

# RAPTORS

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Bureau of Information and Education  
Pennsylvania Game Commission



KESTREL

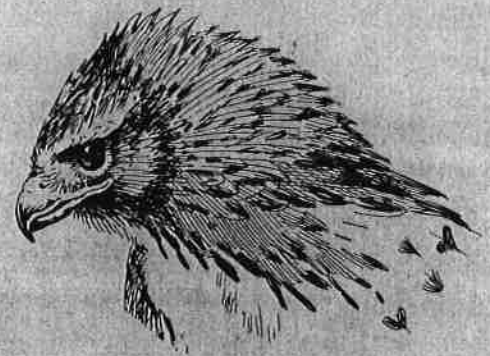
When the night sky brightens in the east, the owls retire to hollow trees and shady thickets. Then enter the raptors; during the day, these fascinating birds continue nature's winnowing process—predation.

“Raptor” comes from a Latin word meaning “plunderer.” It refers generally to all birds of prey and more specifically to eagles, hawks and falcons. This wildlife note covers eleven Pennsylvania raptors: the goshawk, sharp-shinned, Cooper's, red-tailed, red-shouldered, broad-winged, and rough-legged hawks, the harrier or marsh hawk, and the falcons—peregrine (duck hawk), merlin (pigeon hawk) and kestrel (sparrow hawk).

Raptors are quick, efficient predators. They have sharp talons and strong hooked beaks; bills and feet vary in size and shape according to the species' prey preferences. Eyesight of some raptors is as sharp as that of a human looking through 8x binoculars. The eyes of hawks and falcons are located in the front of the head; this gives the birds binocular vision and enables them to judge distance. Raptors' hearing is acute, but their sense of smell is poor—if it exists at all.

In hunting, raptors may soar high, sit and watch from a perch or strike their prey in midair. When a hawk or falcon drops to attack, tendons spread its feet; upon impact, the toes automatically clench and drive the talons deep. A snap from the hooked bill can crush a prey animal's skull or break its back. Raptors “mantle” prey after killing it, crouching and spreading their wings to form a shield that hides it from other predators. The bird may eat on the ground or carry its kill to a feeding spot, often a fencepost or tree limb, where it plucks its prey and tears the meat apart with its beak. Unlike an owl, a raptor does not swallow its food whole or in large chunks. Hours after eating, a hawk or falcon will regurgitate a pellet containing any feathers, fur or small bones swallowed accidentally.

Identifying raptors can be difficult. While males and females of the same species are generally of similar colors, individual variation often occurs within the species. Juveniles are especially hard to identify. Adult females are generally larger than their mates—in some cases, nearly twice as heavy. Our raptors have yellow feet and a yellow cere (area at the base of the bill).



RED-TAILED HAWK

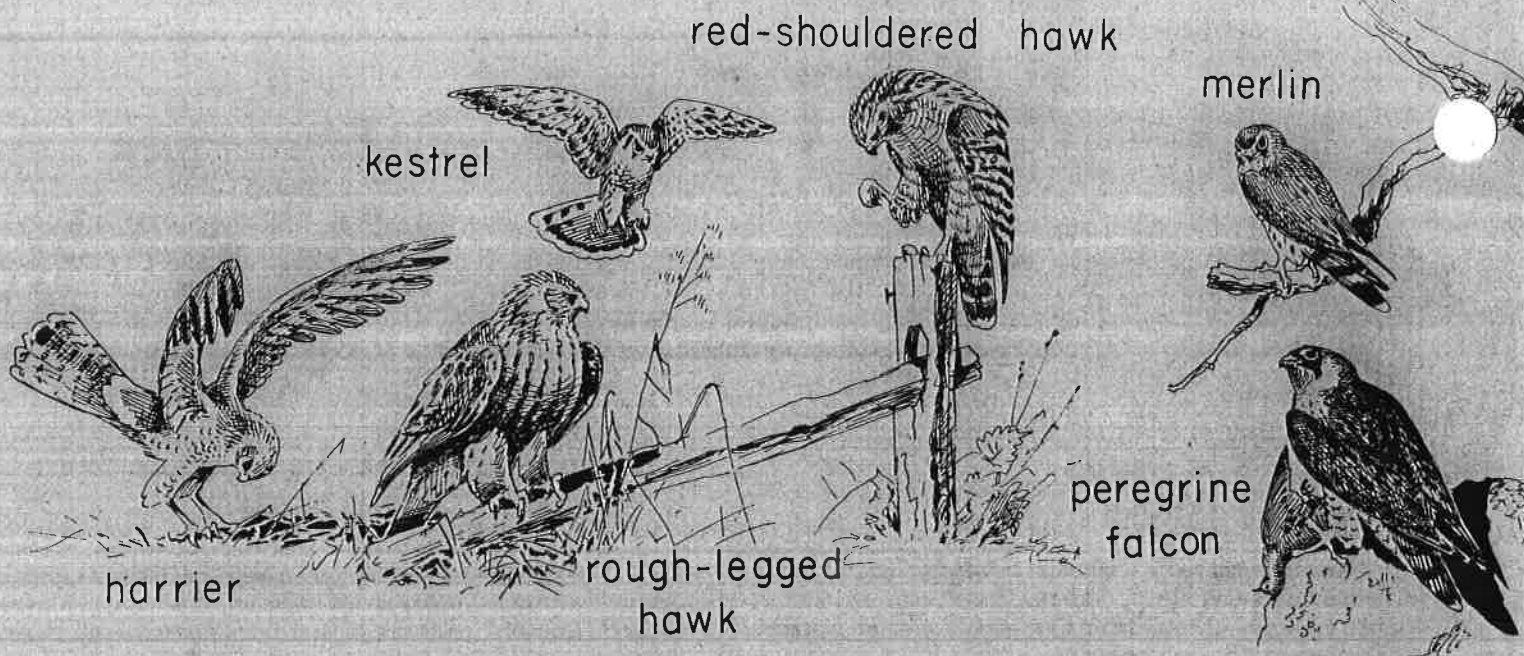
Many raptors mate for life. They nest high above the ground on sturdy limbs, in the crotches of trees, or on rock ledges. Generally, nests are loosely built of sticks and twigs; some are lined with feathers and down plumules. A mated pair will either remodel an old nest or build a new one, occasionally starting on top of a squirrel or crow nest. The female may begin incubation before the last egg is laid, resulting in young of different sizes in the same brood. The female does most of the incubating and is supplied with food by the male.

Newly hatched raptors are altricial—helpless, unfeathered and covered with down—but they grow rapidly. After about two weeks, when the young no longer require constant brooding, the female joins the male in hunting to feed them. The young soon learn to tear meat apart and feed themselves. After five or six weeks, when flight feathers grow in, they begin taking short flights; several weeks later, the fledglings start to hunt.

Hawks and falcons help control insect, rodent and small bird populations. They are a natural predatory force which improves a prey species by making it develop alertness, speed and other survival attributes, and by weeding out unfit individuals. Raptors are also environmental indicators. Pollutants accumulate in natural food chains, and predators are usually the first wild species to show ill effects: failure to reproduce, thin egg shells and nesting failure, or outright death through poisoning. Heavy metals and chlorine-based pesticides such as DDT, aldrin, dieldrin and heptachlor reduce raptors' numbers.

Many hawks and falcons fly south each autumn; species migrating in greatest numbers are often those whose food supplies are diminished. Some hawks that breed here winter as far south as Peru; during migration, a raptor can cover several hundred miles daily, depending on weather and wind conditions. In our state, many migrating birds follow ridges paralleling the Allegheny Plateau, climbing high on thermals that rise along these ridges. Hawk Mountain, near Kempton in southeastern Pennsylvania, is a famous spot from which to observe migrating raptors.

Until fairly recently, birds of prey were often labeled “chicken hawks” and shot on sight. Research has shown that while predators *do* kill some poultry and game, in most cases



they do not drastically deplete game populations. Today, outdoor-oriented people get much esthetic enjoyment from observing raptors. In Pennsylvania, hawks and falcons are protected under both state and federal regulations.

The eleven raptors covered by this note fall into four basic types: accipiters, buteos and harriers—often lumped together under the term “hawk”—and falcons. Accipiters (goshawk, sharp-shinned hawk, Cooper’s hawk) have small heads, long tails and short well-rounded wings. They fly with rapid wingbeats followed by a long glide; extremely maneuverable, they are well-suited to the thick forest areas they inhabit. Accipiters feed largely on other birds.

Buteos (red-tailed, red-shouldered, broad-winged, and rough-legged hawks) have stocky bodies, broad rounded wings and short fanned tails. Most are brown in color; young are similar to adults, but in most cases are streaked lengthwise below, rather than barred. Buteos perch in open country or soar in wide circles when hunting; small mammals are their main prey.

The marsh hawk is the only harrier found in North America. It is long-legged, with long narrow wings and a long tail. It soars with wingtips held perceptibly above the horizontal, much like a turkey vulture, quartering open country in search of prey.

Falcons (peregrine, merlin, kestrel) have large heads, broad shoulders, long pointed wings and a long tail. They are streamlined and built for speed, flying in a direct path with deep rapid wingbeats. They do not usually soar, although the kestrel sometimes hovers with rapid wing strokes. In hunting, the peregrine and merlin often fly above smaller birds and then dive to the attack, striking prey while in full flight.

#### Goshawk

Length, 20-26 inches; wingspread, 40-47 inches; weight, 1½-3½ pounds. Both immatures and adults have a prominent white line over each eye; the eyes of adults are bright red. Adults are blue-gray above and white below, with light barring on the breast. Immatures are brown above and creamy white below, with heavily streaked undersides. The largest of our accipiters, goshawks are seen in greatest numbers in winter, when food scarcities force many south. Also called “blue darters,” goshawks are swift, maneuverable and relentless, sometimes pursuing prey—birds and small mammals—through thick underbrush on foot. Goshawks breed in wooded areas and prefer wild territory and mountains. They nest up to 75 feet above the ground in trees, building bulky nests (3-4 feet in diameter). A pair often uses the same nest year after year. Eggs: 3-4, off-white and usually unmarked, incubated 36-38 days by the female. Goshawks defend their nests fiercely; voice is a harsh *ca ca ca ca* around the nest.

#### Sharp-Shinned Hawk

Length, 10-14 inches; wingspread, 20-27 inches; weight, 5-9 ounces. Identification of this species is often difficult, as large female sharp-shins are nearly the size of small male Cooper’s hawks, which they closely resemble. Adults have red eyes and are blue-gray above, with light rufous barring on the breast. Immatures are brown above, heavily streaked below. These are small hawks with short rounded wings and a long square-tipped tail. Sharp-shins feed almost exclusively on small birds such as sparrows, warblers, vireos, etc.; they fly and sail rapidly through the woods or hunt from a perch. Favored habitat is woodland, preferably coniferous, and woods edges. Sharp-shins breed throughout the eastern U.S.

broad-winged hawk

red-tailed hawk

sharp-shinned hawk

Cooper's hawk

goshawk

south to Alabama. They prefer to nest in conifers, about 30-35 feet up, usually building a new nest each year. Eggs: 4-5 white or bluish with brown blotches. Incubation is by both sexes, mostly by the female, and takes 21-24 days. Around the nest, adults make a *kek kek kek* sound; in flight, a shrill scream.

#### Cooper's Hawk

Length, 14-20 inches; wingspread, 27-36 inches; weight, 10-20 ounces (slightly smaller than a crow). Adults look like large sharp-shinned hawks—red eyes, blue-gray back and a rusty breast—except the Cooper's have rounded tails and the sharp-shins have square-tipped tails. Named in 1828 after William Cooper, New York naturalist, Cooper's hawks prey mainly on birds the size of robins and jays. While hunting, they prefer to perch and wait for prey. Favored habitat is woodland. Cooper's hawks breed throughout most of the eastern U.S.; they nest in trees 20-60 feet up. Eggs: 4-5, white, incubated by both sexes but mainly by the female for approximately one month. Woods where Cooper's hawks nest may remain heavily populated with songbirds, as these raptors hunt away from their nest area. Call is similar to that of the sharp-shinned.

#### Red-Tailed Hawk

Length, 19-25 inches; wingspread, 46-58 inches; weight, 2½-4 pounds. Upper plumage is dark brown, and the light undersides have a belly band of dark streaking. In adults, the upper side of the tail is rusty red; in young, dark gray. Red-tails inhabit deciduous woods. Primarily soaring birds, they prey on mice, birds, rabbits, red and gray squirrels, chipmunks. Voice is a rasping *keer-r-r-r*, slurring downward. Red-tails breed throughout the East. They nest in trees 35-90 feet up, both sexes helping to build a stick-and-twigs nest lined

with bark or green sprigs. Eggs: usually two, white and unmarked or with brown splotches. Incubation is by the female, for one month.

#### Red-Shouldered Hawk

Length, 18-24 inches; wingspread, 33-50 inches; weight, 2-3 pounds. Adults are colorful birds: dark brown above with chestnut-red shoulders, rich reddish-brown and white below, tail strongly barred with black and white. Many individuals have a translucent area or "window" near the wingtips, visible when they are airborne. These *buteos* are shy and hard to approach; they favor damp woods, river bottomlands and swamps. They hunt from an exposed perch offering a wide field of view or by circling high overhead, and prey on rodents, birds, frogs and snakes. Voice is a piercing whistled *kee-yer*, which blue jays often mimic. Red-shouldered hawks nest 20-60 feet above the ground in trees. Eggs: 2-4, usually three, dull white with brown markings; incubation is by both sexes and takes about 28 days.

#### Broad-Winged Hawk

Length, 13-19 inches; wingspread, 32-39 inches; weight, 13-20 ounces. This small *buteo* is easily recognized by its heavily banded tail, with two dark and two light bands. Upper plumage is dark gray-brown; underparts are white, heavily streaked with brown. The broad-winged is a hawk of the forests, preying on snakes, amphibians, insects and small mammals. It is our most common hawk, fairly unwary and approachable. During migration, broad-wings congregate in "kettles" of rising air, which they use to gain height. Voice is a high whistled *p-we-e-e-e-e*. Broad-wings breed mainly in deciduous forests and construct their small nests 24-40 feet up in trees. Eggs: 2-3, dull creamy white with brown markings. Incubation (approximately 30 days) is mostly by the female.

### Rough-Legged Hawk

Length, 19-24 inches; wingspread, 50-56 inches; weight, two pounds. This species exhibits two color phases, with wide individual variation in between. Light phase: upper side light buff to white, streaked with brown; underparts white, with a brown "wrist mark" partway out the wing and a brown band across the abdomen. Dark phase: black or sooty brown, with white at the base of the underside of the tail. Feet are feathered to the toes, hence the name "rough-legged." This large *buteo* often hovers over fields, beating its broad wings in short rapid strokes much like a kingfisher or a kestrel. Its small sharp-taloned feet are adapted to kill rodents—meadow mice, voles, gophers. Rough-legged hawks often hunt at dusk. They nest in the Arctic and northern Canada; like goshawks, most rough-leggeds come to Pennsylvania in the winter, when deep snow covers rodents on the northern feeding grounds and other prey birds have migrated south. They dwell mainly in open country, fields and marshes.

### Harrier (Marsh Hawk)

Length, 18-24 inches; wingspread, 40-54 inches; weight, 12-16 ounces. Marsh hawks have a white rump patch and a ruff of feathers around the face, much like the facial disks of owls. Males are pale bluish-gray above, white below; tail gray with dark bands. Females are brown above, light brown with dark streaks below; tail is barred with black and buff. Immatures resemble females. Marsh hawks inhabit fresh or saltwater marshes, wet meadows, bogs and flat open farmland. They prey on mice, insects, small birds and rabbits. The species tends to congregate in winter. Voice is a weak nasal *pee, pee, pee*. Marsh hawks nest on or near the ground, sometimes in fields and occasionally on a branch over the water. Nests are made of sticks, straw, grasses and are lined with feathers. Eggs: 4-6, usually five, oval, dull white to pale blue. Incubation is mostly by the female and takes about 24 days.

### Peregrine (Duck Hawk)

Length, 15-20 inches; wingspread, 38-46 inches; weight, 1½-2½ pounds. Peregrines are slate blue barred darkly above, with a black cap and "mustache" mark below the eye. Young birds are browner and heavily streaked below. Peregrines have long pointed wings and fly with quick rowing wingbeats similar to those of a pigeon. In attacking prey—ducks, pigeons, blue jays, flickers and other birds—a peregrine folds its wings close to its body and dives at speeds over 175 m.p.h.; it strikes

with its large knobbed feet, usually breaking the victim's back and killing it outright. When the prey falls to the ground, the falcon picks it up and carries it to a convenient perch to be eaten. The peregrine is uncommon and possibly near extinction and is on the federal government's endangered species list. One factor has nearly eliminated the bird in the eastern U.S.—persistent agricultural chemicals, which affect its reproduction. Loss of habitat—cliffs overlooking rivers, lakes and seacoasts—may also be harmful. At present, Cornell University ornithologists are raising peregrines from captive parents and releasing the young birds in suitable habitat. They hope to restore the peregrine to a breeding status in the east. Peregrines winter from the northern U.S. south to the Gulf of Mexico. They breed north to the Arctic, nesting in slight hollows on the ledges of high cliffs. Eggs: 2-4, creamy white covered with rich brown markings; 33-35 day incubation period. Voice is a repeated *we-chew* or a rapid rasping *cack cack cack*.

### Merlin (Pigeon Hawk)

Length, 10-13½ inches; wingspread, 24-26 inches; weight, 6-8 ounces (size of a blue jay). Merlins look like miniature peregrines, with males blue-gray above and banded black on the tail. Females and young birds are dusky brown above, white below. The name "pigeon hawk" comes from this falcon's resemblance to a pigeon in both flight and posture. Voice is a rasping chatter. Merlins prey mainly on birds but also take small mammals and insects. They favor open woods or heavy timber in wild areas, preferably with cliffs for breeding. They nest about 35-60 feet up on ledges, in natural cavities or in old nests of other birds. Eggs: 4-5 whitish, almost covered by fine brown marks. Incubation takes 30 days and is by the female.

### Kestrel (Sparrow Hawk)

Length, 9-12 inches; wingspread, 20-24 inches; weight, 3-4 ounces (robin size). Kestrels have rusty red head caps, backs and tails, and a black and white face pattern. Males have blue-gray wings, females brown wings. The kestrel is one of our smallest raptors and our most common falcon. Its flight is erratic and buoyant, and it often perches on telephone poles or hovers in one spot on rapidly beating wings. Voice is a shrill *killy killy killy*. In summer, kestrels take insects and occasionally birds; in winter, they prey mainly on mice. They inhabit open woods, orchards and fields, and breed throughout the eastern U.S. Kestrels nest in tree cavities, abandoned woodpecker holes and old buildings and accept nest boxes readily. Eggs: 3-5, whitish, dotted with brown; the female incubates them 29-30 days.

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