

**Performance report for South Carolina Project T-55-R-1,
CFDA 15-634, project titled, "Using Citizen Science in the
Study and Conservation of Breeding Painted Buntings"**

South Carolina Department of Natural Resources



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Introduction

The Painted Bunting (PABU) is one of the most colorful birds in the United States. As such, many males were captured and kept as pets during the 1800's and into the early 1900's. Birds were often shipped to the Northeast where they fetched a respectable price for the seller. That practice ceased in the U.S. after the passage of the Migratory Bird Treaty Act in 1918, but the practice continues in Cuba and Mexico. Many thousands of males are caught and exported from Mexico, annually, to supply the "caged bird" industry abroad. There are really no accurate data on how many birds are captured, and thus, no idea of what impact this has on the population. And this holds for the Cuba situation as well.

Very few studies have been conducted on the breeding biology and habitat associations of this species. The co-PI's of this project have been involved in related PABU projects that have looked at: 1) southeast population estimates; 2) breeding success in agricultural fields near Manning, SC; and 3) habitat use in and near the Santee NWR. We began this current project to take advantage of the PABU affinity for bird feeders, and tolerance of an urban/suburban landscape; and that the species holds a high charisma for many homeowners who feed birds. We began a pilot project in 2006, enticing a few "trial" volunteers in the Wilmington area to allow us to band birds in their yards, and then watch those birds and submit data. The idea quickly spread, and this is the genesis of the Painted Bunting Observer Team, or PBOT. To more fully see what we are about, you can visit: www.paintedbuntings.org. Funding for this contract period was matched and augmented with funds from the USFWS, UNCW, and the NC Museum of Natural Sciences.

Study species

Adult males in their third year of life sport rich blue heads, green backs, and red underparts (see cover page). Females are a soft olive-gray, with yellowish underparts (Fig. 4). Young males in their second year are green like the females, although often a richer green, and the yellow underneath is more saturated. They often exhibit some blue feathers in the head and/or neck region (Fig. 5).

The Painted Bunting breeds in both the southeast and southwest regions of the U.S., and into Mexico. U.S. breeders migrate to Mexico and northern Central America. The species also winters on islands in the Caribbean basin. Recently biochemical and plumage analyses indicate that there are two populations, generally east/west, that should be treated as distinct species.

The southeast population is estimated to contain ~150,000 adult birds. Breeding Bird Survey data indicate a decline from the mid 1960's into the mid 1990's. After that the population appeared to stabilize, and even increase slightly, until the present. The reasons for the apparent decline and subsequent trends are not fully

understood. We presume that land use changes along the eastern seaboard had much to do with these.

The PABU prefers “Shrub-scrub” habitat, which is early successional. The species also breeds within mature Maritime Forest, where the more open canopy allows for an understory that mimics, or is, early successional. In South Carolina and Georgia, the species also breeds at inland sites along the edges of agricultural fields, fallow fields, and regenerating industrial pinelands.

Study area

Our work began in North Carolina and quickly spread to South Carolina. As word spread of our project efforts, including our Web presence, we began to receive reports from Georgia and Florida, which we incorporated into a “southeast” platform. We also began receiving extralimital reports of birds from a variety of eastern and Midwestern states – these being birds out-of-range or out of season, usually both at the same time. We have become a hub of Painted Bunting sightings in the East. The current subcontracted efforts focused on work in South Carolina, with additional efforts in NC.

Methods

We chose to band Painted Buntings at 45 sites across NC/SC. We chose 15 in NC, 15 in coastal SC, and 15 in the “interior” of SC. These were a mix of private and public sites. We conducted 3 banding sessions at each site/year, for a total of 135 sessions/year. One session each was conducted during a 6-week time period between May 1 – September 15 (May 1-June 15; June 16-July 31; August 1-Sept 15). Each session lasted ~5 hours, lasting from ~0600-1100, or 1400-1900 hours. We used cage traps (see Fig. 1) with feeders inside, to lure birds. Traps were monitored continuously, and birds removed for processing very promptly. Birds are held in cloth bags until they are banded, measured, and released. We band buntings at both public and private homeowner locations. When possible we had the homeowners attend sessions and help us, which gave them hands-on experiences, and of course, more in depth knowledge and understanding of the process.

Each bird received an aluminum, uniquely-numbered, federal band, and each bird was fitted with a unique combination of three plastic color bands (Fig. 2). This allowed us or other observers to re-sight and track individuals without having to always recapture them.

Sex of individual birds was determined by plumage characters, and the presence of a brood patch or cloacal protuberance (Fig. 2 and 3). Breeding condition was noted by the various stages of a brood patch (partially vascularized, fully vascularized, or feathers re-growing) or the cloacal protuberance (small, medium, or large). Age

was classified as follows: Hatching Year (HY – birds that hatched/were raised on site), based on plumage characteristics and by incomplete skull ossification; Second Year (SY – birds that are one year old, thus beginning their second year of life; see Fig. 5); After Hatching Year (AHY; there are cases where we cannot assign a more definitive age), based on breeding condition, plumage, and complete skull ossification; and After Second Year (ASY – these are the adult males with the gaudy colors; and females with telltale tail feathers).

Internet-based reporting/public outreach –

The project has a primary component of volunteer, or “citizen scientists”, involvement. Volunteers were recruited via targeted workshops at local bird stores; short newspaper articles; word of mouth; and our website. Our primary method of communicating with our volunteer base was, and remains, our website. We hired a person to work part-time as a “website coordinator”. This person posted regular blogs, reviewed reports, forwarded technical inquiries to the co-PI’s, reviewed/posted images sent to us, and answered many email inquiries.

Volunteers submitted reports of bunting sightings at their feeders via our website. Volunteers could send in data in 3 formats: 1) basic, which was simply a report of a bird; 2) a report of a color-banded bird, with some additional metadata (e.g. time, date, age/sex); 3) a detailed report of a timed observation period; e.g. max number of birds in a 15 minute period; ages/sexes of birds in a given period, etc.

We helped produce a number of articles for newspapers and magazines – 4-5 in the past 2 years.

The PBOT program is a “permanent” feature in the new wing of the NC Museum of Natural Sciences Nature Research Center. This 80,000 state-of-the-art new building opened on April 20, 2012. One of the exhibit areas is on Citizen Science, and the PBOT program is a feature of this exhibit area.

We have provided some nice educational events at a few locations, e.g. Kiawah Island and Huntington Beach State Park (see Fig. 7).

Results**Banding efforts:**

After the 2010 season, several of our regular bird banders resigned, due to a variety of other work/family obligations. We had to train several new folks, and adjust our banding schedules a bit.

Year 2011

In South Carolina, we banded a total of: 733 birds.

Age	AHY	HY	SY	ASY	Unk	TOTAL
Female	8	n/a	101	133	2	244
Male	0	n/a	173	131	0	304
Unknown	13	155	17	0	0	185

In North Carolina, we banded: 238

Age	AHY	HY	SY	ASY	Unk	TOTAL
Female	4	n/a	36	60	1	101
Male	0	n/a	43	48	0	91
Unknown	1	45	0	0	0	46

Year: 2012

SC Total Banded: 646

Age	AHY	HY	SY	ASY	Unk	TOTAL
Female	18	n/a	71	101	20	210
Male	5	8	161	95	0	269
Unknown	15	122	14	0	16	167

NC Total banded: 223

Age	AHY	HY	SY	ASY	Unk	TOTAL
Female	1	n/a	16	62	1	80
Male	0	n/a	39	32	0	71
Unknown	0	68	4	0	0	72

Website

Emails received by state -

Oct 1, 2010-Sept 30, 2011

Incoming emails from NC/SC are labeled as “Carolinas”, so the coordinator had to estimate numbers for each of NC/SC, which she could do fairly well.

NC: ~70, SC: ~200, FL: 306, Other: 100

Oct 1, 2011-Sept 20, 2012

NC: ~30; SC: ~125; FL: 152; other: 44

Emailed reports of banded birds, by state, for each period –

NC: 4/7; SC: 5/5, FL: 8/10.

Re-sightings from distant locations – some examples received via our website, including banded and unbanded birds:

- A bird banded on 6/14/2010 at a home in St. Mathews, Calhoun Co. SC, was re-sighted on 1/22/2011 at a feeder in Vero Beach FL.
- Others in past years banded at Folly Beach, SC and Megget, SC were re-sighted at feeders in St. Cloud, FL and Port St. Lucie, FL.
- A “greenie” (female/young male) was detected on the Christmas Bird Count in St. Matthews, SC, in 2012.
- Two pairs appeared in Buxton, NC, on New Year’s Day and stayed through the following spring.
- A greenie (possibly an older female, due to reddish breast) was found near Southport, NC, on Jan 18th.
- A male was reported from Morehead City, NC, on Jan 23rd.
- A male was spotted (and photographed in the snow) in New Jersey in Jan 22 through Feb 11.
- A pair was found in Chesapeake, VA on Feb 6th.
- All of these winter reports are somewhat unusual for the species, as they typically migrate to the tropics for the non-breeding season.
- Reports of early leaving, but late arriving, PABU during the fall 2011 migration.

- A male (and maybe a greenie?) in Rhode Island on April 30th.

Sight reports, via the website – these are reports from the observer/volunteers who agree to watch birds at their feeders. Most of these are unbanded birds. These are the data which may come in at any of the 3 levels described earlier. Breeding season reports are from NC/SC; the others almost entirely from Florida.

Oct 1, 2010-Sept 30, 2011

Winter season (Sept 30-April 14): **14694**

Breeding season (April 15-Sept 30): **5530**

Oct 1, 2011-Sept 20, 2012

Winter season (Sept 21-April 14): **9256**

Breeding season (April 15-Sept 20): **5225**

Number of website blogs and blog comments

Oct 1, 2010-Sept 20, 2011:

12 News blogs, 11 Intern blogs (edited by coordinator)

Communications to and from volunteers: 214 (coordinator replied 153 times)

Oct 1, 2011-Sept 20, 2012:

12 News blogs, 2 Intern blogs

Communications to and from volunteers : 197 (coordinator replied 36 times – at this point, we had encouraged our volunteers/friends to take over and chat amongst themselves in the comments section, so the coordinator did not have to answer every comment – we felt that many did not need her involvement.)

Number of photos posted to Flickr

Oct 1, 2010-Sept 20, 2011: **1127**

Oct 1, 2011-Sept 20, 2012: **449**

Recruitment – we have over 600 registered volunteers on the site, although generally only about 200 are active at any one time. However, more than sheer numbers is the result that we have received some very good observational data, from 30,000+ reports, along with access to over 30 private homesites at which we conducted banding operations.

Conclusions

Our efforts have been extremely successful at getting many in the general public to participate in this project. As with all such endeavors, we have some volunteers who spend more time than we do, “studying” and recording observations of “their” Painted buntings. Many homeowners graciously allowed us access to their homes, properties, and time, with some hosting our banders overnight. One woman in particular, near Manning, SC, also donated the use of her guest house for two full breeding seasons while we conducted additional studies of bunting nesting biology at a nearby property. She also provided some food for our tech, and was also helpful during our separately-funded CP-33 project.

The PBOT project will continue in some form. We currently do not have additional funds and thus we will proceed in reduced fashion, but proceed we shall.

We began to solicit, and receive, donations via the webpage.

We have also generated interested from the public and agency folks in Georgia and Florida, and were recently contacted by PABU researchers in the mid-west about collaborating on a migration/movement study using Geolocators.

In sum, our web presence has been hugely successful at garnering volunteer help to acquire more data on buntings at feeders, and at creating relationships that gave us access to sites for banding, housing, and camaraderie.

One of our goals is to finish editing/proofing all the data, and then producing publications, both peer-reviewed and for popular outlets. However, there are some general “conclusions” we can state now. In addition, we can draw some inferences now from our experiences in the field and just entering the data.

Survivorship/Age – we have found many instances of birds surviving 5-7 years, and another cohort 8-9. This is similar to anecdotal data from one other long term

PABU banding effort. Thus, we think it's safe to say that these birds live, on average, 5-6 years. We have not looked at gender-specific survivorship yet.

Philopatry (Site fidelity) – similar to other studies, we recaptured many birds year after year from the same location. Again, we have not analyzed gender-specific results yet. We received a few reports of non-breeding birds returning to feeders in south Florida. Although we have only a few such reports, it's another fascinating tidbit into the lives of these birds.

Productivity – see the attached report for more information.

Cowbirds – we did not detect what we felt was an over-abundance of cowbirds, either at feeders or in the agricultural areas. But, our data are anecdotal, as we did not focus our efforts on cowbird detections.

Habitat preferences – for this project, what we have found is that the birds seem to survive well enough in an urban landscape. However, we only have the banding and re-sighting data – we do not have focal nest “success” data. Not surprisingly, PABU were more abundant in urban yards with more shrubbery/second growth.

Management – we feel we could generate a “PABU urban habitat” document to encourage homeowners to do landscaping with buntings in mind. We feel we have enough information on both the birds, and native plants/soils, to generate a solid list of recommendations and ways to achieve a “bunting-friendly yard”. That is another project, for which we will have to seek funding.

Additional comments

Two of our busiest banding sites are called Botany Bay and the Murphy property. Botany Bay is owned/managed by the SC DNR. For example, when banding at either site, our crews report capturing 70-90 birds per 5-hour session. That is a LOT of birds in a short amount of time, and in one area. Tom Murphy was an employee of SC DNR and has been a supporter of our efforts for years. He has consistently invited us to do more work on his property. We feel that doing more focal work on home ranges and habitat use during the breeding season, at both his and the Botany Bay sites, would provide some very interesting and useful data.

Figure 1. A field tech is removing a captured bird from the cage trap.



Figure 2. This male shows an enlarged cloacal protuberance; and an array of color bands.



Figure 3. Brood patch of adult breeding female bunting. The wrinkled skin indicates she is in the incubation stage.



Figure 4. Adult female Painted Bunting, taken by a PBOT volunteer.



Figure 5. A Second-Year (SY) male. Such individuals often show blue feathers in the head/neck region, like this bird does.



Figure 6. Feeder in Florida, but typical of many homeowner locations in SC and GA.



Figure 7. Field technician/bander Sarah Green explains the art and science of bird banding, and Painted Buntings, to a visiting school group at Huntington Beach State Park.

