

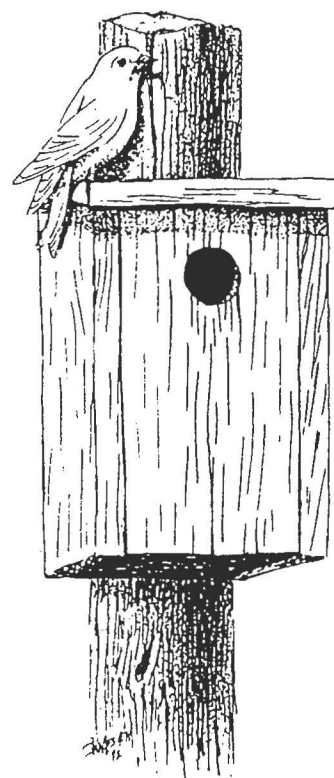


The Bluebird of Happiness

Bluebirds, sometimes referred to as “gems of nature”, have received a lot of attention and help from people in the past 35 years or so. Once commonly found throughout eastern North America, Eastern Bluebird numbers dropped by as much as 90% during the time period of 1930 – 1990.

Why did Eastern Bluebird numbers drop? There were a variety of reasons for this decrease in numbers. Forestry practices, such as clearcutting, removed many trees which had the holes (cavities) that Eastern Bluebirds use for nesting. For the trees with cavities that did remain, Eastern Bluebirds were faced with competition from two new birds, the European Starling and House Sparrow. These birds were introduced into the United States and are successful in outcompeting bluebirds for nest sites and will sometimes kill bluebird nestlings and adults. Another highly effective, non-native predator on bluebirds are cats. It is estimated that as many as 3.7 billion songbirds are killed annually by cats across the United States. Much open grassland habitat (prairie or savanna) was converted to agricultural use or for residential development. During the 1930's, production of pesticides and their use in agricultural production began to expand. This led to the poisoning of the insects that bluebirds feed upon, particularly crickets and grasshoppers. Birds suffered secondary poisoning by eating these animals.

What has been done to help bluebird populations to recover? In 1978, the North American Bluebird Society was founded by Dr. William Zelezny. The Society's goal is to increase the populations of North America's three bluebird species (Eastern Bluebird, Western Bluebird and Mountain Bluebird) and other cavity-nesting birds. Many Iowans share a concern for Eastern Bluebirds, the only species of bluebird that nests in Iowa, and are working to increase their numbers on our landscape.



The Eastern Bluebird is a bit smaller than an American Robin but larger than most of our sparrows. Males have a beautiful blue back and rusty colored throat and breast. Females are a bit duller in color, but do show a bit of blue in their wings and like the male, have a blue tail. Youngsters are gray in color with a speckled breast and bits of blue on their wings and tail.

Eastern Bluebirds are tied to open habitats with a few trees, larger shrubs or fence posts for nesting and perching. This includes orchards, pastures and croplands near wooded area, but in more urban environments, places such as golf courses, cemeteries and parks are used. Eastern Bluebirds use perches when hunting for their favored prey, crickets and grasshoppers. Other items in their diet include beetles, worms and spiders.



Up to a third of Iowa's Eastern Bluebirds overwinter locally, although most leave for more southern states. Eastern Bluebirds do not have insects available during Iowa's winter and instead feed on the fleshy fruit from plants such as red cedar, Virginia creeper, sumacs, and hackberry.

Eastern Bluebirds are cavity nesters although they don't dig their own holes, but use abandoned holes left by woodpeckers or squirrels. These holes keep the bluebird adults and young safe from many predators, especially hawks, owls, crows and jays. With the clearing of forests, loss of orchards, and conversion of fence posts to steel from wood, Eastern Bluebirds have lost many nesting sites and have begun to rely upon nesting boxes provided by people.

In early spring, male Eastern Bluebirds return to set up territories and attract females upon their arrival. The earliest arriving males pick out the best nesting areas, and set up and defend a territory several hundred feet wide to secure access to food for their mates and young. When females arrive, they inspect one to many areas and may start nests in several of these before finishing the one nest that will be used.

Females do most of the nest building, and all of the egg-laying and incubation. The cup-shaped nest is made from materials that are nearby and can include items such as dry grass, strips of dry bark, pine needles, cattail fluff, twigs, straw, and rootlets. Each of the typically four to six pale blue, bluish-white, or rarely white eggs, is laid a day apart. The male feeds the female during the 12-14 day incubation period which begins on the day that the last egg is laid. The young, called nestlings, typically hatch within a 24-hour period with no feathers and eyes closed. To keep the nestlings warm, the female broods (sits atop) them during their first week, particularly at night and during rainy or cold weather. Males are attentive parents and share feeding duties with their mates. At about four days, the nestlings open their eyes and are covered with gray down. By the time they are 16-20 days old, the young fledge (leave the nest). The parents continue to feed the young, now called fledglings, while the fledglings improve their flying and hunting skills. At first, the fledglings will fly only a short distance and try to land on a fence post or tree branch where they'll be fed by one or both of their parents. Within a week or two, the fledglings become better flyers and are able to catch their own food.

As soon as the young leave the nest, the parents begin the construction of a new nest or tidying up of the existing nest, to prepare for their second family. In some cases, youngsters from the first hatch will help in raising the young from the second. In especially good years, with plenty of insects to eat and good weather, bluebirds may even raise a third family in a season.

The various families raised by the parent birds flock together until the fall. Most of Iowa's Eastern Bluebirds then head south to Missouri, Arkansas, Mississippi, and Texas, and return to Iowa the following spring.

Rebecca Christoffel. Christoffel Conservation -March 2014. Rebecca.Christoffel@gmail.com

Special thanks to Rita Gorenson (Member of the Iowa Ornithology Union) for helping make this revision possible.



Activity: Adopt A Bluebird

Objective: Students will take an active role in helping Iowa's bluebird population by constructing bluebird boxes, establishing a bluebird trail, and monitoring a bluebird trail.

Project # 1: Build a Bluebird Box

Objective: Students will construct several bluebird boxes.

Materials: Ask the high school shop class or a parent to donate and cut lumber to the right size. The boards should be $\frac{3}{4}$ inches thick. Pine, cedar, or redwood work best. See the diagrams on the following pages for design specifications. The entrance hole must be $1\frac{3}{8}$ inches to $1\frac{1}{2}$ inches in diameter. If the hole is $\frac{1}{8}$ inch larger, starlings can squeeze into the box. Be sure the distance between the entrance hole and the bottom of the box is six inches so that starlings, cats, raccoons, and other predators will find it difficult to reach in and grab the eggs or babies. Do not add a perch; this will encourage house sparrows to occupy the nest box.

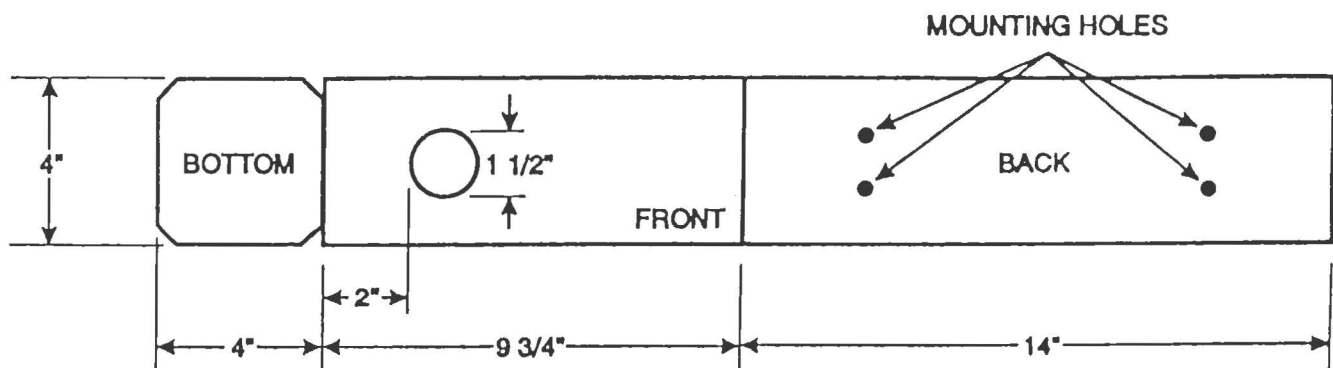
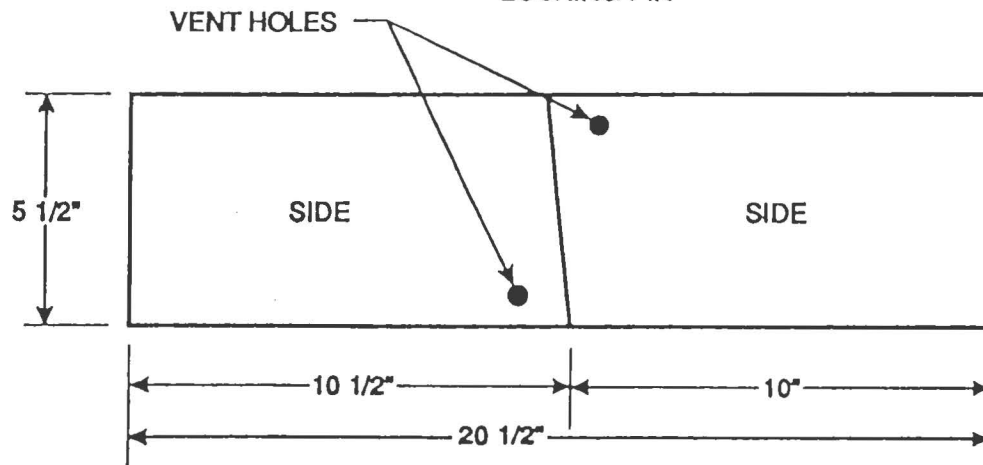
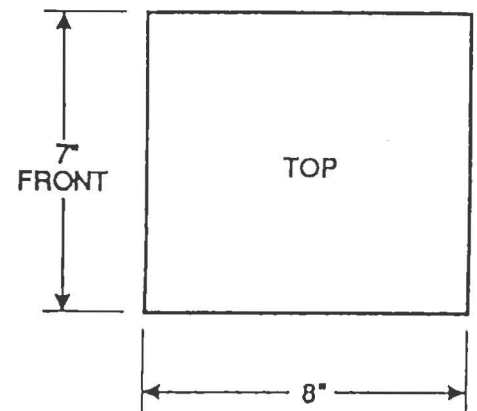
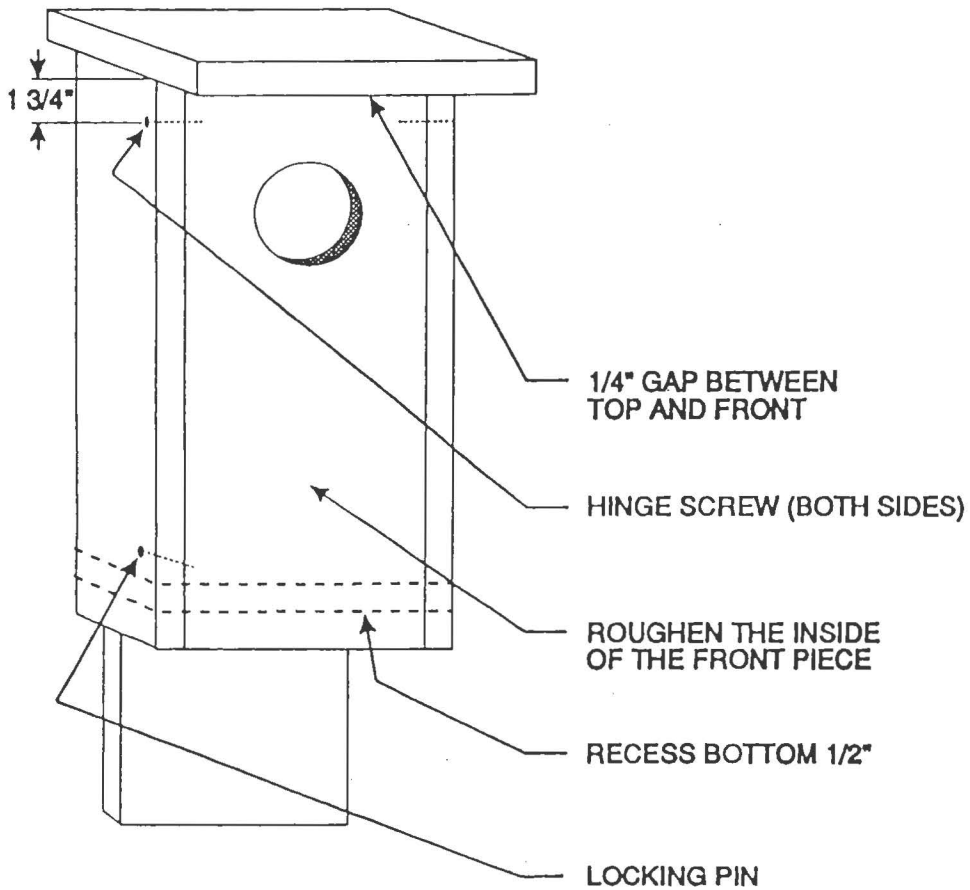
Hammers, screwdrivers, and nails are required for this project. Use ring shank nails or galvanized screws to construct the box. Blunt the nails by striking the point with a hammer; this will minimize wood splitting. Notch the bottom corners to allow for drainage.

Procedure: Students will work in small groups to construct a box. Encourage cooperation among the students. Have several adult volunteers assist the students during construction.

These instructions construct a front opening box. The front should be hinged to the side board to allow easy observation of the birds. Start by placing the side boards on the back board. Be sure the edges are square. Nail the back board to each side piece by placing three nails about three inches apart on each side. Slide the bottom board about $\frac{1}{4}$ inch into the box and nail it securely to the back and sides. Nail the roof onto the sides and back. Slide or place the front board on the front of the box. Using double-headed nails, nail the front to the sides. Only nail the top of the board to the sides. This should allow the front to swing open at the bottom. Use a hook-and-eye bolt to lock the bottom of the front board so it can be opened and closed and then locked.

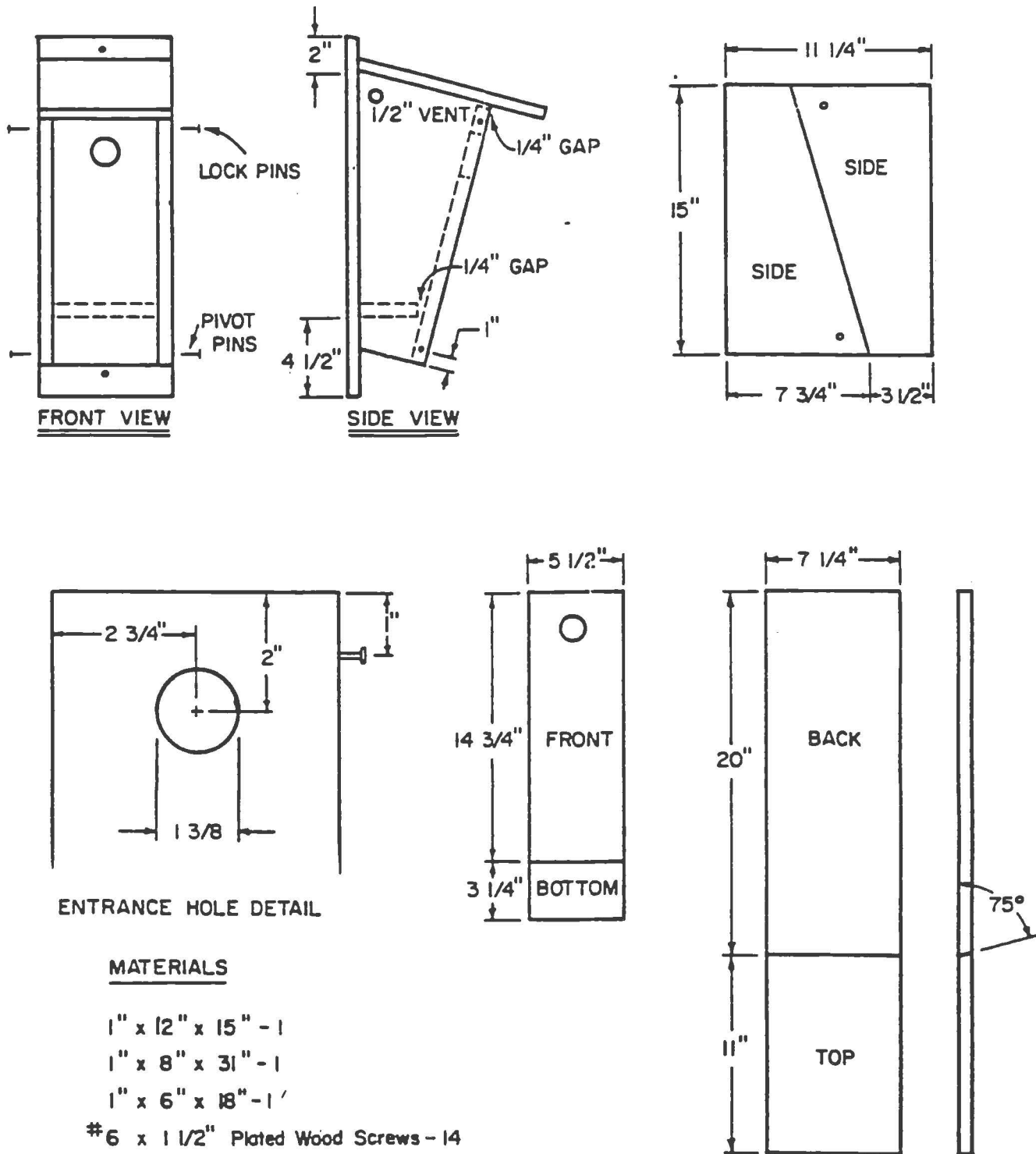


Activity: Bluebird Box Plans Plan One





Activity: Bluebird Box Plans Plan Two



MATERIALS

1" x 12" x 15" - 1

1" x 8" x 31" - 1

1" x 6" x 18" - 1

#6 x 1 1/2" Plated Wood Screws - 14

6d Common Nails - 4

1/4" x 3" Lag Screws - 2 (For Hanging Nesting Box.)



Project # 2: Blazing a Bluebird Trail

Objective: Students will investigate the needs of bluebirds before establishing a bluebird trail.

Procedure: One of the most enjoyable activities that one can undertake to benefit bluebirds and enjoy them is to build a bluebird trail. A trail can consist of any number of bluebird boxes that are placed in appropriate habitat and are monitored and maintained by an individual or group. Trail details and monitoring results can be shared with others through the North American Bluebird Society (<http://www.nabluebirdsociety.org>) or the Cornell Laboratory of Ornithology (birds.cornell.edu/Page.aspx?pid=1478).

But before you blaze your trail, there are some important things to keep in mind. Eastern Bluebirds are birds of open country. Good habitat for them include old pastures, railroad right of ways, edges of rural roads, cemeteries, orchards, big lawns, and parks or old fields. One key feature of good habitat for nesting Eastern Bluebirds is to be free of chemicals used to control insects or weeds, because these same chemicals kill birds and the very insects that the birds eat. You will need to check and monitor houses fairly regularly. Thus, it is often desirable to place houses along an already established foot or bicycle or horse trail for easy access. Iowa is home to many birds that nest in cavities, or holes, and so competition can be stiff for nest boxes. Do not be too disappointed if other birds use at least some of the bluebird boxes that you put out. Use the most current bluebird box plans that are freely available from either the North American Bluebird Society (<http://www.nabluebirdsociety.org>) website to increase the probability that your houses will successfully produce bluebirds. Entrance hole diameter can be used to reduce competition from starlings for houses. Using a box with a 1 1/2" or 1 9/16" inch nest hole will eliminate European Starlings. Many people place a pair of boxes about 25 feet apart so that one may be used by other birds such as tree swallows or house wrens, while Eastern Bluebirds use the other. If House Sparrows try to take up residence in a house, you can remove their nests. House Sparrows and Eurasian Starlings are not protected by law and may be removed from bluebird boxes at any time. However, all other birds such as House Wrens, Black-capped Chickadees and Tree Swallows are protected by federal laws and should not be disturbed once nest building has started.

Eastern Bluebirds are territorial when nesting to protect the resources that they need to successfully raise their young. Because of this, bluebird houses, or pairs of houses spaced about 25 feet apart, should be placed at least 100 yards apart, but preferably 125 -150 yards apart. Boxes should face either east or south to avoid having winds and precipitation enter. It is good to have a shrub or tree 25-100 feet away from the nest hole for the youngsters' first flights.

- Several measures can be taken to reduce predation of the birds, their eggs, and the nestlings.
- Boxes should not be placed near trees, but should be at least 10 feet from any trees. This will keep predators from being able to jump from a tree onto the next box.



- Place a predator guard on the mounting pole below the box. Some people also place a 24-inch piece of hardware cloth around the pole directly under the nest box to protect birds from climbing predators such as cats and snakes. Plans for pole guards are available from the North American Bluebird Society (<http://www.nabluebirdsociety.org>).
- Placing boxes higher (> 6 ft) above ground can also help to reduce predation by cats.
- As added protection, rub the pole with steel wool and apply a layer of car wax or silicone spray to deter predators.

Once the young bluebirds have left the box, remove the nest to avoid parasite problems and to provide a clean site for a new nesting.

In late winter or early spring, check your boxes and prepare them for returning birds. This may include cleaning out mouse nests and replacing nails or worn boards. Contact your local county conservation board, state park, or local park and recreation board about establishing a bluebird trail and monitoring boxes that are already set up in your local parks.

Resources about Bluebirds

Online

Iowa Department of Natural Resources. Bluebird page, <http://www.iowadnr.gov/Environment/LandStewardship/WildlifeLandownerAssistance/TechnicalAssistance/EasternBluebird.aspx>

Mountain Bluebird Trails – Children’s Bluebird Activity Book, <http://www.mountainbluebirdtrails.com/book.htm>

North American Bluebird Society, <http://www.nabluebirdsociety.org/index.htm>

Curricula and Activities

Flying Wild – <http://www.flyingwild.org>

North American Bluebird Society Educational packet,
[http://www.nabluebirdsociety.org/PDF/Educational packet.pdf](http://www.nabluebirdsociety.org/PDF/Educational%20packet.pdf)

Citizen Science programs

Great Backyard Bird Count, <http://gbbc.birdcount.org>

Project Feeder Watch, <http://feederwatch.org>

Nest Watch, <http://www.nestwatch.org>



Books

Kirby, P. F. 2013. What bluebirds do. Boyds Mills Press. ISBN: 1620915936 (* Children's book)

Pitts, D. T. 2011. Studying eastern bluebirds: a biologist's report and reflections. Redleaves Publishing. ISBN: 0615411339

Scriven, D. 1998. Bluebird trails: a guide to success, 3rd edition. Bluebird Recovery Program. ISBN: 096396611

Staake, B. 2013. Bluebird. Random House Children's Books. ISBN-13: 9780375870378

Stokes, D. W. and L. Q. Stokes, 1991. The bluebird book: the complete guide to attracting bluebirds. Little, Brown and Company. ISBN: 0316817457

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Project # 3: Monitoring Bluebird Boxes

Objective: Students will gather and organize data after monitoring a bluebird trail.

Procedure: After you have constructed and mounted the boxes, **monitor the boxes once a week.** Divide the responsibility of monitoring the trail among your class members. Recruit a leader, parent, or responsible student to be in charge of the project. Getting a pair of bluebirds to use your box is the hardest part. Check with local bluebird enthusiasts to locate an area which bluebirds are known to frequent. Once you see evidence of nest building activity, try to determine whose nest it is. Observe what type of bird is flying in and out. If this is not possible, here are several hints to identify bluebird nests.

Bluebird nests are built almost entirely of dry grasses and are neatly arranged. House sparrow nests are made of coarse weeds, grasses, straw, and feathers. They are very messy and often fill up the nest box. House wren nests are built of twigs. Tree swallow nests are often made of grasses and the cup has feathers in it. Black-capped chickadee nests often have moss in them, and mouse nests are rolled into a big ball.

Bluebird eggs are light blue. They are rarely speckled. Sometimes bluebird eggs can be white. House sparrow eggs are smaller and usually speckled.

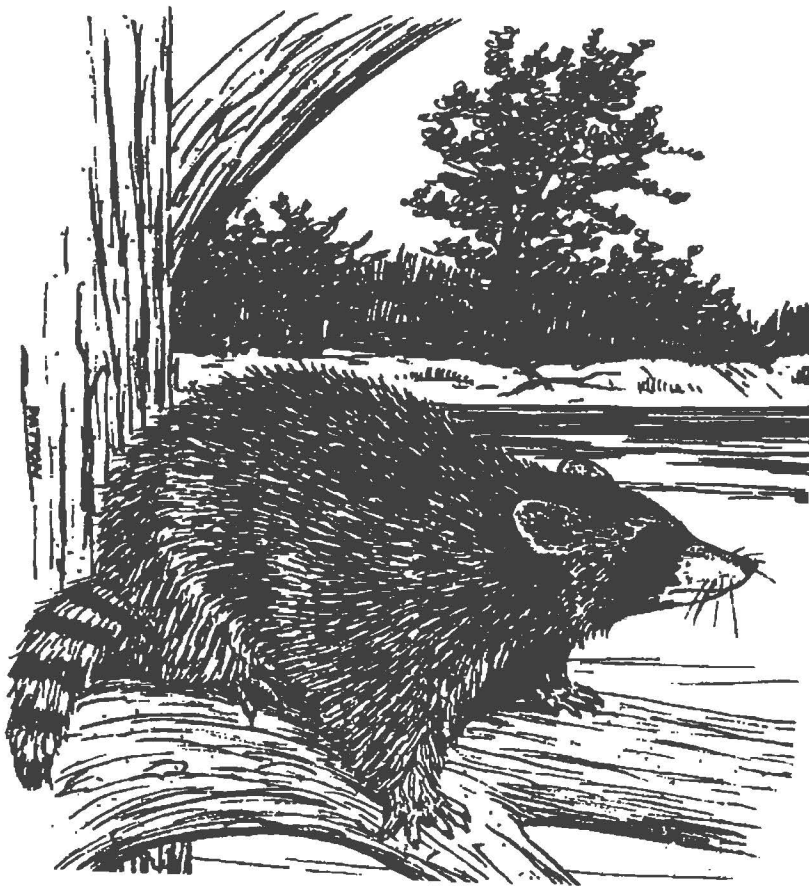
House sparrows are stubborn nesters. Their nest and eggs should be cleaned out regularly. House sparrows are not protected by law.

If you determine you have bluebirds nesting, the box needs to be monitored weekly. Observe the nest box from a distance while the birds are making their nest. After the nest has been completed and the eggs are laid, you may open the box and take a quick look. Try to make your observations quickly. It's a good idea to tap on the side of the box before opening it to let the female bluebird fly out. Sometimes she will sit tightly on the nest, and you'll have to come back later. Use the form on the following pages to record the data.

Both parents take turns incubating the eggs for two weeks. The eggs hatch almost all at once, and the adults begin to search for food for the young birds. Usually bluebirds cannot fly until they are about 20 days old. It is best not to open the nest box after their twelfth day to prevent premature fledging. It is important to record the dates when the eggs are laid and hatched, how many eggs are laid, and how many hatch.



Nest box predation is a problem. Predators of the bluebird include house sparrows, starlings, raccoons, cats, snakes, and blackflies. The house sparrow is the worst avian predator of the bluebird. Sparrows will kill adults, as well as the babies, and take over the box. If the eggs disappear, the culprit is often a snake. Raccoons and cats will reach in and tear up the nest and kill the babies. Printer's tin on the post or automobile grease applied to a pole every week will help cut down on the climbing predators. Cats have been known to sit on top of a box and catch the adult bluebirds as they fly in and out. Blowflies and blackflies can infest the nest and the young nestlings, often killing the young birds. Contact a local bluebirder if you have persistent predation problems.



Raccoon



Activity: Bluebird Box Results

Name _____

Address _____

City _____ State _____ Zip code _____

Phone number _____

_____ Number of bluebird houses monitored

_____ Number of houses occupied by bluebirds

_____ Total number of bluebird eggs laid: _____ blue _____ white

_____ Number of bluebird young hatched

_____ Number of bluebirds presumed fledged or flown from the nest

_____ Number of successful bluebird nesting attempts in occupied boxes

Number of boxes with:

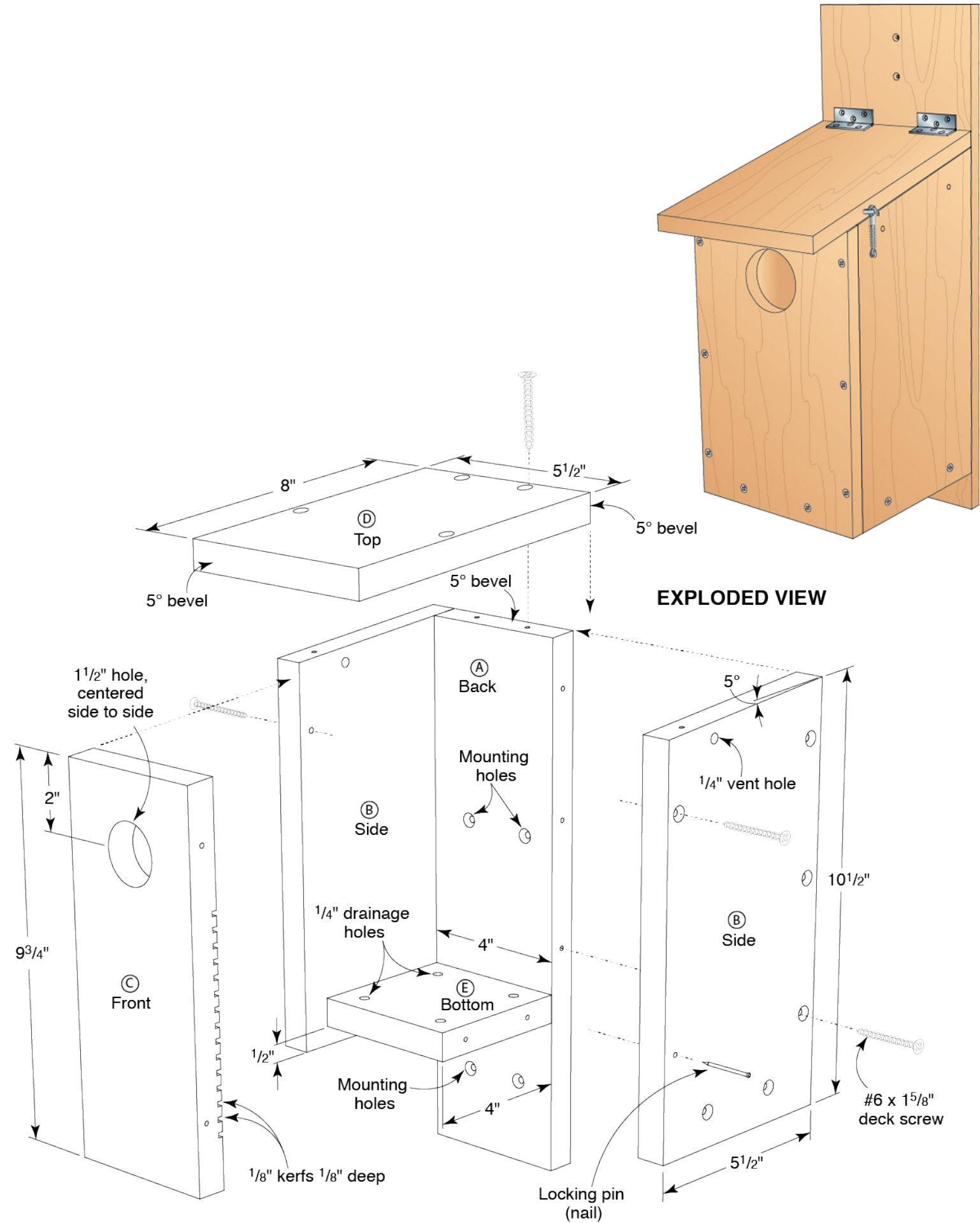
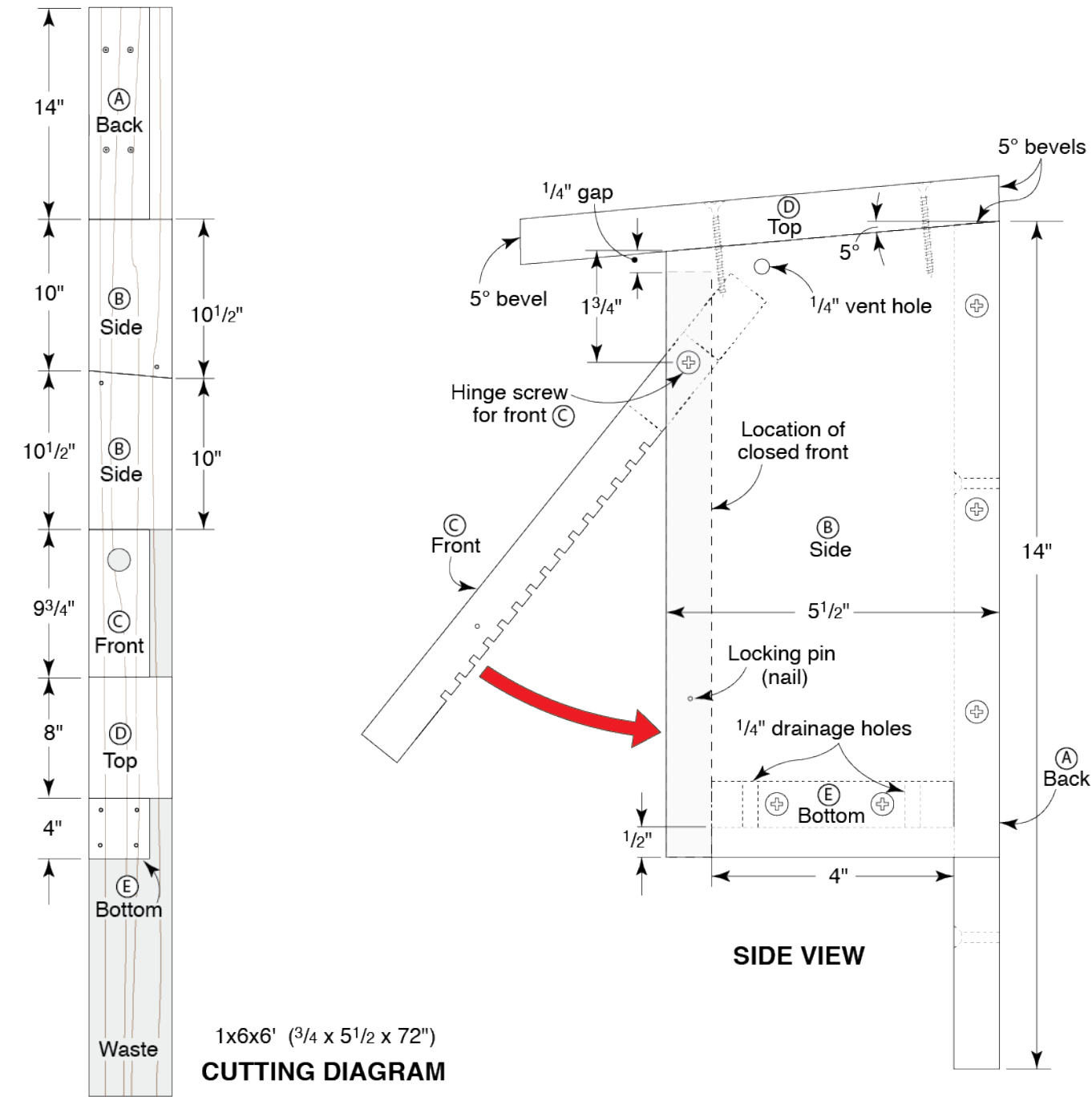
_____ one nest _____ two nests _____ three nests

Number of nest boxes occupied by _____ house sparrows _____ starlings

_____ house wrens _____ tree swallows _____ chickadees _____ others

Please list other species of birds found nesting in the boxes:

MATERIALS LIST FOR BLUEBIRD NESTING BOX						
Parts	Thickness	Width	Length	Material	Pieces	
A back	3/4"	4"	14"	C	1	
B sides	3/4"	5 1/2"	10 1/2"	C	2	
C front	3/4"	4"	9 3/4"	C	1	
D top	3/4"	5 1/2"	8"	C	1	
E bottom	3/4"	4"	4"	C	1	
Choice of cedar, redwood, cypress, or painted white pine						



Nest Box Building Instructions

1. Cut pieces according to the plan drawing, including 1/8” kerf cuts 1/8” deep on the inside of the front board (as indicated in the diagram). Measure from the bottom of the front piece 7 3/4” up and cut out the 1 1/2” entrance hole with the center of the hole lining up with the 7 3/4” mark.
2. Measure and drill four – ¼” drainage holes in the floor piece, as depicted in the first diagram.
3. Place the sides on the back piece, for assembly, so that the angled side pieces slope downward toward the front. Mark and pre-drill pieces for attachment, as shown in the second diagram. Attach sides to the back piece with #6 x 1 5/8” wood or deck screws.
4. Recess the floor piece ½” from the bottom to reduce wicking water infiltration. Pre-drill holes for the floor piece in the sides, then screw the sides to the floor piece.
5. As shown in the first diagram, pre-drill one hole in each side 1 3/4” down from the bottom of the top board, for front piece attachment to the sides. Attach loosely with screws, since the front also is the access door to check contents of the nest box. As shown in the diagram, be sure to leave ¼” space down from the bottom of the top board, when the front piece is attached, so that the front door does not bind on the top when opened.
6. Place the roof piece on top of the sides and make sure that it is centered. Pre-drill holes in the top and attach to the sides and back with screws.
7. Drill one ¼” vent hole in each side (about ¾” down from the top) as shown in the first diagram.
8. Drill four mounting holes in the back piece (as shown in the second diagram) so the nest box can be attached to a pole.
9. Finish the exterior with a low-to-no VOC exterior water-based semi-transparent light-colored stain or paint. Do not stain or paint the interior areas. Apply two coats on the roof. Allow stain or paint to dry before installing nest box.
10. Using the four pre-drilled mounting holes, attach the nest box to a wooden pole with screws or to a metal pole (with matching spaced pre-drilled holes) with bolts.



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Eastern Bluebird *Sialia sialis*

Bluebirds historically nested in cavities of old oaks and elms, across the plains in savannas and along forest edges. Lacking the tools of woodpeckers and squirrels, the bluebird is a secondary tenant, waiting for these excavators to create (and then leave) suitable nest cavities. Today most of these old stubs and snags are gone, cut for fuel, cleared for farm ground, or removed because they were deemed unsightly. Deprived of nesting sites and their short-grass hunting grounds, the bluebird needs our help re-establishing safe and secure nesting sites.



Habitat Needs

Best Locations:

- Savanna habitat, with short to medium height grassland as ground cover
- Large live or dead tree cavities available to provide nesting and roosting habitat
- In winter, native red cedars provide both cover from harsh weather and berries that bluebirds can eat to survive
- Orchards, green golf courses bordered by large trees, or backyards, when part of a larger savanna landscape
- Place the nest box on a pole or post ~five feet above ground
- Place a metal predator guard beneath the nest box
- Nest boxes also can be mounted on the side of a building
- Orient the nest box opening toward the east or southeast

Locations to Avoid:

- Large woodlands or in cultivated areas lacking grassland and trees
- Avoid facing the nest box north to lessen impacts of late winter/early spring snowstorms.