
An Efficient Method of Capturing Painted Buntings and Other Small Granivorous Passerines

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ABSTRACT

To study survival in the eastern breeding population of the Painted Bunting (*Passerina ciris*), I developed a technique to capture a large sample of buntings for color marking with leg-bands. This involved the use of bird feeders and an array of three short mist nets located at 40 sites in four states, each site meeting five specific criteria. In five years of mist netting (1999-2003), 4174 captures (including recaptures) of Painted Buntings were made in 3393 net-hours or 123 captures per 100 net-hours. The technique proved to be effective and efficient, and may have broad application for capturing large numbers of small granivorous passerines.

INTRODUCTION

The North American Breeding Bird Survey (BBS) data from 1966-1999 showed a declining trend in the population of Painted Bunting (*Passerina ciris*) of 2.9% per year (Robbins et al. 1986, Robbins et al. 1989, Sauer and Droege 1992, Lowther et al. 1999, Pardieck and Sauer 2000). Partners in Flight lists the bunting under "Species of continental importance for U.S. and Canada," moderately abundant or widespread with declines or high threats (Rich et al. 2004). The eastern population (Thompson 1991, Sykes and Holzman 2005) is ranked highly by the states of Florida, Georgia, North Carolina, and South Carolina (4.29/5.00-Species At Risk) and in need of attention (Hunter et al. 1993). A number of studies of the eastern population have been undertaken in the last eight years to address problems contributing to declining

populations, among them research on annual survival of the eastern population (Sykes unpublished data). As part of this research, captures of large numbers of buntings are necessary for subsequent study. I developed a methodology to achieve this goal, which is herein described.

METHODS

Painted Buntings are attracted to bird feeders provisioned with white proso millet (*Panicum vergi*) creating a focal point where birds can be trapped. Twenty study areas were selected randomly within the breeding range of the eastern population, five each in Florida, Georgia, South Carolina, and North Carolina. Within each study area, two sites were selected; thus there were 40 sites, ten per state. For practical reasons, each study site had to meet the following five criteria:

- (1) had a high density of buntings present,
- (2) feasibility of capturing buntings at the site was reasonably good,
- (3) site was at a relatively secure location,
- (4) site was available for six or more years, and
- (5) cooperator(s) were willing to maintain the feeder(s) for 3-6 months each year for the period of the study at each site.

Each site was visited once annually for six hours, generally 0630 to 1230 EDT between late June through September. This time period was chosen so that all age classes would be included in the sample. Sites were worked starting in Florida and going to North Carolina. In an effort to reduce the time bias, each year I alternated starting with odd or even numbered sites. Thus, each year I worked half the sites and then returned to Florida and worked the remaining half. Buntings were banded immediately, aged, sexed, measured and released on site. Captured birds were banded uniquely with

three color plastic leg bands and one numbered U.S. Geological Survey band, two bands per leg.

Three types of bird feeders were used over the course of the study and are shown in Fig. 1. The smaller feeder was used only the first year as it did not exclude non-target animals (i.e., raccoons [*Procyon lotor*], eastern gray squirrels [*Sciurus carolinensis*], Blue Jays [*Cyanocitta cristata*], Northern Cardinals [*Cardinalis cardinalis*], Red-winged Blackbirds [*Agelaius phoeniceus*], Common Grackles [*Quiscalus quiscula*], Boat-tailed Grackles [*Quiscalus major*], and Brown-headed Cowbirds [*Molothrus ater*]. In some cases Painted Buntings were kept from feeders for extended periods because of dominant species.

The two larger feeders have a green vinyl-coated 3.8x3.8 cm welded-wire mesh cylinder that

excludes non-target species mentioned above, except for female Brown-headed Cowbirds. The larger feeder, with a hopper at the top, will hold 11 liters of feed (Fig. 1). At several study sites, two feeders were placed side by side to accommodate the large number of birds and reduce the effect of the more aggressive territorial males.

At each study site, feeders were mounted at the top of either 1.3 or 1.9 cm threaded pipe driven into the ground 0.3-0.5 m. A half bag of concrete mix was poured as a collar around the pipe to prevent the feeder from wobbling in the sandy soil of the Atlantic Coastal Plain. The bottoms of feeders were 1.2-1.5 m above ground. Feeders were attached to pipes by threaded flanges or nipples and couplings screwed into threaded fitting on the underside of feeders.



Fig. 1. Three types of feeders used in course of the annual survival study of the eastern population of the Painted Bunting: left to right: Model 3416 Gazebo, Rubbermaid (Wooster, OH); Model 1880 Selective, Duncraft (Concord, NH); and Model Avian 1, Vari-Crafts (Landing, NJ). The use of commercial products listed above does not constitute endorsement.

Feeders were placed and provisioned with seed from late March to mid-April, each feeder being maintained thereafter by a cooperator for the duration of the field season. Having the feeders in place several weeks or longer (feeders were kept full permanently on some cooperators' properties) prior to trapping enabled more birds to find and become accustomed to visiting them regularly during the day. Mornings were used for trapping because of cooler temperatures (less stress on the birds in nets or holding bags) and less wind blowing the nets during the first 3-4 hr.

Three short mist nets were used to form a triangular array (Fig. 2) around a bird feeder. Two 6-m long nets (commonly referred to as half-nets) and one 3-m long net were used. These nets were four-panel black nylon with 32- or 36-mm mesh. The bottom trammel line of each net was placed on the ground, after the ground surface had been cleared of debris and vegetation. The 3-m net was made by cutting a 6-m net in half and attaching loops to the cut ends of the five trammels and threading a piece of trammel line through the cut ends of each panel and tying it to each of the horizontal trammel lines at the loops. Short (3- and 6-m) nets were used so that the array could be set up with minimum cleaning of vegetation and be placed in tight quar-

ters. This net array essentially enclosed the feeder (a triangular box-like trap without a top).

The triangular-shaped net array was designed to be put in place quickly (10-15 min) and removed (5-10 min) by one person. The net array was placed so the opening at one corner of the triangle was facing the direction from which the net setup was to be approached (Fig. 2). Net poles were 3.3 m lengths of 1.3 cm galvanized thin-walled electrical conduit placed over a 1.5 m length of 1.3 cm diameter rebar driven in the ground. The seven pieces of rebar were driven in the ground in the desired pattern and final adjustments made when nets were put in place. Nets were attached by their loops to the poles, and stretched tightly. Net 1 was placed in a straight line, while Net 2 was laid out to form the "triangle," being stretched around the outside of a pole at the middle, this pole being about a meter opposite the feeder (Fig. 2). Net 2 was not attached to the middle pole but remained in place against this pole so long as it remained taut. Net 3 kept birds from escaping through the gaps at the ends of nets 1 and 2. Rebar driven in the ground held the poles in place without having to be guyed in the sandy soils for a relatively short period in use at each site.

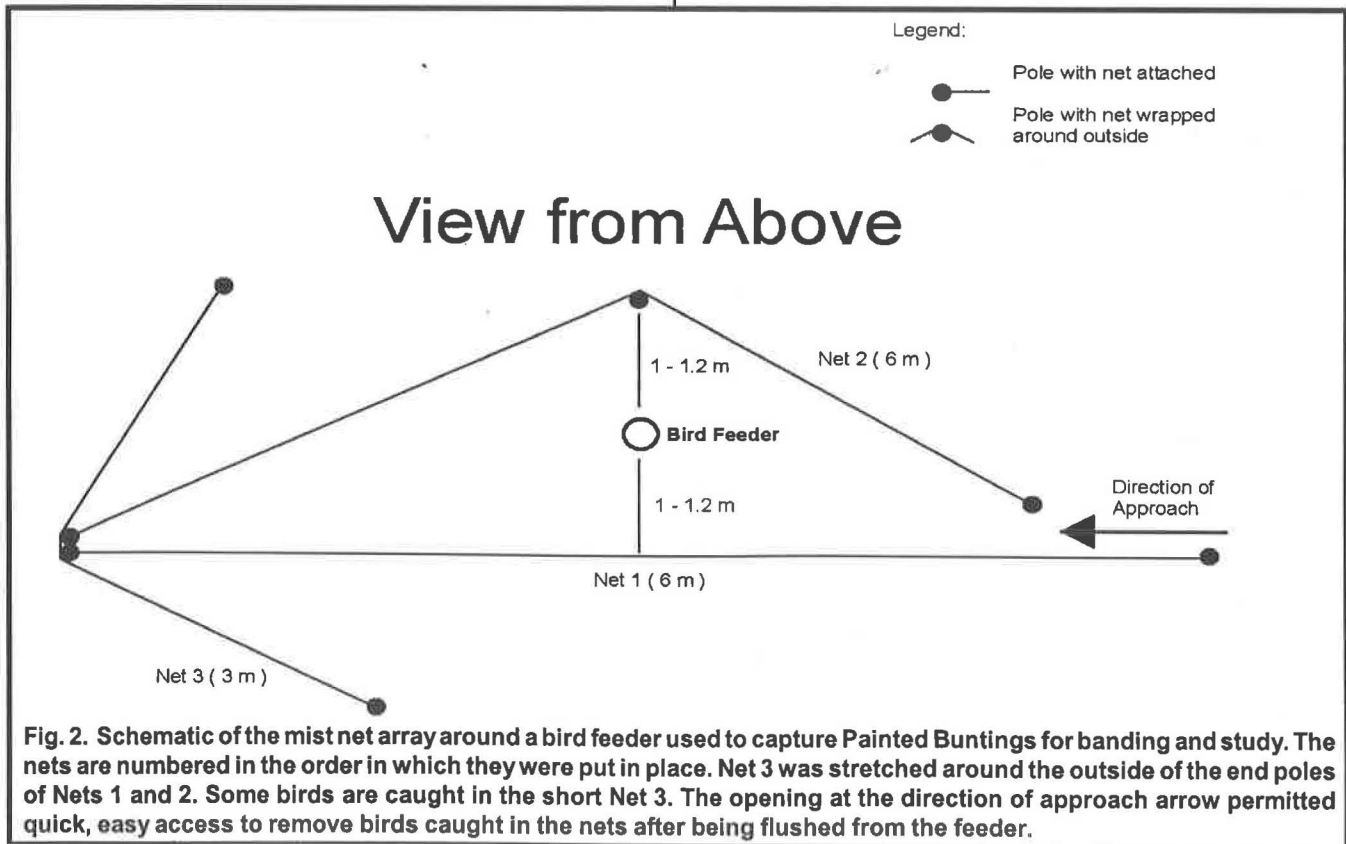


Fig. 2. Schematic of the mist net array around a bird feeder used to capture Painted Buntings for banding and study. The nets are numbered in the order in which they were put in place. Net 3 was stretched around the outside of the end poles of Nets 1 and 2. Some birds are caught in the short Net 3. The opening at the direction of approach arrow permitted quick, easy access to remove birds caught in the nets after being flushed from the feeder.

To reach the feeder, birds had to fly over the top of the net, which was 0.5 to 1.0 m above the top of the feeder, or drop down into the feeder from an overhanging tree branch. Occasionally a bird, not realizing the net was in place, flew directly into the net trying to reach the feeder. Painted Buntings tended to drop onto the feeder from above when possible, so branches overhanging the net and/or feeder are ideal. Where no branches overhung the net, a branch was cut and attached to top of one of the net poles or an additional pole was used to create the overhang.

Nets were opened prior to sunrise and monitored continually for six hours. When a bird or birds landed on the feeder, someone immediately rushed the feeder and clapped their hands flushing the bird(s) into the net. The key to this technique is rushing the feeder and making noise to scare birds into the nets, otherwise the buntings, if left alone, generally flew over the top of the nets when leaving the feeder. Birds were removed immediately from the net and placed in cloth bags with a draw-string and hung on a small rack at the field work table in the shade where they were banded and data recorded prior to release.

Table 1. Captures of eastern Painted Buntings at 40 study sites during the breeding seasons 1999-2003 in four southeastern states ¹.

State	Number of Captures					Total
	1999	2000	2001	2002	2003	
NC	101	158	157	176	198	790
SC	67	167	149	178	150	711
GA	255	326	357	406	449	1793
FL	163	165	192	144	216	880
TOTAL	586	816	855	904	1013	4174

¹ Totals include new bandings for the given year, recaptures from previous years, and foreign retraps (from this and three other studies in the region) but not individuals recaptured multiple times on the same day.

RESULTS

A total of 4174 captures were made at 40 study sites across the four-state breeding range of the eastern population of the Painted Bunting (Table 1).

Adjustments of technique after the first year increased capture efficiency 60-100%. The total number of captures in Georgia was over twice as high as in the other three states and accounted for about 43% of all captures. Total net hours (using two 6-m and one 3-m net) for five years was 3393; this is a capture rate of 123 buntings/100nh or 1.23b/100nh. Some buntings were estimated to come from over 3 km to visit the feeders, based on territory sizes (Lowther et al. 1999) and the number of birds involved.

Rushing the feeder to scare buntings into the nets was successful in capturing birds 90-95% of the time. Few non-target species were captured using this trapping method.

DISCUSSION

Each feeder acted as a focal point so that large numbers could be trapped easily for banding. The immediate area around a feeder appeared to serve as a communal feeding site irrespective of individual breeding territories. Eighty birds were caught in one 6-hr period during a morning at Blackbeard Island Natl. Wildl. Refuge, McIntosh County, GA, using this technique. Individuals are drawn from different habitats to the feeders.

This technique to capture Painted Buntings proved effective and surpassed expectations. This methodology may have broad applications for studies requiring the capturing of large numbers of small- to medium-sized granivorous passerines. This system proved highly efficient at a relatively low cost.

No data analysis of capture rates, survival, longevity, etc. are included; such will be presented in depth in several papers on the results of the study, which is ongoing to observe marked individuals returning (no banding was done after 2003). The intent of this paper is simply to describe the technique used to capture Painted Buntings. The study was not designed to treat habitat usage.

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Predation of Mist Net Birds and an Investigation of a Solution

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ABSTRACT

Predation of birds in mist nets can become a problem during banding efforts, especially at long-term, year-round, banding stations. The San Francisco Bay Bird Observatory started patrolling net lanes between net runs to deter grey fox (*Urocyon cinereoargenteus*) and house cats (*Felis catus*) from taking birds captured in the nets. We compared two years of capture data pre-predator patrol with two years of data during predator patrol to investigate the effect of an increased human presence on the capture rates at the banding station. We used four resident species: Bushtit (*Psaltriparus minimus*), Chestnut-backed Chickadee (*Poecile rufescens*), Common Yellowthroat (*Geothlypis trichas*), and Song Sparrow (*Melospiza melodia*) because resident species should better demonstrate potential year-round effect from predator patrolling should they occur. There was no significant difference found in the capture rates pre- and during predator patrol for these four species. Also, no change was observed in the long-term nine-year trend in capture rates for the four species after predator patrol was initiated. Our results suggest that an increased human presence at net lanes may be useful in deterring predators at banding stations, while not affecting capture rates at the nets.

INTRODUCTION

Mist nets are a tool commonly used in ornithological research (Low 1957; Keyes and Grue 1982; Ralph et al. 1993). Literature on the survival rate of birds in mist nets estimate mortality rates at less than 1% (Low 1957; Keyes and Grue 1982; Ralph et al. 1993). Although mortality rates are low, any reduction in this rate would be an improvement as guided by the North American Banding Council (2001:3, 44-45). Humans cause a majority of the mortalities through banding injuries (Keyes and Grue 1982), but other causes include extensive entanglement (Keyes and Grue 1982) and predation during capture (Freer 1973; Barclay 1977; Allen 1978).

The San Francisco Bay Bird Observatory (SFBBO) runs a long-term banding station where predation by grey fox (*Urocyon cinereoargenteus*) and house cats (*Felis catus*) became a problem in the winter of 2001, when it became evident that predators learned the mist nets provided an easy meal. In January 2002, we closed all nets for a three-month period while we considered potential solutions to stop the predations. For about a month leading up to January 2002, there was an average of one bird/wk being taken in the nets, which the banders at the time considered to be unacceptable. Our solution was to have banders patrol the nets between net runs to deter the predators. Discussions with other bird observatories led us to believe that increased activity at the mist nets could cause a change in capture rates, but we decided that the safety of the birds took precedence.