Southeastern Birds *of* Prey

YANR-193

ALABAMA COOPERATIVE EXTENSION SYSTEM
ALABAMA A&M AND AUBURN UNIVERSITIES

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Contents

Acknowledgments

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Preface

This educational packet is an interdisciplinary environmental education supplement for grades three through six. It is designed to increase knowledge and appreciation of raptors and their role in the environment. Included in the packet are:

- Brief life histories and range maps of some more common raptors found in the Southeast.
- Materials that can be used to help readers learn to recognize raptors.
- Interdisciplinary activities focusing on raptors.

What Are Raptors?

Except for vultures, raptors (or birds of prey), hunt live animals to kill and eat. Most raptors have a strong sharp bill for tearing food and strong feet with sharp claws (talons) to hold the food. Vultures are also birds of prey, but they are different from other raptors because vultures eat primarily animals that they find dead (carrion), and vultures lack the ability to grasp objects strongly with their feet.

The two groups of raptors are hawks and owls:

• Hawks are active during the day **(diurnal)** and rely on their **exceptionally good eyesight** to locate prey. Their eyes are positioned on the sides of their head in order to give them a wide range of vision. Most hawks have three forward-facing toes and one rear-facing toe. Included in the hawk group are eagles, hawks, falcons, kites, and ospreys.

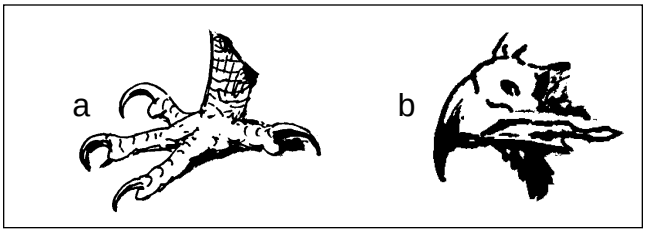


Figure 1. Talons (a) and beak (b).

• Owls are active during the night **(nocturnal)** and rely on their **excellent hearing** to locate prey. Their ears are placed on the sides of their head but one higher than the other **(offset)** so they can locate the source of sounds quickly. The eyes are positioned like a human eye, so the owl can focus on objects better than hawks. The wings make no sound when flying **(modified wings: feathers on the edges of the wings are slotted so air makes no noise as it passes through the feathers).** Owls have two forward-facing toes, one rear-facing, and one toe that can face either direction.

Some terms that may help you in reading about raptors and their identifying marks are listed below (see Figure 2).

Cere (sounds like seer)—a colored fleshy area just behind the bill or beak.

Terminal band—a band of color at the end of the tail.

Subterminal band—one or more bands of color not at the end of the tail.

Primaries—the flight feathers from the outer part of the wing to the elbow.

Secondaries—flight feathers from the elbow in to the body.

Coverts—feathers covering the primary or secondary flight feathers.

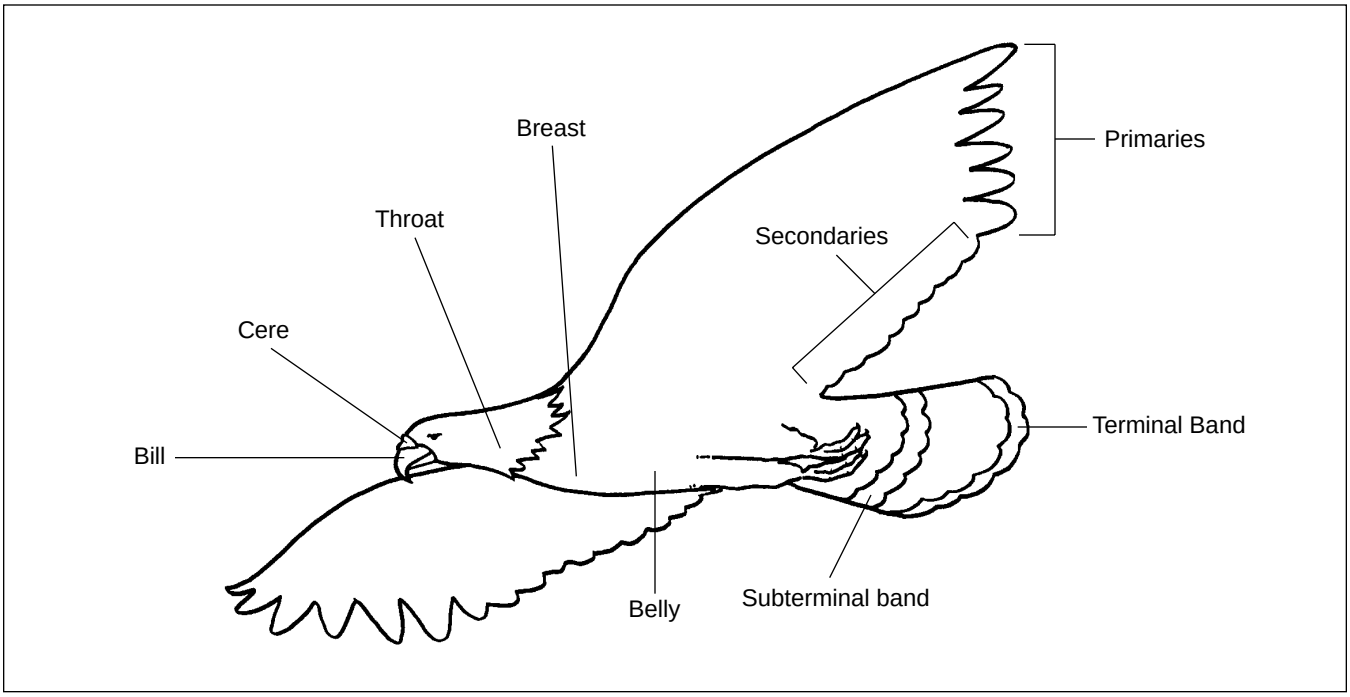


Figure 2. Identifying characteristics of a raptor.

The female raptor is larger than the male, a condition called **reverse sexual dimorphism.** The term sexual dimorphism means that the **males and females differ in size, color, markings, etc.** Usually, the male is larger than the female, but in raptors this is reversed with the female being the larger of the two. Why? One theory is that the female is larger so that she can protect the eggs or young at the nest from males.

Food Chains, Webs, and Predation

As energy is passed through a system, from lowest level to highest, the amount of energy decreases. This is because only a small part of the energy in one level can be passed to the next. And, the energy flow from the lowest to higher levels looks like a pyramid, with the broad base being the **producers** and the narrower upper parts representing the **consumers.**

Plants, called producers, occupy the base of the energy pyramid. Plants serve as food for many animals, such as cows, deer, rodents, and rabbits. These animals are called **primary consumers.** Other animals, called **secondary and tertiary consumers,** are higher-order consumers because they feed higher on the energy pyramid. These secondary and tertiary consumers feed mainly on meat. We will find fewer animals in the highest consumer levels. Some highest order consumers are human beings, bears, mountain lions, and raptors.

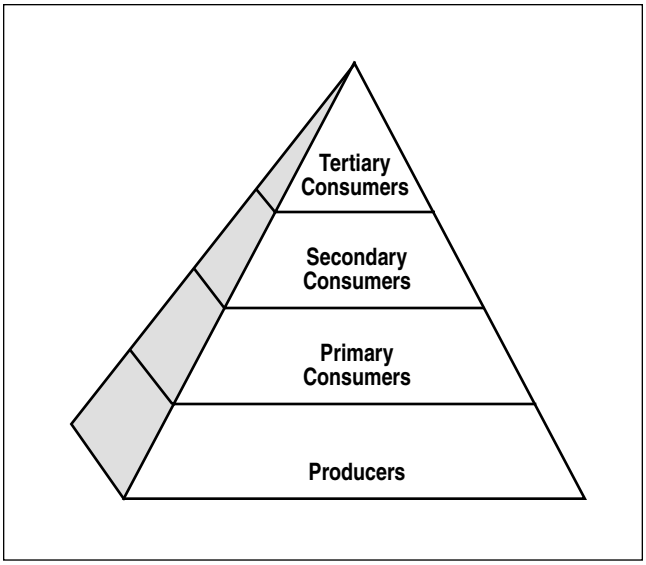
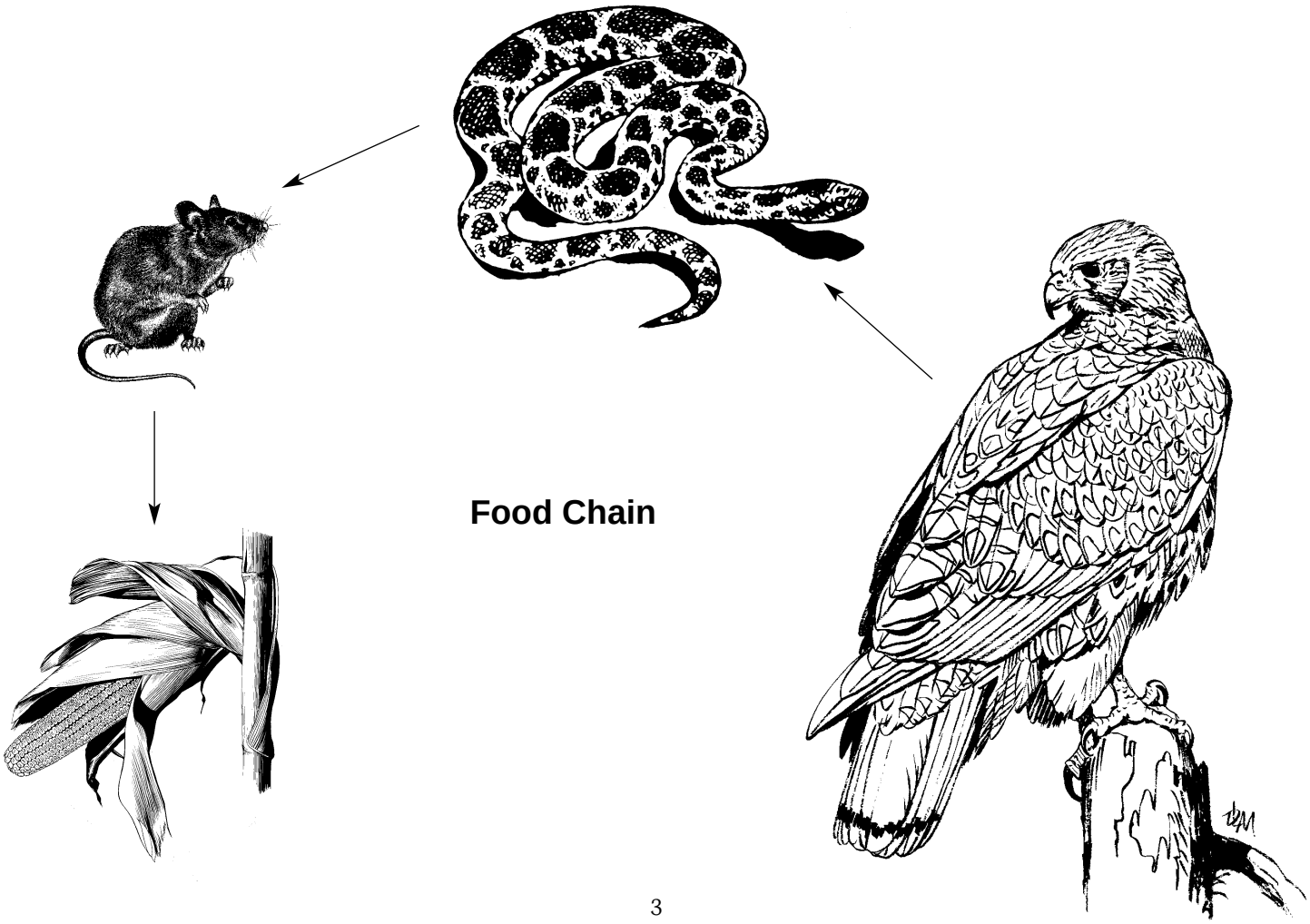


Figure 3. Energy pyramid.

The cycle is completed when organisms die, provide nutrients for plants, and begin the cycle again.

If we were to look at a simple illustration of how energy flows from producers through the consumer levels, we would have a food chain. An example of a food chain might be:



D D T

*DDT and other pesticides contain chlorine, carbon, and hydrogen, which are **chlorinated hydrocarbons.***

At the end of World War II, DDT and other similar chemicals were found to be effective insecticides, killing most insects in a treated area with just one application. It was thought that DDT would rid the world of pests such as the mosquito and fly and the diseases these pests carried.

But, DDT kills pests and beneficial insects alike. It is a nonselective agent. Populations of pest insects recover more quickly than their predators, disrupting the natural balance between predator and prey. This, in turn, lead to even greater amounts of DDT being applied to an area because of the increased number of pest insects. The increased applications caused DDT to concentrate in the soil and animals. Small animals might have small amounts of DDT in their bodies, and, as larger animals ate them, the DDT became even more concentrated. In one lake in California, microorganisms had 5 parts per million (ppm) of DDT, whereas ducks feeding on fish in the lake had concentrations of 16,000 ppm.

As the DDT moved farther up the food chain, its effects became more noticeable. In deer, DDT caused cancer. In raptors such as the bald eagle, osprey, and the peregrine falcon, DDT caused thin-shelled eggs that would crack when the parent sat on them (incubated the eggs). In fact, bald eagle and osprey populations declined in the continental United States, and the eastern subspecies of the peregrine falcon became extinct, because of the high level of DDT in their population. In human beings, DDT caused joint pain, excessive tiredness, and leukemia.

In 1971, the Environmental Protection Agency (EPA) held public hearings on the effects of DDT on the environment. The major concerns expressed were:

- *Effects of DDT on bird populations.*
- *The long-term stability of DDT in the environment; it does not breakdown (not **biodegradable).***
- *The possibility that DDT causes cancer in human beings **(a carcinogen).***

After a year of hearings, DDT was banned, except for uses that would have significant public benefit.

If several food chains are linked together, a food web is formed. This is a more realistic view of nature and energy's travel through the environment, because most animals eat more than one type of food.

Each part of a web connects to another part. A food web has many **interconnections**. Disturbing one part may disturb many others: Spraying insecticide to kill insects will affect other animals. Before any part of a food chain is removed, we need to think about the results it might cause. One part of the food web that we may eventually disturb is our own species, the human being.

Because of the complexity of food webs, we need to begin to preserve large sections of the environment. This will help to maintain whole food webs.

Food webs include the killing of one animal for food by another animal **(predation).** The animal making the kill is called a **predator,** and the animal being killed is called **prey.** A group of animals that provide food for a certain predator may be called a **prey species.**

Predation is a natural act. Raptors catch prey with their talons, usually impaling and killing their prey at the end of a swooping dive. Once captured, the prey may be "footed," where the raptor grabs and releases the animal until it stops moving. Raptors may also hold their prey by the talons and pull at the prey's head and neck. This dislocates the spinal column and quickly kills the prey.

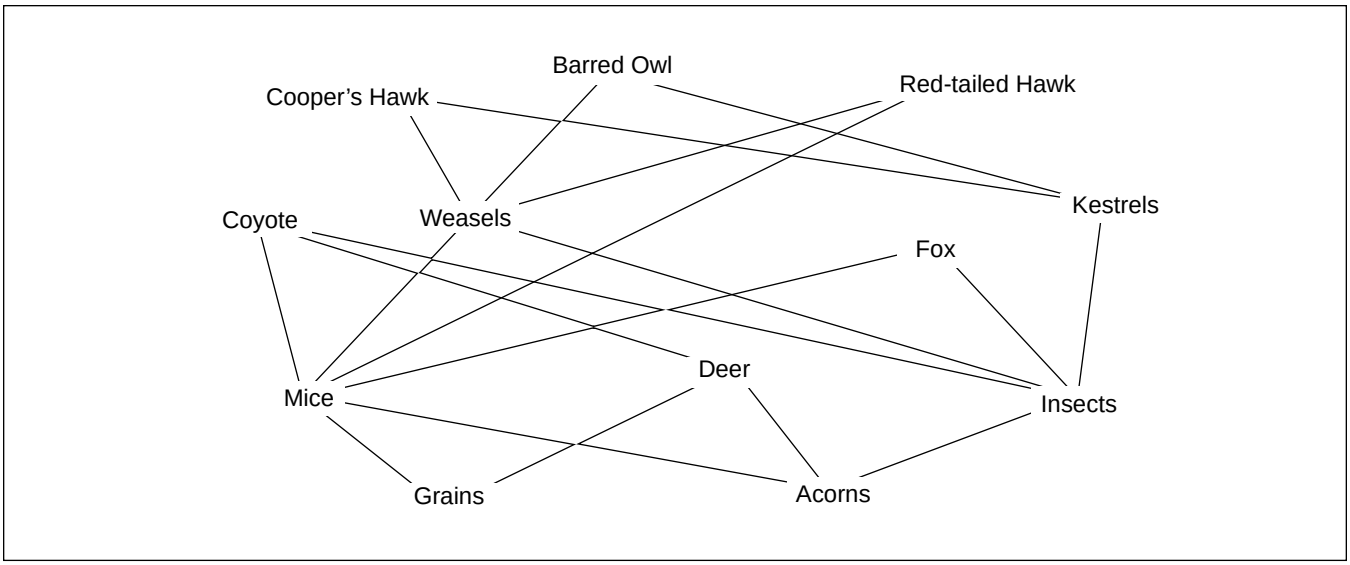


Figure 4. Sample food web

Raptors And People

Raptors have not always been protected by the government. In fact, the government once considered hawks pests and offered reward money to people for shooting them. At Hawk's Mountain, Pennsylvania, people would shoot hawks during their autumn migration. It was not uncommon for people to shoot thousands of hawks in a day during the Hawk's Mountain shoots.

In 1932, Richard Pough, a professional photographer, took pictures of the annual Hawk's Mountain hawk shoot. These pictures angered a conservationist named Rosalie Edge, and in 1934 she bought 1,400 acres of Hawk's Mountain to establish Hawk's Mountain Sanctuary and Association. With the establishment of Hawk's Mountain Sanctuary, the killing of hawks began to decline.

Rosalie Edge fought to have a law passed in the Pennsylvania legislature to protect all hawks. Because of the efforts of Rosalie Edge and others, the Pennsylvania legislature passed a law in 1957 that protected all hawks migrating through the state in September and October. Then, after further lobbying in 1969, Pennsylvania passed a law that provided year-round protection for all raptors except the great horned owl.

With the passage of this law, the Hawk's Mountain Sanctuary Association began to fight for a national law protecting raptors. Under the authority of the Migratory Bird Treaty Act, the Department of the Interior included all hawks and owls as migratory birds and granted them protection. This law says that no one can pursue, hunt, harass, or capture migratory birds. Anyone trying to do any of these acts can be fined up to $2,000 or imprisoned from 6 months to 2 years. Mexico and the United States ratified the amendment to the Migratory Bird Treaty Act on March 10, 1972.

Raptors help control populations of small animals. Without raptors and other predators, large populations of mice and other small mammals and birds might eat all the available food. Once their food supply was depleted the animals would die of starvation and disease. We now know that raptors are mostly beneficial for controlling populations of rodents that may damage crops and gardens.

Not only do raptors help us by controlling small animal populations, they also serve as **environmental indicators.** Just like human beings, raptors occupy the top of the food chain. But, raptors have a much higher metabolism (body chemistry) than people and are quicker to show the effects of toxins in the environment. So, by watching how raptor populations react to an area, people can get some indication of the general environmental health of an area.

Endangered Species Act

While all the birds in this publication are protected by the Migratory Bird Treaty Act, some are offered further protection by the Endangered Species Act (ESA).

The ESA is designed to protect animals and plants in the United States from extinction. The ESA can be applied to the whole species, a subspecies, or just a distinct population of a species (bald eagles in Alaska are not protected under ESA, while bald eagles in the lower 48 states are).

The two levels of protection under the ESA are endangered and threatened. ***Endangered status*** *means the organism could possibly go extinct over its entire range.* ***Threatened status*** *indicates that the population has had a serious decline and merits protection.*

Injured Raptors

Raptors are predators of the sky. If you see a raptor on the ground, you are most likely seeing a bird that has just caught dinner. Stand back and watch; you might see the bird fly away with a meal. Raptors do not normally stay on the ground for long. If the bird has seen you and still stays on the ground for more than a few minutes, it may be injured. **It still has very strong talons and a bill and can cause damage to you.** The best course of action is to call someone who has experience with these birds: the Alabama Game and Fish Commission, the U.S. Fish and Wildlife Service, a local wildlife rehabilitation organization, or local animal control. Look for these groups under the name of your city or county or under U.S. Government in a telephone directory. Your county Extension office can direct you to an Extension Wildlife Scientist for advice. These agencies will assist you in taking the injured raptor to an experienced wildlife **rehabilitator.** Raptor rehabilitators use four procedures when dealing with injured or sick raptors.

1. Triage, the first procedure, occurs when the rehabilitator gives the bird its first check-up as a potential patient. The bird will be examined as to the source and extent of its injuries or illness. At this time the rehabilitator will try to determine what quality of life the bird will have if it survives. Wild adult raptors are not domestic birds; they are stressed by contact with human beings, and some injuries will prevent the bird from having a normal life even in a zoo setting. If the injury to the bird is severe enough to reduce potential quality of life, the bird should be humanely destroyed **(euthanized).** The rehabilitator will consider euthanasia if a raptor has been blinded, lost a wing so close to the body as to affect balance, or lost a leg or whole foot. Triage is complete when the bird begins treatment.

2. Treatment can be as easy as observing a bird with no apparent injuries until it seems normal, or as complex as pinning broken bones or treating head injuries

(trauma). Treating raptors is an art as well as a science, since most birds will not want to cooperate.

3. Rehabilitation occurs after the raptor has recovered from its injuries. During this phase the bird is **reconditioned** to fly and capture prey in the wild. This is done by placing the bird in a large flight cage so it can fly as much as possible. The final step in rehabilitation is a "kill test" after the raptor has been in captivity for a month or longer and has not had to hunt. The raptor passes the test if it kills and eats a mouse placed in the raptor cage. This test shows that the raptor still can hunt wild prey.

4. Release is the last and most rewarding part of rehabilitation. The rehabilitated raptor is taken back to where it was found, placed on the ground, and allowed to fly away.

Raptors that cannot be rehabilitated must be placed with a zoo or other organization. This is getting difficult to do as the number of nonreleasable raptors keeps growing and the numbers of organizations to keep them does not.

A raptor cannot be kept by an individual without state and federal permits.

A C C I P I T E R S

Accipiters are raptors of the deep woods, and they are seldom seen. They have long tails and short wings, which allow them to maneuver through the trees.

Accipiters feed mainly on other birds. All accipiters have a special adaptation that allows them to capture birds; their toes and talons are longer than those of other raptors. The middle toe on some accipiters is twice as long as the rest of their toes.

Accipiters that are commonly seen in the southeast are the sharp-shinned hawk and the Cooper's hawk. These birds are usually seen during their migration.

Sharp-Shinned Hawk

(Accipiter striatus)

Vital Statistics

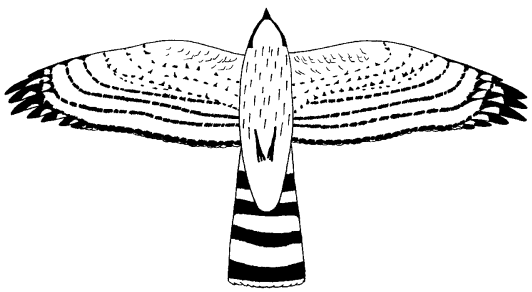
Wingspan	20-26 inches (51-66 centimeters)
Weight	3-8 ounces (85-227 grams)
Length	9-13 inches (23-33 centimeters)

Characteristic marking—Long, narrow tail with light and dark bands of equal width, with a thin, white terminal band on a square end. The breast and belly are white with reddish bands.

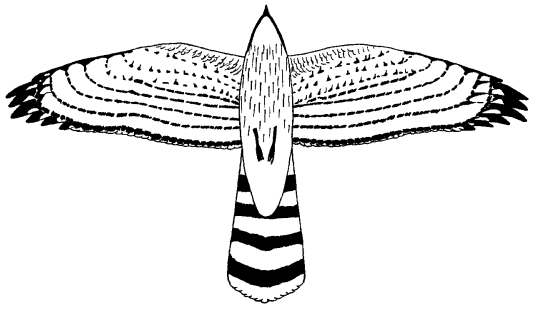
Eggs—Four to eight white or pale blue eggs (may have brown splotches). Eggs average 1.5 inches long by 1.2 inches around (3.8 by 3.1 centimeters).

The sharp-shinned hawk, sometimes called a sharpie or blue darter, is a reclusive bird that prefers to range the forest and mountains of the northern states in which they breed. They most often are seen in the south as they migrate to South America and the Florida keys.

The sharp-shinned hawk hunts by perching and looking for small birds that they then catch after a brief chase. Sharpies can be so intent on pursuing their prey that they may actually crash into windows while chasing birds.



Flight silhouette of the sharp-shinned Hawk.



Flight silhouette of Cooper's hawk.

Cooper's Hawk

(Accipiter cooperii)

Vital Statistics

Wingspan	28-34 inches (71-86 centimeters)
Length	14-19 inches (36-48 centimeters)
Weight	10-24 ounces (284-680 grams)

Characteristic marking—Long, narrow tail with light and dark bands of equal width; the terminal band is broad and white on a rounded end. The breast and belly are white with reddish bars.

Eggs—Three to six brown-splotched white eggs average 1.9 inches long by 1.5 inches around (4.8 by 3.8 centimeters).

The Cooper's hawk, sometimes called a blue darter, is found in almost every part of the country, breeding everywhere except southern Florida and migrating during the winter months to Mexico and Florida.

Cooper's hawks usually choose a new nest site each year. Most of the nest is built by the male who places it high in a tree, near the trunk, or in a fork. The nest is made of twigs and may be lined with bark, grasses, or moss.

While perched, the Cooper's hawk raises the feathers on the back of its head, giving it a large squarish appearance. The hawk will sit patiently, waiting for a bird or small mammal to come into view. Also, the hawk may fly along fences or through the woods trying to flush prey; it has been known to pursue its prey on foot through thick brush.

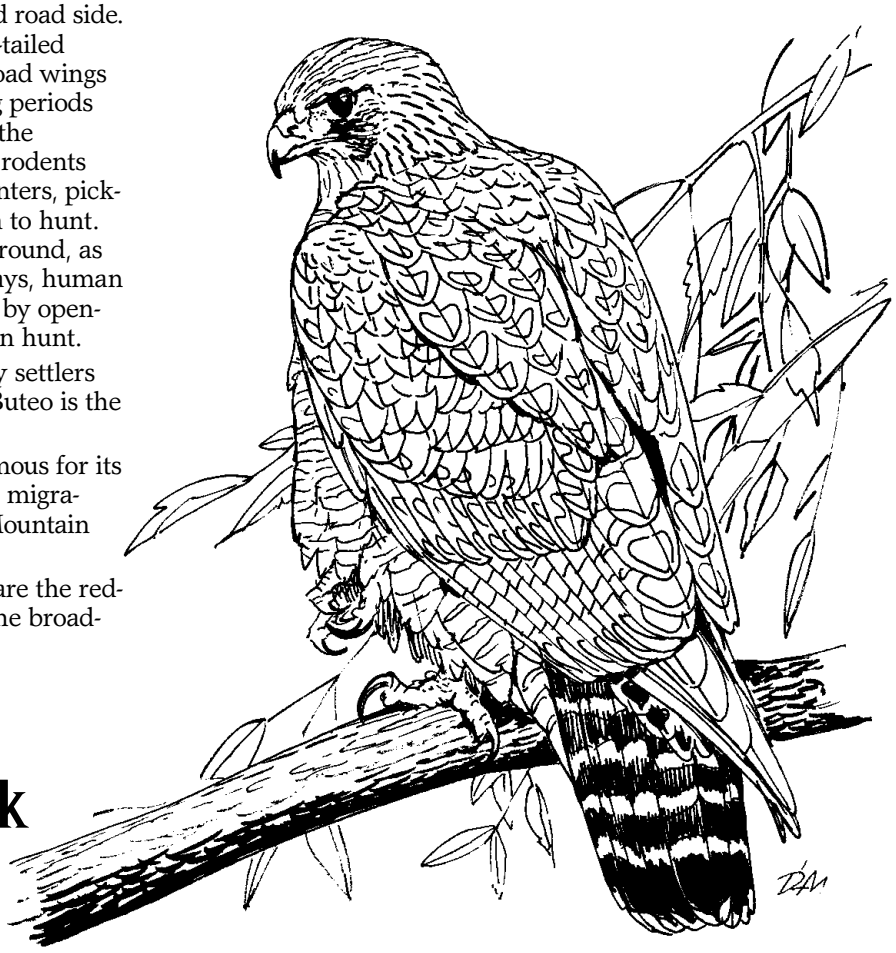
B U T E O S

Buteos are the raptors of the open field and road side. The most commonly seen raptor, the red-tailed hawk, is a buteo. Most buteos have large, broad wings and a broad tail that helps them soar for long periods with little or no effort. These slow flyers are the mousers of the raptor world, hunting mostly rodents and some reptiles. Most buteos are perch hunters, picking a tall perch with a good view from which to hunt. The farmer's field is a buteo's ideal hunting ground, as is the median strip of a highway. In many ways, human beings have helped the buteos' hunting style by opening large areas of land where these hawks can hunt.

Buteos are the true **buzzards,** a term early settlers mistakenly used in describing our vultures. Buteo is the latin word for buzzard.

One buteo, the broad-winged hawk, is famous for its mass migrations in the spring and fall. These migrations are some of the attractions at Hawk's Mountain Sanctuary in Pennsylvania.

Buteos that are common in the southeast are the red-tailed hawk, the red-shouldered hawk, and the broad-winged hawk.



Red-shouldered Hawk

(Buteo lineatus)

Vital Statistics

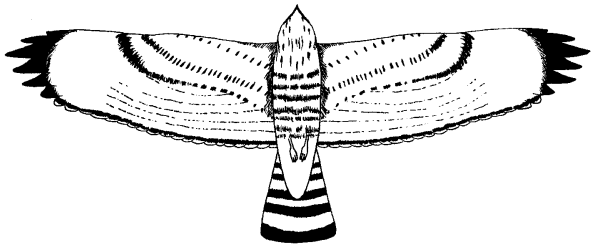
Wingspan	24-30 inches (62-72 centimeters)
Length	15-19 inches (38-48 centimeters)
Weight	17-24 ounces (475-680 grams)

Characteristic marking—Mature birds have a red, crescent-shaped shoulder patch that is visible when the hawk perches. A crescent-shaped patch on the wingtips (called a "window," because light seems to pass through it) is visible when they fly. The tail also has three to five bands on it.

Eggs—Three to four whitish eggs with brown splotches average 2.2 inches long by 1.7 inches around (5.6 by 4.3 centimeters).

Red-shouldered hawks like hardwood forests near rivers or streams, and they may be found in marsh or swamp habitats. This is one of the few hawks that may nest in residential areas.

Red-shouldered hawks are usually woodland hunters, spending hours sitting inconspicuously on a perch and searching for small prey. They catch food wherever they can, even at bird feeders!



Flight silhouette of the red-shouldered hawk.

These hawks will nest in the same area each year, but they seldom use the same nest. Both members of the breeding pair will help build the nest in the fork of a tree. They may use an old squirrel or crow nest as a foundation. The nest is made of sticks and twigs and lined with moss, leaves, or down.

Red-tailed Hawk

(Buteo jamaiecensis)

Vital Statistics

Wingspan	46-58 inches (117-147 centimeters)
Length	19-25 inches (48-64 centimeters)
Weight	2.25-3.5 pounds (1,021-1,588 grams)

Characteristic marking—Red-tailed hawks that are 2 years old and older have a red tail. The breast is white and is crossed with a belly band. Older birds have a white V on the back. Young red-tails have a streaked breast and belly.

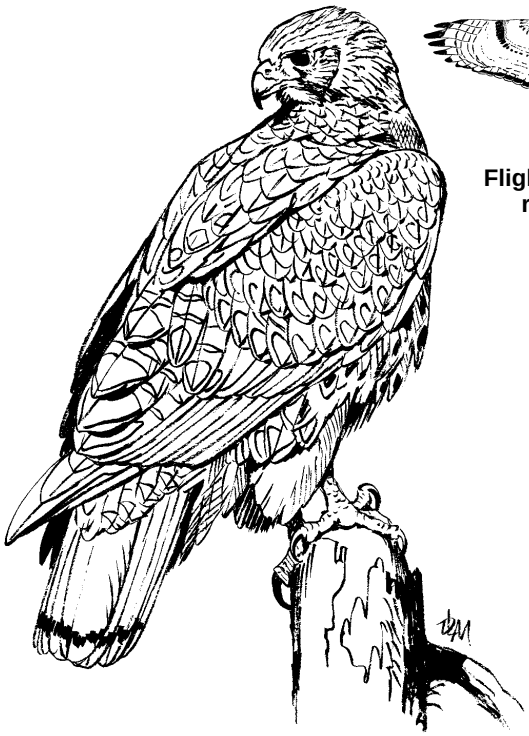
Eggs—One to three white to bluish eggs average 2.3 inches long by 1.9 inches around (5.9 by 4.7 centimeters).

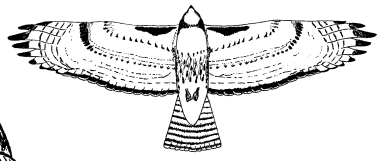
The red-tailed hawk is found throughout the United States, except in those areas with extensive, thick forest and in areas above the Arctic Circle. Red-tailed hawks are abundant throughout most of their range.

Red-tailed hawks may build their own nest or improve a nest from another raptor. The large nest is usually placed in the tallest tree around. The nest is made of twigs and sticks and lined with soft material.

Red-tailed hawks often perch at the edge of woods to search for prey in an adjacent field. The clearing of fields and the building of highways have provided the red-tailed Hawks with ample hunting grounds.

Red-tailed hawks are probably the hawks that you see soaring over open fields or roads. The courtship behavior of red-tailed hawks is spectacular, with long steep dives and aerial acrobatics.





Flight silhouette of the red-tailed hawk.

Broad-winged Hawk

(Buteo platypterus)

Vital Statistics

Wingspan	32-39 inches (81-99 centimeters)
Length	13.5-19 inches (34-48 centimeters)
Weight	11-17 ounces (312 to 482 grams)

Characteristic marking—Broad-winged hawks have a dark tail with two white bands. The breast is white with reddish bars. The wings have a dark outline.

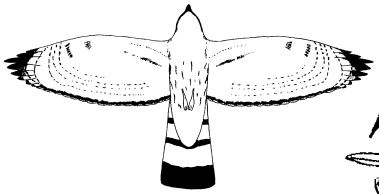
Eggs—Two to three white-splotched eggs average 2 inches long by 1.3 inches around (5.1 by 3.3 centimeters).

Broad-winged hawks are common in the forests of the southeastern United States and eastern Canada, living in hardwood trees that lose their leaves **(deciduous)** and in mixed pine-hardwood forests. Broad-winged hawks are not found in small wooded areas, and, as forests are cleared for timber and housing, broad-winged hawks will leave.

Broad-winged hawks usually build a new nest each year, occasionally improving on an old crow or squirrel nest. Placed near the tree's trunk, the nest is made of sticks and dead leaves and is lined with chips of wood or moist inner tree bark. Nesting broad-wings can be very defensive. They have been known to dive into people who disturb the hawk's nest.

Like other buteos, broad-wing hawks hunt from a perch. Often a broad-wing hawk will perch near a clearing and search for small mammals, reptiles, or birds.

All broad-winged hawks are migratory. They go to South America for the winter. Broad-wing hawks have spectacular fall and spring migrations, with thousands flying together.



Flight silhouette of the broad-winged hawk.

E A G L E S

Eagles are the largest raptors in the southeast. In fact, the only raptor in the entire United States larger than an eagle is the California condor. Eagles are powerful birds that soar at great heights. They have long, broad wings, setting them apart from buteos, which have shorter wings.

The two groups of eagles in the United States are the bald eagle and the golden eagle. The bald or fishing eagle is of the genus *Haliaeetus,* and the golden eagle is of the genus *Aquila,* the true eagles. While both may be seen in the southeast, the bald eagle is more common.

Bald Eagle

(Haliaeetus leucocephalus)

Vital Statistics

Wingspan	6-8 feet (183-229 centimeters)
Length	30-37 inches (76-94 centimeters)
Weight	8-14 pounds (3,629-6,350 grams)

Characteristic marking—Adult bald eagles have a white head and tail. The beak and legs are yellow—the legs have no feathers. The bald eagle soars on flat wings.

Eggs—Two white eggs average 2.8 inches long by 2.1 inches around (7.1 by 5.3 centimeters).

ESA Status—Endangered in the lower 48 states, except Oregon, Minnesota, Wisconsin, and Michigan, where the bald eagle is considered threatened.

Most of America's bald eagles live on the east coast, the Great Lakes region, and in Alaska. In the winter large groups can be found on the Chilkat River in Alaska, in the Klamath Basin in Oregon, and on the upper Mississippi River.

Bald eagles build their nest (called an **aerie** or **eyre,** pronounced ear-y) high in the fork of the tallest tree around. The nest is built with sticks, branches, and even vines and stalks left over from crops. The nest is lined with grass, moss, or other soft material. The same nest is remodeled each year; and, after several years, it may be about the size of a Volkswagen Beetle, weighing several hundred pounds. Some nests are up to 15 feet high! Often, smaller birds, like sparrows, build their nests in the side of a bald eagle nest.

The first young eagle to hatch is usually the only one to survive, which leads some conservation agencies to remove the second egg to incubate it and raise the chick in a captive-release program.

The bald eagle spends most of its time perching or soaring near large bodies of water where it finds fish, which it snatches from the water with its talons. Eagles will also steal fish from other raptors. In winter, when fish are scarce, bald eagles will eat carrion or waterfowl.

The bald eagle suffered greatly from the heavy use of pesticides, especially DDT. Bald eagle populations are recovering, but as of yet they do not occupy the whole extent of their former range. Today the main threat to bald eagles is habitat destruction and water pollution.

Flight silhouette of bald eagle.

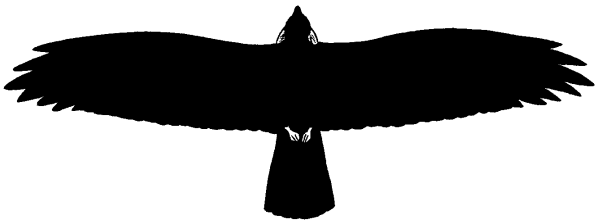
Golden Eagle

(Aquila chrysaetos)

Vital Statistics

Wingspan	6-7 feet (190-213 centimeters)
Length	30-41 inches (76-104 centimeters)
Weight	8-13 pounds (3,629-5,897 grams)

Characteristic marking—The golden eagle is a large, brown soaring bird. The back of the head and the nape of the neck appear golden. The legs are feathered to the toes.



Flight silhouette of the golden eagle.

Eggs—Two white eggs average 2.9 inches long by 2.3 inches around (7.5 by 5.3 centimeters).

Golden eagles are common during the winter in the western part of the United States, and they are reported to spend summers in the Appalachian Mountains. But, the young have begun to move away from mountainous areas, and so eagles may become more common in the southeast. They are found primarily near exposed rock that overlooks hunting areas. They may hunt in places where logging or fire has opened a forested area.

Golden eagles build their nest on exposed rock faces or in tall trees that have a commanding view. A pair of golden eagles may build several nests over a period of years and rotate the use of these nests. Like the bald eagles' nest, the "golden's" may become quite large. The nest is made of sticks and branches and lined with moss, feathers, or leaves.

Golden eagles are large, aggressive raptors that can kill animals much larger than themselves. Goldens have been known to kill deer, sheep, coyotes, and large birds; but, the eagle's diet consists mainly of small mammals and carrion.

The golden eagle has been trapped, poisoned, and shot because of suspected and confirmed reports of livestock damage. But, the major threat to golden eagles is the loss of their home range—**habitat destruction.**

F A L C O N S

Falcons have long, pointed wings and medium-to-long tails, which help them to reach great speeds when diving on their prey. This may be part of the attraction in the sport of falconry.

Falconry was the sport of royalty in the middle ages. Falcons would be caught while still fledglings and then trained to hunt by their master. A falconer could sit on his horse and send his falcon after small birds or mammals. The sport is still practiced today, but in the United States red-tailed hawks, red-shouldered hawks, and American kestrels are used. To become a falconer, you must learn from an experienced falconer (become an **apprentice** to a master falconer).

The skin around the eyes of falcons is bare and is usually the same color as the cere (see parts of a raptor, p. 2). All falcons in the eastern United States have facial markings that make them easy to identify. These markings look like sideburns and are called mustache marks.

Falcons do not build their own nests, but, they may take over or steal a nest from another raptor or a crow. Falcons may also nest in nest boxes and on building ledges.

Falcons native to the southeast include the American kestrel, merlin, and the peregrine falcon.

American Kestrel

(Falco sparverius)

Vital Statistics

Wingspan	20-24 inches (51-61 centimeters)
Length	8-11 inches (20-27 centimeters)
Weight	3.4-5.3 ounces (96-150 grams)

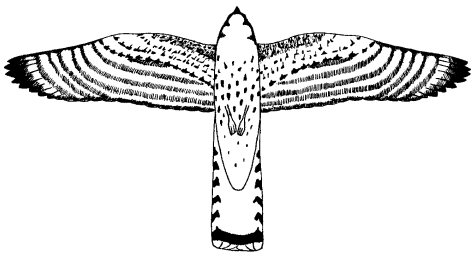
Characteristic marking—The side of the face has two black marks, one below the eye, the other just behind the eye. The tops of the wings are blue-gray with black circles, while the bottoms of the flight feathers are dark with light circles.

Eggs—Four or five white and brown splotched eggs average 1.4 inches long by 1.2 inches around (3.6 by 3.0 centimeters).

The American kestrel, often called a sparrow hawk, can be found perching on poles, stumps, and powerlines throughout North America. During the winter months kestrels are especially common in the South, although northern populations may migrate as far as Central America.

Kestrels nest in tree cavities such as old woodpecker or flicker holes, eaves of buildings, nest boxes, or in crevices of buildings. Kestrels can be aggressive in defense of their nests.Kestrels have a large appetite and prey mainly on insects. Kestrels often dive into the edge of a grass fire, catching insects that are trying to get away.

Kestrels are the only falcons in the United States that are able to remain still in the air by flapping their wings **(hover)** and to soar using a strong wind like a kite (this is called **to kite).**



Flight silhouette of the American kestrel.

Merlin

(Falco columbarius)

Vital Statistics

Wingspan	21-27 inches (53-69 centimeters)
Length	9-12 inches (23-31 centimeters)
Weight	4.5-9 ounces (128 to 255 grams)

Characteristic marking—The tail is dark with three blue bands and a white terminal band. The area behind the eye is darker than the rest of the head, and there is a slight mustache mark.

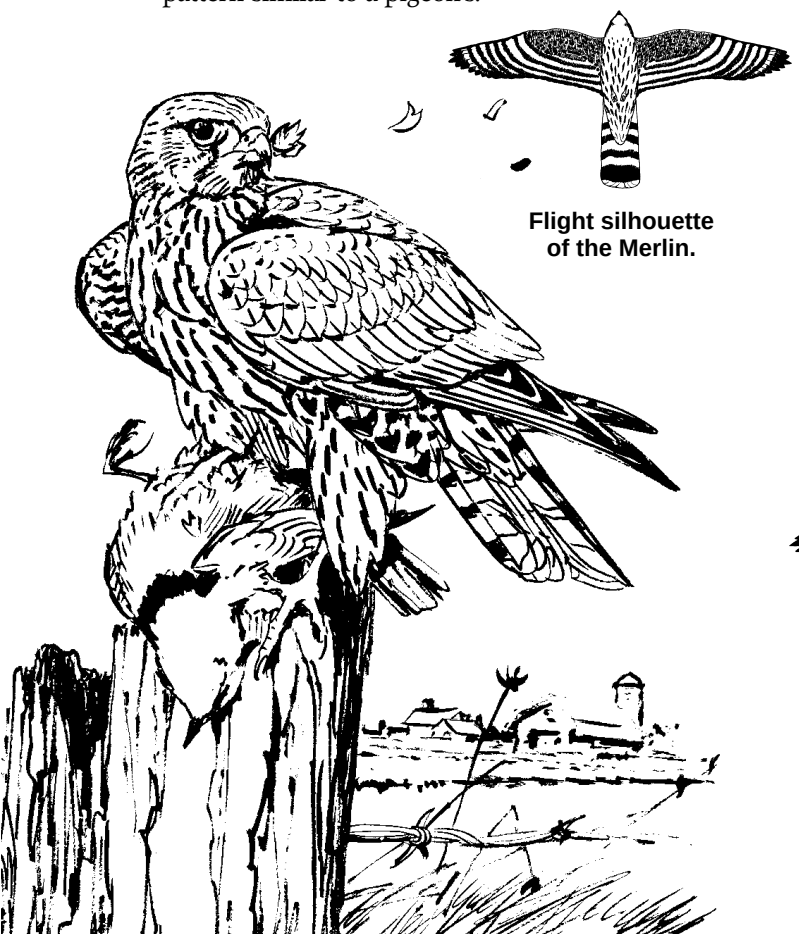
Eggs—Four to five off-white brown speckled eggs average 1.6 inches long by 1.2 inches around (4.1 by 3.0 centimeters).

Merlins, or pigeon hawks, occur mainly in the northern open country. They are not common but are fairly evenly distributed throughout their range. They are found along the edges of woods, in coastal marshes, and around large bodies of water. Merlins winter along the Gulf Coast, southern California, Central America, and the Caribbean.

Merlins nest in tree cavities, old bird nests, or on ledges. The nest consists of sticks and moss woven together and may be lined with bark, twigs, or lichens.

Merlins hunt from a perch, taking their prey after a short pursuit, and they may eat while flying. The primary prey of Merlins is birds, but they may eat mammals and reptiles.

Merlins rarely soar and they glide much less frequently than other raptors. They tend to have a flight pattern similar to a pigeon's.



Flight silhouette of the Merlin.

Peregrine Falcon

(Falco peregrinus)

Vital Statistics

Wingspan	37-46 inches (94-117 centimeters)
Length	14-18 inches (36-46 centimeters)
Weight	16-32 ounces (453-907 grams)

Characteristic marking—The head appears to have a dark hood; peregrines have a large moustache mark. The legs, cere, and eye-ring are yellow.

Eggs—Three to five pinkish, brown-splotched eggs average 2.1 inches long by 1.5 inches around (5.3 by 3.8 centimeters).

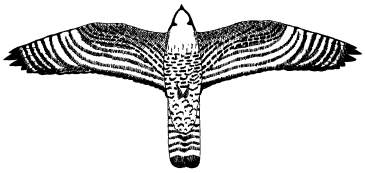
ESA Status—Listed as endangered throughout its range.

Historically, peregrine falcons ranged over much of the United States, but the eastern subspecies was eliminated by DDT. A captive-release program supported by the U.S. Fish and Wildlife Service and the Peregrine Fund (a private organization) is trying to re-establish the eastern peregrine. The captive-release program appears to be having some success, although the peregrine falcon is still an endangered species.

Peregrines are birds of the mountains and rocky ledges; but, many peregrines have become city dwellers, nesting on window ledges and bridges and eating wild pigeons.

Peregrines nest around water where a small depression is scraped into a rock or window ledge. The same nesting area may be used each year.

Peregrine falcons, also called duck hawks, are strong graceful flyers. When capturing prey, they are capable of fast dives, called **stoops,** where they may attain speeds of 200 miles per hour. The wing beats appear stiff and shallow, but, when soaring, the tail and the wings fan out and almost meet each other.



Flight silhouette of the peregrine falcon.

H A R R I E R S

Only one member of the genus Circus (the harriers) is found in the United States—the marsh hawk or northern harrier. Marsh hawks and other harriers have a distinctive white rump patch and large ear openings. These birds are most often active during the early morning or late evening hours, when they hunt with both sight and hearing. Harriers have a slim body, long legs, and a long tail. They also have a ridge of stiff feathers around the face. This **facial disk** acts as an external ear and funnels sound to the ear openings.

Northern Harrier

(Circus cyaneus)

Vital Statistics

Wingspan	38-48 inches (97-122 centimeters)
Length	16-20 inches (41-51 centimeters)
Weight	10-21 ounces (283-595 grams)

Characteristic marking—The harrier's back is dark gray with a distinctive white patch where the tail meets the body. The breast and belly are white. The wings have a dark trailing edge.

Eggs—Four to nine whitish eggs average 1.9 inches long by 1.4 inches around (4.7 by 3.6 centimeters).

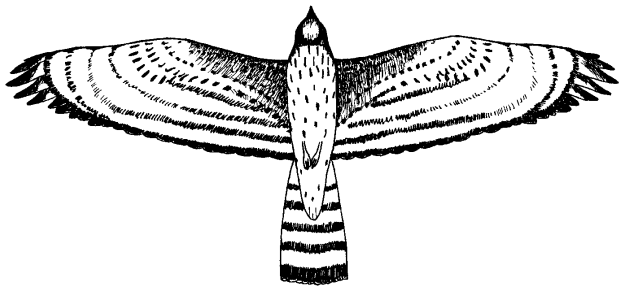
Harriers are common, breeding from Northern Virginia up to the Alaskan tundra. In the winter the bird is common throughout the southern United States. These are raptors of the field and marsh, rarely seen in wooded or mountainous areas.

They usually nest in marshes or bogs but may nest in dry fields if water is nearby. The nest is usually built on a small rise out of grasses and sticks.

The northern harrier or marsh hawk hunts by flying low over open fields and dropping on available prey. The males prey on birds, while the females prefer small mammals. It has been reported that harriers will drown ducks.

Harriers do not perch in high places, preferring to perch on the ground, fenceposts, or other low objects. In the winter, harriers may roost in large groups of more than 100 birds.

Like a turkey vulture, the harrier holds its wings in a V position during flight, and it may rock or wobble when soaring.



Flight silhouette of the northern harrier.

K I T E S

The word kite comes from the Latin word "cyta," the Old English word for two species of European kites. Kites are small birds, with buoyant flights; they seem to float between the flapping of their wings. The most numerous kite in the southeast, the Mississippi kite, has pointed wings and, like a kestrel, is capable of kiting by angling the wings into the wind. Kiting is like hovering, and, by doing this, the bird can remain almost stationary over an area while searching for food. Most kites eat insects or other invertebrates.

Mississippi Kite

(Ictinia mississippiensis)

Vital Statistics

Wingspan	29-33 inches (74-84 centimeters)
Length	12-15 inches (31-38 centimeters)
Weight	8-13 ounces (227-369 grams)

Characteristic marking—Mississippi kites have a gray back and underside, a black tail, and a black eye-ring.

Eggs—One white or pale blue egg averages 1.6 inches long by 1.4 inches around (4.1 by 3.45 centimeters).

The Mississippi kite can be found almost everywhere. It prefers river bottoms for nesting. The main breeding areas are in the Great Plains, along the southern Mississippi River, and on the Gulf coast.

Nests are usually located in the tallest sweetgum, cottonwood, or pine around. The small, sturdy nest is made of twigs, sticks, leaves, and moss and is lined with fresh leaves. The same nest may be used for several years. Kites will aggressively defend their nest against intruders.

Mississippi kites eat mostly insects, which they catch and may eat in flight. They are social and breed and roost in large groups. During their spring and fall migrations to South America hundreds of birds may fly together.

Flight silhouette of a Mississippi kite.

O S P R E Y

The osprey is the only raptor in the family Pandionidae. Ospreys are well suited to catching fish. The fourth toe on the talons can be reversed to allow a better grip on slippery fish, and the bottom of the foot is covered with small spines, called spicules, which also help them grasp fish. Ospreys can hover, allowing them to pinpoint prey before plunging into the water. They can take off from the water after diving using a special wingbeat to lift them almost vertically from the water's surface.

Flight silhouette of the osprey.

Osprey

(Pandion haliaeetus)

Vital Statistics

Wingspan	59-67 inches (23-26 centimeters)
Length	21-26 inches (8-10 centimeters)
Weight	2.2-3.9 pounds (997-1,769 grams)

Characteristic marking—In flight the osprey's wing bends forward at the elbows. The crown is dark with a dark eye-stripe. The undersides are white with dark primaries (see parts of a raptor, p. 00).

Eggs—Three whitish eggs average 2.4 inches long by 1.8 inches around (6.1 by 4.6 centimeters).

Ospreys, called fish hawks, prefer large bodies of water and are found along the Atlantic and Gulf coasts, the Great Lakes, large inland lakes, Alaska, and the California coast.

Ospreys nest near water on a tall structure, including power poles, dead snags (old dead trees), pines, duck blinds, channel markers, or a chimney on a lakeside cottage. The nest may be used for years and be quite large.

When flying or soaring over water looking for fish, the osprey dives into the water feet first, often completely submerging. Once on the surface it will pause for a moment then take off, and, once in the air, shake to remove water. The fish are always carried head first during the flight back to the roost. Ospreys have been reported to catch turtles, small mammals, and even alligators.Osprey populations are stabilizing after a decline caused by DDT and other chemicals. The main threat to the osprey is the building of highways and other development of coastal areas. Populations of osprey are increasing in areas of protection.

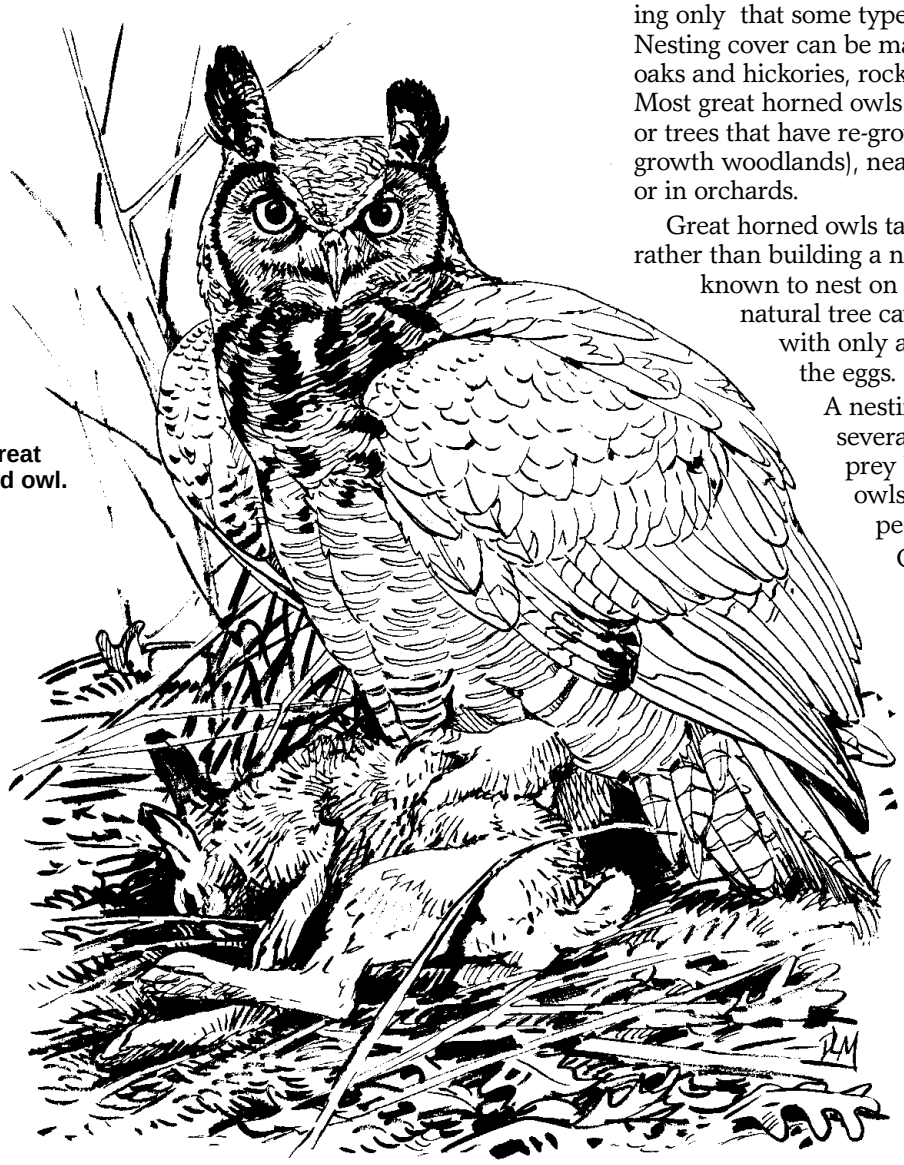
O W L S

Owls are the nighttime equivalent of hawks. They avoid competition with hawks by carrying out the same function, but at night.

Owls have several adaptations that equip them for night hunting. The **asymmetrical** placement of the ears (one higher than the other) allows owls to use sounds to locate their prey. They also have facial disks that act like external ears and channel sound to the ears. The eyes are located in the front of the face so that they can focus on objects. The feathers are modified, with slots to let the wind pass through, so they make no sound in flight and do not alert their prey to their presence.

Unlike other raptors, owls usually swallow their food whole. After all the soft material is digested, owls vomit **(egest)** the bones and hair in a pellet form called a "cast." Owl roosts can be located by looking for castings found on the ground near them.

Common southeastern owls are the great horned owl, barn owl, barred owl, and eastern screech owl.



The great horned owl.

Great Horned Owl

(Bubo virginianus)

Vital Statistics

Wingspan	48-60 inches (122-152 centimeters)
Length	18-25 inches (46-64 centimeters)
Weight	2-3.8 pounds (914-1,706 grams)

Characteristic marking—The great horned owl is characterized by two tufts above the eye and light markings around the eye. It is a large brown owl with gray mottling on the back and breast. The throat is white.

Eggs—Two to five nearly white eggs average 2.2 inches long by 1.9 inches around (5.6 by 4.7 centimeters).

Great horned owls use a variety of habitats, requiring only that some type of nesting cover be present. Nesting cover can be mature deciduous trees, such as oaks and hickories, rocky outcrops, or mature pines. Most great horned owls are found in open woodlands or trees that have re-grown after being cut (second growth woodlands), near agricultural fields, in swamps, or in orchards.

Great horned owls take over old hawk or crow nests rather than building a nest. They have also been known to nest on building ledges, in caves, and in natural tree cavities. The nest site is plain, with only a few feathers added to cushion the eggs.

A nesting area may be abandoned for several years if there is a decline in prey because of over hunting. These owls have been known to attack people who get too close to a nest.

One interesting behavior that these owls exhibit in colder climates is incubating frozen prey. They defrost frozen prey to provide food to the young, which are often hatched while snow is still on the ground.

Great horned owls are active in the early evening and early morning hours. During nesting season they may hunt during the day to provide food for the young.

Barn Owl

(Tyto alba)

Vital Statistics

Wingspan	43-47 inches (109-119 centimeters)
Length	15-20 inches (38-51 centimeters)
Weight	11-13 ounces (312-362 grams)

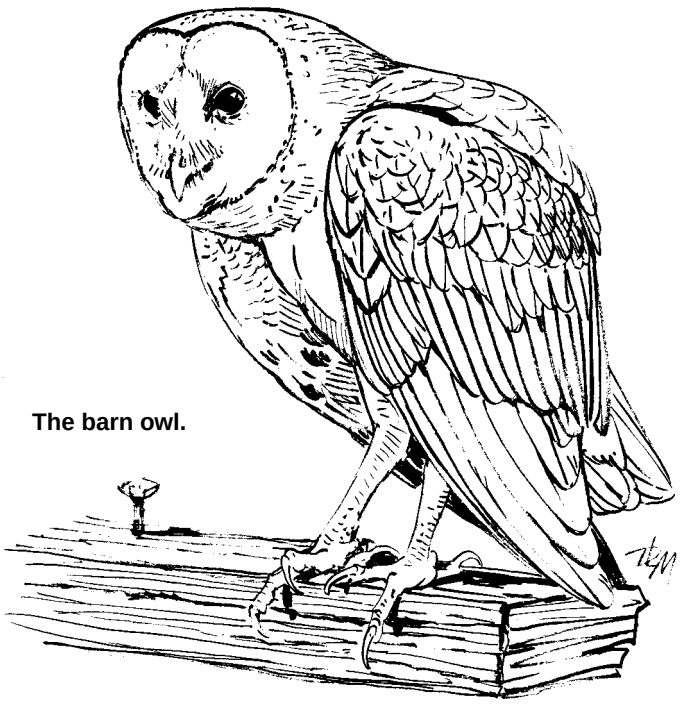
Characteristic marking—The breast and belly of the barn owl are white to light cream in color and may be spotted with brown. The back is pale-yellow and has grayish streaks. The facial disk is heart shaped and the beak is almost lost in the feathers. The face is white and the eyes are black.

Eggs—Three to eleven white eggs average 1.7 inches long by 1.3 inches around (4.3 by 3.3 centimeters).

Barn owls prefer open country for hunting. They are found near old fields, farmyards, grain elevators, and in any area that may attract mice and rats. They may even be found in towns and cities, roosting in old steeples or other old buildings. The nest can be in a building or in barns that are not often used or in nest boxes.

Barn owls hunt only at night. They are beneficial to farmers as they feed almost entirely on rodents.

When irritated, barn owls will crouch, shrieking and twisting their head back and forth.



The barn owl.

Eastern Screech Owl

(Otus asio)

Vital Statistics

Wingspan	20-24 inches (51-61 centimeters
Length	7-10 inches (18-25 centimeters)
Weight	2 ounces (53.9-57.2 grams)

Characteristic marking—The red color phase has a reddish back that is streaked with black. The belly, breast, and underwings are white with red barring. The facial disk on red morphs is an orangish color. Gray color phase screech owls have a brownish-gray back that is streaked with white or brown. The belly, breast, and underwings are white and streaked with brown and black. The facial disk is white with brown spotting.

Eggs—Two eggs average 1.4 inches long by 1.2 inches around (3.5 by 3.0 centimeters).

Screech owls are found in open woodlands, field edges, and marsh edges. They can be common where there is suitable habitat.Screech owls build no nests but use natural cavities, eaves of buildings, or old flicker or woodpecker cavities. The cavity may be lined with feathers and the leftovers of old meals.

Screech owls are aggressive for their size and can take prey as large as themselves.

Many screech owls are hit by cars while hunting the insects that are attracted to the car's headlights. Those owls that are not killed often suffer head traumas that affect balance or cause blindness. Most are not rehabilitated and are either placed in a care facility or humanely **euthanized.**

The eastern screech owl.

Barred Owl

(Strix varia)

Vital Statistics

Wingspan	40-50 inches (102-127 centimeters)
Length	17-24 inches (43-61 centimeters)
Weight	22-28 ounces (632-801 grams)

Characteristic marking—Barred owls have a brown back with white spots or streaks (**mottling**). The undersides are white with gray or brown barring. The head has no ear tufts.

Eggs—Two or three white eggs average 1.9 inches long by 1.7 inches around (4.9 by 4.2 centimeters).

Barred owls inhabit low moist areas and are common in swamps and marshes. They prefer thick forests that give them good daytime roosts where they will not be disturbed. Like other owls, the barred owl can be common in areas of adequate habitat and prey, even in residential areas. Barred Owls are year-round residents in most areas, with northern birds migrating south during severe winters.

Barred owls nest in natural tree cavities or take over old hawk nests. Very rarely will barred owls attempt to build their own nest. The nest is not lined, and debris from meals is left in the nest.

The barred owl is primarily nocturnal but may be seen at dusk.

Barred Owls have a wide range of noises. The most familiar is the hoot, which has five syllables and sounds like WHO COOKS FOR YOU, WHO COOKS FOR YOU ALL. This call is easily imitated and if done well will often get a return call from an owl.

The barred owl.

V U L T U R E S

Vultures in North America are a different species from the vultures of the Old World. There are three species of vultures in North America: the California condor, turkey vulture, and the black vulture. Of these three, only the turkey and black vultures are found in the southeast. The California condor is endangered and, until recently, these birds existed only in captive breeding colonies.

All vultures are primarily scavengers, feeding on carrion. As an adaptation for doing this, they have a strong, sharp, hooked beak. They have weak feet and do not catch prey like most raptors. Also, as an adaptation for feeding on carrion, vultures have bald, dark colored heads. This allows them to feed inside dead animals without their head feathers becoming matted with blood and tissue from the carcass. Furthermore, the dark head and feathers absorb ultraviolet radiation from sunlight, which kills bacteria that may be present on the decaying meat.

Vultures are social, feeding and roosting together. As many as a hundred birds may roost together.

Vultures are incorrectly called buzzards, a misnomer used by early settlers who saw a similarity of vultures to Old World buzzards.

Turkey Vulture

(Cathartes aura)

Vital Statistics

Wingspan	63-71 inches (160-180 centimeters)
Length	24-28 inches (61-71 centimeters)
Weight	3.5-5.3 pounds (1,588-2,404 grams)

Characteristic marking—This is a large black bird with a bald. reddish head and neck. When seen in flight, the tail is long and the primaries and secondary feathers are white against the body.

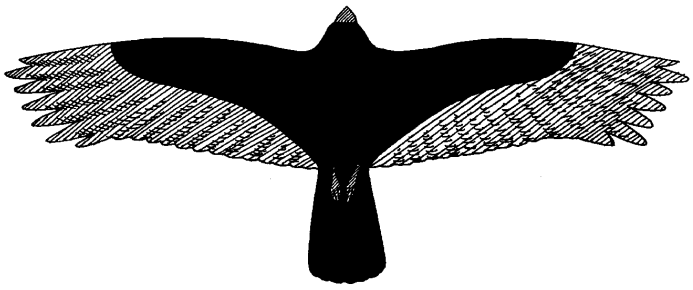
Eggs—Two white eggs have brown spots and average 2.3 inches long by 1.9 inches around (7.1 by 1.9 centimeters).

Turkey vultures are common over most of the United States. Those living in northern areas may migrate south during the winter months.

Turkey vultures do not build nests on tree branches; they lay their eggs on the ground. Unusual sites for turkey vulture nests have included old barns, a deserted pig pen, 6 feet under ground in a rotten stump, and 40 feet above ground in a tree cavity.

Turkey vultures tend to use both their sense of smell and their eyes **(olfactory and visual senses)** in looking for carrion, and they often soar, looking for food.

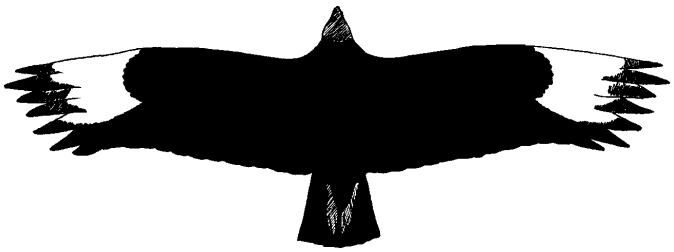
Turkey vultures eat smaller carrion than black vultures eat. Although carrion is their primary food item, it has been reported than turkey vultures can capture fish. They will also eat dying animals that are not capable of escape.



Flight silhouette of the turkey vulture.

Black Vulture

(Coragyps atratus)



Flight silhouette of black vulture.

Vital Statistics

Wingspan	55-63 inches (140-160 centimeters)
Length	23-28 inches (58-71 centimeters)
Weight	3.8-5.1 pounds (1,724-2,313 grams)

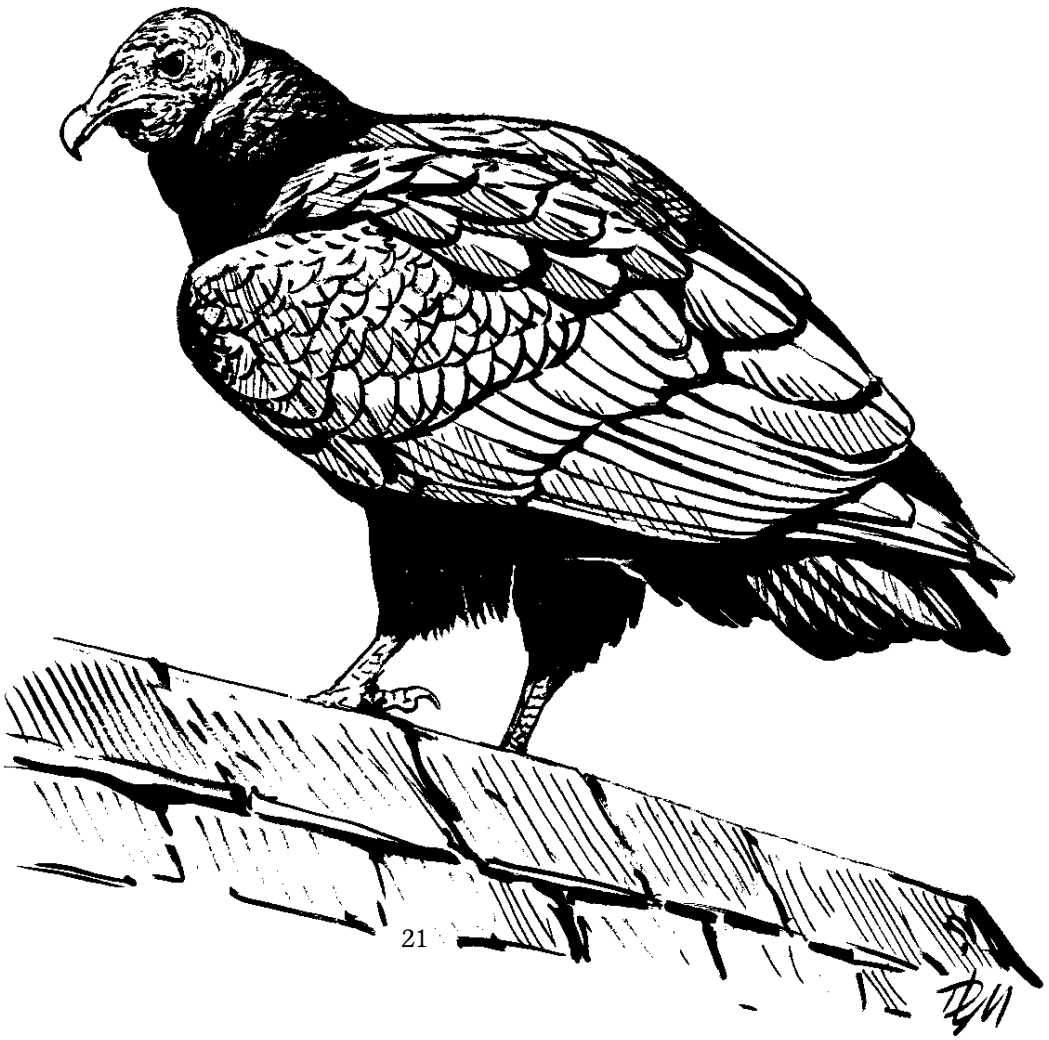
Characteristic marking—The black vulture is a large black raptor. The head is a dark gray and bald. In flight, the tail is short and fanned out; the primary feathers are white against an all black wing.

Eggs—Two gray-green to white eggs are covered with brown spots. They average 3 inches long by 2 inches around (7.6 by 5.1 centimeters).

Black vultures are found throughout the southeastern United States. They nest on the ground in secluded sites and have been known to "decorate" their nests with pieces of broken glass, bottle caps, and other shiny objects.

Black vultures are very social birds and very aggressive. They tend to feed on large carcasses and, because of their numbers and aggression, often force turkey vultures away from these carcasses.

Black vultures find carrion by following other scavengers and by returning to sources of ready food, such as dumps.



Management Strategies

An area to be used by wildlife must provide food, shelter, water, and adequate space. All of these components must be found within the home range of an animal. You can improve your property for wildlife by providing bird feeders, plants or trees that wildlife may eat, nest boxes, and bird baths. While these areas may not be of direct use by raptors, they are beneficial to other wildlife that may ultimately serve as food for raptors.

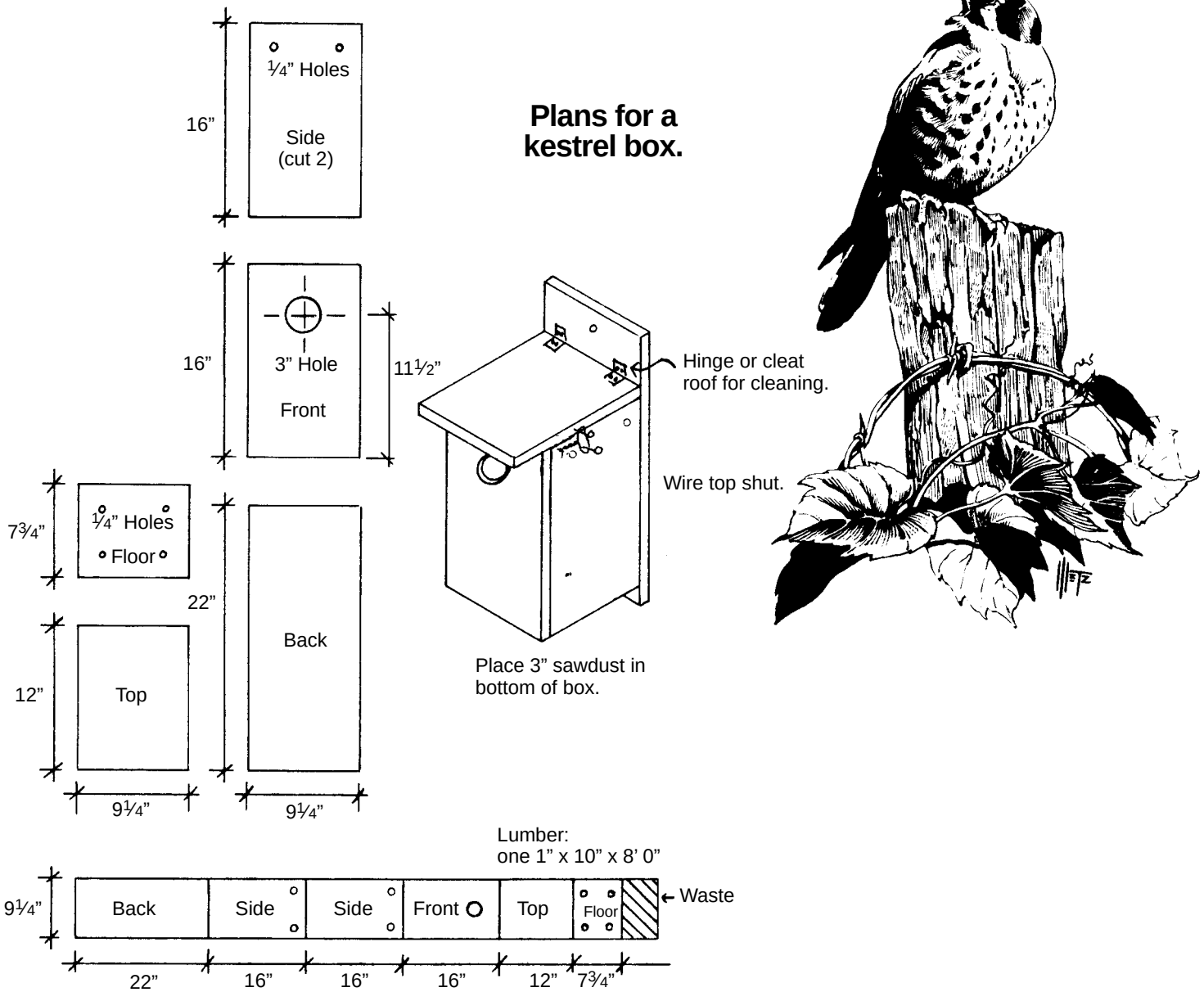
• Bird feeders not only help birds. Seeds that are knocked to the ground help chipmunks and raccoons.

• Planting native wild flowers will also benefit wildlife. If you have a garden, fence off the main area, then plant a row or two outside the fence for wildlife.

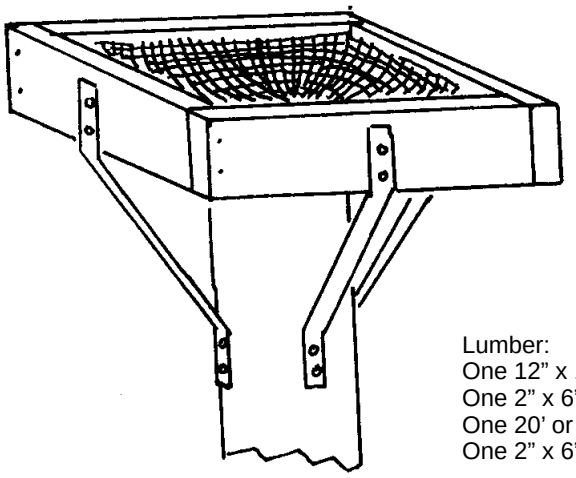
• Nest boxes commonly provide shelter when boxes are placed on trees and posts around the property (see the raptor nest box plans p. 00). Shelter can be provided by leaving fence rows uncut and having dense hedges. Small mammals are attracted to brush piles in which they hide. Old trees that are left standing can provide both shelter and food for wildlife. Dead trees attract many insects, which are eaten by birds and other animals. Flickers and woodpeckers make holes for nest in old trees, which later may be taken over by squirrels or owls.

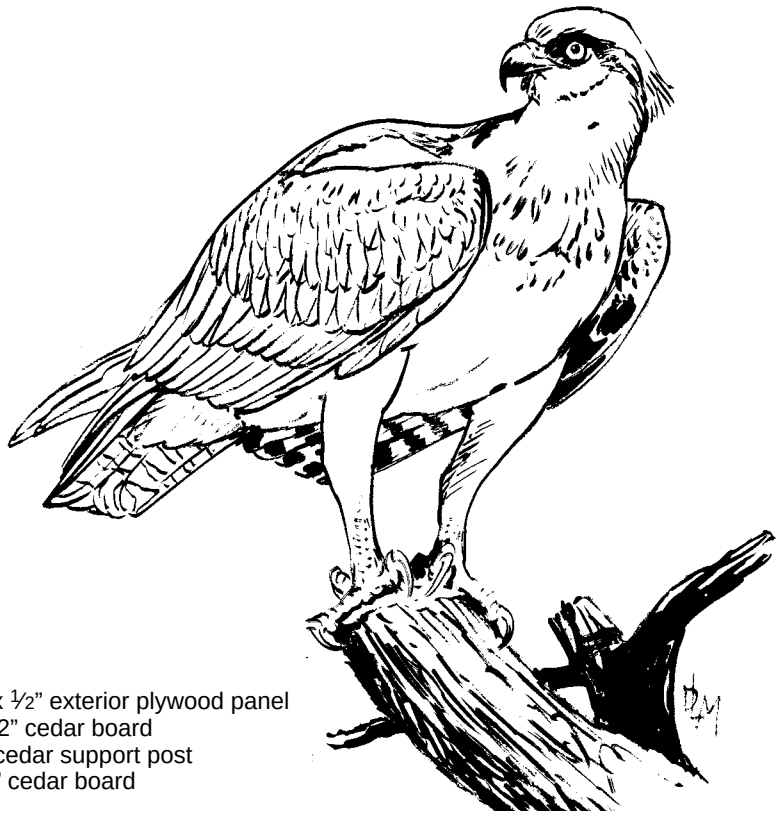
• Bird baths easily provide water to wildlife. The water needs to be kept clean and clear of ice in winter. Water can also be left in a child's splash pool.

If you provide wildlife with a reliable source of food or water, your property will be visited regularly, even if there is not enough room for permanent residence.

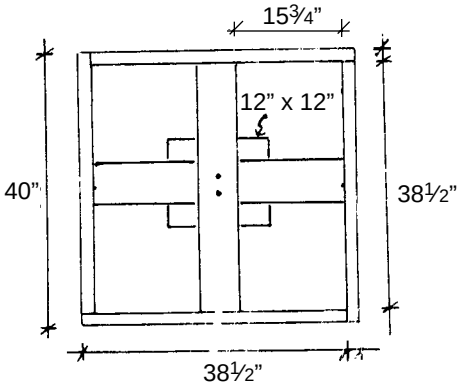


Plans for an osprey nest platform.

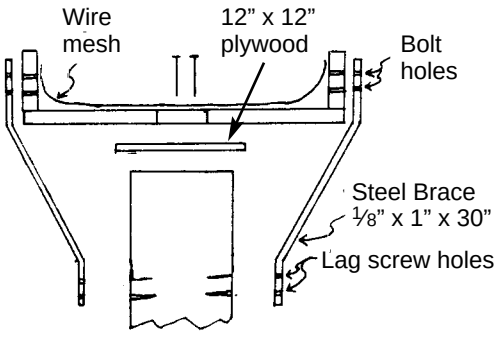




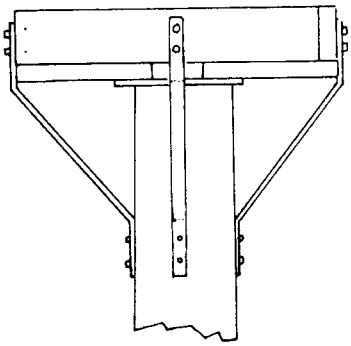
Lumber:
One 12” x 12” x ½” exterior plywood panel
One 2” x 6” x 12” cedar board
One 20’ or 30’ cedar support post
One 2” x 6” x 8’ cedar board



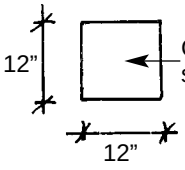
Top view

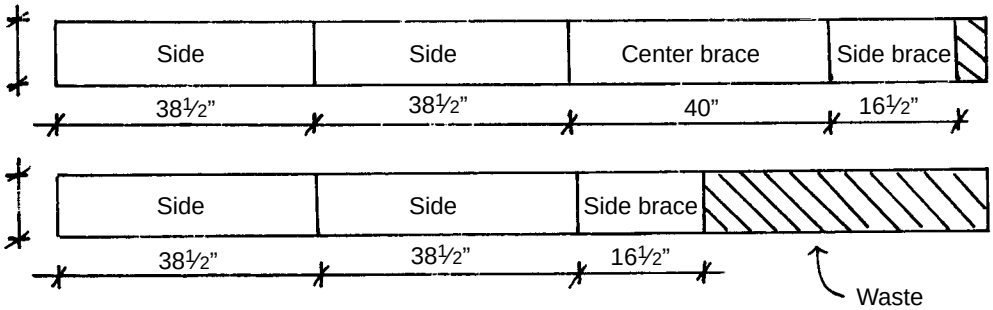


Expanded view

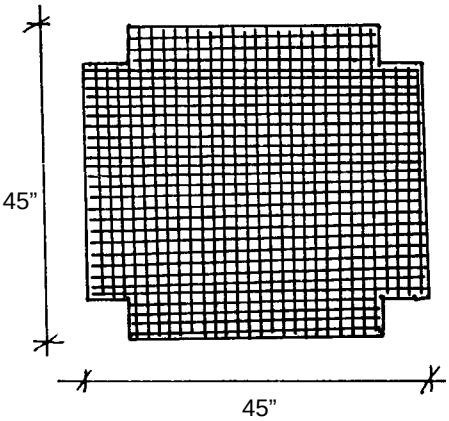


Side view

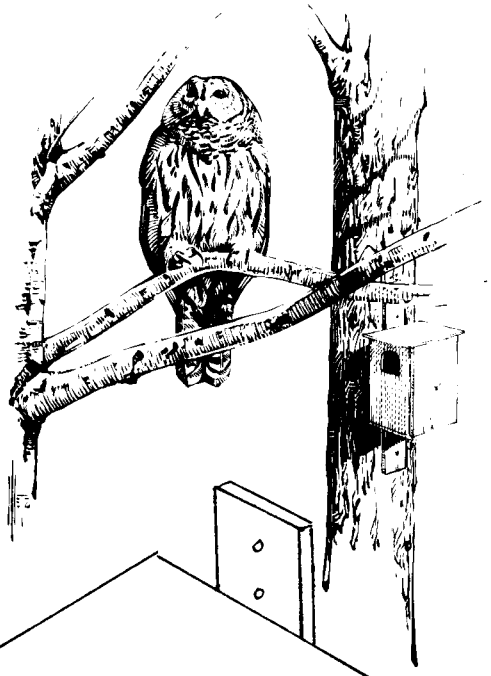




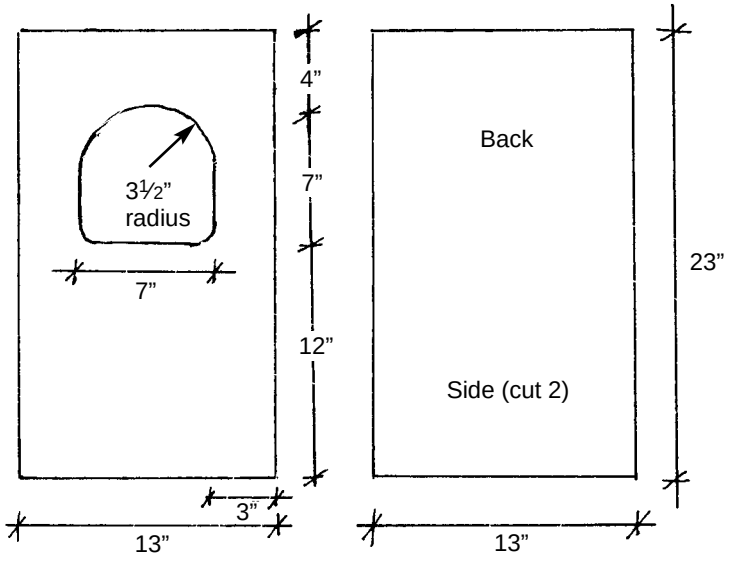
Welded wire, 2” x 4” mesh

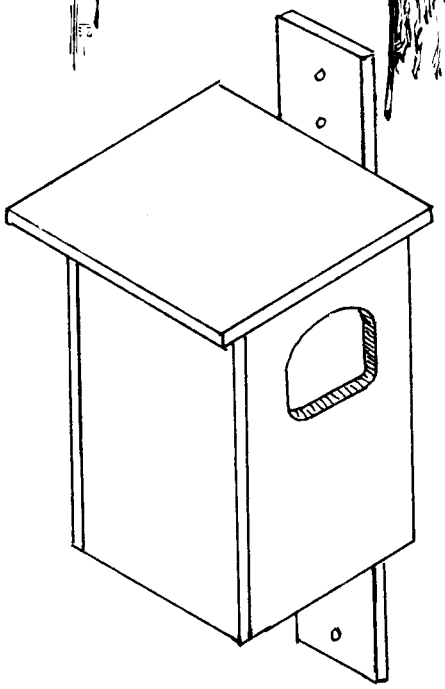


Plans for a barred owl box.

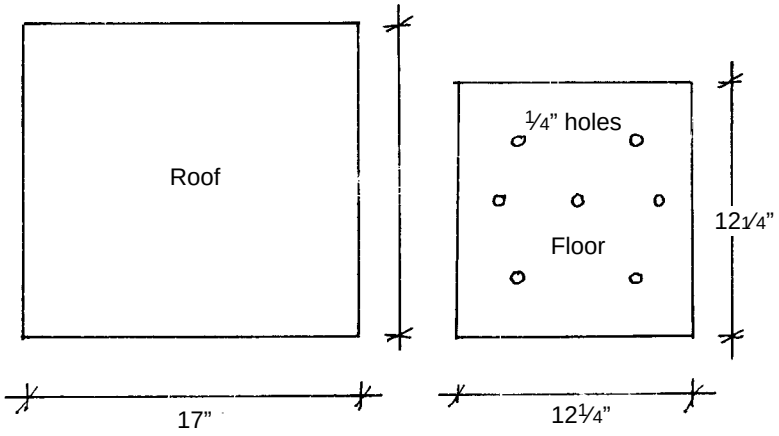


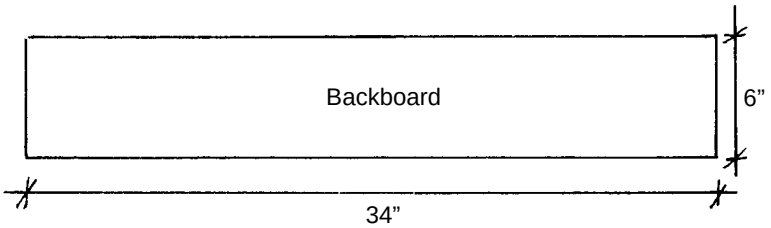
Lumber: one 4’ x 4’ x ¾” exterior plyood panel

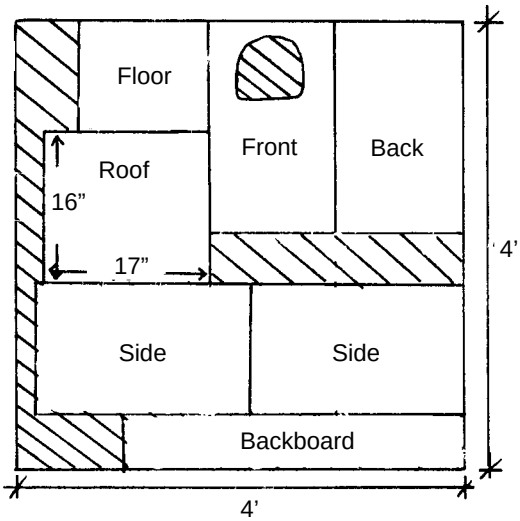




Note: No hinged door needed.
Clean through entrance hole.

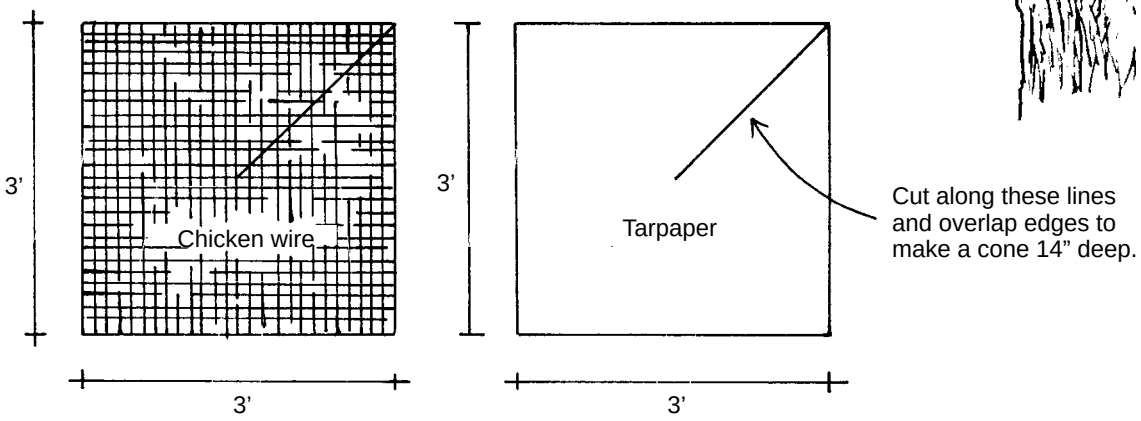




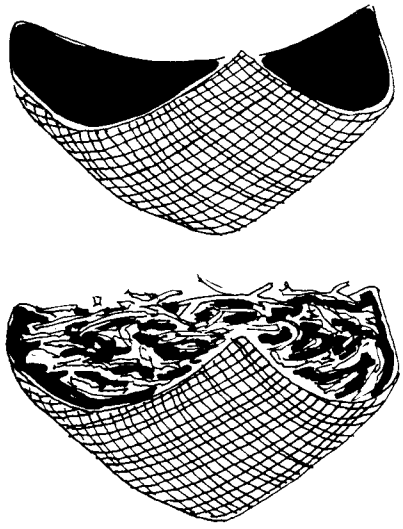


Plans for a great horned owl platform.

Materials: 1 sq. yd. mesh chicken wire
1 sq. yd. tarpaper



Line inside of wire cone with tarpaper.
Cut drain hole in bottom.



Construct stick nest inside cone, wiring branches to cone through tarpaper. Raise finished nest into tree with rope and wire into crotch of tree.

Educational Ideas

Many children have an interest in animals, including wildlife. This interest may be tapped for teaching basic skills in math, reading, social studies, and a variety of other subjects. In addition to the life history information about raptors in the southeastern United States, information provided here can be used to reinforce basic educational concepts. The following section is designed to provide suggestions for using these materials as an interdisciplinary supplement

Social Studies

• Have groups of students research the habitat requirements for a particular species of raptor and decide how to develop an area for that species. The area chosen could be one near the school, or students could be given a description of a fictitious piece of property. This could be made more challenging by providing budget limitations, more than one piece of property to select from, and public support and anger over the proposed conservation action.

• Have students take on the roles of the various interest groups in the southeastern United States. Some students would represent the beach front developers, others conservationists wanting to save the bald eagle, while other students would play the roles of researchers who have the "facts" about the bald eagle. This role playing exercise would require some research on the part of all parties.

• Have students present reports on the role of raptors in an ancient civilization. Students might dress as a person of that culture and give a presentation on why raptors were held in high esteem by that culture.

• Have groups of students plan how they would bring raptors to the attention of the public. Would they only tell the public good things about these birds or would they present a balanced picture telling the good and the bad?

• Have students learn the states by using the range maps of raptors.

• Have students write an essay about environmental changes from the perspective of a raptor.

• Have the students make a raptor-word crossword puzzle.

Math

• An advanced activity might involve calculating "wing loading" (weight per area) for a certain raptor. To do this, calculate the area of the wings using one-third of the body length as the wing width. Then calculate the ratio of body weight to wing. To take this a step further, have the student figure out the wing area he or she would need to fly. Have the student design his or her wings, giving reasons for the shape and style of wings designed.

For example, the male peregrine falcon has a wing area of 187 square inches (39 inches x 0.3 x 16 inches). This gives the peregrine a wing load of 0.13 ounces per square inch. A 75-pound (1,200 ounce) person would have to have a wing area of 9,231 square inches to soar like a peregrine.

• Students could start a measurement wall, with the wingspans of various raptors marked on the wall with tape. The students then could collect other bird measurements and compare to the wingspans already marked.

Ecology And Biology

• Have students create an ecosystem wall representing a major habitat area. First the vegetation would be placed on the wall, followed by animals (student drawings or pictures from books). Then, the animals and plants are connected by string to show the interactions between them. The wall could show several types of ecosystems and the transitions between those habitats.

For example: show an ocean habitat, then beach, dunes, grasslands, deciduous forest, and finally a mountain top habitat. The wall could also start at the tropics and end in the Arctic.

• Students could build food web mobiles. The base of the mobile would have the primary producers, with each level having fewer and fewer animals as the trophic levels are passed. These mobiles will not spin like the normal mobile since there will be more than one string to each object on the mobile.

• Each student could be assigned an animal or plant to briefly research, finding out what it eats or what eats it. The students would then build a food web connecting themselves with string. Ecological disasters could then be simulated, removing parts of the food web. As a person's creature is removed, that person sits, and each person feeling a pull on the string sits, also. This will show how major changes in a food web can affect the whole web.

• Have students recognize the flight silhouettes projected on an overhead projector. Then have students keep a journal of the raptors they see, where they were, and numbers of raptors seen.

• Reduce the size of the raptor silhouettes till they fit on a large flashlight lens or overhead projector. Then have the students cut out the silhouette on cardboard to make their own set of silhouettes that can be projected on the wall of a darkened room. Students can then learn to recognize the silhouettes of the various groups of raptors.

Fundraising

Students can build the various nest boxes shown in this packet and sell them with a brief species account of the raptor that would use that nest box.

Environmental Education Supplements

Others sources of Environmental Education are: NatureScope is produced by the:

National Wildlife Federation
1400 Sixteenth Street
Washington, DC 20036-2266

Project Learning Tree
1250 Connecticut Avenue
Washington, DC 20036

Project Wild
P.O. Box 18060
Boulder, CO. 80308-8060

Raptor Education Foundation
21901 East Hampden Avenue
Aurora, CO 80013

Sources For Species Information

Bonney, R. E., Jr., J. W. Kelly, D. J. Decker, and R. A. Howard Jr. 1981. Understanding predation and north-eastern birds of prey. Department of Natural Resources, Cornell University. 48pp.

Clark, W. S., and B. K. Wheeler. 1987. Hawks. Houghton Mifflin Co., Boston. 198pp.

Harrison, H. H. 1975. A field guide to birds' nest of the eastern United States. Houghton Mifflin Co., Boston. 257pp.

Johnsgard, P. A. 1988. North American Owls. Smithsonian Inst. Press, Washington D.C. 295pp.

Johnsgard, P. A. 1990. Hawks, eagles, and falcons of North America. Smithsonian Institution Press, Washington, D.C. 403pp.

Sources For Management Ideas

Henderson, C. L. 1984. Woodworking for wildlife: homes for birds and mammals. Minnesota Department of Nongame Wildlife, St. Paul. 47pp.

Landscaping for wildlife. Minnesota Department of Nongame Wildlife, St. Paul. 144pp.

ALABAMA COOPERATIVE Extension SYSTEM

Your Experts for Life

Jim Armstrong, *Extension Wildlife Scientist*, Associate Professor, Forestry and Wildlife Sciences, Auburn University. Originally prepared by **Randy Cromwell,** College of Education, Auburn University.

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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