

Managing Habitat for American Kestrels

American kestrels are small, swift, powerful birds of prey with brilliant coloring. Formally known as sparrow hawks, these hunters are one of Pennsylvania's most common raptors, and many are year-round residents.

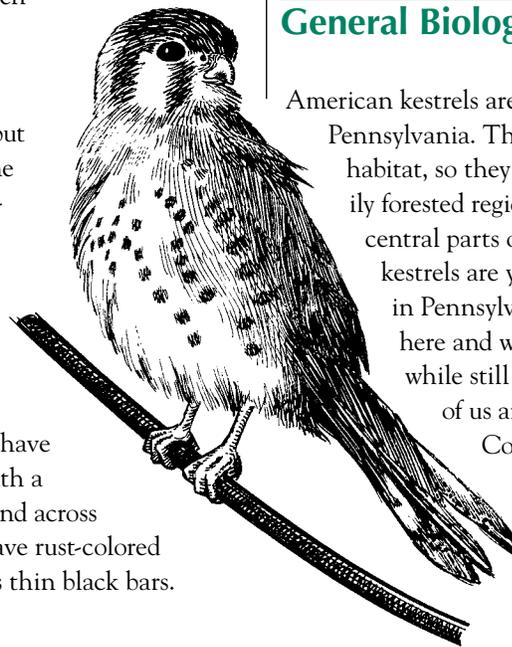
Kestrels are easily identified. Once you become familiar with their size, blue and rusty coloring, and hunting habits, you'll recognize their forms as they hover over fields in search of prey.

Given the right habitat, American kestrels can co-exist with humans, and landowners will find that these birds always pay the rent. Not only are they enjoyable to watch, but kestrels are effective at catching insects and small mammals that feed on agricultural crops. From their place near the top of the food chain, kestrels are also one of Pennsylvania's best bioindicators of ecological health.

Identification

Kestrels are about the size of a blue jay. Their backs and tails are a reddish-brown or rusty color with dark spotting or bar patterns. The bird's underside is a lighter, tawny color with some darker streaking. Its face features two dark, moustache-like stripes against a white background. A kestrel also sports two dark "eye spot" markings on the back of the head. These markings may help prevent strikes from kestrel predators, which include larger birds of prey and even crows.

Females are slightly larger than males, but color variation is the easiest way to determine the sex of a kestrel. Males have blue-gray or slate-colored wings, while females' wings are rust colored. Males have rust-colored tails with a prominent black band across the end. Females have rust-colored tails with numerous thin black bars.



In flight, kestrels have a notably streamlined appearance, their slender wings curved in a sickle shape. Their fluttering wingbeats are punctuated by short glides. While searching for prey, kestrels may also hover in place when there is adequate wind. After choosing a perch, kestrels perform a characteristic series of tail bobs. A high-pitched "klee, klee, klee, klee, klee" or "killy, killy, killy," whether the bird is perched or in flight, is a giveaway that the bird you're observing is an American kestrel.

General Biology

American kestrels are found throughout Pennsylvania. They require open habitat, so they are rare in the heavily forested regions of the north and central parts of the state. Some kestrels are year-round residents in Pennsylvania. Others breed here and winter to our south, while still others breed north of us and winter in the Commonwealth. In



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fall, migrating kestrels pass through the state in September and early October. In spring, peak flights of migrants occur in March and early April.

In early April and May, male kestrels establish territories and conduct a variety of courtship displays to attract a mate. Kestrels are monogamous, and the pair works together to raise the young. Kestrels nest in cavities, usually 10 to 30 feet above the ground, where they lay four to five eggs, white to pale with brown speckling. In the northeastern United States, kestrels usually raise only one brood per year. After 27 to 31 days of incubation, the young hatch in their nest cavity, where they will remain for a month before fledging. The male brings his nest-tending mate food until a week or two after the young hatch, when feeding becomes a shared task between the parents.

After leaving the nest cavity, the young stay nearby and are fed by their parents for another month. The young kestrels leave the nesting area as fall approaches, ready for life on their own. Many kestrels migrate to the southern United States, Mexico, and Central America, while others remain in Pennsylvania. Many young kestrels succumb to accidents or predation by snakes, raccoons, and raptors, but those surviving that first difficult year usually have a life span of at least three years.

Habitat Requirements

When choosing their home range, kestrels look for an area with open spaces for hunting and cavities for nesting. Pastures, agricultural fields, and forest clearings usually meet their needs, although some individuals have been found to colonize golf courses, reclaimed strip mines, drained wetlands, and even small urban areas. A pair of kestrels may defend a breeding area as large as 250 acres.

Cover and Nesting Sites

Kestrels do not construct nests; they search for cavities where they can lay their eggs and rear their young, safe from predators and the elements. These nesting sites can be natural tree cavities, abandoned woodpecker holes, cavities in human-made structures, and nest boxes. Forest edges and tree lines often provide the cover they seek. Kestrels also use trees or telephone poles as hunting perches.

Food

A kestrel's summer diet is largely made up of insects, especially grasshoppers, moths, caterpillars, beetles, and crickets. The birds can take their prey while in flight, but they make most of their larger kills on the ground. In winter, they are more reliant on small birds and mammals, upon which they dive with their talons, then

use their hooked bills to break their prey's neck. Kestrels are also known to feed on lizards, carrion, amphibians, bats, earthworms, and spiders, striving daily to consume the 20 to 25 percent of their body weight they need to survive.

Water

There is little information on drinking and the use of water by kestrels. Kestrels can obtain most or all of the water they need from their food. However, they probably still benefit from available water either directly by using it for bathing or indirectly because of the variety of potential prey species the water attracts.

Management Practices

To attract and keep American kestrels in your area, your land management plan should support open, vegetated fields for kestrels to use as hunting grounds. Kestrels also require nesting cavities and perching locations. Adding nest boxes often makes previously unsuitable habitat suitable.

Maintain Open Areas

Kestrels generally hunt in open fields where they can detect the mice, voles, insects, and small birds that they prefer to dine on. Agricultural fields, forest clearings, pastures, or abandoned meadows on your property would all suit this need.



Maintain Forest Edges

Keeping any forested field edge intact provides kestrels with natural perches from which they can hunt. Forested edges can also supply nesting cavities, and scattered trees within a clearing or field make excellent perch locations.

Add Perches to Open Areas

Fields lacking trees or other natural perches leave kestrels without a place to survey their hunting grounds. While the birds will hunt by hovering when wind conditions are right, installing artificial perches in open areas increases the likelihood they will choose your field or clearing for catching their prey. One plan for constructing perches calls for installing a ½-inch-diameter PVC pipe, 12 to 15 feet in length, upright in the ground. A foot-long piece of pipe should be affixed to the top of the longer piece, forming a “T-shaped” perch.

Install Nest Boxes

While kestrels can adapt to hunting in suburban and agricultural areas, these places often do not offer enough natural cavities to make them suitable habitats. In the absence of natural cavities, kestrels readily adopt nest boxes to rear their young. Providing boxes also helps lessen competition between kestrels and an introduced competitor, the European starling, for nesting cavities.

Making a nest box is a project that even beginning woodworkers can complete. One plan for constructing a kestrel box appears at right. Detailed construction plans and information on box installation are available from the Pennsylvania Game Commission and Hawk Mountain Sanctuary (see Sources of Additional Information).

Nest boxes can be placed in open areas as well as woodland edges, and mounted on posts or trees. Mount boxes 15 to 30 feet above the ground. Some people suggest including 2 or 3 inches of wood shavings in the box each year before the nesting season.

Kestrel Box Design

A nest box needs to provide a safe, quality environment for parents and young alike. Consider the following suggestions for the nest box you construct or purchase.

Material: Use untreated wood, preferably pine or cedar, which weathers well. Box walls should be at least ¾ inch thick for temperature insulation. Do not paint or treat the box with a wood preservative.

Construction: Use galvanized screws or nails. An extended back panel can be included to help with the mounting process. Avoid using outside perches; they may attract unwanted species.

Access: A door with hinges should be included in one side of the box to allow for cleaning and

monitoring. You can use a scaffold nail to keep the door closed.

Dimensions: Total box height should be 14 to 16 inches, and the entry hole should be 3 inches in diameter. The height of the entry hole should be 10 to 12 inches above the floor. Floor dimensions should measure approximately 9 by 9 inches to 10 by 10 inches.

Roof: The roof should be sloped with the lower side at front and extended past the box entrance to protect the fledglings from predators and the elements.

Interior: Walls should be rough or scored on the inside to provide fledglings with a foothold as they leave the nest. You may also place a small interior perch about 3 inches below the entrance.

Drainage and ventilation:

Make drainage holes at the floor corners, and add a small ventilation space between each side wall and the roof. You can seal these ventilation gaps with weatherstripping during the winter months, but you will need to remove it when the weather grows warmer.

Floor: The floor must be recessed and covered by walls on all sides to prevent eggs from getting wet. (See Sources of Additional Information to obtain actual box designs.)

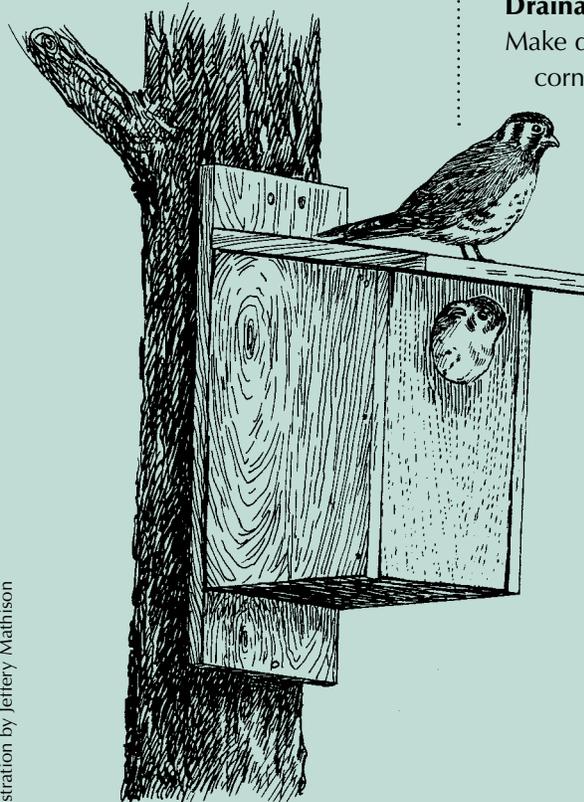


Illustration by Jeffery Mathison

Depending on the location, other animal species such as screech owls, northern saw-whet owls, squirrels, and bluebirds may use kestrel nest boxes. If you observe European starlings or house sparrows using the box, you may remove their nests since they are nonnative species not protected by law. All other species are protected and may not be disturbed if they are using the box.

Maintain Cavity Trees

Cavity trees contain natural cavities where a branch has broken off or woodpeckers have drilled holes. These trees provide nest sites for kestrels and other wildlife. They also serve as hunting perches.

Restore Grassland Conditions on Idle Land

Consider planting grasses on fallow agricultural fields or other unused portions of your property. Grassy areas provide excellent habitat for kestrel prey species and an assortment of other grassland birds.

Minimize Pesticide Use

American kestrels have been affected by compounds like DDT and other agricultural and home lawn chemicals that can cause reproductive failures. Pesticides also affect smaller birds that kestrels may prey upon. Minimize or eliminate the use of

pesticides in your kestrel habitat, especially in the vicinity of nest boxes and known cavities. Alternative pest control methods combined in an integrated pest management (IPM) plan can reduce pesticide needs.

Maintain Good Conservation Practices

If your property includes agricultural areas, practicing good soil and water conservation will have a positive effect on your kestrel habitat. Conservation tillage, planting cover crops, and installing buffer strips, to name just a few practices, benefit all kinds of wildlife species.

Support Kestrels from Afar

Even if your property is not suitable for kestrels, you can easily support kestrel programs in other locations. For instance, Hawk Mountain Sanctuary in Kempton, Pennsylvania, is known worldwide for its research on raptor biology and habitat needs. Hawk Mountain maintains over 200 kestrel nest boxes where researchers study kestrel nesting success and the ecology of kestrels wintering in the area. People from around the world can sponsor these birds through Hawk Mountain's Adopt a Kestrel Nestbox program. (For more on this program, see Sources of Additional Information.)

Sources of Additional Information

For additional information about American kestrel biology and habitat management, as well as details on the Adopt a Kestrel Nestbox program, contact Hawk Mountain Sanctuary or explore their website, which also offers live images taken from kestrel nest box cameras. Hawk Mountain Sanctuary, 1700 Hawk Mountain Road, Kempton, PA 19529-9449; 610-756-6961; www.hawkmountain.org.

The Pennsylvania Game Commission's guide *Woodcrafting for Wildlife* includes 26 different plans for nest boxes and other nesting structures (including kestrel boxes), plus information on proper installation procedures and how to choose the correct sites for boxes. Downloadable at www.pgc.state.pa.us/pgc/cwp/browse.asp?A=3.

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