

# **ASC Bluebird Trail Monitoring Guide (Revised February 2020)**

## **1. Introduction to the Bluebird Trail and Monitoring**

### **What is the ASC Bluebird Trail?**

The ASC Bluebird Trail is a special project of the Audubon Society of Corvallis (ASC) started in 1976. It consists of hundreds of bluebird nest boxes that are monitored on public and private property at dozens of sites in Benton and neighboring counties. This project has resulted in a dramatic increase in the Western Bluebird population, which was severely threatened at the time of trail commencement.

### **What is a bluebird nest box?**

A bluebird nest box is typically a wooden box that provides bluebirds, which are secondary cavity nesters, a place to nest. Bluebirds used to nest in holes created by other birds in decaying trees and wooden fence posts, but most of these nest sites have disappeared because of changes in rural habitat. We help bluebirds survive when we put up nest boxes, and in turn, bluebirds feed on harmful insects and provide beauty wherever they set up housekeeping.

### **Where do boxes go?**

The boxes are placed on property with open grassy fields and nearby trees, usually on wooden or metal poles, fence posts, or trees. A pair of bluebirds will require two to five acres of short vegetation (for example, lawn or pasture) to raise their young. Places to perch nearby are essential so the adults can observe and guard the nest box. Predator control is important.

### **What is a bluebird monitor?**

A bluebird monitor is a volunteer who checks on one or more nest boxes. They can put up their own box and/or monitor other boxes on a bluebird trail. No special birding skills are needed—you learn as you go. ASC Bluebird Trail volunteers offer one-on-one training for new monitors.

### **What is involved in monitoring?**

Monitoring involves inspecting boxes during the nesting season, once a week for active boxes and less often for others. Records are kept of box activity. Some trail monitors may check several locations and will need a car. In some areas, they may have to take short hikes over fields and hills or through rough vegetation. They may need to repair old boxes and set up new ones, and they usually keep in touch with property owners in person or by phone. Boxes must be checked throughout the nesting season, so monitors should arrange for substitutes if they go away on an extended vacation during this time. At the end of the nesting season, monitors report their observations to the Chairperson of the Bluebird Trail, who compiles the results.

## **When does monitoring occur?**

Monitoring boxes usually starts in March and ends in August or early September. Each nesting season can be longer or shorter as a result of fluctuations in rainfall, temperature, and food availability.

## **2. Setting Up and Maintaining Nest Boxes**

If you are interested in setting up a box of your own, you can either build one using instructions downloaded from the Bluebird Trail page on the ASC website ([auduboncorvallis.org/bluebird-trail/](http://auduboncorvallis.org/bluebird-trail/)) or obtain one from the Bluebird Trail. A donation for each new box is appreciated.

### **When should boxes be set up?**

Don't wait for a "best time" to set up your nest box. Set it up immediately and leave it in place year round.

### **Where should boxes be placed?**

Bluebirds like open, sunny locations with short-cropped grasses and nearby perches from which they can hunt insects on the ground and also defend the nest. Avoid brushy areas. Try to have the box opening facing east or northeast, but any direction other than north will be acceptable to the birds. It's also good to face the opening toward trees (about 50–100 yards away) into which the young can fly when they first leave the nest. Place the box on, or hang it from, a fence post, pole, or tree, with the bottom about 5–6 feet from the ground. Head-high boxes are easy to check. If you place the box on top of a post, allow space between the bottom of the box and the post for drainage.

Don't place boxes too close together. Bluebird pairs prefer a minimum distance of 100 yards between boxes. If bluebirds are competing with swallows for a single box, you may consider putting two boxes on the same pole or within 10 feet of each other, so bluebirds can use one box and swallows the other. However, putting up too many boxes in one location can lead to takeover by swallows, which may be willing to nest close to one another. This can actually reduce bluebird nesting opportunities.

A nearby bird bath is very desirable, but nearby seed feeders are not. Too much bird "traffic" around the box may discourage nesting.

### **Modifying boxes**

Nest boxes may be left with their natural cedar finish or treated on the outside only with a nontoxic paint or wood sealer, so that they can withstand Western Oregon's rainy winter and spring weather. Both the inside and outside of the front should be relatively rough, so the adults can cling to the outside and the young can climb up the inside to the hole. (In predator-resistant boxes, the inner surface of the sides should be rough, since that is the part of the box the birds climb up.) Never install a perch. Perches may attract House Sparrows (see below), which will attack bluebird parents or chicks as well as other species of cavity nesters.

## **Nest box maintenance**

Always check boxes in the fall whether you think birds used them or not. Remove any old nests, and use a putty knife to scrape away droppings. Don't dump the discards on the ground near the box. Instead, take them away from the box to lessen the chance that predators will find it. Open clogged ventilation holes, and make sure the top is leak-proof and the door opens freely and closes securely. Make any needed repairs at this time. Inspect boxes again in early spring to see if any birds died in them during the winter and to check that the boxes are still in good condition.

## **Discouraging introduced competitors**

House Sparrows and European Starlings were introduced to this country from Europe and are now numerous across the United States. Neither species is protected by law, and it **is legal** to trap and remove or eliminate them. House Sparrows are small enough to enter nest boxes. They are more aggressive than bluebirds and other native cavity nesters and will kill the parents or chicks in a box they want. They should be actively discouraged from using nest boxes by removing their nests as often as necessary. European Starlings are too large to enter a nest box with a normal-sized entrance hole, but they can enter if the hole has been enlarged (for example, by woodpeckers or rodents). If one of your boxes has an enlarged hole, either replace the door or cover the opening with a panel that has a normal-sized hole. If problems with these introduced species persist, it may be necessary to remove or relocate the box.

## **Discouraging predators and insect pests**

Cats, raccoons, weasels, snakes, and other birds can prey on bluebird eggs, chicks, and adults. Don't let dense ground cover grow near the nest box, where cats can lurk. If given the opportunity, cats can jump and sit on the top of a box, keeping adult birds from attending to their young. Vines growing on a post may make it easier for gopher snakes to climb into a box. PVC pipe over a metal post can sometimes deter climbing predators. The pipe will be more effective if it is greased. Alternatively, you can mount a baffle on the post just below the box or use a predator-resistant box. Plans for some of these options are available from the Bluebird Trail page on the ASC website.

Earwigs supposedly do not hurt nesting birds, but smearing the post with Tree Tanglefoot®, a non-toxic, sticky substance, may prevent them and ants from infesting the box. Wasps may also try to use the box. Carefully remove them at night or during cold weather. If you do not kill them, they may return to the box. Once a box contains an active bird nest, wasps are not likely to return. Honey bees should be left alone.

## **3. Monitoring Nest Boxes**

If you are interested in monitoring boxes on an established route or starting a new route, contact the ASC Bluebird Trail to discuss your interests and availability.

## **Basic duties**

Each monitor has his/her own route. You may be given a list of names and addresses for the places where bluebird boxes are located. Before nest building begins, usually in March, try to visit your route and find out how long it takes to cover it. If the boxes are on private property, meet the owners or leave a note with your name and contact information. Pay careful attention especially in rural areas: Leave all gates as you find them, open or closed, as you come and go. Observe how closed gates are secured before you open them so that you can be sure of closing them properly. Watch out for uneven ground near nest boxes, poison oak, electrified fencing, and livestock in pastures.

## **What to take when monitoring**

- Notebook and pen or pencil (or smartphone or tablet) for recording observations
- Binoculars for observing birds and other animals
- Map(s) for marking box locations
- Hat for keeping off rain, sun, and insects
- Boots or sturdy, waterproof shoes
- Gaiters to keep burrs and foxtails out of your socks
- Small hand mirror for looking into nests
- Gloves and putty knife for cleaning out boxes
- Screwdriver and pliers for repairs
- Nails to replace missing locking nails
- Wide-tipped permanent marker (e.g., Marks-A-Lot) for restoring faded box numbers
- Garden pruners for trimming blackberries and branches near boxes
- Non-toxic wasp spray (made from mint oil)
- Snacks and drinking water!

## **How to check a box**

Start keeping a record of your visits right away, even before nesting begins. Watch the nest box for a few minutes before approaching it. If there are bluebirds or other birds nearby, they may be investigating the box as a nest site. Record what you see. If you are not familiar with birds, take along a field guide, or take notes and check identification later.

Be careful when reaching into a box. It may be advisable to use gloves, as sometimes wasps and mice use these boxes. Approach quietly and listen before you open it—there may be birds inside. Stand to one side in case an adult bird flies out suddenly. Tapping gently on the box will alert an adult bird so it can leave. Remove the locking nail from the side or front panel, and open the box slowly. If a bird is inside on a nest, gently close the door, replace the locking nail, and move away. Each time you inspect a box, record your observations, even if there is no evidence of birds using the box.

## 4. Keeping Track of Nesting Birds

### The nesting cycle

Some bluebirds in western Oregon stay during the winter and inspect boxes in February. Nesting usually begins in March or April.

The timing of a nesting cycle varies. As a rule of thumb, figure one week to build the nest once the box is selected. Then the female lays usually four to six eggs, typically one per day. (A group of eggs is called a *clutch*.) She doesn't start incubating until the day **after** the last egg is laid. As a result, all of the embryos in the eggs begin developing at the same time, even though they were laid on different days. The eggs should hatch into chicks on the 13th day of incubation. (A group of chicks is called a *brood*.) Approximately 19–22 days after hatching, the young fly away (*fledge*) with one or both parents. Occasionally, fledging may take longer than usual, especially if parasites or food shortage slow the development of the chicks. Altogether, nest-building to fledging takes about six to seven weeks, and the parents may have one, two, or rarely three broods in a season.

### Visiting the box

Inspect nest boxes once a week until the chicks are 14 days old. From that time until the chicks have fledged, do not open the box. During this period, the young birds are strong enough to jump out of the box, but they are not yet able to fly.

The ASC Bluebird Trail does not have the permits required to handle bluebirds or other native birds for any purpose. This applies to adults, chicks, and eggs. Nest box monitors are allowed only to open nest boxes, look inside, record their observations (see below), and close the boxes.

Remove nests and clean boxes as soon as you are certain that all the chicks have fledged. Adult bluebirds may be looking for an empty box in which to raise another brood.

### Estimating and predicting dates of nesting events

Use these suggestions to estimate when egg laying began and to predict when hatching and fledging will occur for each nest:

1. Since the female typically lays one egg per day, you can extrapolate back to estimate the date the *first* egg was laid. For example, if you find three eggs on April 3, you can assume the first egg was laid two days earlier, on April 1. Bear in mind that if you check a nest early in the morning, that day's egg may not yet have been laid yet.
2. Revisit the nest about 7–14 days after the first egg was laid, and count the eggs again. At one egg per day, you can now establish the date the *last* egg was laid. Continuing the previous example, if you find six eggs on April 10, you can assume the last egg was laid on April 6.
3. The predicted *hatching* date will be 13 days after the date the last egg was laid.

4. Count forward 19–22 days from the predicted hatching date to determine the predicted *fledging* date. If you find that hatching actually occurred earlier or later than you predicted, you can adjust the predicted fledging date accordingly.

### **What to record—field notes**

Each time you inspect a box, record your observations. If there are no signs of birds using the box, that too should be recorded.

1. Date and box number.

2. Nest description, including its composition (for example, grasses, sticks, mosses, feathers, fur) and height—from a few grasses to a full nest built to the top of the box. These details help identify which species built the nest (see **5. Identification Guide**). Sometimes one species will usurp another, resulting in one type of nest built atop another.

3. Adult birds in, on, or near the box, including their number, species, and sex (if known). If you see a bluebird with aluminum and colored bands on its legs, try to note the colors of the bands, which leg they're on, and their position (for example, white over dark blue on the right leg, red over aluminum on the left leg). Report your findings on the Bluebird Sightings Form, which you can download from the Bluebird Trail page on the ASC website.

4. Eggs: If you see pale blue eggs in the nest, they are bluebird eggs (see **5. Identification Guide**). Count them, using a mirror if necessary. Do not handle the eggs. There is no need to count the eggs (or chicks) of other species besides bluebirds, as the Bluebird Trail does not study nesting success in other species.

5. Chicks: Count the bluebird chicks, but do not pick them up or probe them; an estimate is good enough. Older chicks will quietly hunker down in the nest when the box is opened. This is normal. Do not linger with the box open during cold or rainy weather.

6. Outcome: You will seldom get to observe fledging. However, if it has been at least 19–22 days since hatching, and you no longer hear the chicks calling or see adults coming to the box to feed them, it is likely that they have fledged. You may then open the box to look for signs that fledging has happened:

- The nest is flattened, contains no live chicks, and shows no evidence of predation, such as being torn apart.
- There are droppings (fecal sacs) in the nest. Bluebirds are very clean, and the adults typically remove most of the chicks' droppings until near fledging time.
- There is pinfeather dust in and under the nest. This grayish material is from the sheaths that covered the feathers as they erupted from the chicks' skin. It slowly flakes off and filters down through the nest to the bottom of the box.

These are some examples of outcomes you might record: young seen leaving nest; parent(s) with young near nest; nest empty, intact; nest empty, damaged; failure due to weather, predation, parasites, competition with other species, human activities, or pesticides (if known).

### **Dates to remember**

February/March: Check boxes for roosting wasps, wasp nests, and dead birds, especially after severe winter weather.

Mid-June: Remove weather stripping (if present), and make sure ventilation holes are clear.

July-August: If temperatures exceed 100°F for several days, shade the top and sides of boxes that contain active nests, using aluminum foil or cardboard securely fastened so wind doesn't blow it off.

September/October: Clean out all boxes before the rains begin. Repair cracks and holes. Put weather stripping over side vents (if present) to keep out wind and rain.

### **Problems during nesting**

Misfortune may befall a nest at any time and in many ways. Record details of whatever you find.

**Bad weather:** Prolonged cold, rain, and wind may make finding food difficult. Both adults feed the chicks, but when food is scarce the female may remain out of the box too long when she should be on the nest, keeping the chicks warm. The male can't take over in her absence because he lacks a brood patch, the area of featherless skin that the female has on her underside. Even feathered chicks may become so sluggish that they cannot respond to an adult with food. If bad weather is expected (for example, a cold spell or rain for 48 hours or more), you may consider providing supplementary mealworms.

**Predation:** You won't usually see a predator, but you may see evidence of one after the fact. If the eggs or chicks that you saw earlier are gone, look in or under the nest and on the ground below the box for bits of egg shell, fur, feathers, or dead birds. If a gopher snake has visited the box and the eggs or chicks are gone, the snake may have a trail to the box. In that case, the box should be relocated.

**Abandonment:** Adults sometimes abandon a nest, although they may remain nearby for a short period. If you know that a nest has been abandoned—for example, if unhatched eggs have been in the nest for more than three weeks and no adults are around, or if all the chicks in the nest are dead—scrape everything in the box into a container and dispose of the discards somewhere far from the box. Record any signs of predation and whether the adults are still nearby.

**Damage to the nest box:** You may find that a box has been shot with a gun, damaged or knocked off its support by livestock or elk, stolen, or had its top pried off. Such boxes may have to be relocated or removed. Telescoping mounts can be used to keep boxes above the reach of livestock and elk.

## 5. Identification Guide

The table below describes the field marks, nests, and eggs of the six most common bird species to use bluebird nest boxes in our area. The information is taken from *Peterson's Field Guide to Western Birds* (1990), *Natl. Geog. Soc. Birds of North America* (1999), and The North American Bluebird Society. All birds listed, except the House Sparrow, are native species protected by law; if they nest in a box, it is illegal to interfere. You may, however, remove any empty nests after fledging.

| SPECIES                | FIELD MARKS   | NEST  | EGGS   |
|------------------------|---|---|--|
| WESTERN BLUEBIRD       | 6" long. Male: bright blue head, wings, tail; reddish-brown breast. Female: gray head, throat, back; pale blue wings, tail; pinkish breast. 278, 346*                               | fine textured grass, 4-5" high, deep cup, occasional feather              | 3-7 pale blue-green, rarely white                      |
| TREE SWALLOW           | 5 1/2" long. Male: metallic blue head, back; dark rump. Female: dull blue-gray head, back; dark rump. Both sexes white below; white extends up to eye. 248, 322*                    | coarse textured grass, 3-4" high, cup lined with many fluffy feathers     | 3-5 white; indistinguishable from V-G Swallow          |
| VIOLET-GREEN SWALLOW   | 5 1/2" long. Both sexes similar, female less colorful. Iridescent violet-green head, back; <u>white below, upper rump</u> ; white on face extends over <u>eye</u> . 248, 322*       | coarse textured grass, 3-4" high, topped with many white feathers         | 3-5 white  |
| BLACK-CAPPED CHICKADEE | 4 1/2" long. Both sexes similar. Black cap, throat; back grayish; white below, white cheeks. 258, 328*  | Usually green moss, 3-4" high cup lined with fur, horsehair               | 6-9 white, dotted with reddish-brown                   |
| HOUSE WREN             | 4 1/2" long. Both sexes similar. Dark brown above; grayish-brown below; tail usually cocked up. 264, 334*   | twigs often <u>fill</u> box; cup lined with fur, grass                    | 6-9 white with reddish-brown speckles                  |
| HOUSE SPARROW          | 5 1/2" long. Male: black throat; gray below; reddish-brown nape; brown back; gray cap. Female: brown back; gray below; buffy eye stripe. Both sexes have finch-like beak. 346, 456* | coarse textured grass, buds, string; often fills box; lined with feathers | 3-7 white, gray, or greenish-white speckled with brown |

### Nests you may find in your boxes

#### CUT-AWAY VIEWS OF NESTING BOXES



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## 6. Troubleshooting

| Observation   | Possible Cause                       | Action   |
|---|--------------------------------------|--|
| Box filled with twigs. Eggs pierced and/or on ground below box.   | House Wren                           | Keep box at least 50 yards from brush and shrubs.  |
| Grass nest with cupped feathers. Female swallow occupying bluebird nest with eggs or chicks. Rarely, bluebird eggs gone or chicks pecked. | Tree Swallow or Violet-Green Swallow | Set up second box within 10 feet. Reduce overall number of boxes on property.  |
| Box filled with messy, domed nest. Eggs missing or on ground. Chicks and/or adults dead, heads pecked.                                    | House Sparrow                        | Passive: Plug hole or remove box. Active: Trap and/or dispatch sparrow, targeting male.  |
| One or more eggs or chicks gone. No remains or scratch marks on box. Nest material undisturbed.   | Crow or jay                          | Apply entry-hole predator guard. Use predator-resistant box. Extend roof several inches beyond hole.   |
| All eggs or chicks gone. Nest material undisturbed.   | Snake                                | Mount box on pole with baffle just below box.  |
| Eggs or chicks gone. Nest material disturbed, pulled out of hole. Fine scratch marks on box. Sometimes feathers on ground below box.      | Raccoon or cat                       | Use predator-resistant box or install baffle just below box.   |
| Some or all eggs gone or damaged. Chicks gone with feathers and/or remains on nest. Adult decapitated.                                    | Weasel                               | Mount box 6 feet high on pole with baffle just below box.  |
| Adults reluctant to enter box.  | Wasps                                | At dusk or when box is cold, use putty knife to kill and remove wasps. Apply repellent (e.g., mint oil or soap) to inside top of box, without contacting eggs or chicks. |
| Chicks weak and developing slowly. Chicks with maggots attached. Dark pupal cases or damp, dirty layer under nest.                        | Blowflies                            | Let nature take its course.  |
| Many ants in box. Ant eggs in nest. Parent bluebirds present.   | Ants                                 | Provide second box for bluebirds and let nature take its course. Apply Tree Tanglefoot® below box.   |