

  
**Organization**



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REWHC



Raytheon Employees  
Wildlife Habitat Committee

# Nest Box Monitoring Guide



Eastern Bluebird

**REWHC, Increasing Species Diversity:**

- Installation of Nesting Cavities in Favorable Locations,
- Monitoring of Nestboxes to Minimize "Pest" Species,
- Recording Usage and Behavior to Tune Our Process,
- Reporting Results to WHC for Overall Statistics.

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## Bibliography

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- [1] New England regional information excerpted from National Audubon Society Field Guide to New England (Alfred A. Knopf).
- [2] The species behavior tips are excerpted from the Stokes Nature Guides to Bird Behavior, Volumes I-III by Donald and Lillian Stokes.
- [3] Detailed bird nest information excerpted from the Peterson Field Guide to Eastern Birds' Nests, Hal H. Harrison, 1975
- [4] Graphics sources include ArtToday.com and those graphics on the REWHC.org website.

## Introduction

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### What is Nestbox Monitoring?

Nestbox monitoring includes observation of activity at nestboxes, and actions to discourage pest species such as House Sparrows and Starlings. It also includes the recording of observations and actions to better understand what works and what doesn't for future seasons.

### Who Can Be a Nest Monitor?

Nestbox monitoring is performed by a dedicated team of volunteers, interested in helping the environment and in learning bird identification and behavior. No prior experience is required. Each volunteer will be assigned a series of nestboxes to monitor weekly during the nesting season. A brief nest monitoring course, featuring this booklet, will be provided to all applicants before they perform nestbox monitoring.

### What's In This Booklet?

This booklet is composed of the following sections:

- **Introduction:** (why we are here)
  - **Process:** (how to monitor)
  - **Identification Notes:** (who is who)
  - **Behavior Notes:** (what they are doing)
  - **Monitoring Data Form:** (for field use)
  - **Bibliography**
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## Process

### What Do They Do in Those Nestboxes?

Birds use nestboxes primarily for nesting and raising of young. This is usually accompanied with interesting behavior such as audible and visual displays which gives us insight into their feathered worlds.

Activity is usually performed in the following phases:

- **Courtship** - Male and female pair off, accompanying audible and visual displays,
- **Nestbuilding** - Nest material is brought into the box to provide a cup of some sort to receive eggs,
- **Egg Laying & Incubation** - Eggs are laid and kept warm by one of the parents,
- **Nestling** - Eggs are hatched and chicks are fed until ready to leave nest,
- **Fledgling** - The young leave the nest.

### What is Important to Record?

Of most importance is the recording of the success of the nestboxes to provide viable offspring. This means that we ultimately want to know what species nested in a given box, how many eggs they laid, and how many fledglings resulted. Also important is recording of the actions performed such as removal of a house sparrow nest. Other items of secondary interest include the audible and visual displays exhibited at the box. A form is provided in this booklet which should be reproduced for field use.

## Monitoring Data Form (continued)

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

## Monitoring Data Form

Monitor's Name:

Date (mm/dd/yy):  /  /

Time (hh:mm):  :   AM  
 PM

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

Box No:  Species:

Eggs:  Nestlings:  Fledged:

Action Taken:  Observed-Only  Removed Nest  
 Opened Box  Other  None

Visual:  Audible:

Comments:

## Process (continued)

### How To Monitor

First, you should become familiar with the species you're likely to see in or around the nestbox. This booklet provides a good start in that direction, but you may wish to consult additional field guides. Get a pair of binoculars so you can observe activity at the nestbox from a distance before your presence distracts their natural activity. Note the coloring of the bird, its size, its call, and any visual displays. Attempt to identify the occupants of the box before you get close to inspect it.

Monitoring should be performed at least once a week. Approach the nestbox quickly and quietly. Before you open the nestbox, give the adult bird a chance to vacate. You can do this by talking quietly or gently tapping on the side.

**Warning:** Don't stand in front of the entrance hole when you do this or you'll get hit by a missile! If you open the box and the adult is still inside (which often happens), just gently close up the box and check it again later.

Once the box is open, note if a nest is in the works or is completed. Determine if it's the nest of a native species like Tree Swallow, Eastern Bluebird, House Wren, or Black Capped Chickadee. If it's a House Sparrow nest, remove it. If eggs are present, count them and record the number. When the last egg is laid, incubation will commence. Note when the last egg has been laid so you can determine when hatching should occur. It is important to know the

## Process (continued)

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age of the chicks since monitoring the boxes should cease when the nestlings are close to fledging (12 days or older). If the nestlings get too excited they will leave the box prematurely and become highly vulnerable to ground predators.

If nestlings escape from the box prematurely, plug the entrance hole with grass, put the young birds back into the box and wait for them to calm down. Then quietly remove the grass plug with the hope that they will stay in the box.

**Note:** If it's a lousy day such that it's especially cold or rainy, choose another day to monitor. Never check boxes during inclement weather, especially during April and May. Do not disturb the box if the temperature is colder than 55° F. The chicks will need all the parental heat they can get on these kind of days! Monitoring the box will only deprive them of their parents' warmth.

Remove bluebird nests and those of other birds as soon as the young birds have fledged. You may wish to wear gloves or use a nearby twig for this purpose.

Using a copy of the data form at the end of this booklet, record the following for each box monitored:

- Box Number,
  - Date and Time,
  - Species,
- 

## Bluebird Behavior (continued)

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### Flock Behavior

Bluebirds in winter often move about in small, loose flocks of five to ten birds, or occasionally more. They feed together on fruits and berries such as sumac and multiflora rose. Occasionally, these bluebirds come to feeders that offer raisins and suet mixtures. During cold weather the birds may roost together in nest boxes or other protected spots. In some cases the birds even arrange themselves side by side, with their heads pointing inward, possibly to conserve warmth.

## Bluebird Behavior (continued)

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### Plumage

#### **DISTINGUISHING THE SEXES:**

The male has bright blue plumage on back and head; female has grayish blue plumage on back and head.

#### **DISTINGUISHING JUVENILES FROM ADULTS:**

The juvenile's plumage is similar to the adult female's but with brownish spots all over its breast. Juveniles have a partial molt in August and September, in which the spots are lost; they then resemble adults.

**MOLTS:** Bluebirds have one complete molt per year, occurring in August and September.

### Seasonal Movement

In the northern portion of their range, bluebirds migrate in winter to the southeastern United States and on down to Mexico and Central America. Migration occurs in October and November, and the birds generally travel in small or large flocks.

Occasionally, individual bluebirds do not migrate, but winter near where they previously bred, especially if there is sufficient food and their previous nesting attempt has been successful. Sometimes these wintering adults may remain with their offspring as a family group through the winter until the next breeding season.

Bluebirds in the southern portion of their range generally are year-round residents.

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## Process (continued)

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- The Action You Performed,
- The Number of Eggs Counted,
- The Number of Nestlings Counted,
- The Number of Fledglings Estimated,
- The Primary Visual Display Seen,
- The Primary Audible Display Heard,
- Any Additional Comments

If you are unable to monitor in a given week, please arrange a substitute from the list of monitors.

### Getting the Data OnLine

Once you have returned from monitoring, it's important to get your data online. The REWHC website has an online database and entry forms for you to enter your results. Go to <http://rewhc.org> and follow the survey link for birds, then click on the nestbox monitoring link. You should have been provided with an individual username and password at the end of your Nestbox Monitoring Training Course; use it to access the database. Attempt to enter the information online the same day as monitoring, if possible or the next day at latest. It's important for the information to be up to date.

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## Identification Notes

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### Identifying Birds

Birds are commonly identified by their profile, coloration, and song. For our nestbox monitoring, it is important to tell the difference between anticipated native residents (good-put out the welcome mat) and non-native residents (bad - kick their little butts out).

The following are the anticipated native species:

- **Tree Swallow,**
- **Eastern Bluebird,**
- **House Wren,**
- **Black Capped Chickadee.**

The following are the anticipated non-native species:

- **House Sparrow,**
- **Starling.**

## Bluebird Behavior (continued)

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nest and this may help the parents locate them during food trips. Both parents will usually continue to feed the young for three to four weeks or more. However, if the female starts in on another brood, the male will do all feeding of the fledglings.

The female bluebird may begin a new nest for a second or third brood in the same or a different nest box. She may begin her new brood as early as three to four days after her earlier brood has fledged. Occasionally, one or more of the young from a previous brood remain in the area and actually help feed the nestlings of the following brood. They are referred to as “helpers at the nest.” There are also reports of other adult bluebirds being helpers at the nest. In one case, a one-year-old male raised a brood and then in the same season returned to his parents and helped them feed their brood. It has also been reported that adults who are feeding their own fledglings have also fed other fledglings that wandered onto their territory.

Bluebirds that have nested successfully usually remain paired for future nestings. Following an unsuccessful nesting, one or both members of a pair may leave the nesting area and possibly nest elsewhere. Males have been known to move three miles to a new territory; a female traveled twelve miles after a nest failure. The cause of nest failures is most often bad weather or predation by raccoons, other mammals, snakes, house wrens, or house sparrows.

## Bluebird Behavior (continued)

been replaced by the blue and gray juvenal plumage. By the fifteenth day they are completely feathered.

In the early days of the nestling phase the parents may eat the fecal sacs. By the seventh or eighth day they carry them up to fifty yards away from the nest. Another clue to the stage of the nestling phase is how far the parents reach into the nest. In the early stages they go all the way into the box or cavity to feed the young; later they feed them while clinging to the entrance.

If one of the young dies during the nestling phase, the parents may remove it, unless it is too large for them to handle.

### Fledgling Phase

When the young leave the nest varies. If they are disturbed during the late nestling phase they may leave prematurely and at great risk to their survival. Generally they leave when about seventeen to twenty days old. This is preceded by the adults' feeding them less until they leave the nest.

Within a period of about two hours the whole brood may leave the nest, although sometimes one or more members wait longer, even until the next day. On their first flight the nestlings are often capable of flying seventy-five to a hundred yards, often landing in the lower branches of trees and then working their way up to the higher branches. They usually start to give the **Tur-a-wee-call** as soon as they leave the

## Tree Swallow Identification [1]



**Tree Swallow**  
*Tachycineta bicolor*

**Description:** 6". Adult dark iridescent green-blue above; entirely snowy white below. Imm. uniformly brown above. Tail notched. Young birds are dull

brown above but may be distinguished from Bank and Northern Rough-winged swallows by their clearer white underparts.

**Voice:** Cheerful series of liquid twitters.

**Habitat:** Lakeshores, flooded meadows, marshes, and streams.



**Nesting:** 4-6 white eggs in a feather-lined cup of grass placed in a hole in a tree or in a nest box.

**Range:** Breeds from Alaska east through northern Manitoba to Newfoundland and south to California, Colorado, Nebraska, and Maryland. Winters north to southern California, Gulf Coast, and Carolinas; occasionally farther.

**Discussion:** This bird's habit of feeding on bayberries enables it to winter farther north than other swal-

## Tree Swallow Identification (cont.)

lows. It is the first of our swallows to reappear in the spring. Hole-nesters such as the Tree Swallow often face a housing shortage and must fight to get into, or keep, woodpecker holes or other sought-after nest sites. Man-made breeding boxes may help increase the numbers of these birds. The Tree Swallow almost invariably nests in the immediate vicinity of water. Several pairs once nested on a ferry boat that shuttled across the Saint Lawrence River, foraging on both the American and Canadian sides. Tree Swallows often enjoy playing with a feather, which they drop and then retrieve as it floats in the air. They gather in enormous flocks along the coast in fall, where they circle in big eddies like leaves caught in a whirlwind. Tree Swallows are also voracious Mosquito eaters, a natural form of pest control in this time of West Nile Virus and other mosquito borne diseases.



## Bluebird Behavior (continued)



the eggs were laid. There can be one or more infertile eggs in a clutch. After the eggs hatch the shells may be eaten or carried away. At first the young are practically "naked," covered only with scattered gray down. The female broods them for the first few days to keep them warm until they have developed more feathers and can regulate their own body temperature.

At first the male delivers most of the food, giving it to the female, who then feeds it to the young. Later, when the female no longer needs to brood the young as much, she participates in collecting food, and then both parents feed the food directly to the young. At first the young are fed soft insects, such as small caterpillars, but later they are fed larger adult insects, such as beetles and grasshoppers, and, sometimes, berries.



The young grow very fast, their eyes opening on the fourth to seventh day. The primary wing feathers are noticeable on the fourth day and tail feathers show on the eighth day. For the first week they give soft peeping sounds, which change to a harsher "zee" sound during the second week. By the twelfth day the young weigh almost as much as the adults and their down has

## Bluebird Behavior (continued)

the eggs. Throughout this period the male continues to bring some food to the female.



Another interesting behavior revealed in the course of studies in which researchers have been able to observe inside the nest box is called "tremble-thrust." In this, the female pokes her bill down through the nesting material and vibrates it.

This occurs throughout the incubation and nestling phase. Why she does this is not known, but it may serve to shake parasites and other debris down to the base of the nest and away from the eggs and young.

Recent studies of bluebirds have shown that occasionally a female bluebird may lay an egg in another female bluebird's nest. This is called egg-dumping and, although it is known to occur among other birds like the Wood Duck, it is just beginning to be studied in songbirds. Through the examination of blood samples taken from bluebirds and their young without harming them, scientists have found that in 9 percent of bluebird nests the young are from more than one father or more than one mother. This could only occur if the female had mated with more than one male, or if another female had egg-dumped in her nest. The reasons for either one of these fascinating breeding strategies are still unknown.

### Nestling Phase

The young hatch in the approximate order in which

## Bluebird Identification



**Eastern Bluebird**  
*Sialia sialis*

**Description:** 7" (17 cm). Bright blue above and on wings and tail; rusty throat and breast; white belly and undertail coverts. Female similar, but duller.

**Voice:** Call a liquid and musical turee or queedle. Song a soft melodious warble.

**Habitat:** Open woodlands and farmlands with scattered trees.



**Nesting:** 4-6 pale blue eggs in a loose cup of grasses and plant stems in natural tree cavities, old woodpecker holes, fence posts, and bird boxes.

**Range:** Breeds east of Rockies from southeastern Canada to Gulf of Mexico; also in mountains of southeastern Arizona and southwestern New Mexico. Winters in southern part of breeding range. Also in Mexico.

**Discussion:** This beautiful bird is a favorite of many people and is eagerly awaited in the spring after a long winter. In places where bluebird nest boxes are erected and European Starlings and House Sparrows are controlled, up to six pairs of bluebirds will

## Bluebird Identification (cont.)

nest on as many acres. In the past 25 years bluebirds have become uncommon in the East for reasons not altogether clear. Competition for nest sites with European Starlings and House Sparrows is likely a critical factor. The erection of many artificial nest boxes in recent years seems to be helping to increase the population.



## Bluebird Behavior (continued)

two to twelve days but is usually accomplished within four to five days. If there is cold weather, nest-building may be temporarily stopped.

### Breeding

**Eggs:** Usually 4 or 5. Clear blue or, occasionally, white

**Incubation:** 12-18 days, average 13-14, by female only

**Nestling phase:** Usually 16-20 days

**Fledgling phase:** 3 - 4 weeks

**Broods:** 2 or 3

### Egg-laying and Incubation



After the completion of the nest, egg-laying may not begin for a week or more. Bluebirds usually lay one egg per day, with laying usually occurring before midmorning. Incubation begins after the last egg is laid, but the female may spend brief periods sitting on the eggs prior to this.

Incubation is done by the female. The length of the periods spent attending the eggs varies with weather and other unknown factors. When the female leaves the nesting box for a break or to feed herself, the male may come to the box, occasionally going in but not actually settling on and incubating the eggs, since he has no brood patch. This has been verified by studies in which researchers had special blinds that enabled them to look into the nest box. At night, males often stay in the box with the female, standing next to her on the rim of the nest while she incubates

## Bluebird Behavior (continued)

female and started a second brood. See Egg-Laying and Incubation.

### Nest-Building

**Placement:** In a natural tree hole or a nesting box.

**Size:** Inside diameter 2.5 - 3 inches

**Materials:** Base of fine grasses, pine needles, weed stalks, and fine twigs; inner lining of finer grasses and, rarely, hair or feathers.

Bluebirds build their nests in boxes or natural cavities in trees. They have also been known to use unusual nest locations, such as stacks of drain pipes, tin cans, cliff swallows' nests, cannons, and other cavities.

The nest is a loose structure of dried grasses and weeds with or without a distinct lining. When there is a lining it is made of finer grasses and, possibly, horsehair or feathers.

Although the male and female may enter several nest holes during courtship, it is the female that selects the final site. One to six weeks may go by between when the nest site is chosen and when the nest is actually built. A female may also start to build several nests and then choose one of these in which to lay her eggs.

The male may carry around bits of nesting material during courtship and nest-building and, occasionally, may add some to a nest, but the actual building is done mostly by the female. Building may take from

## House Wren Identification



### House Wren

Troglodytes aedon

**Description:** 4 1/2 - 5 1/4" (11-13 cm). A tiny bird with a short tail, often held cocked over the back. Dusky brown above, paler below, with no distinctive markings. Winter Wren is similar but smaller and darker, with shorter tail and pale eyebrow.

**Voice:** A gurgling, bubbling, exuberant song, first rising, then falling. Sounds like dialing an old-style rotary phone.

**Habitat:** Residential areas, city parks, farmlands, and woodland edges.



**Nesting:** 5-8 white eggs, thickly speckled with brown, in a cup lined with feathers and other soft material contained within a mass of sticks and grass, placed in a natural cavity or bird box.

**Range:** Breeds from British Columbia east across Canada to New Brunswick, and south to southeastern Arizona, northern Texas, Tennessee, and northern Georgia. Winters north to southern California, Gulf Coast states, and Virginia. Also in tropical America.

## House Wren Identification (cont.)



**Discussion:** This wren often nests in odd places such as mailboxes, flowerpots, and even the pockets of coats on clotheslines. When competing for a nest site, the House Wren may throw out the nest, eggs, and even the young of other hole-breeding birds. In the process this bird may kill its competitors, or if they are more powerful, it harasses them by filling the hole with its own nest material.



If House Wrens return in spring to find an old nest still in place, they usually remove it stick by stick, then proceed to re-build, often using the very material they've just discarded. Outside the breeding season, House Wrens are shy and much less in evidence than when they are singing during the breeding season.

## Bluebird Behavior (continued)

If she enters a nest hole while the male is also inside, this is a good sign that the two are paired. Following this she takes more of the lead around the nest site and is able to displace the male from any place that she flies to. She may be dominant over the male at this point.

Following this initial courtship phase the male and female will do fewer displays but will keep in contact with the soft **Tur-a-wee-call** and may do **Wing-wave** when coming together. Bluebirds also do courtship feeding, with the male bringing food to the female. Sometimes the female crouches down, flutters her wings, and makes peeping noises before the male feeds her. Courtship feeding continues throughout the early part of breeding.

Copulation in bluebirds may be seen starting before nest building and continuing into the incubation phase. During copulation the male gets onto the back of the female, who is crouched down, and may even peck at her head.

Bluebirds are usually monogamous and male and female may remain together in successive seasons, especially if their previous breeding is successful. Occasionally, a bluebird finds a new mate for a second brood during a nesting season. There are also several recorded instances of polygamy. In one case, two males defended a territory together, mated with one female, and all three parents successfully raised two broods. In another case, a paired male, who had nestlings, courted and mated with another

## Bluebird Behavior (continued)

tivities with several displays. He will do **Flight-display** with **Song**, ending up at a prospective nest site. Here he will cling to the entrance or a nearby perch and do **Wing-wave** while continuing his singing. After this he may go to the nest hole and, while clinging to the entrance, rock back and forth, putting his head and shoulders in and out of the nest hole and looking around between each rocking motion. He may be carrying a bit of nest material while doing this. The male may also land on the nest box with his back to the female and spread his tail and droop his wings, exposing his vibrant blue back. He may lift and quiver his wings and pivot, appearing to dance.

These four elements are the main parts of early courtship: **Song**, **Flight-display**, **Wing-wave**, and the birds poking his head in and out of the nest hole. They can be done in just about any order, and they can be repeated many times at the same or a different nest hole. Occasionally, the male may also fly at the female and chase her for a short distance.

At first the female seems to show little interest, but gradually she will approach a nest hole where a male has displayed and perch nearby or look in and out of the hole. Often the male will then enter the hole and may even sing softly while in the hole. The female usually leaves after a first visit, in which case the male continues his displays. She often approaches several boxes before she finally enters one. In the interludes between visits to nest holes she may also **Wing-wave** and give **Song**.

## Chickadee Identification



**Black-capped Chickadee**  
*Parus atricapillus*

**Description:** 4 3/4-5 3/4" (12-15 cm). Black cap and throat, white cheeks, gray back, dull white un-

derparts. Wing feathers narrowly and indistinctly edged with white.

**Voice:** A buzzy chick-a-dee-dee-dee or a clear, whistled fee-bee, the second note lower and often doubled.

**Habitat:** Deciduous and mixed forests and open woodlands; suburban areas in winter.



**Nesting:** 6-8 brown-speckled white eggs in a cup of grass, fur, plant down, feathers, and moss, placed in a hole in a rotten tree stub excavated by the birds, or in a natural cavity or bird box.

**Range:** Largely resident from Alaska east across Canada to Newfoundland, south to northern California, northern New Mexico, Missouri, and northern

## Chickadee Identification (cont.)

New Jersey. Winters south to Maryland and Texas.



**Discussion:** These birds are constantly active-hopping, often feeding upside down, clinging to the underside of twigs and branches in their search for insect eggs and larvae. Flocks of this tame and inquisitive bird spend the winter making the rounds

of feeders in a neighborhood, often appearing at each feeder with striking regularity. Chickadees form the nucleus of mixed flocks of woodpeckers, nut-hatches, creepers, and kinglets that move through the winter woods. In spring, chickadees disband into the woods to nest. Black-capped Chickadees usually prepare their own nesting hole in soft, rotting tree stumps. Enticing them into breeding boxes is difficult unless the boxes are filled with sawdust, which deceives the chickadees; they carry the sawdust out bit by bit and accept the box for nesting.



## Bluebird Behavior (continued)

Aggressive interactions may include **chases** and several displays, such as **Song**, **Chip-call**, **Wing-flick**, and **Head-forward**. These can occur at a nest box or at a territorial border. Song duels between two males at territorial borders may be common where two pairs are nesting close together.

Other actions of bluebirds at this time that may function to advertise territory are short semi-circular flights, a straight rapid flight between two perches while continuously singing, and an action in which the male bluebird perches at the nest entrance with tail spread and repeatedly pokes his head in and out of the nest hole. This latter action is sometimes done with nest material in the bird's beak.

In the fall, bluebirds may inspect and be aggressive at nesting boxes. They may even add a little nesting material.

### Courtship

**Main behavior:** **Song**, **Flight-display**, **Wing-wave**

**Duration:** For a few days after the arrival of the female on the territory

Before the female shows up on the territory, the male may do a great deal of **Song**, often singing as many as twenty times per minute. Once the female has arrived, the male tends to sing at a slower rate, more like five to ten times per minute.

When a female first arrives on the territory, or the pair arrive together, the male will start courtship ac-

## Bluebird Behavior (continued)

anywhere from two or three to twenty-five acres and may contain many nest holes, even though the birds will use only one. Bluebird pairs do not usually nest closer than about three hundred feet from each other, but sometimes they may nest closer.

Bluebirds may migrate or, in some cases, winter near their breeding ground. In either case they usually return to their previous breeding territories in early spring. In some cases, males and females arrive separately; in others, the pair arrive together. First-year bluebirds often return to breed near the area where they were hatched.

Bluebird behavior during the first few days on the territory may be erratic. They may show up for only a few hours in the morning, feed, visit nest holes, and then leave for the rest of the day. Gradually, they spend more and more time on the territory. Even after spending a few days visiting a nesting territory, a pair may fly off to a new area. Inclement weather may also cause bluebirds to vacate their territory temporarily.

The male claims the territory by giving **Song** from perches around the territory. He may also do **Flight-displays** accompanied by **Song** as he flies from one perch to another, or from a perch to the nest hole. Both male and female may defend the territory against the intrusion of other bluebirds, but each only defends against other bluebirds of its own sex. Thus, males will fight with males and females with females.

## House Sparrow Identification



**House Sparrow**  
Passer domesticus

**Description:** 5-6 1/2" (13-17 cm). Male has a black throat, white cheeks, and chestnut nape; gray crown and rump. Female and young are streaked dull brown above, dingy white below, with pale eyebrow.

**Voice:** Shrill, monotonous, noisy chirping.

**Habitat:** Cities, towns, and agricultural areas.



**Nesting:** 5 or 6 white eggs, lightly speckled with brown, in a loose mass of grass, feathers, strips of paper, string, and similar debris placed in a man-made or natural cavity. 2 or 3 broods a season. Sometimes builds a globular nest in a tree.

**Range:** Introduced and resident throughout temperate North America. Native to Eurasia and North Africa, and introduced on all continents and on many islands.

**Discussion:** The entire North American population of the House Sparrow is descended from a few birds released in New York City's Central Park in 1850. These birds found an unoccupied niche-the many

## House Sparrow Identification (cont.)



towns and farms of the settled parts of the country-and quickly multiplied. As so often happens, introduced species can become a problem, and the House Sparrow is no exception. Because they compete for food and nest sites, some native species have suffered. Within a short time after their introduction, these sparrows adapted to the local environment. Thus the sparrows of the rainy climate of Vancouver, British Columbia, are plump, dark birds, whereas

those inhabiting Death Valley, California, are slim, pale, sand-colored birds. These changes took less than 60 years, and influence our ideas about the speed of evolutionary change in birds.



## Tree Swallow Behavior (continued)

bances at the nest, such as your approach. See Territory, Courtship.

- **Tur-a-Wee-Call**

Male or Female: Sp, Su, F, W

One to three soft, low-pitched, melodious whistles. Sounds like the written "tur-a-wee." CONTEXT: Given as a location note between mates, family members, or flock members. Also given by parents as they approach the nest with food. See Courtship, Breeding.

- **Chip-Call**

Male or Female: Sp, Su, F, W

A short, harsh call that may be given singly or in a rapid series making it sound like a chatter.

CONTEXT: Given in moments of alarm, such as when an intruder comes near the nest.

## BEHAVIOR DESCRIPTIONS

### Territory

**Type:** Mating, nesting, feeding

**Size:** 2- 25 acres

**Main behavior:** *Song, Flight-display, chases*

**Duration:** From arrival of male to end of breeding.

Territories usually occur in open land with tree holes or nest boxes and some clear ground from which the birds can gather insects to eat. Size of territory varies, being generally larger at first and then shrinking with pressure from other arriving bluebirds and when more duties are required around the nest. It can be

## Bluebird Behavior (continued)

- **Wing-Flick**

Male or Female: Sp, Su

Wings are rapidly flicked and tail quickly spread at the same time.

CALL: **Chip-call**

CONTEXT: Given during aggressive encounters between bluebirds; often followed by a chase. See Territory.

- **Head-Forward**

Male or Female: Sp, Su, F, W

Perched bird leans forward and assumes a horizontal posture with beak and head pointed forward.



CALL: **Chip-call** or none

CONTEXT: Occurs during aggressive encounters such as when other bluebirds approach the nest. May be combined with gaping bill or bill-snapping at the intruder.

## Auditory Displays

- **Song**

Male or Female: Sp, Su

A series of six to eight soft, low-pitched, melodious whistles. May be strung together in a long series. Occasionally, just the first part of the song may be given. Although it is true that both sexes sing, the song of the male is louder, more brilliant, and heard more frequently.

CONTEXT: Used during territorial advertisement, courtship, and during some distur-

## Starling Identification



### European Starling

*Sturnus vulgaris*

**Description:** 7 1/2-8 1/2" (19-22 cm). Smaller than a robin. A short-tailed, chunky, iridescent black bird; long pointed bill, yellow in summer and dark in fall and early winter. Plumage flecked with white in winter. Juvenile is uniform dull gray with dark bill.

**Voice:** A series of discordant, musical, squeaky, and rasping notes; often imitates other birds. Call a descending whee-ee.

**Habitat:** Cities, suburban areas, farmlands, and ranches.



**Nesting:** 4-6 pale blue eggs in a mass of twigs, grass, and trash lined with finer plant material and feathers, and placed in a tree or building cavity.

**Range:** Occurs from Alaska and Quebec south throughout continent to Gulf Coast and northern Mexico. Native to Eurasia

## Starling Identification (cont.)

and widely introduced around the world.

**Discussion:** Conditioned by centuries of living in settled areas in Europe, this species easily adapted to American cities after 100 birds were liberated in Central Park, New York City, in 1890. Since then it has spread over most of the continent. Its large roosts, often located on buildings, may contain tens of thousands of birds. Hordes of these birds create much noise, damage vegetable or fruit crops, and do considerable damage around feedlots, consuming and fouling the feed of domestic cattle, and have proved difficult to drive away. Starlings compete with native hole-nesters for woodpecker holes and natural cavities. There has been much debate regarding their economic value, but their consumption of insects, such as locusts and ground beetles, seems to tip the balance in their favor.



## Bluebird Behavior (continued)

the construction, setting up, and monitoring of bluebird nesting boxes all across the country. However, more nesting boxes are still needed. This is an area where amateurs can still make a valuable contribution toward the conservation of this beautiful bird.

### Visual Displays

- **Flight-Display**

Male: Sp, Su

Bluebirds vary their flight in several ways to communicate with one another. One Flight-display is a butterfly-like flight in which wings are fluttered in slow deep wingbeats; another is hovering in front of the nest hole; and a third is a lopsided flight, with wings seeming to move out of synchrony and unevenly.

CALL: **Song** or **Chip-call**

CONTEXT: Given during territory formation and courtship. May function as territorial or mate advertisement. See Territory, Courtship

- **Wing-Wave**

Male or Female: Sp, Su

Bird lifts one or both wings at a moderate speed while perched. Wings may also be raised and quivered.

CALL: **Song**

CONTEXT: Done by male as part of courtship when female is near; may be done at nest entrance. May be done as greeting between pair. See Courtship.



## Bluebird Behavior [2]



Few other birds have captured the hearts of so many, and it's easy to see why; in terms of physical beauty and endearing tameness, the Eastern bluebird has few rivals. Nearly everyone who has bluebirds breeding on his or her property

feels blessed, as if he or she were specially chosen for the honor.

The bluebird was once a more common bird, but since the turn of the century its populations have greatly declined. This may have been due to the introduction from Europe, in 1851, of the house sparrow and, in 1890, of the starling, two birds who are aggressive competitors for the nest holes needed by the bluebird. In addition, traditional bluebird nest sites, such as old apple orchards and tree holes along field edges, became more scarce as the country continued to become more urban and suburban. Bluebirds are also susceptible to cold weather and suffer great mortality during very severe weather on their wintering grounds in the southeastern United States.

Fortunately, Eastern bluebird populations are now on the upswing, aided by the efforts of the North American Bluebird Society and its inspirational founder, Dr. Lawrence Zeleny, in encouraging

## Behavior Notes

Much can be learned from birds by watching their behavior. Birds tend to exhibit visible and audible behaviors when staking out territory, during courtship, prior to mating, and in defense of the nest.

Understanding bird signs and motivations allow us to better manage their well being.

This section is composed of several detailed behavioral summaries of the native species most likely to be encountered.

## Tree Swallow Behavior [2]



The beautiful flight of tree swallows as they swoop in graceful arcs to gather food is enough to fill many delightful hours of observing. But if you watch the birds over a period of a few weeks, you are bound to see some unusual occurrences that will make you wonder more deeply

about their lives. Imagine that you have visited a Tree Swallow nesting area for a few days and found the birds actively feeding, nest-building, and courting. You may return the next day at the same time to discover that there is not a single swallow to be seen. They may stay away for up to four days, and then, just as suddenly, return. No one has been able to account for these unexpected departures or explain where the birds go.

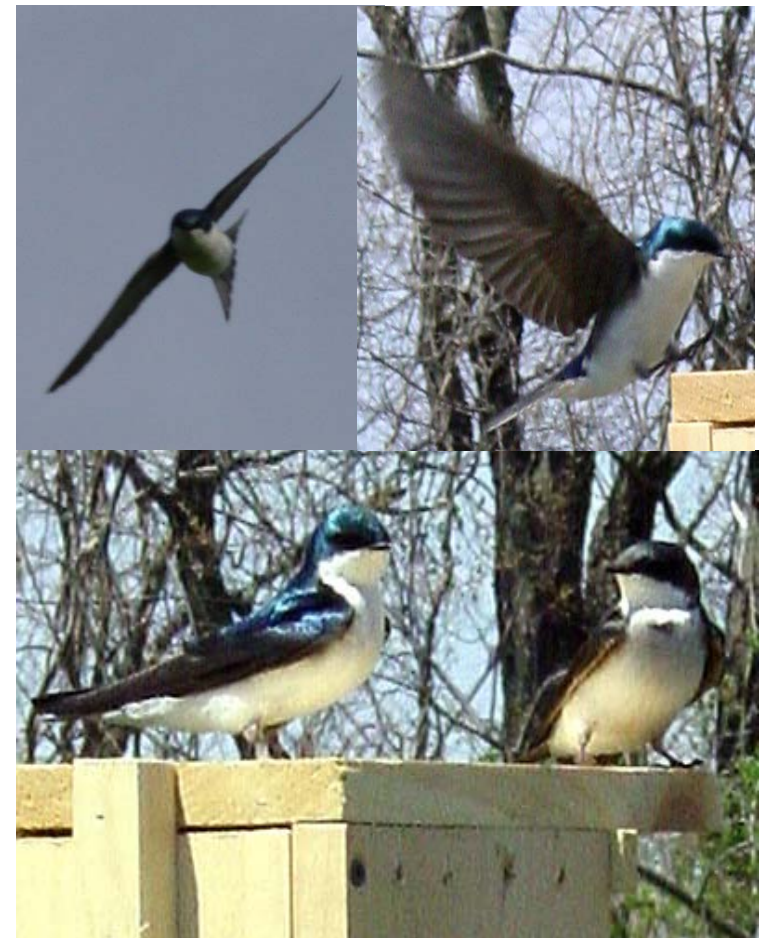
Other aspects of Tree Swallow behavior are the interesting displays around the nest site. Two common visual displays are **Flutter-flight** performed by the male in the presence of the female, and **Bowing**, which is performed together by the pair very near the nest site, or in the case of nesting boxes, right on top of the box. A third display, which is sometimes harder to see, is **Billing**, when the male and female touch beaks.

An especially good place to observe Tree Swallows

## Tree Swallow Behavior (continued)

and dive down at it.

Both the function of Towering and the reasons for mass abandonment of the breeding area are still intriguing mysteries of the Tree Swallows' behavior.



## Tree Swallow Behavior (continued)

arrive on the breeding grounds over a period of a month.

### Social Behavior

A fascinating aspect of the life of Tree Swallows is their habit of occasionally abandoning their breeding ground. It can be a real shock if one day you visit a nesting area and see tens of Swallows active about the nest boxes, and then on the next day you find no Swallows at all. It is not clear what the Swallows do when they leave the breeding area, but it generally occurs on cool, cloudy days when there is a lack of aerial insects, on which the birds depend for food. They may interrupt egg-laying for up to four days during one of these abandonments and then return to continue laying the clutch. Even more remarkable is the fact that this has little effect on the overall success of the eggs; these abandonments may even occur in the middle of the incubation phase with no ill effects on the young. During these periods observers have gone out to look elsewhere for the Swallows, but have not been able to find them.

Another interesting group activity of Tree Swallows is called "**Towering**." This behavior occurs mostly in the period before egg-laying has started. It starts with one bird's flying far above and giving a call similar to the **Cheedeep-call**. The other Tree Swallows in the area join the first, and circling high in the air they give the call for a minute or two and then drop down to their nest areas. This is slightly different from the response to predators, which generally involves a few birds who fly directly over the danger

## Tree Swallow Behavior (continued)

is in conservation areas where there are many nesting boxes, for here the Swallows will be active and you will have more chances to see interactions. The birds are very active in defending their nests, and at certain times in the breeding season, if you approach too near, a whole group of birds from the area will give the **Cheedeep-call** and start circling above you. Some of the birds, possibly the owners of nearby nests, will actually do spectacular dives at your head, swerving just at the last moment and giving a call as they pass. A similar pattern of behavior, called **Towering** (see Social Behavior), occurs early in the season, but at these times it is not in response to predators and involves the whole nesting colony. Its function is still to be discovered.

### Visual Displays

- **Flutter-Flight**

Male: Spring (Sp), Summer (Su)

The male hovers or flies short distances with rapid, shallow wingbeats. He sometimes approaches the female with this flight.

CALL: **Twitter-call**

CONTEXT: Usually done near female; often followed by the bird's landing near or on the nest and doing the **Bowing** display; may also be followed by mating. See Courtship.

- **Bowing**

Male and Female: Sp, Su

Two perched birds approach each other, rhythmically bowing the front halves of their bodies



## Tree Swallow Behavior (continued)

toward the ground.

CALL: None or Song

CONTEXT: Done by a pair near their nest.

See Courtship.

- **Billing**

Male and Female: Sp, Su

Two birds touch bills.

CONTEXT: Occurs between mates near the nest.

See Courtship.



## **Auditory Displays**

- **Song**

Male: Sp

Three fairly long, descending notes, followed by a warbling call

CONTEXT: Done by the male, especially when he is near his mate; may accompany **Bowing** and is heard from his arrival on the breeding ground until the incubation phase.

See Courtship

- **Cheedeep-Call**

Male or Female: Sp, Su

A sharp, rapidly repeated note:  
cheedeedeedeedeep

CONTEXT: Given when there is possible danger near the nest. The birds generally circle over the intruder's head while giving the call. A somewhat softer version of this call may cause "**Towering**" early in the breeding season.-See Breeding, Social Behavior

## Tree Swallow Behavior (continued)

### **Plumage**

Adult Tree Swallows go through one complete molt per year. This occurs in late summer just before migration. In this respect they differ from most other Swallows, which generally go through their molt after migration.

Young males in their first year already have the iridescent blue-green back of older adults, but females may not acquire this coloring until their second or third year. Before that they have a slightly browner back. Because of this, females in their first two years can be distinguished from males and from older females, but after that the sexes are identical in appearance.

The best behavioral clues for distinguishing the sexes are that the male is the only one to give the Song display and the female is the only one to incubate the eggs.

### **Seasonal Movement**

After the fledgling phase, the young and adults may leave the breeding area and join other Swallows over marshy areas where aerial insects are plentiful. They also roost-in these areas, and, before settling in for the night, may funnel down in large formations into the roosting trees.

In early fall, Tree Swallows start migrating to the south. There they remain as large flocks through the winter, feeding and roosting in marshy areas. In spring they migrate north in much smaller flocks that

## Tree Swallow Behavior (continued)

side the nest hole. When the male arrives, she leaves and he enters the nest and immediately turns around to place his head and shoulders in the nest hole and peer out. He leaves when the female returns, and she continues incubation. Occasionally the male brings food to the female while she is incubating.

During incubation the adults may temporarily abandon the nest area for several days, leaving the eggs uncovered and unprotected. This behavior makes the incubation period longer.

### **Nestling Phase**

The young are brooded by the female for the first three days of the nestling phase. Both parents participate in feeding and make frequent trips to the nest. They may go up to a mile from the nest to gather food. The adults have the interesting habit of carrying the fecal sacs of the young away from the nest and dropping them into water. They will do this even if the water is a few hundred yards away, but if it is any farther than that they will just drop the sacs on the ground.

### **Fledgling Phase**

There is practically no fledgling phase. The young are strong fliers as soon as they leave the nest, and having left it, they do not return. They may, however, be fed by the parents in the vicinity of the nest for two to three days before being totally independent.

## Tree Swallow Behavior (continued)

- **Twitter-Call**

Male: Sp

A twittering call given during **Flutter-flight**

CONTEXT: Usually precedes mating.

See Courtship.

## **BEHAVIOR DESCRIPTIONS**

### **Territory**

**Type:** Nesting

**Size:** Immediate area of the nest

**Main behavior:** Chases

**Duration of defense:** From arrival on the breeding ground until the fledgling stage

Tree Swallows defend only the nest itself. They are tree-hole-nesting birds, which have readily taken to using man-made nesting boxes. There is a lot of competition for this type of nest, and Tree Swallows can be very aggressive even against their own species when trying to claim a nest. Other species that compete with them are House Sparrows, Bluebirds, and House Wrens.

Both the male and the female help defend the nest, and when you or any other possible predator approaches it, the birds will give the **Cheedeep-call** and circle over your head. Other birds in the immediate area will join in, and every once in a while one will dive directly at your head. This can be unnerving, for they swerve off only at the very last moment. When competing with its own species the defender may meet with the challenger in midair, and the two grapple as they begin to fall.

## Tree Swallow Behavior (continued)

### Courtship

**Main behavior:** Flutter-flight, Bowing, Billing, Song, Twitter-call

**Duration:** 1-2 weeks

Soon after the Tree Swallows arrive on the breeding grounds you will see pairs of birds perched near their nest holes or on top of their nest boxes. You will hear the male give **Song** frequently until the beginning of the incubation period. Sometimes the male will do **Flutter-flight** about the nest box when the female is there, and then land and move toward her doing the **Bowing** display as he gets closer. **Billing** may also be seen in these situations, the male and the female touching beaks.

Mating starts to occur about a week before egg-laying begins. Before mounting the female, the male goes into **Flutter-flight** about her. Then he begins to descend while giving the **Twitter-call**. If the female is receptive she leans forward, and the male lands on her back, holding her head feathers in his beak and bending his tail down to make contact with her. This whole pattern may then be immediately repeated. If the female is unreceptive to the male, then she will raise her wings in such a way that he does not land. Most courtship displays are stopped once incubation has started.

### Nest-Building

**Placement:** In a tree hole or nest box about 5-10 feet above ground

**Size:** Entrance hole 1.5 inches in diameter

## Tree Swallow Behavior (continued)

**Materials:** Grasses and then a lining of feathers

Nest-building for Tree Swallows can be a very slow process; the birds often take up to a month to complete their nests. The average construction time is two to three weeks. The female does the majority of building although the male may help gather materials. The nest is made of grasses built into a foundation and then is lined with feathers. Sometimes there is competition for these feathers, and you may see some Swallows trying to steal feathers that others have collected.

### Breeding

**Eggs:** 5

**Incubation:** 14-15 days, by female only

**Nestling phase:** Variable, but averages 21 days

**Fledgling phase:** 2-3 days

**Broods:** 2

### Egg-Laying and Incubation

The eggs are laid one each day until the clutch is complete, except in cases where there is a temporary abandonment of the nesting area (see Social Behavior). Egg-laying generally starts right after the nest is completed, but with first-year females, it may start earlier, and if it does, the birds will continue to line the nest during the egg-laying period.

Incubation is done only by the female, but the male guards the entrance to the nest when the female leaves to feed. When the female is about to leave the nest, she waits with her head and shoulders out-