FNR-246-W

EXPERT REVIEWED

Purdue University
Forestry and Natural Resources

Size Does Matter–Nest Boxes for Wildlife

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Many people enjoy viewing wildlife on their property. The first step in attracting wildlife to your backyard is to provide the specific habitat elements of food, water, cover, and space that your desired wildlife species require.

Suitable cover is often one of the most limited habitat elements in backyard habitats. Over 50 wildlife species in the Midwest use cavities in live trees (den trees) or dead, standing trees (called snags) for nesting and denning cover. Unfortunately, yard management practiced by many of us does not encourage either of these critical habitat features needed by cavity nesting wildlife. New developments often lack an abundance of trees. Even when planted, many of the tree species selected for landscaping such as Bradford pear, flowering crabapple, or ash, do not favor development of natural cavities. Native hardwoods such as oak, sycamore, and beech trees readily form natural cavities, but may take many years to do so. While nest boxes are not a replacement for these species or wildlife habitat management, they are a great way to supplement natural cavities, make your backyard more attractive to cavity nesting species, and complement your landscape design at the same time.

Whether you purchase nest boxes or build them yourself, a properly maintained nest box can last for years. You can maximize their value by installing them at the proper heights and in the proper locations. They should be located near food, water, and other cover needed by your desired species. There are a few basic "rules of thumb" that will help you select and install nesting structures most beneficial for the wildlife species you wish to attract in your backyard.

Live den tree.

Size and Location Matters

Each wildlife species has specific requirements for the dimensions and location of a nest cavity. Some of these requirements overlap among species. Bookstores and the Internet contain a myriad of nesting box plans and designs for most cavity-nesting wildlife species. While the outward appearance may vary widely for these structures, the basic function of a nest box is to attract a backyard resident.

The size of the entrance hole is a major factor in determining what species can use the box and what species can be excluded from the box. This has been well documented in the Eastern bluebird. Now bluebird specialists are promoting a box design with a long, narrow slit at top rather than a round opening. These are preferred by bluebirds, but are unattractive to house sparrows.

The size of the internal cavity is arguably more important than the entrance hole diameter. Be aware of typical nest cavity dimension and placement characteristics for your target species. If you purchase or build a nest box, make sure the dimensions and entrance hole are the right size for the species you wish to attract. Recommendations for some common Indiana backyard wildlife species are listed in the following table. See the References Section for specific designs and detailed information resources.

Species	Entrance hole diameter (in)	Hole height Above Floor (in)	Floor dimensions inside box (in)	Total height of box (in)	Height above ground (ft)	Average start of nesting season	Location tips
Birds							
American kestrel	3	10-12	8 x 8 to 9 x 9	14-16	10-30	mid-March to April	Place in orchards, pastures, or relatively open areas near grassy habitats (hunting areas). Facing south or west and space at least ½ mile apart. Place 2-3" of wood chips in bottom of box.
Bluebird	1½ or 1⅛ vertical slit	6-7	4 x 4	11-12	3-6	March to early-April	Face north or east, spaced 100 yards apart in open fields, orchards, and meadows.
Chickadees	1⅛	6-7	4 x 4 to 5 x 5	9-12	5-15	late-April to early-May	In hardwood forests, woodlots, or yards with mature trees; need 40-60% sunlight on box; one box per 10 acres. Place 1" of sawdust on nest box floor.
House wren	1⅛	6-7	4 x 4 to 5 x 5	9-12	5-10	late-April to May	Locate under an eave of a building or in a tree. Can be free hanging.
Carolina wren	1½	6-7	4 x 4 to 5 x 5	9-12	5-10	mid-March to April	In mature hardwood forests, forest edges, yards with mature trees.
Tree swallow	1⅜	6-7	4 x 4 to 5 x 5	9-12	4	late-April to May	In open fields near water, marshes, meadows, wooded swamps; on a post in open areas near tree or fence, 30-100 feet apart; face entrance hole eastward.

Species	Entrance hole diameter (in)	Hole height Above Floor (in)	Floor dimensions inside box (in)	Total height of box (in)	Height above ground (ft)	Average start of nesting season	Location tips
Wood duck	4 wide x 3 tall	18	7 x 8	24-26	>20 for trees >3 feet above high water mark for posts in water	late-April to early-May	In forested wetlands or near marshes, swamps, and ponds; place in deciduous trees, 30-100 feet from the nearest water; place 4" of wood shavings in box bottom.
Purple martin	2⅛	1	6 x 6	6	8-20	late-April to May	In open areas at least 40ft from trees near utility wires and open water; paint white.
Screech owl	2½ - 4	10-12	6 x 6 to 8 x 8	15-18	10-30	late-March to April (will use year round)	Edge of mature hardwood forest; wooded parks or stream edges. Place 2-3" of wood chips in box bottom.
Mourning dove	Shallow cones or nest baskets	-	12	-	6-16	February to March	In moderate shade in the crotch of a horizontal tree limb.
American robin	On shelves	-	7 x 7 to 8 x 8	-	6-10	late-April to May	In sheltered sites under eaves or soffits, or on tree trunks.
Mammals							
Bats	1 (between dividers)	-	Variable	Variable	12-15	Early April	Attach to tree trunk, side of building, post. Face east on sites protected from the wind.
Southern flying squirrel	1¼	6	4 x 4 to 5 x 5	9-12	10-30	February to March (will use year round)	In heavily wooded sites. Locate hole on side of house close to tree trunk.
Gray and fox squirrel	3 (located on the side, 2½" from tree)	10-12	8 x 8 to 9 x 9	14-16	>15		Locate in woodlots, backyards with mature trees in trees > 10" diameter. Face east or south and fill half full of dry leaves.
Red (pine) squirrel	2½ - 4	10-12	6 x 6 to 8 x 8	15-18	10-30		Locate in coniferous woods or yards with conifer trees.

Data for table adapted from Mumford and Keller (1984), Henderson (1992), and Cornell Lab of Ornithology (http://birds.cornell.edu).

Once basic cavity dimensions are met, you need to choose a location based on the requirements of your target species. Review recommended locations in the table above and the resources at the end of the publication. Ask yourself these questions.

- Is it at the height the animal feels comfortable?
- Is the cavity protected from predators?
- Does the nest structure get the proper amount of sun or shade to provide comfortable temperatures?
- Is the nest structure near required food, water, and escape cover?

Choosing and placing nest structures that favorably meet these criteria will increase their use. Arrangement can also be important. Purple martins need their boxes clustered into groups. Apartment houses or groups of gourd nests work well for purple martins.

Basic Design Tips

Follow these basic design tips, maintenance suggestions, and predator reduction advice to make your nest structures more useful to your backyard visitors.

- Use quality materials that are weather resistant. Exterior grade plywood and lumber are good choices. Cedar and other rot-resistant woods are best. Avoid using treated lumber and metal.
- Avoid painting or staining inside nest boxes. Painting the outside can prolong its life and may be attractive for some species (white for purple martins, for example).
- The roof should be sloped to allow water runoff and should hang over the sides.
- Drill at least four 3/8-inch drainage holes on the floor.
- The roof or one side should open to allow easy access for cleaning.
- Avoid perches. Natural cavities don't have them and neither should your nest box. Perches also allow European starlings and English house sparrows, non-native invasive species, to harass native cavity-nesters and take over a nest box.
- Near the top of each side, leave gaps or drill 5/8 inch holes (at least 2 per side)
- Erect your nest box well before the average start of the nesting season. Some species will set up their nesting territory 3 to 4 weeks prior to egg laying.

Maintenance

After the nesting season, clean out the old nesting materials. While there are some species that like to build a new nest on top of old nests, most experts agree that cleaning out boxes is the best practice. This will minimize parasite infestations and will make the box less attractive for deer mice which can exclude birds the following spring. If unexpected residents occupy a nest box, you may need to erect additional houses. Nest boxes for year round residents, such as screech owls, gray squirrel, and fox squirrel may be used throughout the winter.

Bluebird box.

Problem Species

Monitor your nest boxes for use by house sparrows and European starlings. Competition by these species has been a leading factor in the decline of eastern bluebirds. Proper entrance hole diameter will exclude starlings (1.5 inches or less) and house sparrows (1.25 inches or less) from nest boxes. If you find a starling or house sparrow in your nest box, remove the nest and all of its contents so the house is available for your target species. However, this is just a temporary solution since they will simply rebuild their nest, although persistence may produce results. House sparrows have abandoned a site after repeated (3-4 times) destruction of their nests. You may also close the box entrance until the expected arrival time of your target species, although this would not work for year-round residents. Trapping and humanely dispatching starlings and house sparrows is another method of reducing nest box competition.

WARNING! House sparrows and European starlings are exotic species to North America. They are not protected by law and can be legally trapped or killed using safe and approved methods. Most other species are protected by federal and state laws so be sure you properly identify your visitor before taking action. Boxes for some species may be utilized by native species other than your target species. For more information on laws and regulations protecting Indiana wildlife, see *Animal Damage Management – Rules and Regulations in Indiana* listed in the reference section.

Predation by raccoons and house cats are serious problems in most areas of Indiana. Many nest box designs have predator guards that prevent nest predators from enlarging the entrance hole or from reaching into the box. For additional protection, install structures that prevent predators from climbing to the nest box. Generally, nest boxes on trees are easier targets than those mounted on poles. Using a cone or metal band can inhibit cats and raccoons from ascending trees or poles. When mounting inverted cones or other predator guards, locate them high enough on the pole or tree so predators can't jump over them.

When placing a predator guard on a tree or pole, look around. If a predator can gain access to the nest box from adjacent trees or buildings, you will have to prevent access to all of them or select an appropriate location that is easier to prevent predator access.

Last, But Not Least

One of the best reasons to put up a nest box is for you. Place it in an area that is easily viewed from an area you spend some quiet time like a reading area, the chair you sit in when enjoying your morning cup of coffee, or a screened porch or deck. Then, sit back and enjoy the show!

Acknowledgements

The authors would like to thank J. B. Dunning, Jr. and J. Castrale for providing many helpful comments that contributed greatly to this publication.

Tree squirrel.

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Cornell Lab of Ornithology Bird House Network <http://birds.cornell.edu/birdhouse/>

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