Eastern Bluebird
(*Sialia sialis*)

January 2007 *Fish and Wildlife Habitat Management Leaflet* *Number 2*

General information

The eastern bluebird is a favorite migratory songbird of birders and nonbirders alike. The bird's bright blue color and melodious song make it a welcome visitor to backyards. The history of the bluebird spans a series of struggles and successes and only recently, through active wildlife management, has its future been considered secure. During the days of frontier settlement, the bluebird was among the wildlife species that benefited from the decimation of the eastern forests. The conversion of forest into pasture, orchards, and homesites created an abundance of ideal bluebird habitat—open areas that supported the nesting and foraging activities of the species. Farmers unintentionally assisted bluebirds by bordering their fields with wooden fenceposts, thus supplying additional nesting sites. Combined, these factors led to a proliferation of bluebird numbers throughout the Eastern United States through the mid-1800s. However, this situation changed in the late nineteenth century with the introduction of the European starling and the English house sparrow. In the twentieth century, increased use of harmful pesticides, replacement of wooden fenceposts with metal posts, clearing of field borders and fence rows to increase cropland acreage, and a growing human population also contributed to population reductions.

John English, Big Country Audubon Society
Eastern bluebird

Fortunately, the favored status of the bluebird and its acceptance of artificial nesting structures have led to increased efforts to boost its populations to sustainable levels. Placement of thousands of nest boxes by concerned individuals has contributed significantly to ensuring a future for the eastern bluebird. The ongoing recovery of the eastern bluebird is an example of how sound wildlife management practices have been used to increase the survival success of an individual wildlife species.

This leaflet is designed to serve as an introduction to the habitat requirements of the eastern bluebird and assist in the development of a comprehensive bluebird management plan. The success of any individual species management plan depends on targeting the specific needs of the species and analyzing the designated habitat areas as a whole to ensure that all required habitat elements are present. This guide also provides recommendations for program monitoring to document successes and ensure that problems are addressed as they arise.

Range

The summer, winter, and breeding ranges of the eastern bluebird differ primarily in how far south the bird reaches within each range. Eastern bluebirds nest from southern Saskatchewan, east across southern Canada to Nova Scotia, south to southern Florida, and

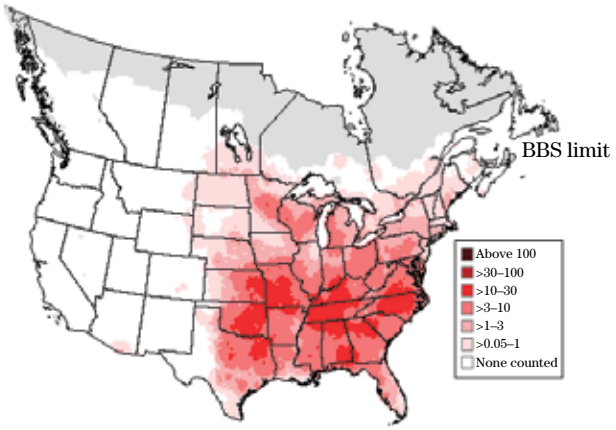
south from eastern foothills of the Rocky Mountains from Montana, Wyoming, Colorado, and the Dakotas south to Texas (fig. 1). Bluebirds winter in the middle parts of eastern North America south into Mexico, the Gulf Coast, and southern Florida. Populations also exist in southeast Arizona and extend south to Nicaragua.

Habitat requirements

General

Ideal eastern bluebird habitat consists of scattered hardwoods and grasslands in a rural setting. Frequently used grassy areas include meadows, pastures, yards, roadsides, power line rights-of-way, and farmlands. Mowed areas such as golf courses, large lawns, and grazed areas provide suitable habitat, as well. Open grassy areas provide foraging habitat, and nearby trees serve as perching or possible nesting sites. Although eastern bluebird populations are on the rise, the largest threat to their future is the continued loss of nesting habitat. By protecting snags (dead or dying standing trees) and properly managing open grassy areas, landowners can assist in the continued success of eastern bluebirds and other species that rely on similar habitat.

Figure 1 Breeding range of the eastern bluebird



Food

Approximately two-thirds of the diet of an adult eastern bluebird consists of insects and other invertebrates. The remainder of the bird's diet is made up of wild fruits. Favored insect foods include grasshoppers, crickets, katydids, and beetles. Other food items include earthworms, spiders, millipedes, centipedes, sow bugs, and snails. Fruits are especially important when insects are scarce in the winter months. Some preferred winter food sources include dogwood, hawthorn, wild grape, and sumac and hackberry seeds. Supplemental fruits eaten include blackberries, bayberries, fruit of honeysuckle, Virginia creeper, red cedar, and pokeberries. Bluebirds feed by perching on a high point, such as a branch or fencepost, and swooping down to catch insects on or near the ground. The availability of a winter food source will often determine whether or not a bird will migrate. If bluebirds do remain in a region for the winter, they will group and seek cover in heavy thickets, orchards, or other areas in which adequate food and cover resources are available. These plant species may be used to enhance vegetation that already exists in and along open areas, brush and fence rows, and woodlots. Adding these species to those currently existing will enhance both food and insect availability for eastern bluebirds.

Water

Water requirements for bluebirds are assumed to be met when the birds nest in areas with suitable nesting and wintering habitat. The bluebird's foraging behavior and the types of food eaten provide it with an adequate amount of water.

Cover—Nesting

The eastern bluebird is a cavity-nesting species but does not have the ability to create its own nesting cavity. It must rely on the abandoned cavities of woodpeckers or find other natural cavities such as open tops of rotted-out stumps or wooden fenceposts. Nesting boxes are also readily accepted for nesting. Nesting pairs typically select cavities 3 to 20 feet above ground in areas where abundant open space provides an insect base on which to forage. The role of the nesting cavity remains important throughout nestling development, as young remain in the nest dependent upon parent bluebirds until fledging roughly 15 to 18 days after hatching. Optimal nesting habitat contains up to seven suitable cavities per acre and an adequate number of perches from which to forage in close proximity to foraging habitat. In areas that lack snags or natural cavities, nest boxes can be used to augment the availability of natural cavities.

John English, Big Country Audubon Society

The eastern bluebird historically relied on abandoned cavities or rotted out stumps for nesting but readily accepts artificial nest boxes.

Nest box design—Nest boxes should be constructed of a weather-resistant wood; cedar is often recommended. The wood can be painted or stained but only on the outside surface. The entrance hole should be 1.5 inches in diameter. Numerous nest box designs have been used with success. A good method of assisting fledglings in their climb from the nest to the entrance hole is to roughen up the inside wood surface under the hole with a chisel. The lid or one side of the box should open to facilitate monitoring and cleaning. Three or four quarter-inch drain holes should be drilled into the box bottom. Ventilation and shade requirements are met by overhanging roofs and construction designs. Figure 1 shows a nesting box design.

All bluebird boxes should be fitted with a galvanized sheet metal predator guard. The predator guard should be placed on the pole 6 to 12 inches below the bottom of the box. Figure 2 shows a top view layout for cutting a predator guard from a 3-foot x 3-foot sheet of 26-gauge galvanized metal. The first cut is to remove a 60-degree wedge from the sheet. The center hole is then cut. The side view shows a guard affixed to a nest box post. This is done by overlapping the edges of the 60-degree wedge to the shown dotted line. Bolts or screws are then used to form the sheet into a cone. Fasten the guard to the post with supporting brackets. Three wooden mounting blocks can also be placed on the underside of the guard to fasten it to the post. Fasten the blocks to the guard and post with screws. The predator guard should be placed on the post so the bottom of the guard is at least 4 feet from the ground.

Also, to help deter predation, an even coating of nondrying crankcase grease or carnauba wax can be applied to the pole from the ground to 6 inches below the box.

Nest box installation—Place eastern bluebird nest boxes in open grassy areas that are accompanied by widely scattered trees and shrubs. Open areas are preferred, as placement of boxes in or near areas thick with brush and woody vegetation likely will result in habitation of many boxes by house wrens. Boxes should be placed at least 100 yards apart to accommodate individual territories established by nesting pairs during the breeding season. Boxes should be placed well away from buildings because of the high concentration of house sparrows generally found near human habitations. Mount nest boxes 4 to 6 feet above the ground on a metal or wooden post equipped with a predator guard. Research has shown that placing boxes low to the ground, at 4 to 5 feet, may help to deter sparrows from inhabiting them. Boxes should face away from prevailing winds and rain and be placed in a location that will enable the box to receive a fair amount of sunlight. Ideally, a tree or shrub should be located 25 to 100 feet away in front of a box entrance. This will provide a perch for foraging adults and fledglings will use this cover on their first flight out of the box. Nest boxes should be located far away from any area that is heavily treated with pesticides or herbicides. Overall, the attempt should be made to accommodate the natural nesting instincts and requirements of the birds while still allowing for weekly monitoring during the breeding season.

Nest box monitoring—Before nesting boxes are erected, maintenance, monitoring, and data collection plans should be developed to ensure program success. Figure 3 shows an example of a nest box monitoring data sheet. Data collected using the Nest Box Data Sheet can be sent to the North American Bluebird Society, P.O. Box 74, Darlington, WI 53530, for assistance in evaluating the status of the eastern bluebird throughout North America.

Figure 1 Design of eastern bluebird nesting box

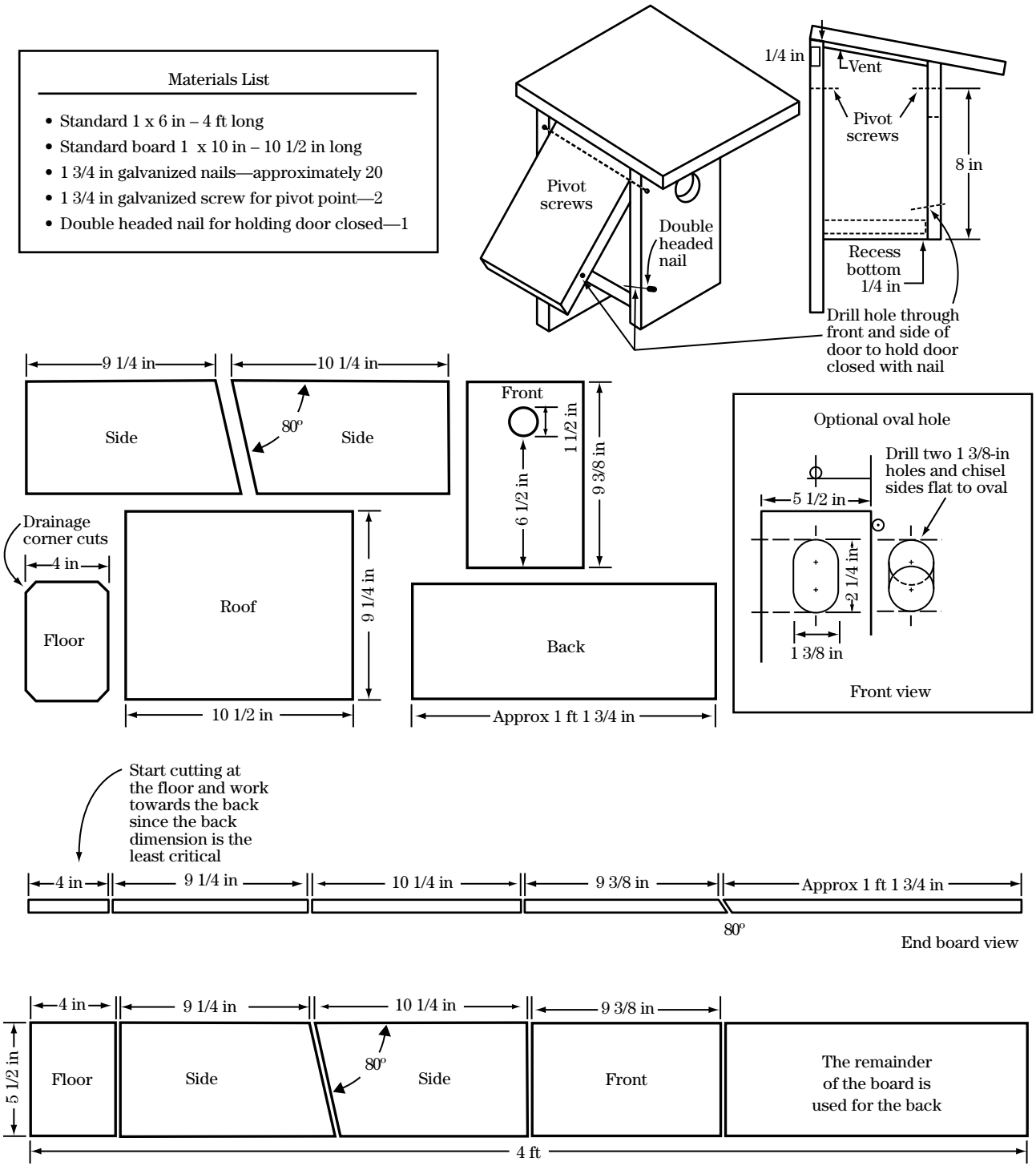


Figure 2 Diagram of standard cone-shaped predator guard

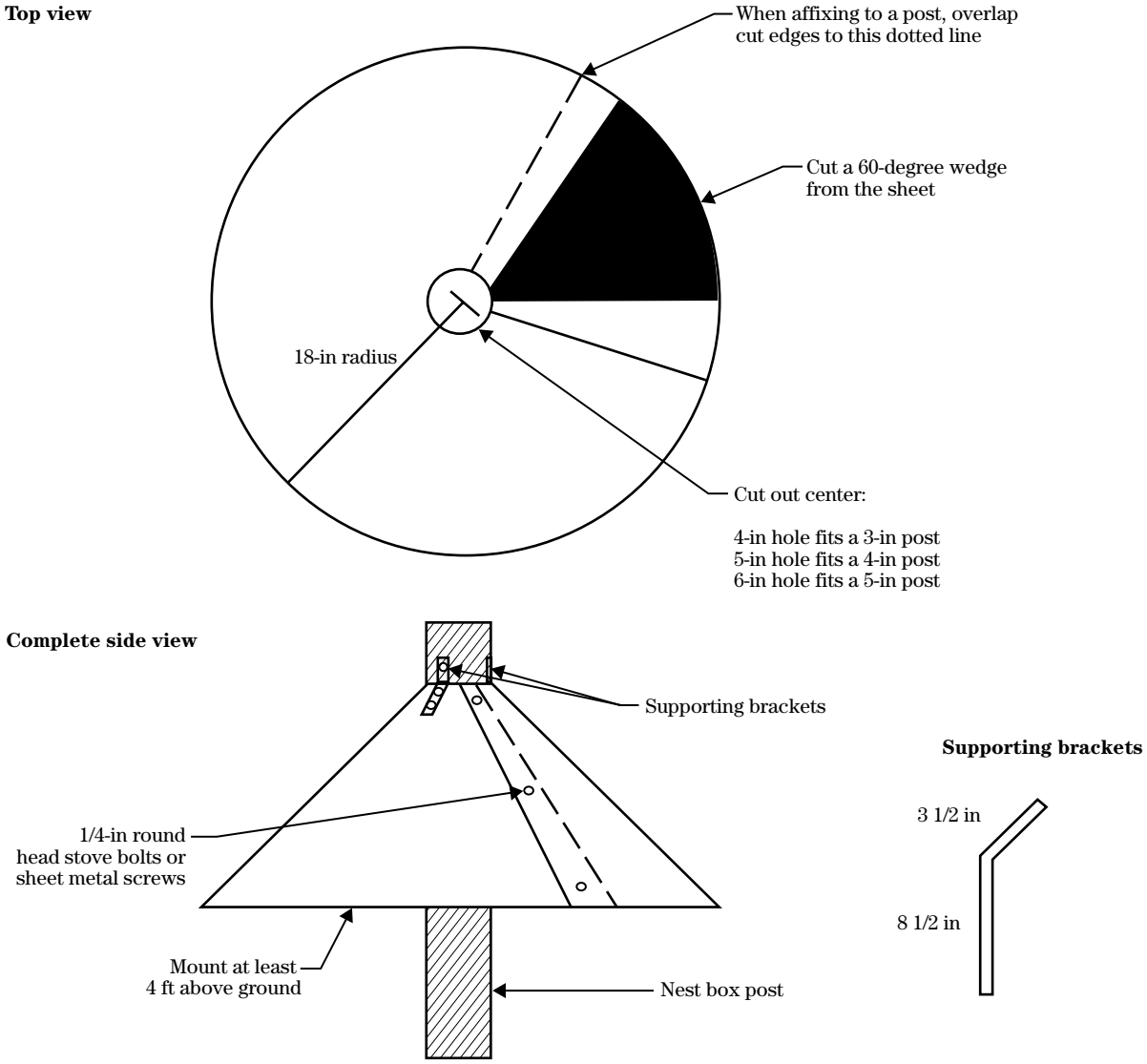


Figure 3 Nest box monitoring data sheet

Landowner, Company, or Site:

Name _____ Location_____
_____ Year_____ Monitor_____ Box Number_____

	First brood	Second brood
Species		
Eggs laid		
Young hatched		
Young fledged		
Hatch date		
Cause of nest failure		

Notes/observations

Date_____

Year_____ Monitor_____ Box Number_____

	First brood	Second brood
Species		
Eggs laid		
Young hatched		
Young fledged		
Hatch date		
Cause of nest failure		

Notes/observations:

Date_____

Unmonitored boxes may be counter productive by helping to increase populations of exotic competitor species such as house sparrow. It is essential to erect only as many boxes as can be realistically monitored. Boxes should be monitored once a week during the breeding season (March–July). However, monitors should avoid disturbing boxes during cold, rainy, or other inclement weather that may harm nesting birds or eggs. Activity characteristic of adult nesting bluebirds includes frequent entering and exiting of the nest box with nest materials or food, as well as adults leaving the box carrying fecal sacs for disposal. Approach nest boxes from an angle, and make a slight noise to flush the female from the nest. Gently tapping on the box may cue the female to exit, as well. Once the female exits, the box can be opened and its contents recorded. Boxes should not, however, be opened after the 12th day following hatching to prevent young from prematurely leaving the nest. Move away from the box at the same angle but in the opposite direction in which it was approached, keeping footsteps around the box to a minimum. This will help to reduce predation by not establishing a scent trail that results from approaching and returning from a box along the same path. Since bluebird pairs often raise more than one clutch each season, old nests should be removed from boxes after each clutch fledges. Boxes should be left out at the end of the nesting season, as they sometimes provide winter shelter for various species of birds and other wildlife. Clean nesting materials may be beneficial to wildlife using boxes in the winter and can be left in boxes at season's end. Boxes should be cleaned of all nesting materials in the spring, however, before the start of the nesting season.

A bluebird management project is an easy way to provide fun, hands-on learning opportunities, especially for children. If the land is corporate owned, encourage interested employees to become involved. Involve students or scouts in building and monitoring nest boxes. The educational benefits can greatly increase the value of your individual bluebird management project.

Wildlife Habitat Council (WHC) member organizations may enroll in WHC's Nest Monitoring Program, useful in WHC's Corporate Wildlife Habitat Certification Program. To enroll, contact the WHC Nest Monitoring Program Coordinator at (301) 588–8994.

Exotic species control—A major factor leading to the decline of eastern bluebird populations has been nesting competition with nonnative species, specifically European starlings and house sparrows. Simple steps can be taken; however, to prevent the use of boxes by exotic species. By using the nest box entrance hole dimensions shown in the nesting box design in figure 1, starlings should be prevented from entering. However, house sparrows will continue to be a problem. Sparrows will aggressively compete with native species for nesting sites, going so far as to destroy the eggs and kill the nestlings of native cavity-nesting birds. Boxes should be constructed without a perch post to discourage sparrow use. If house sparrows are found to be nesting in a box, remove and dispose of the nest and its contents. Trapping and eliminating the adult bird in the box is more effective than simply removing the nests. Trapping with inside-the-box traps or bait-type traps such as those made by Trio, and Havahart®, is recommended. If uncomfortable with removing the birds or nests, another option is to vigorously shake the eggs, or addle them, for 60 seconds and leave them in the nest so that the female will continue to expend reproductive energy without hatching success. This also prevents the exotic species from attempting to take over another box.

Other native cavity-nesting birds, such as Carolina and black-capped chickadee, tree swallow, house wren, house finch, tufted titmouse, and great-crested flycatcher may use and are welcomed in nest boxes. Because they are federally protected, it is illegal to destroy them, their nests, or their eggs. Therefore, nest monitors must be certain of the bird species nesting in a box before control measures are implemented. Two aids, "Guide to Nests, Eggs," and "Nestlings of North American Birds and Birds' Nests," in the Peterson Field Guide Series are recommended.

Box placement is the best method to control exotic species. Careful box placement will also reduce competition from tree swallows and house wrens. Placing boxes a good distance from buildings and human habitation will work to prevent house sparrows from using bluebird boxes. Using box pairing and placing boxes in open grassy areas away from brushy, woody vegetation will help to reduce overuse of boxes by nontarget natives such as tree swallows and house wrens.

Cover—Winter

In areas where bluebirds winter, habitat requirements differ little from nesting or summer cover types. Woodland edges, fence rows, open fields, mowed yards, cemeteries, and farmlands provide adequate winter cover needs when mixed with snags, open grassy areas, and wild fruit-bearing trees and shrubs. Nest boxes can provide roosting cover for bluebirds in winter months, as well. Due to the variability in

climates between the cooler, northern reaches and warmer, southern reaches of the bluebird's range, available food sources may differ but habitat requirements remain constant. The year-round availability of insects determines where bluebirds winter.

Interspersion of habitat components

For successful bluebird reproduction and survival to occur, all required habitat components must be available in relative proximity to one another. Since bluebirds are migratory and highly mobile during winter, the most critical aspect of habitat interspersion, or the mix of different habitat types, is the proximity of suitable foraging habitat to nesting habitat in the spring. The highest-quality nesting habitat is of little use if the nearest open foraging habitat is not within close proximity. Likewise, the best foraging habitat will not support nesting pairs if there are no available nest cavities. Ideal interspersion of the bluebird's required habitat components consists of a complex of open grassy fields, either mown or of low growth, widely scattered trees, berry-producing shrubs and vines, snags, and perches in the form of trees, shrubs, utility wires, telephone poles, or fenceposts. Table 1 provides a summary of eastern bluebird habitat requirements.

Bill Hohman, NRCS

Ideal winter cover consists of a mixture of snags, open grassy areas, and wild fruit-bearing trees and shrubs.

Table 1 Eastern bluebird habitat requirements

Habitat component	Habitat requirements
Food—young	Small, tender insects at hatching. Larger insects as maturity is reached
Food—adult	Insects, especially grasshoppers, crickets, katydids, and beetles; and earthworms, spiders, millipedes, centipedes, sow bugs, and snails Fruits of dogwood, hawthorn, wild grape, and sumac and hackberry seeds in the winter months Fruits such as blackberries, bayberries, fruit of honeysuckle, Virginia creeper, red cedar, and pokeberries
Nesting cover	Natural tree cavities, rotted stumps, wooden fenceposts or artificial nesting boxes located in or in close proximity to open fields, roadsides, meadows, mowed yards, golf courses, cemeteries, or farmlands
Brood-rearing cover	Same requirements as nesting cover. Nestlings remain in the cavity/nest dependent on adult bluebirds until fledging roughly 15 to 18 days after hatching
Winter cover	Nest boxes, woodland edges, fence rows, open fields, mowed yards, cemeteries, and farmlands where adequate ratios of snags exist with open grassy areas, and fruit-bearing trees and shrubs produce a food source
Water	Water requirements for bluebirds are met through daily food intake
Interspersion	Prefer a complex of open, low-growing grassy fields, either mown or growing freely, widely scattered trees, berry-producing shrubs and vines, snags, and perches in the form of trees, shrubs, utility wires, telephone poles, or fenceposts

Minimum habitat requirements

Minimum habitat requirements become an issue only when two or more nesting pairs desire to nest within one general area. Because bluebirds are territorial, nesting pairs typically will nest in cavities that are separated by at least 100 yards. Thus, nest boxes should be spaced at least 100 yards apart if more than one box is placed in an area. In general, an area the size of a football field is needed between two boxes for the boxes to be most attractive to bluebirds. Lands outside the immediate planning area should be considered when making the determination of minimum habitat area for bluebird reproduction.

Limiting factors

For planning purposes, the limiting factors provided in table 2 can be used to inventory the site to determine the availability of each of the basic habitat components, based on the above narrative habitat requirement descriptions. Habitat components that are absent or rated low are limiting the habitat quality for eastern bluebirds.

Management treatments

Management treatments should address the habitat components that are determined to be limiting eastern bluebird habitat potential. For planning purposes, select among the possible action items listed in table 3 to raise the quality or availability of each habitat component determined to be limiting.

Table 2 Inventory of limiting factors

Habitat component	Availability/quality			
	High	Medium	Low	Absent
Food				
Nesting cover				
Winter cover (may not be applicable if eastern bluebirds do not winter in the area)				
Interspersion of habitat components				
Minimum habitat size				

Table 3 Management treatments for increasing habitat quality or availability

Habitat component	Management practice
Food	Plant, preserve, and encourage berry-producing trees, shrubs, and vines
	Maintain grassy and open field areas by conducting rotational mowing and managed grazing where appropriate
Nesting and brood-rearing cover	Install artificial nesting boxes in open field areas
	Preserve large live and dead-standing hardwood trees conducive to natural cavities in and adjacent to open field areas
	Preserve snags, wooden fenceposts, and rotten tree stumps conducive to natural cavities. Girdle non-mass producing hardwoods to create snags
Winter cover	Plant, preserve, and encourage berry-producing trees, shrubs, and vines (see plant species list insert)
	Preserve old growth timber, including both large, live and dead standing hardwood trees, conducive to natural cavities in and adjacent to open field areas
	Preserve snags, wooden fenceposts, and rotten tree stumps conducive to natural cavities
Interspersion and minimum habitat size	Combine above prescriptions to increase interspersion of habitat components or size of habitat blocks available

Assistance

Landowners interested in making their individual efforts more valuable to the community can work with WHC and NRCS to involve school and scout groups and their families in habitat projects, as well as State and Federal fish and wildlife agency personnel.

Table 4 provides a list of programs that may provide financial or technical assistance.

Table 4 Programs to assist landowners in creating wildlife habitat

Program	Land eligibility	Type of assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland, and certain other lands with cropping history. Streamside areas in pasture land	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10- to 15-year contracts. Additional financial incentives are available for some practices	NRCS or FSA State or county office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land and other agricultural land in need of treatment	Up to 75% cost-share for conservation practices in accordance with 5- to 10-year contracts. Incentive payments for certain management practices	NRCS State or county office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/or wildlife habitat	Up to 100% financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements	Local office of the U.S. Fish & Wildlife Service
Waterways for Wildlife	Private land	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals	Wildlife Habitat Council
Wildlife at Work	Corporate land	Technical assistance on developing habitat projects into a program that will allow companies to involve employees and the community	Wildlife Habitat Council
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats	Up to 75% cost-share for conservation practices under 5- to 10-year contracts	NRCS State or county office
State fish and wildlife agencies and private groups such as state audubon societies, American Birding Association, North American Bluebird Society, and others may have assistance programs in your state			State or local contacts

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The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

www.nrcs.usda.gov

Wildlife Habitat Council

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(301) 588–8994

The mission of the Wildlife Habitat Council is to increase the amount of quality wildlife habitat on corporate, private, and public land. WHC engages corporations, public agencies, and private, nonprofit organizations on a voluntary basis as one team for the recovery, development, and preservation of wildlife habitat worldwide.

www.wildlifehc.org

This leaflet is a revision of a leaflet that was developed cooperatively by the Wildlife Habitat Council and the Natural Resources Conservation Service (NRCS) Agricultural Wildlife Conservation Center (AWCC) (formally Wildlife Management Institute) and formatted for printed or electronic distribution in April 1999. The original leaflet was peer reviewed by NRCS technical experts and the North American Bluebird Society, P.O. Box 74, Darlington, WI 53530-0074, Web site: *http://www.cobleskill.edu.com*, E-mail: nabluebird@aol.com.

The release of the original and revised leaflets is consistent with the mission of the AWCC; namely, the cooperative development and dissemination of scientifically based technical materials to assist NRCS field staffs and others to promote conservation stewardship of fish and wildlife and deliver sound habitat management principles and practices to America's land users.

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