Fascinating Falcons

Falcons, worshipped as the "Lofty Ones," appeared in the writings, paintings, and sculptures of the early Egyptians and Persians some 3,000 years ago. References to the grace and power of falcons appeared during the times of Aristotle and Marco Polo. During the Middle Ages, owning falcons, particularly peregrine falcons, became a symbol of power. Peregrines were sought by kings and other nobility as valuable gifts.

Falcons are swift birds of prey found throughout the world, except for a few oceanic islands and Antarctica. The 58 species of the falcon family range in size from the 6.5-inch pygmy falcon of South America to the 25-inch gyrfalcon of the Arctic tundra. The smallest North American falcon is the 9 to 12-inch American kestrel, and the rarest North American falcon is the aplamado falcon. Members of the falcon family have a conspicuous notched bill which is used to break the necks of their prey. Falcons have excellent eyesight. Experiments in Germany confirmed that peregrine falcons can recognize sitting doves from a distance up to 1.5 miles.


Peregrine Falcon

With high-speed adaptations such as bullet-like heads, short necks, broad shoulders, and long, pointed wings, falcons are among the fastest birds in the world. Peregrines are considered the fastest falcons; they are able to cruise in level flight at 50-60 miles an hour and have been clocked at more than 200 miles per hour in their dives after prey.

The peregrine falcon's speed and grace make it one of the most interesting falcons to watch or study. Its hunting style is spectacular. When this regal-looking falcon spots its prey, usually smaller birds such as swifts, flickers, robins, jays, crows, and pigeons, it seems to pause in midair, turns downward with a few rapid wing beats, and dives almost too quickly for the eye to follow. Moving at incredible speed, the peregrine usually strikes its prey with clenched foot, knocking its prey out of the air and using the notched beak to kill it on the ground. Usually peregrines are successful in killing their prey only ten to 40 percent of the time. Consequently, they hunt over a wide area, up to 18 miles from their nest.

Partly because they are so fascinating, peregrine falcons have become one of the best-known symbols in humanity's efforts to save endangered species. Since the passage of the Endangered Species Act in 1973, peregrines have been the subject of intensive attention to keep them from sliding over the brink into extinction. An important step in recovery efforts was successful propagation of falcons in captivity and reintroduction back to the wild. The peregrine still faces serious threats to its survival. These threats include the continued use in Central and South America of dangerous pesticides such as DDT, and the loss of its wintering habitat.

Iowa's Peregrine Recovery Program

Peregrine falcons are a state and federal endangered species. Prior to 1960, there were more than 350 peregrine nests in the eastern United States. By 1964, not a single peregrine could be found in the eastern U.S., and in 1975, only 39 peregrine pairs remained in the lower 48 states.

DDT pesticides were discovered to be the cause of the decline. The pesticides were sprayed on crops kill harmful insects. The insects were then eated by small birds. The peregrine preys on the small birds that have ingested the pesticide. With each step up the food chain, the negative effects increased. The pesticides inhibited the ability of the peregrine (and other birds, like the bald eagle) to produce enough calcium to produce strong eggshells. This caused vast reproductive failure. Eventually there were no young birds to replace the adult birds, and the population of peregrine falcons plummeted. The dangers of DDT were eventually recognized, and the pesticide was banned from use in the U.S. in 1972. Thus the peregrine was a valuable indicator of the quality of our environment.

Peregrines in Iowa nested primarily along the Mississippi River in Allamakee, Clayton, Dubuque, and Clinton Counties. They also nested along cliffs in Linn, Johnson, Black Hawk, Boone, and Dallas Counties. The last peregrines were known to have nested in Iowa in 1956.

To restore peregrine populations, biologists with the Peregrine Fund at Cornell University in New York began captive breeding and "hacking" peregrines in 1974. Hacking involves placing captively-produced young falcons in a large captive "hack" box in known nesting locations. The birds are held and fed in the box for several days. When the box is opened, the birds are free to learn how to fly. Because they cannot capture their own food, they continue to be fed in the box for six more weeks. The ultimate goal is to imprint the young on the area where they are released, so that when the birds are sexually mature, they come back to the area to nest.

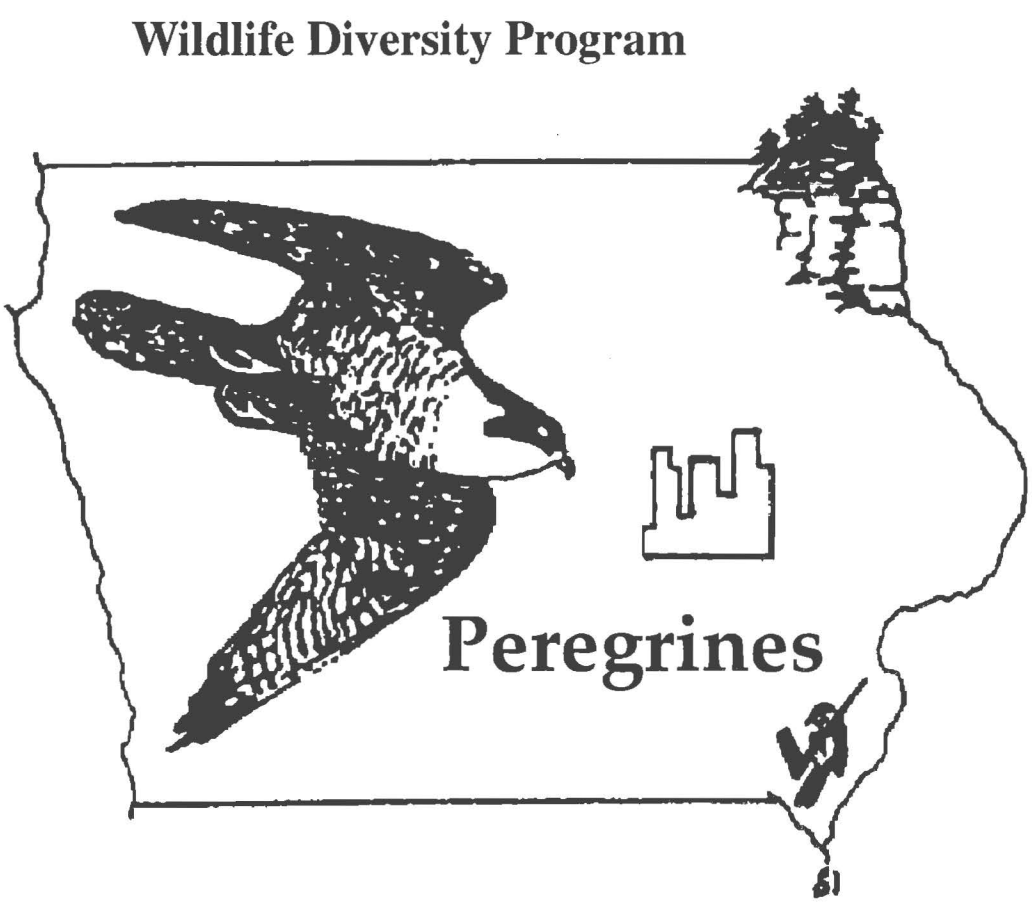
In Iowa, peregrines have been hacked in Cedar Rapids, Des Moines, Muscatine, and Mason City. The canyons, sheer walls, and ledges of the buildings in Cedar Rapids and Des Moines provide artificial cliffs for the falcons. Iowa first released peregrines in 1989 as part of the midwestern effort of the Eastern Peregrine Recovery Program. Iowa has released 57 peregrines since that time and now has had successful nesting peregrines in Cedar Rapids and Des Moines each year since 1993.

In 1996, the Cedar Rapids pair produced three young, while the Des Moines pair hatched three young and fledged two birds. One young bird disappeared mysteriously after two weeks. Mason City released seven peregrines in July, and Iowa City attempted a release of three falcons. When a wild peregrine falcon killed a young male, the birds were relocated to Mason City where they were released successfully.

The goal of Iowa's peregrine recovery program was to establish five nesting pairs by the year 2000. Progress toward reaching this goal has been slow, so a Peregrine Falcon Recovery Team was formed. The goal of the group is to establish a sustainable peregrine

population that requires little or no maintenance or manipulation. Members of the team include the Iowa Raptor Foundation, Iowa Wildlife Federation, Iowa Falconers Association, McBride Raptor Project U.S., National Park Service, Ogalala Nation, Iowa Audubon Society, U.S. Fish and Wildlife Service, Firstar Bank, and Iowa Department of Natural Resources.

Efforts to establish core peregrine populations may be enhanced by additional falcon releases in urban areas in central and eastern Iowa near historic eyries on the bluffs along the Mississippi River. Nest box placement to entice nesting peregrines will continue in urban areas and on smokestacks of power plants along the Mississippi River. Fund raising efforts have targeted interested groups. If your school is interested, contact the Wildlife Diversity Program at Wildlife Research Station, 1436 255th Street, Boone, IA 50036. The peregrine project is supervised by the Iowa Department of Natural Resources' Wildlife Diversity Program. The program is funded by donations to the Fish and Wildlife Protection Fund Checkoff on the state income tax form.

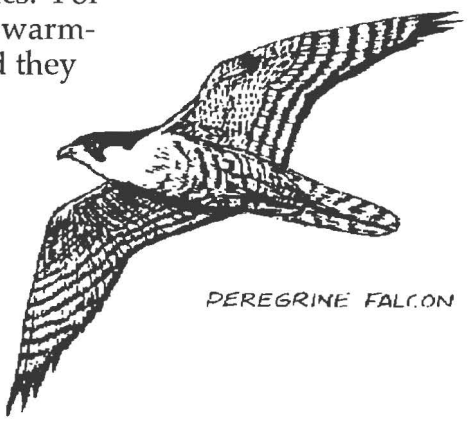


Activity: Suited for Survival

Objectives: Students will be able to describe several characteristics of a peregrine falcon. Students will describe how each characteristic helps the peregrine survive.

Materials: Copies of "Peregrine Parts" handout, scissors, glue, crayons, construction paper, and pictures of peregrine falcons

Background: All birds share certain general characteristics. For example, they all have wings, beaks, and feathers; they are warm-blooded (able to regulate their own body temperature); and they lay eggs. They also have individual species characteristics such as narrow, pointed wings or strong talons that help them survive in their environment.



Like all birds of prey (raptors), peregrines have adaptations that make them efficient hunters of other animals. The following adaptations help the peregrine survive:

- The combination of sleek, streamlined bodies and long, pointed wings allows them to fly rapidly and maneuver quickly.
- Forward-facing eyes and keen eyesight (up to eight times more powerful than a human's) help the peregrine spot prey from far away.
- Long, sharp talons and a sharp, hooked beak allow them to grasp and tear meat.
- Strong flight muscles help the peregrine fly great distances to search for food and to migrate.
- Strong leg muscles help the peregrine transport food over long distances.
- The black feathers on the crown of the peregrine's head dip down below the eyes and cover the cheeks to form a dark helmet; this eye stripe helps reduce glare from the sun.
- The peregrine's long, narrow tail helps the bird maneuver quickly at high speeds.

These adaptions help peregrine falcons fly fast and maneuver quickly in the air when they hunt for food. Peregrines prey almost exclusively on smaller birds, such as shorebirds, pigeons, doves, robins, jays, swifts, and swallows.

Procedure: By assembling a paper peregrine falcon, the students will learn about the physical characteristics and adaptations that help peregrine falcons survive. Discuss adaptations, defining the term and discovering examples. Have the students glue on the wings and ask why long, pointed wings would be an important adaptation. Discuss the talons. Continue with the head, emphasizing the shape of the beak.

Once the peregrine is assembled, discuss other features, such as eyesight, flight and leg muscles, and coloration that make peregrines good hunters.

Have the students color their paper peregrines using bird identification keys found in the school library.

When the students have completed their paper peregrines, ask them to show their peregrines to the rest of the class, describing at least one adaptation.

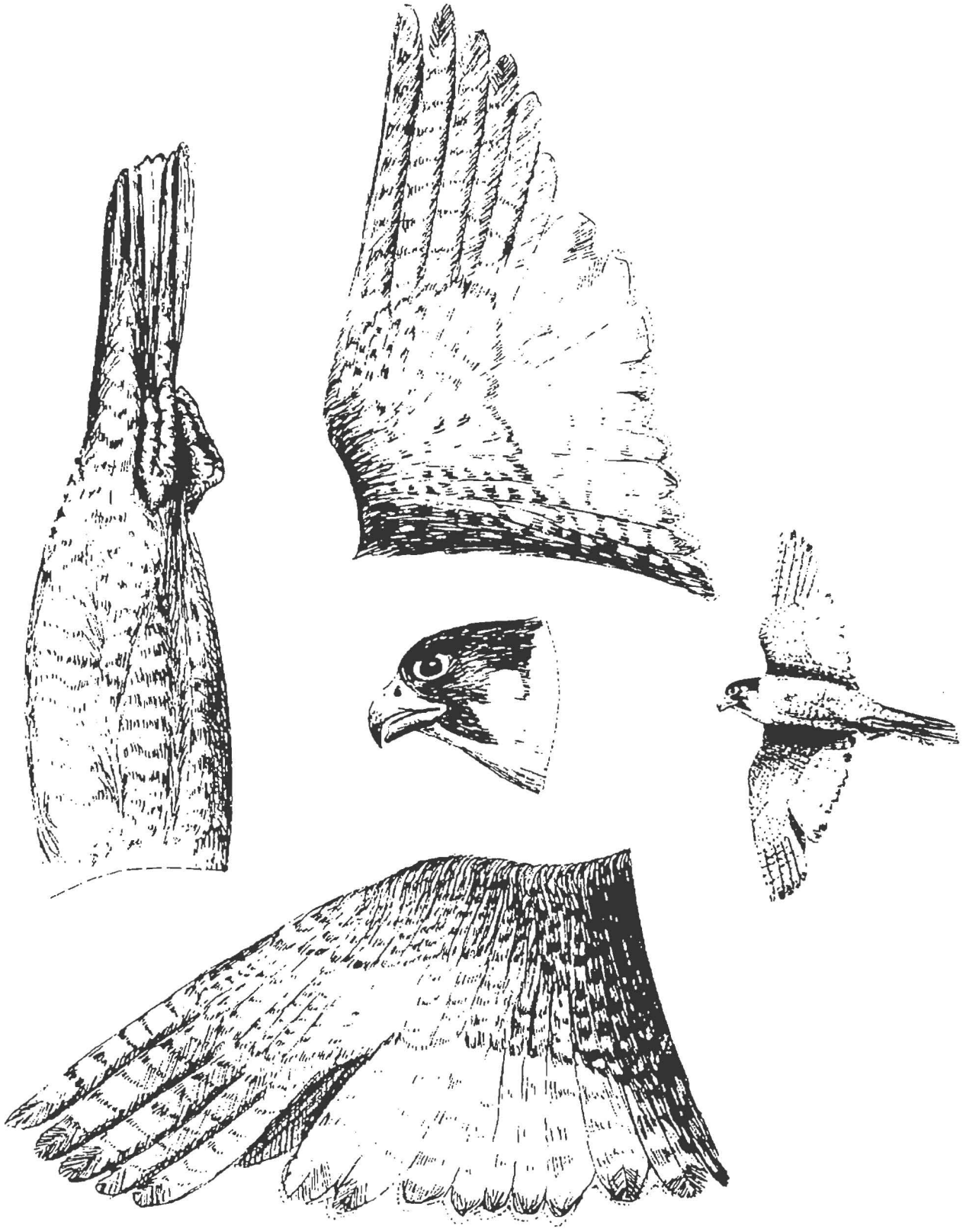
Follow-up: Make a paper mache or a torn paper mask of a peregrine falcon's head, showing the black feathers of the peregrine's helmet.

List and compare the characteristics and adaptations of a peregrine falcon to the characteristics and adaptations of a songbird, such as a robin.

This activity may be used with "Migration Mysteries" and "Where Would a Bird Be Without Its Bill?" Students may wish to learn about another Iowa raptor, the bald eagle. Contact your county conservation board or Jim Pease, Extension Wildlife Specialist (Iowa State University 124 Science II, Ames, IA 50011 (515/294-7429)) to borrow a copy of the video *On the Wings of the Wind.*

Activity was used adapted from *Recovering Our Heritage: Peregrine Falcons* by the Iowa Department of Natural Resources' Wildlife Diversity Program and the Iowa Wildlife Federation.

Activity: Peregrine Parts

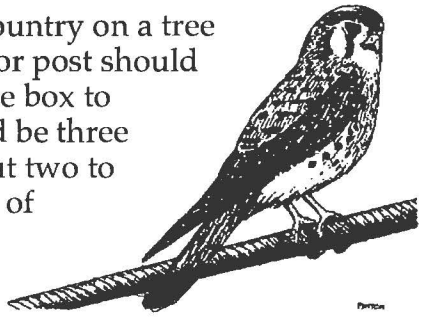


American Kestrel

The American kestrel is Iowa's smallest falcon. It is abundant in agricultural areas characterized by scattered woodlots and trees, shelterbelts, meadows, highway rights-of-way, pastures, and hay fields. This species is valuable because of the large numbers of rodents and insects it eats. Kestrels are frequently seen sitting on powerlines along highways or hovering above grassy roadside ditches in search of their prey. An adult kestrel is about the size of a grackle.

The State of Iowa has established a program in which kestrel nest boxes are strapped with steel bands to the backs of information signs along Interstate Highway 35. The boxes are predator-proof because the steel posts supporting the signs can't be climbed by cats or raccoons. The grassy interstate provides good habitat for kestrels. In southern Minnesota and northern Iowa, approximately 40 to 60 percent of all kestrel boxes placed by the Iowa and Minnesota Departments of Natural Resources are used by kestrels.

The lack of suitable nesting cavities appears to be a significant limiting factor for kestrels. In one Colorado study, a local population increased from six pairs to at least 25 pairs after nest boxes were provided.



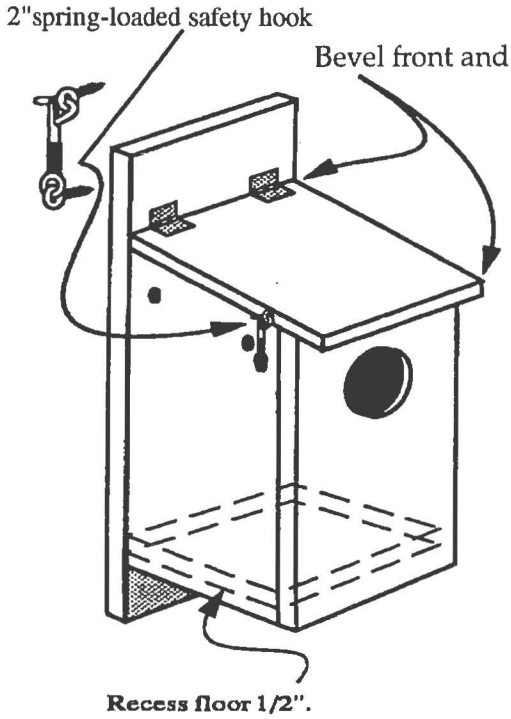
Nest boxes may be placed in orchards or relatively open country on a tree or a free-standing post that is ten to 30 feet high. The tree or post should have a sheet of tin or aluminum nailed or stapled under the box to prevent squirrels from using the box. The nest hole should be three inches in diameter and preferably face south or east. About two to three inches of wood chips should be placed in the bottom of the box. Grassy habitat should be nearby to provide hunting habitat for the kestrels. Kestrel boxes should be spaced one-half mile from each other. Kestrel boxes should be installed by the first of February to attract the first migrants returning from their wintering grounds.

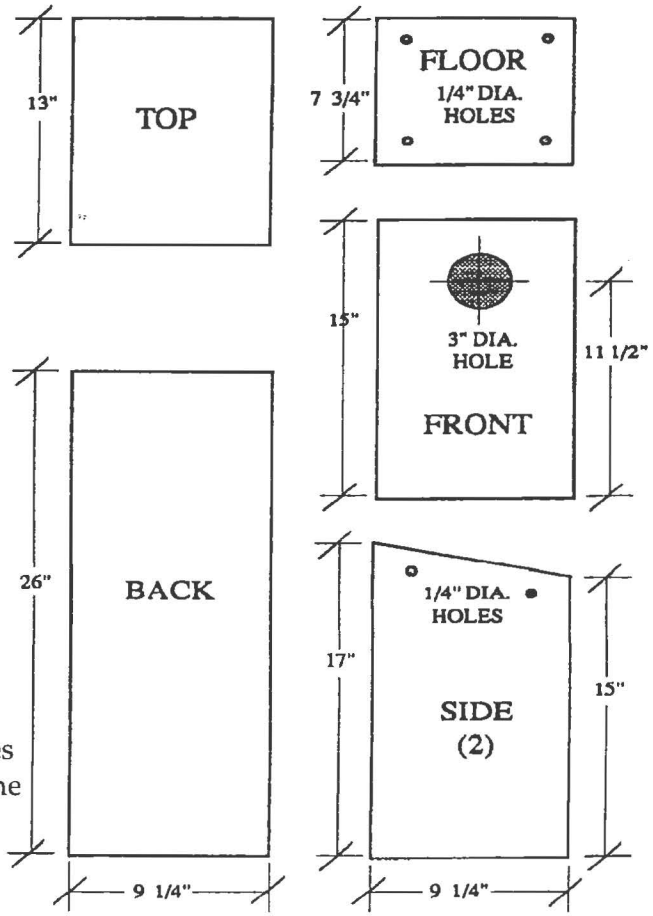
Starlings may be a persistent problem in a kestrel box. The boxes need to be checked regularly every week or ten days to remove starling eggs and nests. European starlings are not native, hence they are an unprotected species and are not beneficial in Iowa. This occasional checking will not cause the kestrels to abandon the nest. Kestrels normally lay five eggs that are white, pinkish-white, or cinnamon. They are evenly covered with small spots of brown.

Contact the Iowa Wildlife Diversity Program or your local county conservation board for more information about building and monitoring kestrel nest boxes.

Activity: Build a Kestrel Nest Box

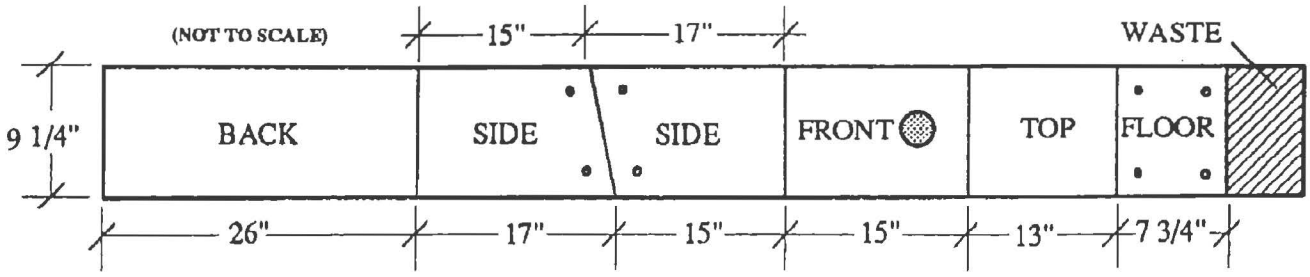
This plan is modified from kestrel nest box plans featured in *Woodworking for Wildlife: Homes for Birds and Mammals*, published by the Minnesota Department of Natural Resources.





To hold the roof secure and allow for easy cleaning access, hinge the roof and use a spring-loaded safety hook. Place three inches of wood chips, wood shavings, or straw in the box.

Lumber: one 1" x 10" x 8' (#2 white pine recommended)
Recommended hardware: 22 -1.5" wood screws (#6), two 2" hinges, and one 2" spring-loaded safety hook



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Results of Monitoring Kestrel Nest Boxes in Iowa

Questionnaires and kestrel nest box data forms were distributed during the fall of 1993 to known kestrel nest box trail coordinators in an attempt to find out how many kestrel nest boxes were being monitored throughout the state and what kind of nesting success was being experienced. The results of the mailed survey, numerous follow-up phone calls, and Iowa Department of Natural Resources (DNR) kestrel banding data indicated that the number of kestrel nest box programs within Iowa has grown dramatically since Ron Andrews, of the DNR, initiated an experimental nest box trail along Interstate 35 in Cerro Gordo County in 1983.

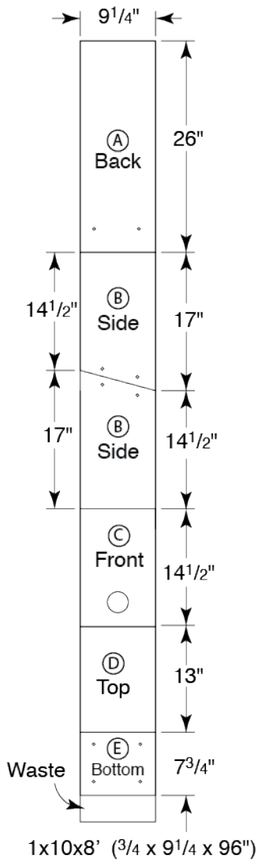
Presently there are at least 35 Iowa counties with kestrel nest box trails. Overall, there are at least 740 nest boxes in these counties with the average trail consisting of 20 nest boxes. The longest trail consists of 289 nest boxes along Interstate 35 and stretches from the Minnesota border to Missouri. Some nest boxes are not monitored closely, but of 592 nest boxes which were maintained from 1992-1994, 308 (52 percent) of those nest boxes were used by kestrels. It appears that at least 994 kestrels fledge from those nest boxes each year. In 16 counties where good nesting records are kept, 219 nest boxes used by kestrels produced an average of 3.5 young fledged per nest box. The counties with the most nest boxes include Kossuth (54 nest boxes), Winnebago (52 nest boxes), and Appanoose (43 nest boxes). All three of these trails are monitored by county conservation board personnel, as are trails in 17 other counties.

Banding young and adults has been emphasized in many counties. Since 1992, approximately 700 kestrels were banded each year in 16 counties where 395 nest boxes are monitored. County conservation board and DNR personnel do most of the banding, but school teachers, environmental groups, and dedicated individuals also are involved. Some interesting results have been found by banding. It is not unusual to find adults returning to nest in the same or a nearby nest box year after year. In Hamilton County, two adult females were found nesting in the same area for at least three years. Band returns also indicate at least some young return to nest in areas from which they fledge.

Other information from this survey included preferred nest box height and preferred direction of nest box orientation. For 71 nest boxes used by kestrels where nest height was recorded, the average height was 14.1 feet above ground. Nest boxes used by kestrels ranged in height from six feet to 25 feet. The preferred direction that a nest box faces was not so easily determined. Since most nest box trails occur along roadways, most boxes are oriented either north-south or east-west.

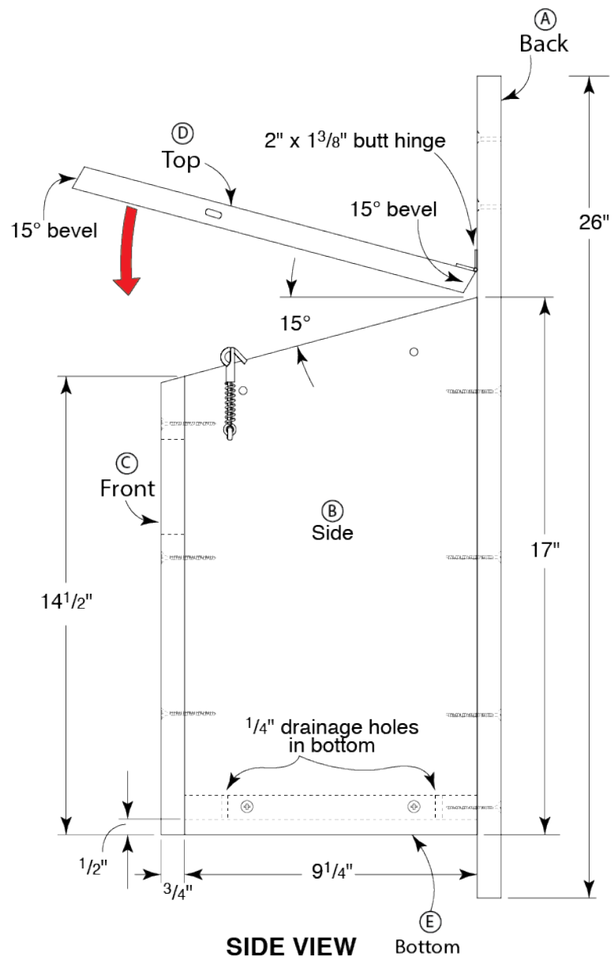
Overall, most nest boxes face south, so most of the nest boxes that have been used by kestrels face south. On two nest box trails where nest boxes are oriented in all four directions, there appears to be no definite direction preference. The type of area in which the nest box is placed appears to be more crucial to nest box use than does the direction the nest box faces.

MATERIALS LIST FOR AMERICAN KESTREL NESTING BOX						
	Parts	**Thickness**	**Width**	**Length**	**Material**	**Pieces**
A	back	3/4"	9 1/4"	26"	C	1
B	sides	3/4"	9 1/4"	17"	C	2
C	front	3/4"	9 1/4"	14 1/2"	C	1
D	top	3/4"	9 1/4"	13"	C	1
E	bottom	3/4"	9 1/4"	7 3/4"	C	1
Choice of cedar, redwood, cypress, or painted white pine						

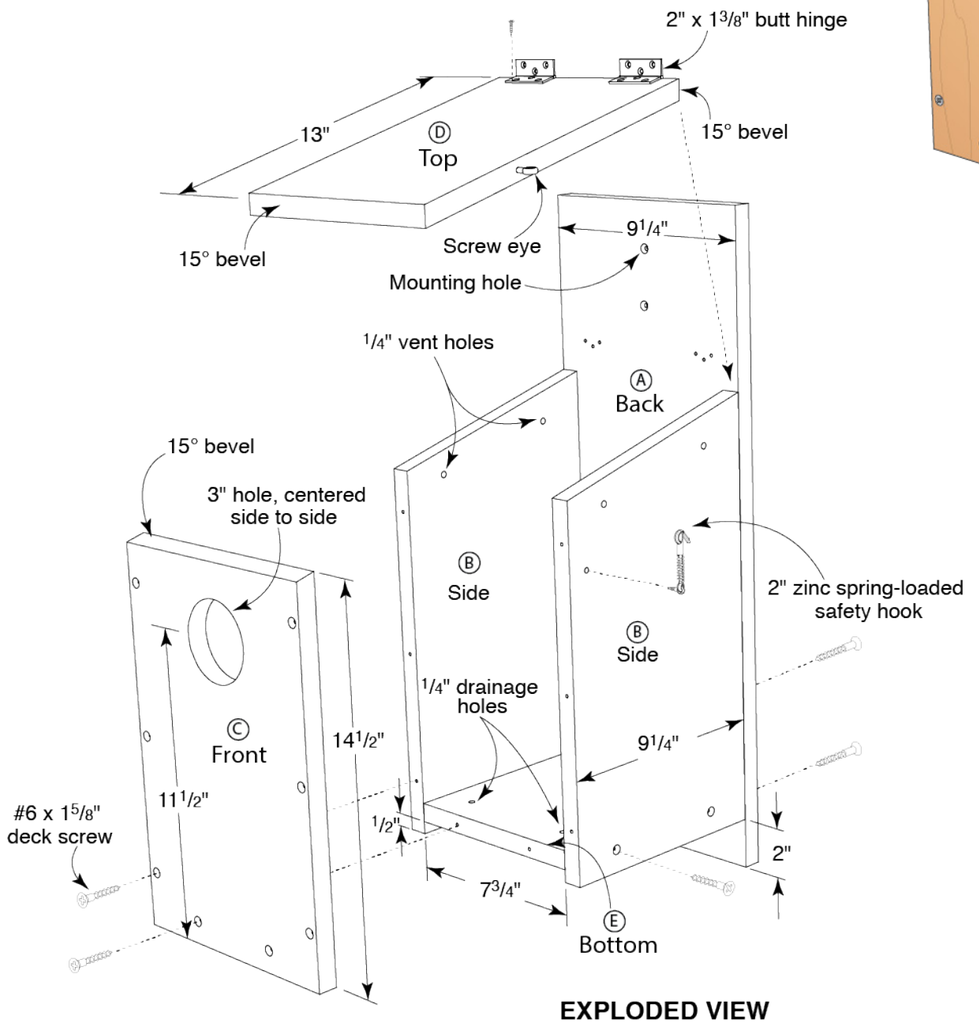


1x10x8' (3/4 x 9 1/4 x 96")

CUTTING DIAGRAM



SIDE VIEW



EXPLODED VIEW

Nest Box Building Instructions

1. Cut pieces according to the plan drawing. Measure from the bottom of the front piece 11 ½" up and cut out the 3" entrance hole with the center of the hole lining up with the 11 ½" mark.

2. Measure and drill four –¼" drainage holes in the floor piece.

3. Place the sides on the back piece for assembly. Mark and pre-drill pieces. Attach sides to the back piece with wood screws.

4. Recess the floor piece ½" from the bottom to reduce wicking water infiltration. Pre-drill holes for the floor piece, then screw to the sides.

5. Attach the pre-drilled front piece to the sides and to the floor. Be sure that the front piece is aligned with the angle of the sides at the top, as this allows for a tight fitting roof.

6. Place the roof piece on top of the sides and make sure that it is centered. Attach the hinges to the roof so that they are equal distance apart from the edge, approximately 1" from the edge of the roof. Attach the hinges to the back piece.

7. Install spring-loaded hook and eye closure (as pictured in the diagram). The hook is attached to the upper left side of the box, and the eye is attached to the left side of the top so the hook fits into it.

8. Drill two mounting holes in the back piece (as shown in the 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 two 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.

BIRD FRIENDLY IOWA

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Iowa State University, Department of Landscape Architecture & Bruce Ehresman, Iowa Ornithologists' Union & Bird Friendly Iowa
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Nestbox design: Marleen Kemnect and technical drawings by Roxy LeMoine
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Resource Enhancement and Protection Program (REAP)
Invest in Iowa, our outdoors, our heritage, our people. REAP is supported by the state of Iowa, providing funidng to public and private partners for natural and cultural resources projects, including water quality, widlife habitat, soil conservation, parks, trails, historic preseration and more.

American Kestrel *Falco sparverius*

North America's littlest falcon, the American Kestrel packs a predator's fierce intensity into its small body. It's one of the most colorful of all raptors: the male's slate-blue head and wings contrast elegantly with its rusty-red back and tail; the female has the same warm reddish hue to her wings, back, and tail. Hunting for insects and other small prey in open territory, kestrels perch on wires or poles, or hover facing into the wind, flapping and adjusting their long tails to stay in place. Kestrel numbers are declining in many parts of its range, and it is a Species of Greatest Conservation Need in Iowa. You can help it by putting up nest boxes.

Habitat Needs

Best Locations for Nest Boxes:

- Open grassland habitat, with a few large live or dead tree cavities for nesting and roosting habitat
- Old farm woodlots, surrounded by nearby vegetation that harbor small mammals, grasshoppers, and small bird prey
- Place the nest box on a pole or post 8-10 feet above ground
- Place a metal predator guard beneath the nest box
- The side of a building,as long as predators cannot access the nest box
- Orient the nest box opening toward the east or southeast, if possible
- Add 1-2 inches of wood chips inside the nest box to provide nesting material, since kestrels do not build nests

Nest Box Locations to Avoid:

- Edge of large woods to avoid larger predators
- Near smaller bird houses or bird feeders
- Avoid facing the nest box north to lessen impacts of winter storms.