida Fish and Wildlife Conservation Commission and the Power of Flight Bird Conservation Program sponsored by the Southern Company and National Fish and Wildlife Foundation

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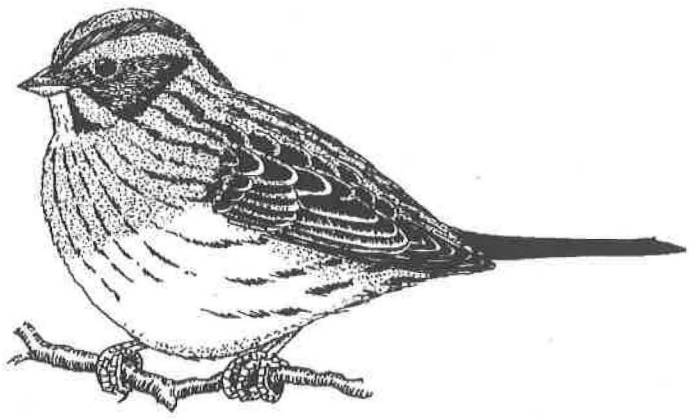

Lincoln's Sparrow
by George West