



# Increasing Eastern Bluebirds in Kansas



Kansas State University  
Agricultural Experiment Station and  
Cooperative Extension Service

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**B**luebirds can bring a lot of joy and beauty into our lives. Early settlers called the eastern bluebird the harbinger of spring or blue robin because of its chestnut orange breast and iridescent-blue back and tail. One of Kansas' common resident passerine birds, this strikingly elegant bird is admired most for its beauty, gentle disposition, family devotion, and delightful call. Also, it is easily attracted to home and farm surroundings when nesting structures are constructed and placed correctly.

However, the eastern bluebird population has declined drastically, not only in Kansas but also nationwide. Estimates run as high as 90 percent fewer in the last four decades. A major cause is the decrease in nesting sites. Bluebirds are cavity nesters whose natural nesting sites are tree holes they do not make themselves. Clearing land, using fewer wood fences, and eliminating dead trees have destroyed many cavity nesting sites.

Another major detriment to bluebirds is the overwhelming competition from non-native starlings and house sparrows. Bluebirds are rural and do not nest in cities or towns, although occasionally they will nest on the edges of small towns.

There are ways to increase bluebird numbers. One way is to provide nesting boxes, an effort underway nationwide. Kansans would benefit greatly from participating in this effort.

### Natural History

Because bluebirds prefer a mixture of open grasslands and scattered trees and shrubs, they are often called a forest "edge" species. Appropriate bluebird grassland habitat consists of open meadows, pastures, yards, cemeteries, parks, and highway right-of-ways. Bluebirds also exist in old orchards and cutover woodlands.

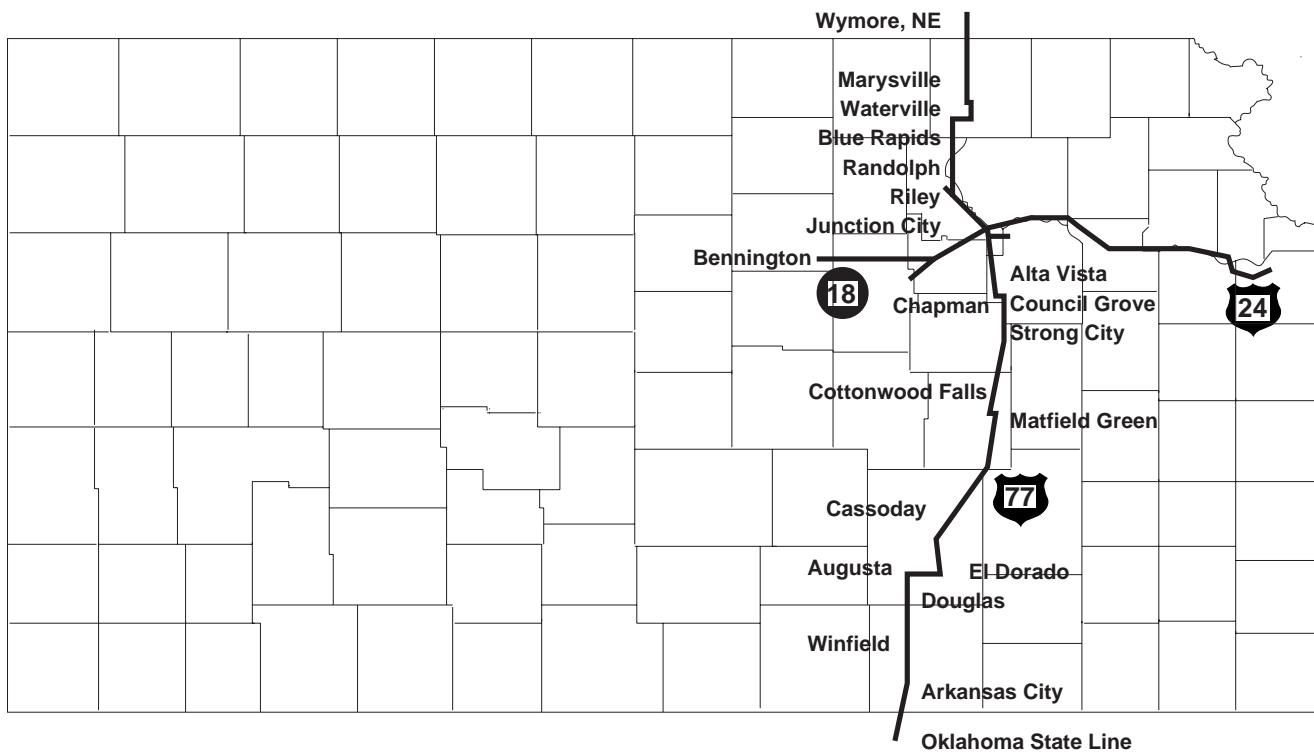
In these habitats they consume grasshoppers, flying insects, beetles, and caterpillars during short forays to the ground from an elevated perch during the summer. During winter they travel in flocks, feeding primarily on berries or fruits.

The eastern bluebird's breeding season in Kansas extends from March through July, although the birds occasionally may initiate nesting into August. Peak breeding activity in Kansas begins in April. Normally, bluebirds raise two to three broods per year, often using the same nesting site each time.

The female selects a proper nesting site 4 to 6 feet above ground in a natural cavity or hole excavated by another animal. The nest is a neat, cup-shaped structure made of fine grass. The female lays one egg per day for 4 to 6 days and incubates the pale blue eggs for 12 to 14 days.



## Trailway Plans for Homesteading the Bluebird in Kansas



In eastern Kansas, the proposed bluebird corridor follows Highway 77 north to south. Another section follows Highways 18 and 24 west to east from Bennington to De Soto. (See explanation on page 3.)

Soon after hatching, the fledglings sprout feathers. At this time, they have gray backs coupled with spotted white breasts and only a hint of blue in the wing and tail feathers. Young birds remain in the nest from 15 to 18 days.

After they leave the nest, the male is in charge of the fledglings. He feeds the growing birds and teaches them how to obtain food. This training continues for several days until the youngsters can feed themselves. During this time the female is busy constructing a new nest for the second or third brood.

### How You Can Help

Perhaps the most severe problem facing bluebirds today is the lack of suitable nesting sites. Allowing trees to mature and develop natural nesting cavities is a lengthy process. However, humans can speed it up by providing artificial nest boxes. Bluebirds readily accept manmade nest boxes and, in some cases, prefer them to natural cavities. These boxes are easy to build, set up, and maintain.

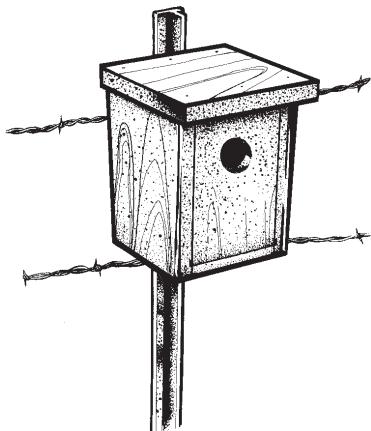
Bluebirds appear to be site-specific in their acceptance of artificial nesting structures. This publication provides plans for four different styles of nest boxes: Zeleny, Davis,

Slot, and Bleach Bottle. Bluebird houses can be purchased or built.

Building and providing nest boxes for songbirds can be rewarding for people of all ages. The ease of building and maintaining makes this hands-on activity a good educational experience in avian biology for youth clubs, classes, and individuals. This can also be a successful money-generating project if you sell the boxes. Also helpful is a videotape showing different types of bluebird houses, their placement, and maintenance. It is available through your nearest county Research and Extension office.



Groups wishing to have a program on the bluebird house project can contact the Research and Extension Wildlife Office, Room 128, Call Hall, Kansas State University, Manhattan, Kansas 66506-1600. Telephone number is (785) 532-5654.



#### Properly constructed houses encourage bluebirds to homestead

Kansans have proposed creating a bluebird corridor. They would like to place and maintain bluebird nests north and south through Kansas 25 miles on either side of a line from Marysville to Arkansas City. A bluebird corridor also runs along Highways 18 and 24 from Bennington east. Within that area, it may be possible to have an experienced bluebird person meet with your group and explain their enjoyment and success in helping the bluebird population in Kansas. Several retired persons have agreed to speak to groups. The Research and Extension Wildlife office will make arrangements and schedules.

Individuals and groups wishing to establish bluebird trails, (a series of bluebird houses in a line spaced at least 300 yards apart), can seek additional information and possibly special funds by contacting the Kansas Department of Wildlife and Parks, Non-game Program, P.O. Box 1525, Emporia, Kansas 66801.

### Nest Box Construction Materials

Select durable, weather-resistant materials because a properly constructed nest box should last 10 to 15 years. Most kinds of lumber or exterior plywood are satisfactory. The most durable woods for nest box construction are red cedar, redwood, bald cypress, and red or white oak. These are usually expensive and tend to split when nails are driven into them without pre-drilled holes. Spruce, pine, or hemlock are less durable, but are easier to work with and are less expensive. Exterior grade  $\frac{1}{2}$  to  $\frac{3}{4}$  inch plywood, called T-11, may be used in place of lumber. This

material weathers well and is often used for siding on homes. Because it does not warp easily, it may be used as a roof when other lumber is used on the rest of the box.

Boxes can be constructed of new or old lumber. Those constructed of old lumber are less noticeable, already weathered, and probably less expensive. You can build nest boxes of either rough or smooth (planed) lumber. Do not use wood treated with preservatives such as creosote or pentachlorophenol (penta). Some people get wooden crates used for shipping grapes at local grocery stores. This wood is reportedly useful for constructing nest boxes.

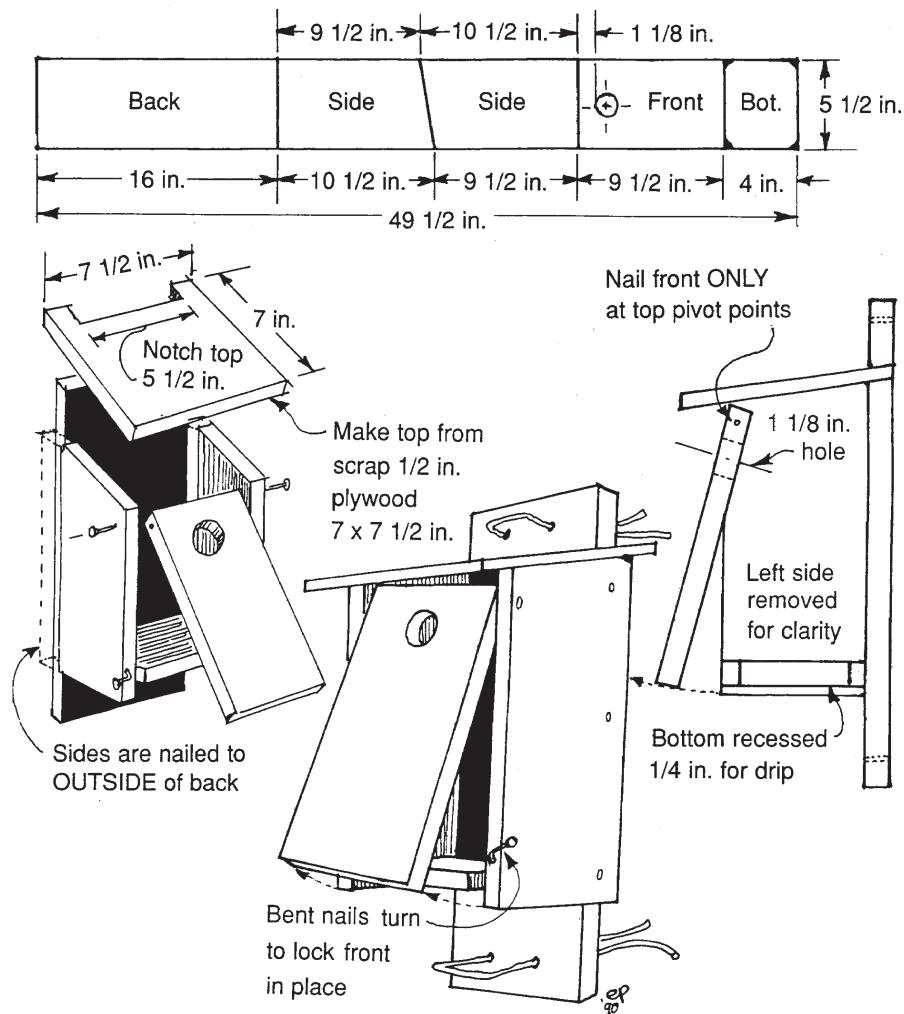


Figure 2. Bluebird House (after Davis)



Use dry wall screws, wood screws, corrugated underlayment nails, or galvanized nails. Common or smooth nails are unsatisfactory because they do not hold well. Concrete coated, ring shank, or roughened shank nails are recommended for boxes constructed of cedar or redwood.

It is unnecessary to paint nest boxes — exterior finishing may please the builder more than the occupant. Unpainted boxes made of cedar, redwood, bald cypress, or oak will weather naturally and turn gray, blending with their surroundings. If you paint the boxes, select a water-based exterior latex paint. Use light color, green, gray or tan, to prevent overheating of eggs or young. Oil-based stains used on homes and fences also may be used, but do not use paints containing lead or chemical preservatives. Apply finishes only to exterior surfaces.

### Construction of Kentucky Bluebird House

(After Davis 1988)

Cut the pieces shown in Figure 2.

Measure and mark a point approximately 2 inches from the top of each side. Using nails, fasten the door to each side at the top only. Be sure to leave about  $\frac{1}{2}$  to  $\frac{3}{4}$  inch of the door below the sides.

Using nails or screws, fasten the front and sides to the back.

Measure carefully  $1\frac{1}{8}$  inch from the top of the box. Mark each side on front and nail the entrance strip to the box. The opening size is critical because an entrance much larger than  $1\frac{1}{2}$  inch will allow starlings to enter. Bluebirds will not use an entrance with a smaller opening. Drive a 6d finishing nail into the side and bend it across the front to act as a latch.

Move the door back and forth several times so it will move easily.

If the house is to be placed on a fence, drill four holes in the back above and below the box and place galvanized wire through them to allow for hanging. Wire the box firmly to the metal post.

### Construction of Traditional Zeleny Nest Box (After Zeleny 1976)

Cut pieces shown in Figure 3.

Measure and mark a point approximately 2 inches from the top of the front and back pieces. Using nails, fasten one side on the top and bottom to the front and back pieces. On the other side, fasten the side door with nails at the marked points on the front and back.

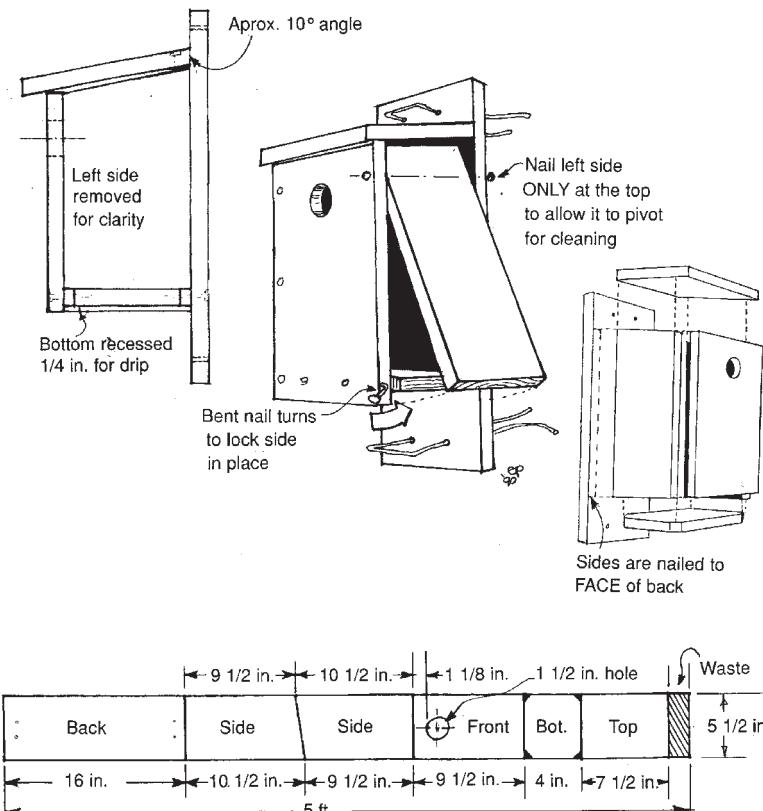


Figure 3. Bluebird House (after Zeleny)



Do not nail at the bottom of this side.

Fasten this section to the back using nails or screws.

Fasten the top and bottom pieces. Recess the bottom piece approximately  $\frac{1}{4}$  inch up.

Drive a 6d nail into the side and bend to act as a latch.

Move the door back and forth several times so it will move easily.

## Top Slot Opening

### Nest Boxes

Wildlife researchers in Iowa tested various models and found that a box with a front slot opening was used more successfully and more often than the traditional circular opening. These boxes are easier to construct and maintain. The box is a standard square with inside dimensions of approximately 5 x 5 x 10 inches, (see Figure 4). Instead of a hole in the front of the box, a gap of  $1\frac{3}{16}$  inch is left just below the roof. This creates a slot across the front of the box.

### Bleach Jug Bluebird House

An inexpensive bluebird house can be built from 1-gallon plastic bleach jugs, (see Figure 5). Holes can be drilled for air vents and wire fasteners. A clean-out door can be cut in one side near the bottom and by using duct tape the door can be held shut. Use duct tape over the bottom and top edges of the  $1\frac{1}{2}$ -inch hole cut for the entrance.

When using a plastic jug for a bluebird house it is important to paint the outside of house with at least two coats of paint. (light grey or tan is preferred.) This helps cool the house. Further cooling should be provided by a flat roof. Houses can be individually numbered for identification in your records.

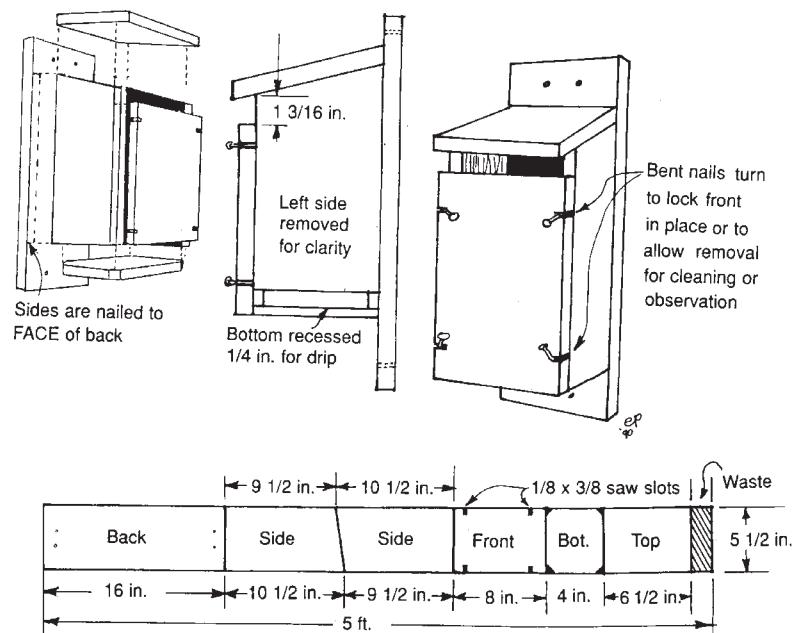


Figure 4. Bluebird House (slot type)

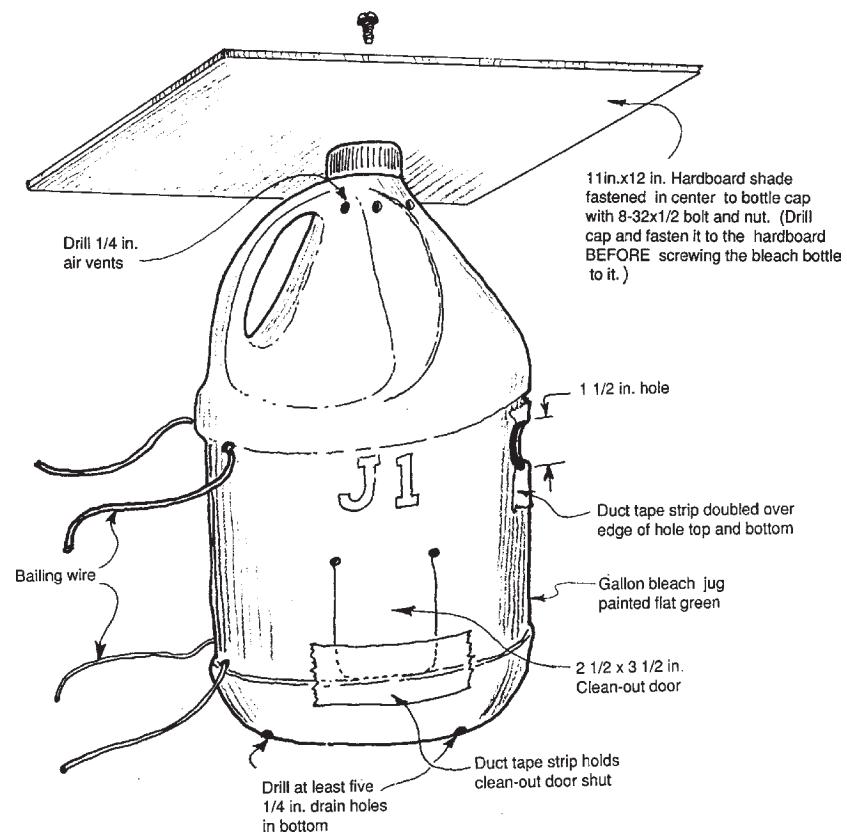


Figure 5. Bleach Jug Bluebird House



## Modifications

If house sparrows are common in your area, you may want to modify the above designs by placing a strip of  $\frac{1}{4}$  inch painted plexiglass or hardware cloth on the top of the bleach jug model. Sparrows like dark nesting areas and may not use structures that let more light enter.

## Installation

Mount nest boxes on fence posts, metal posts, utility poles, buildings, or fences 4 to 6 feet above ground. The preferred mounting site is a metal post. The next choice is a wooden post. A utility pole is also a good site, but remember to get permission from the utility company before erecting any boxes. Tree trunks are less desirable because bluebirds show a definite preference for boxes on posts. In addition, boxes on trees are more susceptible to damage by squirrels, predation by cats and snakes, and use by mice and flying squirrels.

Fences are excellent sites if the box is on the side away from cattle. Otherwise, cattle will rub on a box and knock it down. Horses will reach across a fence and chew the box unless a barbed wire is stretched across the top. Near horse pastures, put the box low enough to be beyond the reach of the horse, but not easily accessed by cats. The preferred option in this situation is to erect a metal post outside the fence.

Predators like house cats, raccoons, and snakes will readily eat the eggs and young in a bluebird house. Make it difficult for predators to get into them by placing the boxes on metal posts. Coating the post with grease may further discourage predators and ants. Another method of reducing predation is to place a cone-shaped metal shield just below the box. Paint metal predator guards with a flat paint to reduce glare.

Hornets and/or yellow jackets often build their nest in bluebird houses. Vaseline or other odorless petroleum jellies will keep these creatures out when applied inside on the lower surface of the nest box top. Also, by placing the nest boxes at least 300 yards away from buildings, house sparrows use of nest boxes will be greatly reduced.

## Location

Spacing of boxes is essential because birds have and defend territories during the nesting season. The spacing pattern will be dictated by the arrangement of food, cover and isolation in any one locality. Place the boxes 100 to 300 yards or more apart in areas where trees, shrubs, fences, or utility wires are present. These structures provide perching sites for feeding.

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Boxes can be erected at any time. However, you have your best chance of getting tenants if you put them up by the end of February when the bluebirds start searching for nesting locations. The birds will use boxes erected as late as August. Place the boxes in suitable habitat including areas where insects abound and where there is a mixture of trees and open grassland. Open fields, cemeteries, pastures, golf courses, gardens, and large lawns can all be appropriate habitat. Try to avoid placing the boxes in areas where insecticides are heavily used. Often, several boxes in good locations may be necessary to attract one pair of birds.

Boxes placed near woods, brush piles, or aquatic areas often attract other bird species such as chickadees, titmice, wrens, nuthatches, or tree swallows. Do not discourage these species from nesting because they are welcome additions to the area and eat large numbers of insects. House sparrows may take over the boxes. Because this species is not protected by Federal or State laws, these eggs and young can be removed. By repeatedly removing nest eggs or young, you can discourage nesting by sparrows. If house sparrows evict bluebirds, quickly erect another box nearby. Bluebirds will not return to the boxes sparrows have taken over, but they will quickly find an empty box in the vicinity. The eviction is a minor setback to the bluebirds if another box is available.

## Maintenance

Nest boxes should be inspected, cleaned, and repaired periodically. By late February each year, boxes should be cleaned of debris, drains opened, and any structural repairs made. During the nesting season, frequent inspection may be required to prevent house sparrows from using nest boxes. Bluebirds do not seem to mind if you look in their nest; they will not desert it.

The bluebird's nesting material will be composed of small cuttings of grass, and fine roots. The house sparrow will fill the nest with any kind of material that is loose. This includes feathers, string, paper, sticks and grass. Remove the nests built by sparrows as often as is necessary and dispose of that material away from the nest site.

Leave old nesting material in the box during the winter to provide insulation for birds taking refuge in the boxes during cold, winter nights.



## Evaluation

It might be interesting and fun to set up an experiment to evaluate which nesting boxes birds use the most and how many young are produced each year. It is not necessary to check the boxes; however, amateur ornithologists have contributed greatly to our understanding of bird ecology and behavior.

Begin visitations in mid-March and continue throughout the summer. Boxes should be checked every 7 to 14 days. During the egg laying period, do not disturb the female in the morning. When you observe near completion of nest construction, check the box in the afternoon. Do not disturb young birds after they are about 12 days old (near the time of leaving the box) at any time during the day. Disturbance during this period may cause the young to leave prematurely and result in death due to starvation or predation.

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When checking the boxes, be careful not to disturb the nest, eggs, or young. Gently tap on the top of the box before opening to allow the female to leave. She will return after a short absence. After opening, examine for signs of nest building, eggs, young, or other activity.

It is important to keep good records of the number of boxes containing nests, which bird species are utilizing the boxes, number of boxes with eggs, and how many young are hatched. More detailed information on the number of eggs per clutch, approximate hatching date, number of eggs hatched, number of young surviving, number of nestlings fledged, approximate time of fledgling and probable causes of nest, egg, or young loss can also be recorded.

## **Enhancing Bluebird Habitat**

You can improve bluebird habitat, and songbird habitat in general, by planting a variety of shrubs and trees in your yard or garden. The bluebird's diet is composed largely of insects, although they do eat substantial amounts of fruits and berries during the winter. A variety of birds will benefit from these plantings.

Trees

## Shrubs

Oaks	Dogwoods
Cherry	Sumacs
Hackberry	Honeysuckle
Crabapple	Raspberry
Pines	Blackberry
Spruces	Serviceberry
Cedar	Inkberry, hollies
Mulberry	Viburnum
	Bittersweet
	Cyraeautha

## Further Reading

- *The Bluebird: How You Can Help its Fight for Survival*, by Lawrence Zeleny. 1976. Indiana University Press, Bloomington, Indiana. 170 pp.
  - *A Field Guide to Birds East of the Rockies*, by Roger Tory Peterson. 1980. Houghton Mifflin Company, Boston. 384 pp.
  - *The Audubon Society Master Guide to Birding*. Vol. 3, Old World Warblers to Sparrows. Edited by John Farrand, Jr. 1983. Alfred A. Knopf Inc., New York, 400 pp.
  - *Field Guide to the Birds of North America*. 1983. National Geographic Society, Washington, D.C. 464 pp.
  - *A Guide to Field Identification: Birds of North America*. 1983. Golden Press, New York. 360 pp.
  - *Sialia*, Official quarterly publication of the North American Bluebird Society, Box 6295, Silver Spring MD 20906.

## Season Record of Monitoring

**Legend:** BN = Bluebird nest  
BE = Bluebird eggs  
BH = Bluebirds hatched  
BF = Bluebirds fledged

SN = Sparrow nest removed  
VAN = Vandalism  
PD = Predator damage  
OBN = Other bird nesting

Bluebird House



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