

Play-back Surveys for Monitoring Bachman's Sparrow and Brown-headed Nuthatch

Adapted from the Painted Bunting Survey protocols
by

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Birds associated with longleaf pine forests of the southeastern U.S. have undergone widespread population declines in recent decades. Bachman's Sparrow and Brown-headed Nuthatch are among this group of declining species, and concern for both species runs high because of the rate of the declines documented as well as the importance of both species in southern pine forests. Bachman's Sparrows nest and forage on the ground and are intimately linked to areas with diverse, healthy ground cover conditions maintained by frequent use of prescribed fire. Brown-headed Nuthatches are a primary cavity-nesting species that excavates cavities that are used by several other species (e.g., Eastern Bluebird, Tufted Titmouse, and Carolina Chickadee).

Monitoring procedures are described here that can help land managers assess the presence and distribution of Bachman's Sparrows and Brown-headed Nuthatches. Breeding season point counts are an excellent method for collecting this type of information for both species (as well as many others); however, some land managers who lack the skills needed to identify all breeding birds have expressed interest in conducting species-specific surveys for sparrows and nuthatches. The procedures outlined here were developed to fill this need and were based on Florida's range-wide Painted Bunting point-count survey ([linked here](#)).

The information collected in these surveys is simple presence/absence at locations that are sampled at least three times during the breeding season. Standardized playback vocalizations (which are provided on-line) are used to increase detection of individuals. Presence/absence is strongly correlated with abundance for many species, and the data collected in these surveys can be analyzed using Program [MARK](#) and Program [PRESENCE](#), which are designed specifically to handle presence/absence data. The data also can provide information on presence/absence, distribution, habitat associations, and trends that can help to support management decisions.

Seasonality and Timing: Bachman's Sparrow surveys should take place during the breeding season (Apr 15 – June 30) when territories are most actively defended. Nuthatch surveys should be performed prior to (Jan-Feb) or just after nesting season (Jul-Dec) because adults often are more focused on providing food to young rather than defending territories during this time period. Efforts should be made to complete surveys within a 4-week time frame. However, if coverage of a very large area is the goal and

personnel resources are limited, surveys conducted over 3 month period can be undertaken. The goal of such surveys should be to determine a general distribution of these species within the managed area and then be used to develop more specific surveys for future efforts. Ideally, the same person should complete all surveys, but the playback methods ensure individuals can be detected adequately by people who know the calls and vocalizations of these species but have a broader range of identification capabilities when it comes to other species. Samples collected for each point within a given year should be ≥ 3 days apart.

Repetition: Detection of both species is high when recorded vocalizations are used. Work on Tall Timbers suggests an observer with limited experience has $\approx 95\%$ chances of observing Bachman's Sparrow (when they are present) if they make at least 2 visits to a sample site and use playback vocalizations. Chances of observing Brown-headed Nuthatch detection probabilities are $\approx 90\%$ when 3 visits are used (and hence the rationale for 3 visits). The lower detection probabilities observed for Brown-headed Nuthatches probably relate to the larger territories (10-20 acres) they typically maintain in comparison to sparrows (3-10 acres). Variation in these percentages may exist based on habitat and geographic variation, but data need to be collected before site-specific detection rates can be determined with confidence and adjustments recommended.

If neither species is detected for 2 consecutive years, a less intensive sampling regime (i.e., every other year, or once every 3-4 years) can be used to document recolonization (should it occur).

Required Equipment: vehicle, map of survey points (or GPS unit), binoculars, playback device (tape, CD, or mp3 player), external speaker or car CD or MP3 player, write-in-the-rain paper, and pencil.

Field Procedures:

A. Route Creation:

A survey route should be established to cover as much potential breeding habitat (e.g., sandhill, flatwoods, scrubby flatwoods, and prairies; see descriptions below) as time and energies allow. Sparrows are not likely to occur in planted pines with dense overstories, unburned pine flatwoods with heavy palmetto cover, hardwood hammocks, etc. Nuthatches sometimes do well in heavy palmetto cover but are not likely to be found in areas with low snag resources or pine basal area ($< 20 \text{ ft}^2$ per acre). The procedures are intended for monitoring both species; however a focus either on nuthatches or sparrows would be appropriate in some settings. To this end, separate digital sound files are provided for sparrows and nuthatches for use in areas where surveys for a single species are contemplated.

Sampling stations should be >250 meters apart. On large managed areas, the stations may be distributed along narrow roads, horse and ATV trails, and other paths that can be traversed suitable habitat and can be efficiently sampled using a motorized vehicle. On smaller managed areas, the sampling points might be placed along foot paths or directly in the middle of a small patch of suitable habitat. Both species are common along narrow roads and paths, and the data collected are being used to assess distributional trends and status and fall toward the “extensive” side of the intensive-to-extensive spectrum. The surveys will quickly help land managers assess the relative commonness/rarity of the two birds. Follow-up analyses may suggest more intensive follow-up work will be needed on areas where suitable habitat appears to exist but one of the species is not recorded in large numbers. More intensive work also could be suggested if 10-years of sampling suggested a strongly declining trend. However, the purpose here is to develop data that improve understanding of the status and distribution without placing undue burden on staff commitments. Managers will end up knowing not simply whether or not either bird occurs on their site, but also the relative rarity/commonness and distribution.

The total number of sample stations to be sampled each year will depend on time and staff availability. Surveys can be expanded once preliminary data are available, but it’s important to start with a comfortable level of commitment and scale-up as time allows and as the data collected dictate. Approximately 50 stations could be visited in a single morning, but the maximum sampled in a single day should be ≤ 30 to avoid fatigue. A total of 30-50 stations should adequately cover parcels with up to 10,000 acres of potential habitat (the average distance between sampling stations would be approximately 1000 m if 50 stations were evenly distributed throughout such an area). Managed areas that contain <2,500 acres of suitable habitat should adjust numbers downward, while coverage of very large managed areas may best be accomplished by placing sampling stations in as many distinctive management units (such as timber stands) as possible. Don’t hesitate to discuss your plans with before initiating surveys (jim@ttrs.org).

Each station should be given a unique ID# with coordinates recorded in a GPS unit. Stations should also be flagged to help locate stops during the survey, and a more permanent marker (metal post; metal tag on tree or fence post; etc.) should be placed at the station eventually.

Record the habitat type at each point count station using the Survey Location Description form, which should be completed annually for each survey station. In most instances, only the requested information on recent burn history will need to be updated on this form annually. Eventually, I all forms will be moved to a web-based mapping application that can be

filled out conveniently on-line (or perhaps even by developing a phone app that observers can use in the field)

Careful selection of sampling stations is essential; stations become permanent and do not change over time. Additional sampling stations may be added as habitat becomes suitable or if birds are seen in other areas.

B. Sampling

Surveys should be conducted during a 6-hour period beginning no earlier than official sunrise and ending no later than 1:00 PM to avoid the hottest time of the day. Birds respond vigorously to the playback at all times of the day, but extremely long sampling periods may take a toll on the person conducting the work. Sampling stations also MAY be visited during a 2-hr period prior to official sunset to allow for sampling later in the day.

Example: a managed area with 25,000 acres of potential habitat decides it can conduct 50 surveys each year (total of 150 individual surveys with 3 visits to each of 50 sampling stations). A total of 6 mornings is allocated for the effort so that 25 stations can be sampled each morning (or 1-2 mornings per week for the four-week sampling period). If only 20 stations are sampled on one morning because of rain, the observer could wrap up the remaining 5 some evening (or morning) later on.

Because surveys are conducted along trails and secondary roads, the CD or MP3 player in a vehicle can be used to broadcast the vocalizations. Just be sure to keep the volume as consistent as possible and somewhere in the 6-8 range on a 10-unit volume scale. Radio Shack also sells a digital-display sound-level meter for under \$60.00 that can be used to standardize the playback.

The vocalizations provided on-line and consist of a 2-minute sampling period for Bachman's Sparrows and a 3-minute sampling period for Brown-headed Nuthatch. Nuthatches maintain larger territories than sparrows, and the longer sampling period provides time for individuals to fly in from greater distances. Separate files also are provided for instances where only one species is expected to be encountered (e.g., sparrows in treeless dry prairies or nuthatches in palmetto-dominated pine flatwoods).

At each sample station, the observer should start playing the recorded vocalizations and immediately start looking and listening for Bachman's Sparrows (the first species on the file). The sequence of the vocalization is:

10 seconds of silence that gives observers a chance to start a CD player and step in front of the vehicle

45 seconds of sparrow vocalizations
15 seconds of silence
45 seconds of sparrow vocalizations
15 seconds of silence

CLOSE OF BACHMAN'S SPARROW SAMPLING PERIOD

45 seconds of nuthatch vocalizations
15 seconds of silence
45 seconds of nuthatch vocalizations
15 seconds of silence
45 seconds of nuthatch vocalizations
15 seconds of silence

CLOSE OF BACHMAN'S SPARROW SAMPLING PERIOD

The two intervals of silence allow observers to listen for individuals off in the distance or responding with weak calls.

The WAV file can be transferred directly to an MP3 player using Windows Media Player (and similar software). Hook the player to the computer and use the *SYNC* function to transfer the WAV file to the MP3. The WAV also can be placed directly on a CD using appropriate software.

The number of individuals observed during each sequence should be entered in the appropriate column of the data sheet. Entries should be made during the period when a bird is **FIRST** heard or seen. As an example, a male sparrow observed flying toward the playback during first 45 seconds of sparrow vocalizations is recorded in the first column. If the bird is not observed until the vocalization stops, it is recorded in the second column (15 s). If 2 males fly up in response to the playback in the first 45 seconds, then a 2 is placed in the first column under 45 s. Only a distinct **NEW** sparrow observed during the 2nd 45-second period of vocalization would be recorded in the second box. The bird heard/seen during the first period should not be recorded in any subsequent period; only record new observations.

There is a third category of observation that also should be noted. Both sparrows and nuthatches may be observed outside the specific sampling periods designed for them. The third series of columns (**BHNU** and **BACS OUTSIDE**) is used to record these observations. For example, if a male sparrow is heard singing during the 10 seconds of silence at the start of the sample, it should be recorded under the **OUTSIDE** column. If a

nuthatch is heard during the first 2 minutes of sparrows sampling, it too should be recorded under the OUTSIDE column. Conversely, if no sparrow was observed early but then is heard sometime during the nuthatch portion of the survey, it should also be recorded in the OUTSIDE column.

Do not count individuals known or suspected to have been counted at a previous point. Use 'Notes' to record sparrows and nuthatches detected while traveling between points.

Surveys should not occur during rainy or windy conditions. Acceptable weather conditions include wind <12 mph (see Beaufort scale below), clear or partly cloudy skies, and no fog/smoke or precipitation.

- C. Data Submission: Data should be entered into an Excel spreadsheet and sent as an attachment to an email (jim@ttrs.org). Observers should keep a copy on their own computers, but eventually all this will be moved to a web-based data entry program to make entry as simple as possible (or possibly even a phone app).

Information for Data Sheet:

Sky Codes

- 0 - Clear or few clouds
- 1 - Partly cloudy (scattered) or variable sky
- 2 - Cloudy (broken) or overcast
- STOP! Poor conditions for survey---**
- 4 - Fog or smoke
- 5 - Drizzle, showers, rain

Wind Speed Codes (Beaufort scale)

- 0 - Smoke rises vertically (< 1 mph, < 2 Kph)
- 1 - Wind direction shown by smoke drift (1-3mph, 2-5 Kph)
- 2 - Wind felt on face; leaves rustle (4 - 7 mph, 6-12 Kph)
- 3 - Leaves, small twigs in constant motion (8 - 12 mph, 13 - 19 Kph)
- STOP! Poor conditions for survey-----**
- 4 - Dust rises; small branches move (13 - 18 mph, 20 - 29 Kph)
- 5 - Small trees in leaf begin to sway (19 24 mph, 30 - 38 Kph)

Survey Location Descriptions

Observer: _____ Date: _____ Sample Station #: _____

Managed Area Name: _____

Station Location (Dec/Deg): Lat: _____ Long: _____

Description/Directions: _____

Other Comments: _____

Dominant habitat within 100 m (circle one)

Natural Communities

Upland Mixed Woodland

Upland Pine

Sandhill

Scrub

Wet Flatwoods

Cutthroat Grass Flatwoods

Cabbage Palm Flatwoods

Mesic Flatwoods

Scrubby Flatwoods

Pine Rockland

Dry Prairie

Other Cover

Pasture/hay field

Mid-rotation planted pine

Early successional forest

Recent Burn History (circle one for area burned within 200 m)

% burned <2 months: 0 1-25 25-50 50-75 >75

% burned 2-12 months: 0 1-25 25-50 50-75 >75

% burned 1-2 years: 0 1-25 25-50 50-75 >75

% burned \geq 2 years: 0 1-25 25-50 50-75 >75

Community Descriptions (from FNAI)

Upland Mixed Woodland – uplands with loamy soils; mesic-xeric; central Panhandle to extreme northern central peninsula; open to partially closed canopy over an open understory of mixed of southern red oak, mockernut hickory, and longleaf or shortleaf pine with other mixed hardwoods; wiregrass infrequent.

Upland Pine – upland with sand/clay substrate; mesic-xeric; Panhandle to extreme northern central peninsula; savanna of widely spaced pines over primarily longleaf pine and/or loblolly pine and/or shortleaf pine, southern red oak, wiregrass.

Sandhill – upland with deep sand substrate; xeric; Panhandle to central peninsula; savanna of widely spaced longleaf pine and/or turkey oak with wiregrass understory.

Scrub – upland with deep sand substrate; xeric; statewide except extreme southern peninsula, mainly coastal in Panhandle; open or dense shrubs with or without pine canopy; sand pine and/or scrub oaks and/or Florida rosemary.

Rosemary scrub – on the driest ridge crests, particularly at the southern end of the Lake Wales Ridge and on Panhandle barrier islands; occasional or rare fire (10-40 years); dominated by Florida rosemary with large areas of bare sand visible between the shrubs.

Sand Pine scrub – on ridges throughout the state; rare fire (20-80 years); canopy of sand pine and an understory of the three shrubby oaks, or less commonly, Florida rosemary.

Wet Flatwoods – flatland with sand substrate; seasonally inundated; statewide except extreme southern peninsula and Keys; closed to open pine canopy with slash pine, pond pine, large gallberry, fetterbush, sweetbay, cabbage palm, wiregrass, toothache grass.

Cutthroat Grass Flatwoods – on and near the Lake Wales Ridge; frequent fire (2-4 years); widely scattered pines over cutthroat grass and/or other hydrophytic herbs.

Cabbage Palm Flatwoods – on shelly sand or where limestone is near the surface; central to southern peninsula; pine canopy over cabbage palm understory.

Mesic Flatwoods – flatland with sand substrate; mesic; statewide except extreme southern peninsula and Keys; open pine canopy with longleaf pine and/or slash pine, saw palmetto, gallberry, dwarf live oak, wiregrass.

Scrubby Flatwoods – flatland with sand substrate; xeric-mesic; statewide except extreme southern peninsula and Keys; widely scattered pine canopy with longleaf pine, sand live oak, myrtle oak, Chapman's oak, saw palmetto, wiregrass.

Pine Rockland – flatland with exposed limestone substrate; mesic-xeric; southern peninsula and Keys; open pine canopy with South Florida slash pine, palms, mixed tropical and temperate shrubs, grasses, and herbs.

Dry Prairie – flatland with sand soils over an organic or clay hardpan; mesic-xeric; central peninsula; treeless with a low cover of shrubs and herbs; wiregrass, dwarf live oak, stunted saw palmetto, bottlebrush threawn, broomsedge bluestem.