

A TEACHER'S
ACTIVITY
BOOKLET
ABOUT...

IOWA BIRDS



A Teacher's Activity Booklet About...Iowa Birds

by Linda R.F. Zaletel, Rick Hollis, and Beth Brown

1992

Revised Edition

by Linda R. F. Zaletel

1997

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Revised Edition 1997

Whenever I take on an extra project, everyone in my family groans. Especially when it involves the computer. With two teens who need to do homework or search the Web, it's hard to grab time on the computer. This booklet has been a labor of love. The more time I spent on it, the more information and activities I found. But it's time to stop and get this to the printer. I thank Jim and Cindy Pease, Jim Dinsmore, Cele Burnett, Linette Riley, Kay Neumann, Lisa Hemesath, Bruce Ehresman, Pat Schlarbaum, Jolene Van Waus, Hank, Anne and Libby Zaletel, and the Story County Conservation Board. Special thanks to Shirley Janssen for her original artwork, and Scott Patton and Mark Muller for use of their clip art.

I dedicate this booklet to Betty Ford, Marlyn Smith, Ruth Buckles, and Isabel Wasson. These people first sparked my interest in birds.





Birds are everywhere around us. They are colorful. They are noisy. And they are easy to observe. They inspire poets, explorers, and researchers. And they are environmental indicators for the world we live in.

In 1962, Rachel Carson's *Silent Spring* awakened the country to the possibility of a spring without birds and inspired many people to become environmentally active. Roger Tory Peterson's *A Field Guide to Birds* first published in 1934 brought identification of birds to the general public, and birdwatching has become a hobby for millions of people. In fact, people who feed and watch birds spend more than two billion dollars a year on their hobby. Serious birdwatchers will go to great lengths to see an accidental species and travel to faraway places to see an unusual or rare bird.

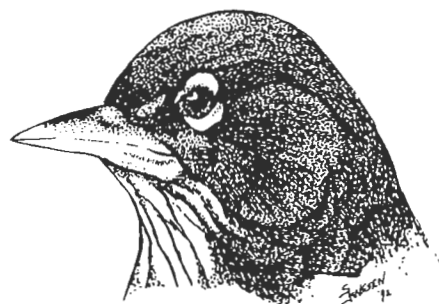
The Iowa Ornithologists' Union and Iowa Conservation Education Council hope this booklet will help teachers, scout and youth leaders, grandparents, and parents transfer the joy of birds and an awareness of a conservation ethic to their students, grandchildren, and children.

The goal of this booklet is not merely to teach young people about birds, but to involve them in all aspects of avian activity. The guide was designed for all age and grade levels. Adults have a marvelous opportunity to be flexible and adapt the skill level for each activity to meet their needs.

Background informational pages are included with many of the activities to prepare teachers for teaching on a particular topic. Each activity can be presented alone or used in sequence. Permission is given to copy anything in this booklet for educational purposes.

This revised edition has new ideas and information. If you have suggestions for new activities, contact the Iowa Conservation Education Council (124 Science II, Iowa State University, Ames, IA 50011) or Linda R.F. Zaletel (1928 6th St., Nevada, IA 50201; madowl@nevia.net).

Have fun and enjoy the birds!





The State Bird of Iowa: American Goldfinch

Flashes of yellow bow and swoop, flutter and perch on flowers and shrubs along field and woodland edges. Energetic birds, the goldfinches, liven and color natural scenes, startling in their contrasting colors, yet soft as the down on a thistle.

The American goldfinch (*Carduelis tristis*) is a small bird, a little smaller than a sparrow, with a wingspan of less than nine inches. In summer the males are boldly-colored, with a bright yellow body and black wings, tail, and top of the head. The females have less conspicuous colors, with an olive body and dark tail and wings, with two distinctive white wing bars. As winter approaches, male goldfinches attain the same plumage as the females, making them harder to recognize, and leading some people to think that the goldfinches have left their feeders.

Goldfinches are beautiful and entertaining birds that are easily observed as they feed in fields or woodland edges or while perched at winter feeders. They are also very vocal birds, singing while perched or in flight. Sometimes small flocks of goldfinches will sing together as a group, rendered phonetically as "po-TA-to-chip, po-TA-to-chip" or "per-CHICK-o-ree, per-CHICK-or-ree." While in flight, they sing in unison with the bows of their undulating flights. In spring, the males' more plaintive call sometimes rendered phonetically as "dear-me, see-me."

Like all finches, goldfinches have short, strong beaks, well-designed for breaking open seeds. Their favorite seed plants are thistles, but they will eat seeds from a variety of plants, including asters, goldenrods, and dandelions. Both males and females join flocks during the summer months and travel over fields and woodlands, displaying their unique undulating flight. In winter, some goldfinches migrate as far south as Mexico. Others remain in Iowa due, in part, to well-stocked bird feeders or natural supplies of thistle and other wild seeds that remain available throughout the winter months. Goldfinches will feed alongside purple finches, house finches, and pine siskins at thistle feeders. They prefer niger thistle seed. Remember that, to attract goldfinches to your birdfeeder, it is important that there is water and shelter nearby.

Pairs of goldfinches begin nesting when thistle, milkweed, or cattail down is available with which to line their nests. The nests are so thick and dense that they can hold water, and young goldfinches have been known to drown while the parents are away during a rain storm. Most nests are built in a forked tree branch or in the crotch of several branches, usually located along the brushy edge of a field or pasture. Goldfinches lay four to six pale

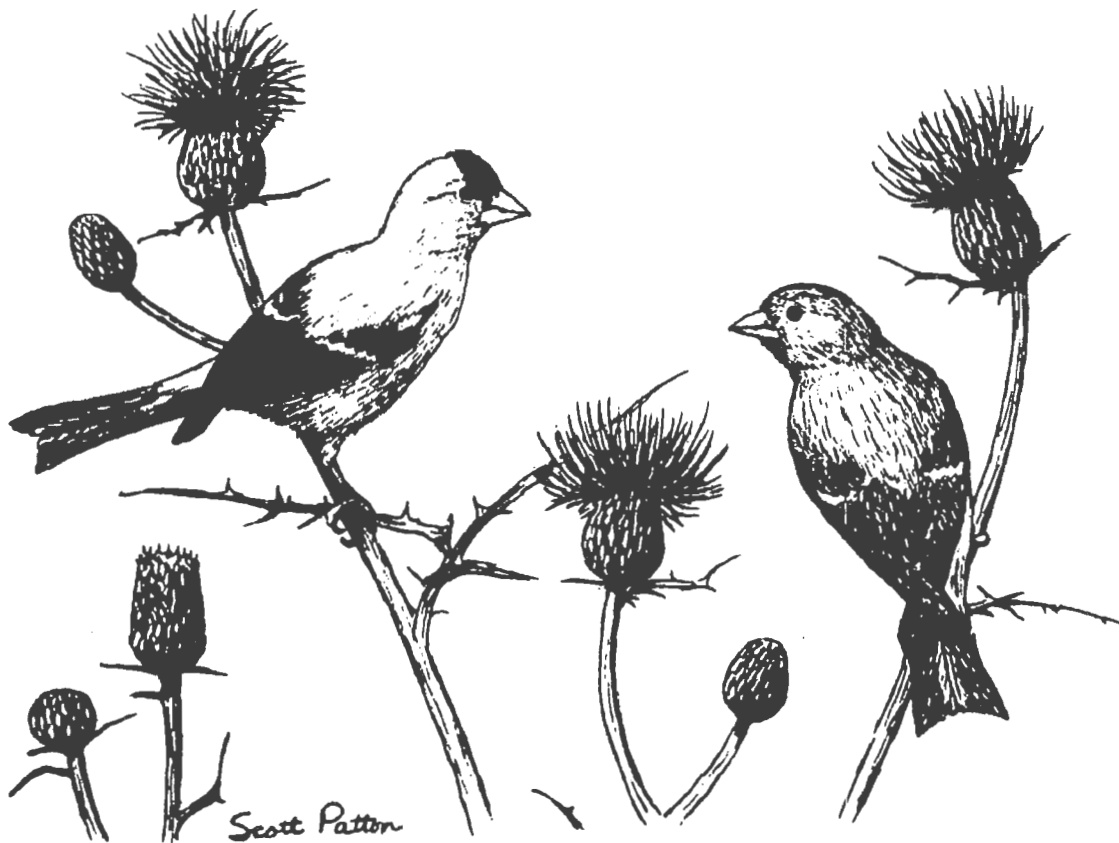


blue eggs, each about 5/8 inch in diameter.

Goldfinches are popular birds, and there has been some concern that their population may be declining. In fact, some studies have indicated a possible decline in the number of goldfinches in Iowa. Whether this reflects a natural fluctuation in the goldfinch population or a real and dangerous decline in the number of goldfinches is not clear. The goldfinch's habitat, which must contain a mixture of grassland and shrub plants, seems to be adequate among Iowa's farms, pastures, and woodland borders. Future bird surveys and studies may help us learn more about any possible threats to goldfinch populations in Iowa.

The lively, colorful goldfinch is a common bird of open fields, woodland edges, and backyard gardens. It is a very charismatic bird, well-suited to the character of Iowa. The American goldfinch was officially designated the State Bird of Iowa on May 22, 1933. At the time it was designated, it was known scientifically as *Spinus tristis*. Most books now use the scientific name *Carduelis tristis*. The goldfinch was nominated to be the State Bird of Iowa by the Iowa Ornithologists' Union, and the proposal passed the legislature because of the backing of that group and because the goldfinch is a year-round resident of Iowa that is easily recognized by Iowans.

By Dan Cohen
Buchanan County Conservation Board





How the Goldfinch Became Iowa's State Bird

In February 1926, Iowa Ornithologists' Union (IOU) president Walter Rosene noted in a letter to members that Nebraska had recently named a state bird. He wrote that "if each state has its state flower, why should we not have a state bird? It would be interesting to hear from all members in regard to this matter, and I would welcome letters offering suggestions."

Two months later, he wrote that a few suggestions had been received but not enough to reach a consensus. Margo Frankel from Des Moines suggested that the group "choose an all-year-round bird for Iowa - downy woodpecker or chickadee." Althea Sherman of National suggested the goldfinch as "a beautiful bird, easily recognized by everyone. It is of common occurrence in most parts of our state throughout the whole year." Rosene suggested more nominations for discussion at the spring meeting in Atlantic.

No further action was taken on this matter until June 1931 when Dr. F.L.R. Roberts, in a president's letter to the membership, wrote that "there is a popular demand for a state bird, and it is appropriate that we should be active in choosing one." He then appointed a committee, consisting of two former IOU presidents, Walter Bennett and Walter Rosene, to prepare recommendations to be presented at the next annual meeting.

The next spring at the banquet, members prepared a list of birds for consideration. After much debate, the goldfinch was selected and was unanimously voted as the IOU's choice for state bird. It was chosen because it was commonly known and found in the state year-round.

Former IOU president Arthur Palas was chosen as chair of a committee to present this petition to the Iowa Legislature in January 1933. Representative J. Wilbur Dole later recalled that Mr. Palas approached him during the first week of March to present this matter. Mr. Palas, it seems, had forgotten his assignment.

Several members of the legislature approached Representative Dole and asked why such birds as the robin, bluebird, or quail should not be considered. He stated that other states had already selected those and no one pressed the matter further. Others asked why Iowa even needed a state bird. He replied that there were only four other states that did not have a state bird. This answer seemed to satisfy their queries.



On March 21, 1933, Dole called up the resolution and spoke in favor of its passage. It passed unanimously by voice vote. He made the only speech in support of the resolution; none was made in opposition. Similar action was taken in the Senate.



The text of the resolution adopted by the Iowa Legislature is as follows:

Whereas, the twenty-sixth General Assembly of the state of Iowa, in the year 1897, by concurrent resolution, adopted the wild rose as the state flower of Iowa, the record of which is duly recorded in Senate Journal, pages 1124 and 1164 and in House Journal, page 10235; and

Whereas, many states have not only adopted certain named flowers as their state flower but have also adopted certain named birds as their state birds, and

Whereas, the Iowa Ornithologists' Union, an association comprising students and the lovers of birds, residing within our state, at their annual meeting held in Des Moines, in May 1932, by resolution and vote designated the Eastern Goldfinch as their choice for a state bird and recommended that said Eastern Goldfinch be adopted as the official state bird of Iowa, therefore

Be it resolved by the House of Representatives, the Senate concurring, that the Eastern Goldfinch, *Spinus tristis tristis*, is hereby designated and shall hereafter be officially known as the state bird of Iowa.

A revealing glimpse of how our perceptions of birds have changed can be seen by reading the byline and story in the March 27, 1933 *Des Moines Register* article about Iowa's new state bird. It read, "Goldfinch, Iowa's Official Bird, Is an Aid to Farmer." Further into the story, it stated that "the goldfinch is valuable to farmers because of the great quantity of weed seed they consume during a season and the war they wage upon cankerworms, plant lice, small grasshoppers, and beetles." How many people view goldfinches, or birds in general, in this manner now?

Much of the information for this article came from a booklet entitled "The Goldfinch: Official Iowa Bird," written by Josephine Baumgartner and Mabel Goshorn Tate, the editors of the Des Moines Audubon Society's newsletter, and published on May 29, 1945. J. Wilbur Dole's account of the events is included in a letter to the editors of the newsletter.



Activity: State Bird Search

Objective: Students will identify the state birds of the 50 states in the United States.

Materials: Worksheets, pencils, map of the United States, and encyclopedias

Procedure: Hand out worksheets and pencils. Have the students use encyclopedias to identify the state bird of each state. On the map of the United States, paste a picture of the state bird on that state. Discuss why this bird might have been chosen.

Alabama	Montana
Alaska	Nebraska
Arizona	Nevada
Arkansas	New Hampshire
California	New Jersey
Colorado	New Mexico
Connecticut	New York
Delaware	North Carolina
Florida	North Dakota
Georgia	Ohio
Hawaii	Oklahoma
Idaho	Oregon
Illinois	Pennsylvania
Indiana	Rhode Island
Iowa	South Carolina
Kansas	South Dakota
Kentucky	Tennessee
Louisiana	Texas
Maine	Utah
Maryland	Vermont
Massachusetts	Virginia
Michigan	Washington
Minnesota	West Virginia
Mississippi	Wisconsin
Missouri	Wyoming



Key to Worksheet: The state birds of the 50 states of the United States

Alabama	Northern flicker	Montana	Western meadowlark
Alaska	Ptarmigan	Nebraska	Western meadowlark
Arizona	Cactus wren	Nevada	Mountain bluebird
Arkansas	Northern mockingbird	New Hampshire	Purple finch
California	California quail	New Jersey	American goldfinch
Colorado	Lark bunting	New Mexico	Roadrunner
Connecticut	American robin	New York	Eastern bluebird
Delaware	Blue hen	North Carolina	Northern cardinal
Florida	Northern mockingbird	North Dakota	Western meadowlark
Georgia	Brown thrasher	Ohio	Northern cardinal
Hawaii	Nene	Oklahoma	Scissor-tailed flycatcher
Idaho	Mountain bluebird	Oregon	Western meadowlark
Illinois	Northern cardinal	Pennsylvania	Ruffed grouse
Indiana	Northern cardinal	Rhode Island	Rhode Island red
Iowa	American goldfinch	South Carolina	Carolina wren
Kansas	Western meadowlark	South Dakota	Ring-necked pheasant
Kentucky	Northern cardinal	Tennessee	Northern mockingbird
Louisiana	Brown pelican	Texas	Northern mockingbird
Maine	Black-capped chickadee	Utah	California gull
Maryland	Baltimore oriole	Vermont	Hermit thrush
Massachusetts	Black-capped chickadee	Virginia	Northern cardinal
Michigan	American robin	Washington	American goldfinch
Minnesota	Common loon	West Virginia	Northern cardinal
Mississippi	Northern mockingbird	Wisconsin	American robin
Missouri	Eastern bluebird	Wyoming	Western meadowlark



Birding Pioneers in Iowa

Often, the first pre-settlement records of birds that lived in Iowa were from midden piles left by American Indians. Cardinals, for example were recorded in some of the archeological digs.

A number of well-known explorers noted the variety of birds seen on their explorations. Lewis and Clark mentioned flocks of Canada geese along the Missouri River on their expedition between 1804-06. Zebulon Pike passed through Iowa in 1805 and hunted passenger pigeons. Thomas Say, an early biologist, reported long-billed dowitchers, passenger pigeons, Carolina parakeets, swallow-tailed kite, Mississippi kite, sharp-tailed grouse, long-billed curlews, ravens, and greater prairie-chickens in the Pottawattamie County area near Omaha between 1819-1820.

Joel A. Allen spent time in central and western Iowa collecting birds and mammals. This resulted in the first papers on Iowa birds and mammals. Allen was also a founder of the American Ornithologists' Union. John James Audubon visited Iowa briefly in 1843 and mentioned Carolina parakeets, ravens, lark buntings, wild turkeys, sandhill cranes, and pileated woodpeckers near the present site of Sioux City.

The first book on the birds of Iowa was published in 1907 by Rudolph M. Anderson. In 1933 Philip A. DuMont revised and updated the list, and in 1971 Woodward H. Brown published an annotated list of 369 species in Iowa.

In 1897 the Iowa Ornithologist Union (IOU) was formed to compile the state list but there is no evidence that the project was completed. This early group only lasted five years.

On February 28, 1923, Thomas C. Stephans encouraged the reformation of the Iowa Ornithologists' Union and, in 1931, published the first *Iowa Bird Life*. Many local Iowans wrote about birds: "How to Know the Wild Birds of Iowa and Nebraska" by Dietrich Lange 1906; "Bird Notes from the Journal of a Nature Lover" by William G. Ross; "Birds of an Iowa Dooryard" by Althea R. Sherman, 1952; and "Birding in Eastern Iowa" by Fred W. and Thomas H. Kent, 1975; "Waterfowl in Iowa" by Jack W. and Mary R. Musgrove, to name a few.

IOU is still an active group that publishes the journal *Iowa Bird Life* and a newsletter. Many new books on birds in Iowa have been published, including, "Birds of Iowa" by Gladys Black, (1979); and "Iowa Birds" by James J. Dinsmore, Thomas, H. Kent, Darwin Koenig, Peter C. Petersen, and Dean M. Roosa (1984); "The Iowa Breeding Bird Atlas" by Laura Spess-Jackson, Carol A. Thompson, and James J. Dinsmore (1997); "Birds in Iowa" by Thomas H. Kent and James J. Dinsmore (1996); and "Birds of an Iowa Dooryard" by Althea R. Sherman (1952,1996).

The IOU Records Committee periodically updates the Field Checklist of Iowa birds. The 1996 edition is included in this booklet.



FIELD CHECKLIST OF IOWA BIRDS

IOWA ORNITHOLOGISTS' UNION

Revised 1996

DATE _____ TIME: _____ to _____

LOCATION(S): _____

WEATHER: Temp: _____ - _____ Wind: _____ - _____ mph from _____

Sky: _____

OBSERVER(S): _____

SPECIES: _____

REPORTING SIGHTINGS: Observers are encouraged to submit written details of unusual observations to Field Reports editors (see back cover of *Iowa Bird Life* for deadlines and addresses).

Unusual sightings should always be substantiated by notes taken at time of observation and, if possible, with photographs. Species for which written description is desired are marked as follows:

* = provide key details of bird's appearance/song

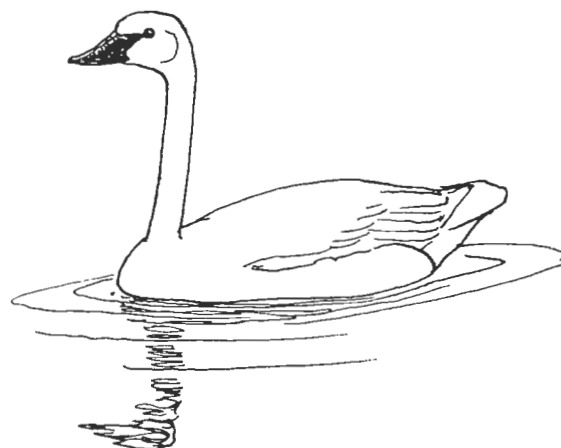
** = fully document bird's appearance and behavior

= document if away from range indicated

Species not on this checklist are accidental and should be fully documented; the documentation will be reviewed by the I.O.U. Records Committee. Also document birds that are out of season.

IOWA BIRDLINE: Unusual birds should also be reported immediately to the Iowa Birdline (319) 338-9881. This recorded summary of weekly observations is updated every Monday. After listening to the message, you can report your interesting observations and request information.

INFORMATION: For membership information, reporting forms, and prices for checklists and other materials, send a self-addressed stamped envelope to the Treasurer of I.O.U. (see *Iowa Bird Life* for address).



REGULAR SPECIES

(records in at least 8 of 10 years)

Loons

____ Common Loon

Grebes

____ Pied-billed Grebe

____ Horned Grebe

____ Red-necked Grebe

____ Eared Grebe

____ Western Grebe

Pelicans

____ American White Pelican

Cormorants

____ Double-crested Cormorant

Bitterns and Herons

____ American Bittern

____ Least Bittern

____ Great Blue Heron

____ Great Egret

____ Snowy Egret

____ Little Blue Heron

____ Cattle Egret

____ Green Heron

____ Black-crowned Night-Heron

____ Yellow-crowned Night-Heron

Swans, Geese, and Ducks

____ Tundra Swan

____ **Trumpeter Swan

____ **Mute Swan

____ Greater White-fronted Goose

____ Snow Goose

____ Ross' Goose

____ Canada Goose

____ Wood Duck

____ Green-winged Teal

____ American Black Duck

____ Mallard

____ Northern Pintail

____ Blue-winged Teal

____ Cinnamon Teal

____ Northern Shoveler

____ Gadwall

____ American Wigeon

____ Canvasback

____ Redhead

____ Ring-necked Duck

____ Greater Scaup

____ Lesser Scaup

____ Oldsquaw

____ Black Scoter

____ Surf Scoter

____ White-winged Scoter

____ Common Goldeneye

____ Bufflehead

____ Hooded Merganser

____ Common Merganser

____ Red-breasted Merganser

____ Ruddy Duck

American Vultures

____ Turkey Vulture

____ Kites, Hawks, and Eagles

____ Osprey

____ *Mississippi Kite

____ Bald Eagle

____ Northern Harrier

____ Sharp-shinned Hawk

____ Cooper's Hawk

____ *Northern Goshawk

____ (Accipiter species)

____ Red-shouldered Hawk

____ Broad-winged Hawk

____ Swainson's Hawk

____ Red-tailed Hawk

____ Rough-legged Hawk

____ *Golden Eagle

Falcons

____ American Kestrel

____ Merlin

____ Peregrine Falcon

____ *Prairie Falcon

____ Partridge, Grouse, Turkeys, and Quail

____ Gray Partridge

____ Ring-necked Pheasant

____ #Ruffed Grouse (NE)

____ Wild Turkey

____ Northern Bobwhite

____ Rails, Gallinules, and Coots

____ Yellow Rail

____ King Rail

____ Virginia Rail

____ Sora

____ Common Moorhen

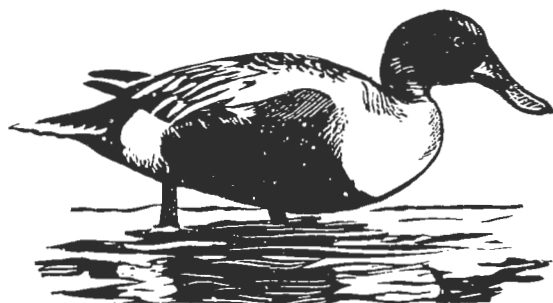
____ American Coot

Cranes

____ Sandhill Crane

Plovers

____ Black-bellied Plover





___ American Golden-Plover
___ Semipalmated Plover
___ Piping Plover
___ Killdeer

Stilts and Avocets

___ American Avocet
___ Sandpipers and Phalaropes

___ Greater Yellowlegs
___ Lesser Yellowlegs
___ Solitary Sandpiper
___ Willet
___ Spotted Sandpiper
___ Upland Sandpiper
___ Hudsonian Godwit
___ *Marbled Godwit
___ Ruddy Turnstone
___ Sanderling
___ Semipalmated Sandpiper
___ *Western Sandpiper
___ Least Sandpiper
___ White-rumped Sandpiper
___ Baird's Sandpiper
___ Pectoral Sandpiper
___ Dunlin
___ Stilt Sandpiper
___ Buff-breasted Sandpiper
___ Short-billed Dowitcher
___ Long-billed Dowitcher
___ (Dowitcher species)
___ Common Snipe
___ American Woodcock
___ Wilson's Phalarope
___ Red-necked Phalarope

Gulls and Terns

___ Franklin's Gull
___ Bonaparte's Gull
___ Ring-billed Gull
___ Herring Gull
___ **Thayer's Gull
___ **Lesser Black-backed Gull
___ Glaucous Gull
___ **Great Black-backed Gull
___ **Black-legged Kittiwake
___ Caspian Tern
___ *Common Tern
___ Forster's Tern
___ Least Tern
___ Black Tern

Pigeons and Doves

___ Rock Dove
___ Mourning Dove

Cuckoos

___ Black-billed Cuckoo
___ Yellow-billed Cuckoo

Owls

___ Barn Owl
___ Eastern Screech-Owl
___ Great Horned Owl
___ Snowy Owl
___ Burrowing Owl
___ Barred Owl
___ Long-eared Owl
___ Short-eared Owl
___ Northern Saw-whet Owl

Goatsuckers

___ Common Nighthawk
___ #Chuck-will's-widow (S)
___ Whip-poor-will

Swifts

___ Chimney Swift

Hummingbirds

___ Ruby-throated Hummingbird

Kingfishers

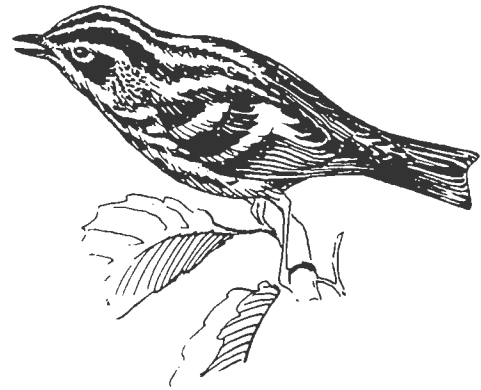
___ Belted Kingfisher

Woodpeckers

___ Red-headed Woodpecker
___ Red-bellied Woodpecker
___ Yellow-bellied Sapsucker
___ Downy Woodpecker
___ Hairy Woodpecker
___ Northern Flicker
___ Pileated Woodpecker

Tyrant Flycatchers

___ Olive-sided Flycatcher
___ Eastern Wood-Pewee
___ Yellow-bellied Flycatcher
___ Acadian Flycatcher
___ Alder Flycatcher
___ Willow Flycatcher
___ Least Flycatcher
___ (Empidonax species)
___ Eastern Phoebe
___ Great Crested Flycatcher
___ Western Kingbird
___ Eastern Kingbird
___ **Scissor-tailed Flycatcher



Larks

___ Horned Lark

Swallows

___ Purple Martin
___ Tree Swallow
___ N. Rough-winged Swallow
___ Bank Swallow
___ Cliff Swallow
___ Barn Swallow

Jays and Crows

___ Blue Jay
___ American Crow

Titmice

___ Black-capped Chickadee
___ Tufted Titmouse

Nuthatches

___ Red-breasted Nuthatch
___ White-breasted Nuthatch

Creepers

___ Brown Creeper

Wrens

___ Carolina Wren
___ Bewick's Wren
___ House Wren
___ Winter Wren
___ Sedge Wren
___ Marsh Wren

Kinglets and Gnatcatchers

___ Golden-crowned Kinglet
___ Ruby-crowned Kinglet
___ Blue-gray Gnatcatcher

Thrushes

___ Eastern Bluebird
___ Townsend's Solitaire
___ Veery
___ Gray-cheeked Thrush
___ Swainson's Thrush
___ Hermit Thrush
___ Wood Thrush
___ American Robin
___ Varied Thrush

Mockingbirds and Thrashers

___ Gray Catbird
___ Northern Mockingbird
___ Brown Thrasher

Pipits

___ Water Pipit

Waxwings

___ *Bohemian Waxwing
___ Cedar Waxwing

Shrikes

___ Northern Shrike
___ Loggerhead Shrike
___ (Shrike species)

Starlings

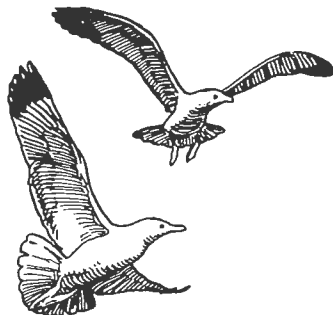
___ European Starling

Vireos

___ White-eyed Vireo
___ Bell's Vireo
___ Solitary Vireo
___ Yellow-throated Vireo
___ Warbling Vireo
___ Philadelphia Vireo
___ Red-eyed Vireo

Wood-Warblers

___ Blue-winged Warbler
___ Golden-winged Warbler
___ Tennessee Warbler
___ Orange-crowned Warbler
___ Nashville Warbler
___ Northern Parula
___ Yellow Warbler
___ Chestnut-sided Warbler
___ Magnolia Warbler
___ Cape May Warbler
___ Black-throated Blue Warbler
___ Yellow-rumped Warbler
___ Black-throated Green Warbler
___ Blackburnian Warbler
___ Yellow-throated Warbler
___ **Pine Warbler
___ Prairie Warbler
___ Palm Warbler
___ Bay-breasted Warbler
___ Blackpoll Warbler
___ Cerulean Warbler
___ Black-and-white Warbler
___ American Redstart
___ Prothonotary Warbler
___ Worm-eating Warbler
___ Ovenbird
___ Northern Waterthrush
___ Louisiana Waterthrush
___ Kentucky Warbler





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[illegible]

The Iowa Ornithologists' Union is a non-profit group organized in 1923 to promote the study and enjoyment of birds. Membership is open to anyone with an interest in birds. Members receive *Iowa Bird Life* and *I.O.U. News*. Spring and fall meetings provide good birding opportunities and a chance to meet fellow birders.



Birds of an Iowa Dooryard: Althea R. Sherman

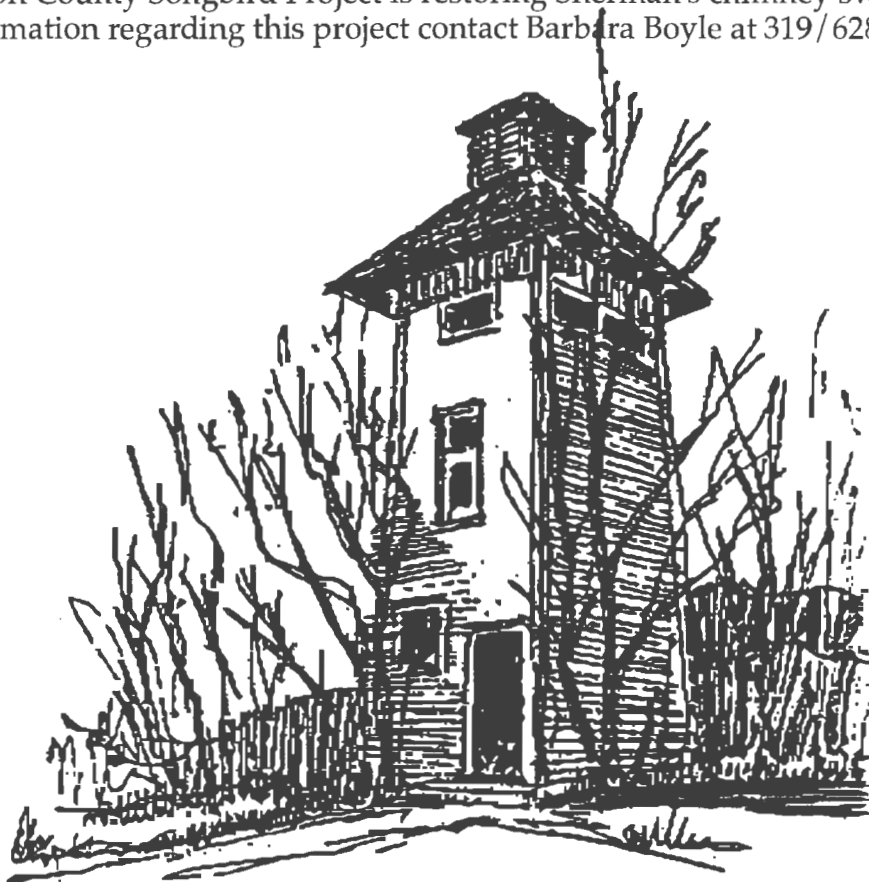
As we look back in Iowa's history, we discover an early Iowa bird researcher of great importance. Althea Sherman wrote many articles that appeared in many prestigious bird journals. She was one of the first researchers to study the nesting cycles of the chimney swift.

Sherman grew up in a frame house on the prairie near National in Clayton County in northeastern Iowa. Her first career was teaching art in schools and colleges, but by 1900 she had a new career as a scientist. She began observing the bird and animal behavior around her home and learned the importance of habitat and the effect of habitat loss on bird species.

In 1915, she built a tower nine feet square and twenty-eight feet tall. From this artificial chimney she could view the nesting, hatching, and rearing of chimney swifts. By 1932, 1,700 visitors, including college professors, students, and professional and amateur naturalists, had visited her farmstead to visit the tower and the swifts.

In 1912, Althea Sherman was elected by fellow ornithologists to the rank of "member" in the American Ornithologists' Union; only 100 members were so honored. In 1921, she was selected for inclusion in the third edition of American Men of Science.

The Johnson County Songbird Project is restoring Sherman's chimney swift tower. For more information regarding this project contact Barbara Boyle at 319/628-4824.





Birds in Iowa's History: Where Did They Go?

Have you ever visited the Iowa towns of Curlew, Mallard, and Plover? How did these towns get their names? Iowa's history of glaciers and prairies left Iowa with rich soil and many wetlands. In northwestern Iowa, wetlands are still common today. The names of these towns came from the birds that once frequented this wet region of the state.

Several species of birds became extinct or extirpated in Iowa as a result of habitat changes and market hunting. Market hunters made their living by killing and selling wild game. In the 1880s, a mixed bag of ducks sold for \$1.50 a dozen. Often they were shipped to Chicago or cities on the east coast.

Passenger pigeon

The demise of the passenger pigeon was caused by market hunting, decline of forests, and loss of colony nesting sites. These birds depended on oak, beech, and chestnut forest areas for food and nesting sites. Often tens of thousands of pigeons nested in a small area. Market hunters could easily kill many birds at one time by using sticks to knock them out of their nests or easily shooting them. In the 1860-70s, an estimated 600 million migrated near Dubuque in one day! The last in Iowa was shot near Keokuk in 1896. By 1914, the very last passenger pigeon died in the Cincinnati Zoo.

Greater prairie chicken

The prairie chicken was one of many game species that were hunted by early settlers in Iowa. Market hunters killed tens of thousands of these birds and shipped them back east for consumption. When settlers first arrived, prairie chicken populations increased because early farming practices created a mixture of habitats which was good for prairie-chicken nesting. The 1870s-1880s were probably the height of the prairie chicken populations. Soon, however, the balance shifted, and as native prairies disappeared, so, too, did prairie chickens. Their population began a long decline as modern farming removed the grassy lands they needed to nest. By 1955, no prairie chickens remained in Iowa.

Wild turkeys

The turkey was once common in the forested areas of Iowa. The American Indians used turkeys for food, and their feathers for clothing and ceremonial purposes. By the 1920s, no wild turkeys remained in the state. Again, market hunters and reduced forest habitat led to their demise. In the 1960s, the Iowa Conservation Commission (now the Iowa Department of Natural Resources) began introducing wild turkeys into Iowa. By the 1990s, it was estimated that nearly 75,000 turkeys roamed our forested lands.

Long-billed curlew

This unusual bird was a common nester on the prairies of northwestern Iowa in the 1800s. Long-billed curlews were common in Cherokee and Sac Counties. But, by the 1890s, curlews no longer nested in the state. Loss of the prairies, wetlands, and market hunting were the culprits.



American golden plover

Plover, Iowa! It was Charles Whitehead, railroad president and hunter, who named three towns in Iowa after his favorite games birds - the plover, curlew, and mallard. Golden plovers nest on the arctic tundra and winter in southern South America. Huge flocks once passed through Iowa, especially during spring migrations. At Steamboat Rock in 1860, thousands of these birds passed overhead in huge flocks. Pomeroy also reported the same in 1877. Market hunters harvested many of these birds, and changes in habitat in the far north and south finally decreased their numbers. These birds still migrate through Iowa today but are no longer seen in large flocks.

Whooping and sandhill cranes

Both whooping and sandhill cranes once nested in abundance on the prairies and wetlands of northwestern and north-central Iowa, although sandhill cranes were the more abundant of the two species. In May 1871, it was reported that thousands of sandhill cranes were seen at the headwaters of the Iowa River in Hancock County. The last year that a whooping crane nest was found was in 1894 north of Hayfield in Hancock County. These eggs were collected and put into private egg collections, a popular hobby in those days. Loss of wetland habitat and mortality due to collecting as a hobby were the primary reasons for the disappearance of these nesting birds.

Thousands of sandhill cranes can be seen during their migrations along the Platte River in central Nebraska each spring and fall. Their beautiful mating dances attract thousands of visitors each spring. Sandhill crane numbers are increasing; nesting has been documented at marshes in Tama, Bremer, Jackson, and Butler counties.

Waterfowl

Early settlers and explorers often commented on the abundance of ducks and geese in Iowa. Iowa's waterfowl habitat stretched from Des Moines north and east to Mason City and west to Spirit Lake. The rolling topography of this land was dotted with thousands of small depressions called prairie pothole wetlands. Iowa also had good wetland habitat along the Missouri, Mississippi, Des Moines, Skunk, and Iowa Rivers. Many species of ducks and geese migrated through Iowa every year. It was estimated that before the wetlands were drained, three to four million ducks nested annually in Iowa. Species such as blue-winged teal, redhead, northern shoveler, ruddy duck, mallard, and northern pintail were predominant in Iowa. In the 1860s-1870s, with rail service being introduced into Iowa, market hunters increased, and they took their toll on the waterfowl. Sport hunters did not sell their game on the market and were often at odds with market hunters because of the large numbers of birds killed.

Help for waterfowl and other species arrived in the early 1900s with the Lacey Act, which attempted to stop market hunting. This bill was introduced by Representative John Lacey of Oskaloosa. The Migratory Bird Treaty between the United States and Canada also set regulations on waterfowl hunting. Other famous Iowans who took lead roles in protecting habitat and waterfowl in the United States included Aldo Leopold, J.N. "Ding" Darling, and Ira Gabrielson.



Activity: Birds Under Glass

Objective: Students will identify the birds in a collection.

Materials: Pencils, checklists, and clipboards

Procedure: Complete the activity "What is a Bird" and "Where Would a Bird Be Without Its Bill?" Obtain permission to visit a nearby bird collection. Students will observe the many specimens of birds in the bird collection and compare the feet, beaks, and color of the birds, as discussed during the previous activities. Students will check off the birds that are on the IOU checklist. The IOU checklist is located on pages 8-10.

University of Iowa Museum of Natural History
Iowa State University
University of Northern Iowa
Coe College Biology Department
Central College
Luther College
St. Ambrose College
Wartburg College
Westmar College

Iowa Historical Society Collection
Iowa Conservation Education Center

Calhoun County Historical Society

Putnam Museum
Museum of History and Science
Sanford Museum
Sioux City Public Museum
Sogers Museum

Iowa City
Ames
Cedar Falls
Cedar Rapids
Pella
Decorah
Davenport
Waverly
LeMars

Des Moines
Springbrook State
Park in Guthrie County

Rockwell City

Davenport
Waterloo
Cherokee
Sioux City
Maquoketa

Many state and county conservation agencies have nature centers with exhibits and displays.



Activity: What Is a Bird?

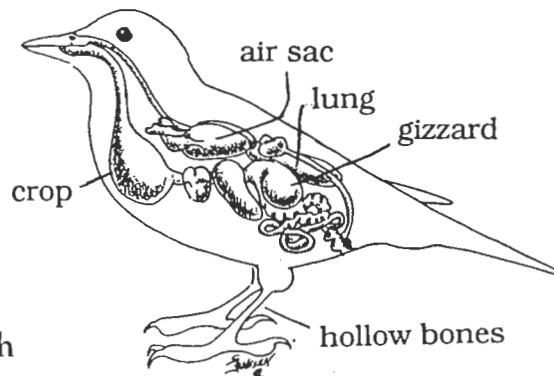
Objective: Students will study the characteristics that make a bird a bird.

Materials: None, although a mounted bird would demonstrate parts of this discussion. Borrow a mounted pheasant or duck from someone you know.

Background: Everyone knows what a bird is. We see them every day. Most of your students probably saw a bird this morning on their way to school. But what makes a bird a bird? What are the distinguishing characteristics that let you separate birds from other animals? This activity will help students separate birds from other vertebrates (animals with backbones). There is usually not a problem separating birds from invertebrates, although hawk moths and clear-winged moths are sometimes confused with hummingbirds because they make a humming sound when hovering over flowers.

Procedure: Ask your class to pretend that they are being visited by an alien from another planet who has no concept of what a bird is. Ask them to list the most important distinguishing characteristics of birds. Write the list on the board. It will get harder as the list gets longer; the easy ideas will surface first.

After completing your list, ask your students if any animals besides birds possess these characteristics. Discuss each characteristic. Obviously, any suggested characteristic that is not possessed by all birds is not as diagnostic as something that is true for all birds. (For example, not all birds fly.) Discuss whether any animals that are not birds have each characteristic.



Discuss the list again. At this point, the group should decide which of the characteristics really do distinguish birds from other animals.

Conclude this exercise by reviewing the list one last time to discuss the functions of the characteristics listed.

Follow this standard format::

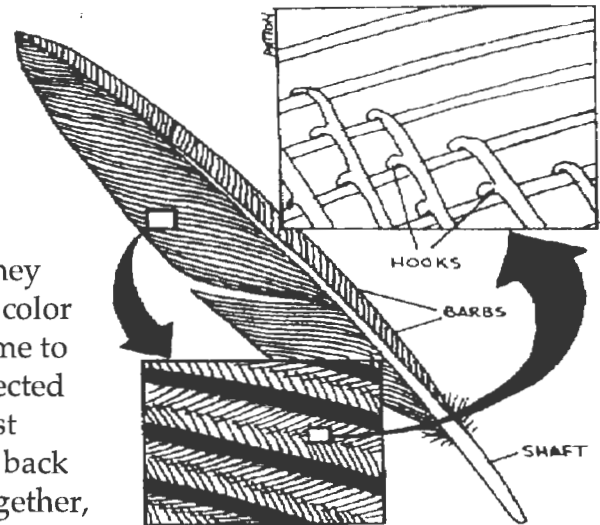
Characteristic

- a. Does this occur in all birds?
- b. Does this occur in any other animals?
- c. Why do animals do this or have this?



1. Feathers

- a. Yes. This is the one unique characteristic of birds. All birds have them, and no other animals have feathers as a body covering.
- b. No
- c. Feathers have many functions in birds. They clothe birds, keeping them warm and dry. By their color patterns, feathers can camouflage birds or allow some to show off. Their overall lightness and the interconnected barbs and barbules help make flight possible in most birds. Pulling apart an old feather and "zipping" it back up demonstrates how the barbs hold the feather together, while a feather's lightness, compared with an equal-sized piece of an airplane wing, is obvious. Feathers on different regions of birds' bodies serve different functions.



2. Wings

- a. Yes. Even flightless birds have wings, although they may be very small stubs.
- b. Yes. Bats and insects have wings.
- c. Wings allow true flight in most birds.

3. Flight

- a. No. Penguins, ostriches, and a number of other birds cannot fly.
- b. Yes. Bats and insects fly well.
- c. This method of locomotion is important to birds as a way to get food, escape enemies, and migrate each spring and fall.

4. Egg Laying

- a. Yes
- b. Yes. A few mammals, such as the duck-billed platypus, as well as most fish, insects, amphibians, and reptiles, lay eggs.
- c. Birds lay eggs to allow the next generation to develop outside of the mother's body. This frees the mother from carrying the weight of the eggs within her body. For some species, the weight of the clutch of eggs is quite heavy and certainly would slow down the female, and expose her to predators. The weight of the average bobwhite quail clutch is greater than the weight of the average bobwhite female! Laying eggs also allows the male bird to share sometimes in the incubation.





5. Migration

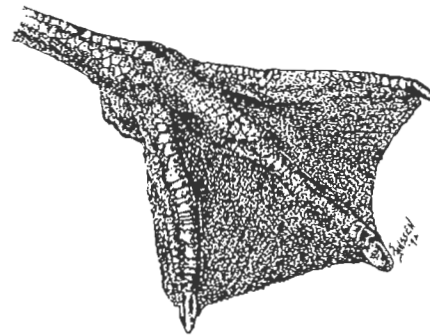
- a. No. House sparrows, cardinals, and many other birds do not migrate.
- b. Yes. Some bats, whales, seals, fish, crabs, monarch butterflies, and caribou, among others, migrate.
- c. Migration helps put animals in good habitats at the right time of the year. It allows animals to take advantage of seasonal differences in the environment. Most insect-eaters would have an impossible time finding food during Iowa's winters. But there are many insects in Iowa during the summer -- a food source so abundant that many birds, such as cardinals, survive over the winter by eating seeds and feeding on insects in the summer.

6. Feet Like a Bird

- a. Yes. But mentally compare a hawk's talons, a robin's foot, and a duck's foot. Birds' feet vary greatly. They can be completely webbed (pelican webs connect all four toes, while duck webs are only between the three forward-facing toes), partially webbed (some sandpipers have webbing that does not reach more than half-way to the toes), or lobed (grebes and coots). A bird may have normal nails at the end of their feet, or they may have strong, curved nails (talons on hawks). Birds can have two toes (ostriches), three toes (some sandpipers), or four toes (most birds). They can have a "normal" toe arrangement with three toes pointing forward and one toe to the rear or two toes can point forward and two toes to the rear (woodpeckers).
- b. Some lizards have feet which look very much like a bird's foot.
- c. Birds use their feet for many purposes -- to walk, to hold food, to carry things, and to propel them in the water.



Grebe foot



Duck Foot



7. Beaks or Bills

- a. Yes. They vary greatly in their size and shape.
- b. Turtles and some fish have horny beaks.
- c. Birds use their beaks for many purposes -- to catch and carry food, to tear food into bite-sized pieces, to feed their young, to build their nests, to drive away predators, and to comb their feathers.

8. Crop

- a. No. Not all birds have crops.
- b. No other animal has a crop, although some other animals store their food before digesting it, such as squirrels storing nuts in their cheek pouches.
- c. The crop is part of the esophagus, the tube that carries food from the mouth to the stomach. The crop is simply a widened section of the esophagus that serves mainly as a place to temporarily store food. It also may have other functions, including production of pigeon milk, sound resonance, and digestion of food.



9. Gizzard (instead of teeth)

- a. No. Most carnivorous (meat-eating) birds lack a gizzard; eagles and falcons do not have a gizzard.
- b. No. Insects, for example, do not chew with teeth as we do.
- c. The gizzard is actually part of the stomach. It is thick and heavy with muscle and often contains bits of gravel or sand called grit. Gizzards play the same role in birds as our teeth and jaws — to “chew” hard food such as seeds.

10. Nest

- a. No. Cowbirds make no nest but lay their eggs in the nests of others. Other birds, such as common nighthawks, merely lay their eggs on the ground and do not even scrape a few twigs together.
- b. Squirrels, mice, alligators, and even some fish build nests.
- c. Nests are structured to hold the eggs and later the young birds. The nest helps protect the eggs from predators, holds the eggs together so they can be incubated, and, in general, provides a safe place for the eggs and young.



**11. Sing**

a. No, or at best maybe. All birds make noise, but it would truly stretch most people's idea of song to call the noises of a red-tailed hawk, a blue jay, or a downy woodpecker a song.

b. Yes. Crickets, frogs, toads, monkeys, whales, coyotes, wolves, and humans sing.

c. The purpose of singing is to advertise possession of a territory or readiness to take a mate.

12. Colorful

a. Not really. Some birds, such as hen pheasants and both males and females of most species of sparrows, are very dull in color.

b. Some of the most colorful animals are insects, snakes, fish, and other marine creatures, such as anemones and jellyfish.

c. Color serves many functions in the animal world. It can be used to advertise for a mate, scare enemies, and allow other individuals to recognize the species of bird. Color can also help an animal hide from its enemies through camouflage.

13. Warm Blood

a. Yes. Scientists would describe warm-bloodedness as having a constant body temperature.

b. Yes. Mammals and at least a few species in several other groups are warm-blooded.

c. Constant body temperature allows activity when the environment cools off at night or in the winter. Another advantage is that the constant body temperature allows the body to run more efficiently. The body temperature of some birds drops at night, however, apparently to conserve energy. A hummingbird, for example, may drop its temperature as much as 50 degrees F. at night.

14. Hollow Bones

a. No. Surprisingly, some birds which do not fly and some diving birds have bones which, unlike most birds, are not hollow.

b. Although some mammal bones (especially the larger bones of the body) are hollow in the sense that they are not solid bone; the cavity in them is filled with marrow. They are not hollow in the sense of bird bones which are filled with air spaces.

c. Pneumaticized hollow bones allow long avian bones to be light for their size. If you are going to fly, it is important to save weight wherever you can!

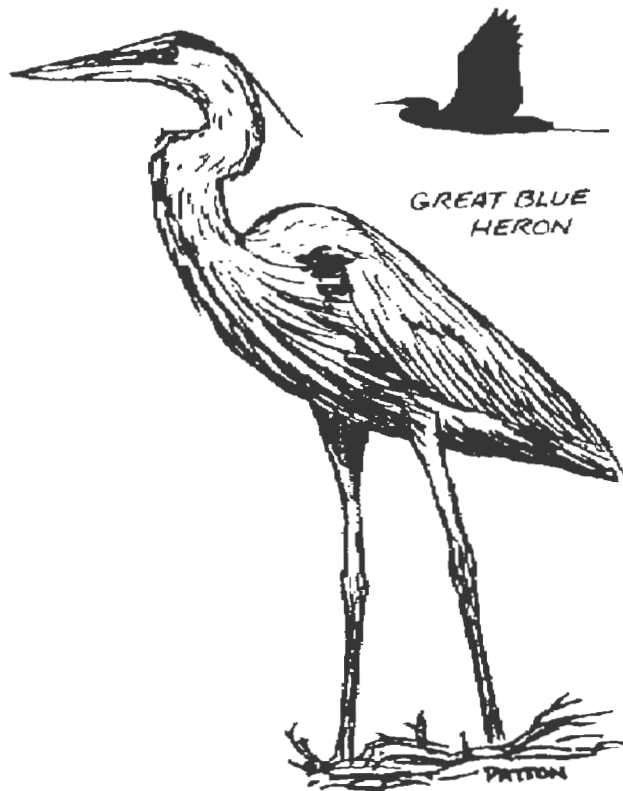


15. Oil Gland or Preen Gland

- a. No. Ostriches, some pigeons, and some parrots completely lack these glands.
- b. Certainly mammals have glands which secrete an oil, but these are scattered throughout the body. On a bird, a pair of oil glands is located on the back at the base of the tail.
- c. Most birds have a specialized gland located just above the base of the tail. A preening bird can be observed rubbing its bill around the opening of the gland, picking up a load of oil on the bill, and spreading the oil through its feathers as it preens. This is thought to play an important role in waterproofing and insulating a bird. Waterproofing also maintains feather flexibility and condition.

16. Two Legs

- a. This characteristic is certainly true for all birds. The ancestors of birds (probably small dinosaur-like reptiles) had four legs, but in birds, the front pair has become highly specialized for flight and is now called the wings.
- b. Yes. Children may suggest that humans and monkeys have two legs, but scientists would say they have four limbs -- two legs and two arms.
- c. Legs are used for locomotion. Even though legs are not the primary means by which most birds travel, they are still vitally important for almost all birds.





Activity: Where Would A Bird Be Without Its Bill?

Objective: Students will experiment to see how Iowa's birds are specifically adapted to feeding and living in a particular habitat by using food-gathering tools representing different beaks, and using these "beaks" to gather "food" from different habitats.

Materials: Bird "beaks" made of strainers, straws, tongs, chopsticks, fishnets, letter openers, nutcrackers, tweezers, and knives and forks; "food" items using water in a tall thin vase, oatmeal, nuts, marshmallows, rice, a rubber mouse and rubber fish; clipboards, pencils, and worksheets

Background: Much about a bird's way of life can be told by looking at its adaptations such as bill shape. Iowa birds' beaks vary widely in shape, size, and form. The ruby-throated hummingbird has a long, hollow beak that it uses to probe flowers for nectar. Many sandpipers, snipes, and woodcock have long bills for probing in the mud of an Iowa marsh or lake for soft invertebrates, similar to eating with chopsticks. Cardinals and grosbeaks have heavy, conically-shaped bills with sharp edges (nutcracker) used for splitting open seeds. Many ducks and geese that migrate through Iowa have flat beaks with a fringed edge (strainer or slotted spoon) for straining food from the water. Nighthawks, chimney swifts, and barn swallows have large, gaping mouths with short, pointed beaks (fishnet) for catching insects on the wing. Robins, wood thrushes, red-winged blackbirds, and other insect-eating birds have bills that are sharp and pointed (tweezers) for picking insects from leaves, logs, and twigs. Birds of prey, such as the kestrels, red-tailed hawks, or great-horned owls, have hooked beaks for cutting and tearing, similar to cutting with a knife and fork. Great blue herons that can be seen in Iowa's marshes, lakes, and streams have long, sharp, spearing beaks (letter opener); they also have long necks to reach down into the water while wading and stab fish.

Procedure: Set up eight different stations, each with a special type of food that fits one of the eight different types of beaks that you have discussed with the students. At each station, you will need three beak types and a card identifying the type of food represented. Send groups of three-five students with a clipboard and pencil to visit each station to identify answers matching the correct bird "beak" with the type of "food" displayed.



Stations

- #1 Food: Water in a tall thin vase to represent nectar in a flower
Beaks: strainer, straw, (hummingbirds, for example)

- #2 Food: Bowl with dry oatmeal and sticks on the bottom to represent worms buried in the mud
Beaks: chopsticks, fishnet, letter opener (woodcock, for example)

- #3 Food: Whole walnuts or other nuts to represent seeds with hard coverings
Beaks: nutcracker, straw, (cardinals, for example)

- #4 Food: Marshmallows in a bowl filled with water to represent tiny aquatic plants and animals
Beaks: chopsticks, strainer, tweezers (ducks, for example)

- #5 Food: Marshmallows tossed in the air one at a time (which must be caught while in the air) to represent flying insects
Beaks: fishnet, straw (swallows, for example)

- #6 Food: Rice spread on a log to represent caterpillars and other insects
Beaks: tweezers, strainer, chopsticks (robins, for example)

- #7 Food: A rubber mouse to represent a real one
Beaks: tweezers, knife/fork (hawks, for example)

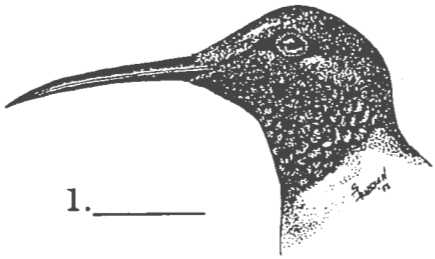
- #8 Food: A rubber fish to represent a real one
Beaks: straw, letter opener, tweezers (kingfishers, for example)

Follow-up: Ask your local county conservation board or local Iowa Department of Natural Resources personnel to present a program with mounted birds so the students can examine the bills and foot types of Iowa birds.

Have students identify the Iowa birds used in this activity by using a field guide. Nature magazines are a good source of pictures of bird beaks and feet. Compare pictures of birds to corresponding feet and beaks. Construct a food chart and match beak and foot types to the chart.



Activity: Match the Type of Food the Bird Eats to the Beak Type.



1. _____



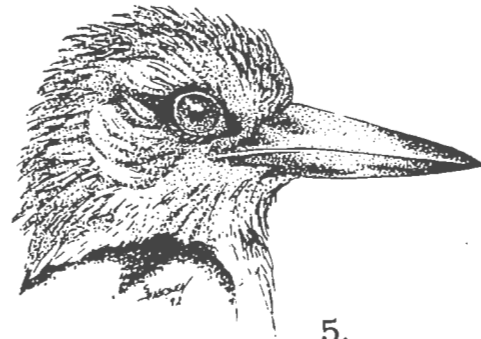
2. _____



3. _____



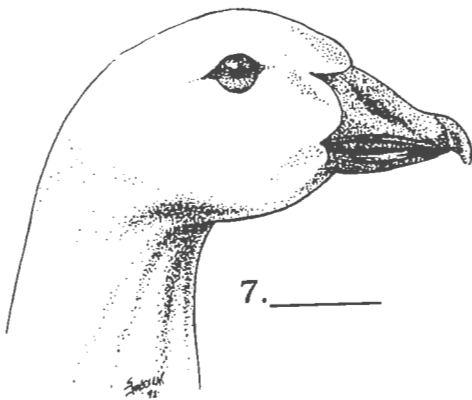
4. _____



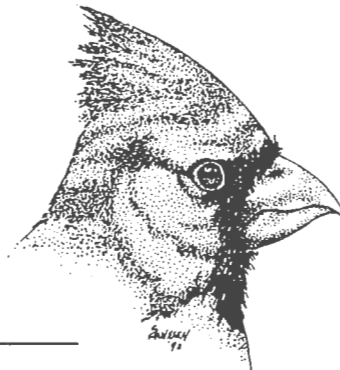
5. _____



6. _____



7. _____



8. _____

- a. caterpillars, beetles, and crawling insects
- b. flying insects
- c. fish
- d. rats, mice, and snakes
- e. small water plants
- f. nectar
- g. seeds
- h. worms and invertebrates in the mud



Activity: Discovering Behaviors

Objective: Students will observe bird behaviors to distinguish between different bird species.

Materials: "Discovering Behaviors" and "Bird Behavior Bingo" sheets

Background: Think for a moment about your brother or sister, best friend, mother, or father. If you hear their footsteps but can't see them, can you identify them just by the sound of their footsteps? Some people walk with a sway or a swing. Others march steadily in step to a beat. Still others have a little hop in their step or are always half-running. If a group of people were standing around talking and you could see nothing but their silhouettes, could you pick out your friend just by seeing the way he or she stands? Some people stand with their hands on their hips or in their pockets. Others seem to have ants in their pants and can't stand still for even a moment! We use these actions or behaviors as clues to identify people. As you watch birds, you will begin to notice that certain species also have special behaviors that will help you recognize them.

Procedure: Observe a bird for 15 minutes, either at a feeder or in the school yard. Distinguish between the different behaviors using the "Bird Behavior Bingo" and "Discovering Behaviors" sheets. Make a list of the behaviors that were observed. Discuss these behaviors with the class. How do the behaviors aid in identification? What is the purpose of different behaviors? Why do different birds have different behaviors?

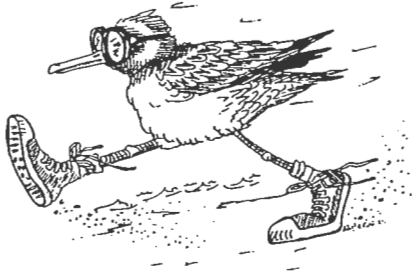




Activity: Discovering Behaviors

Watch how birds perch or stand.

Some hop.
(robins, blue jays, juncos)



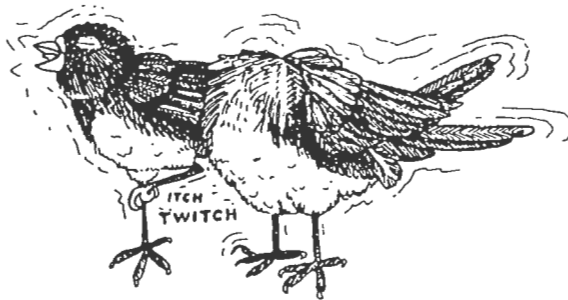
Some walk with a sway.
(crows, starlings, grackles)



Some run.
(sandpipers, killdeer)



Some stand upright at attention.
(owls, jays)



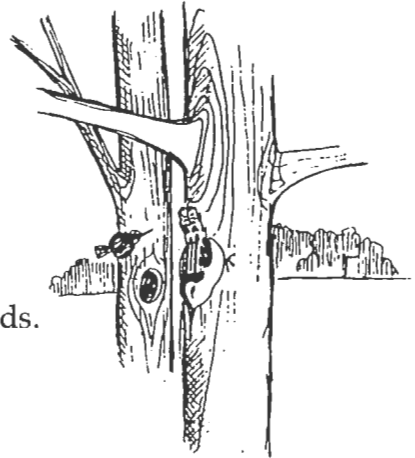
Some can't stand still or flick their tail or wings constantly.
(juncos, chickadees, cardinals, wrens, some sparrows, kinglets)



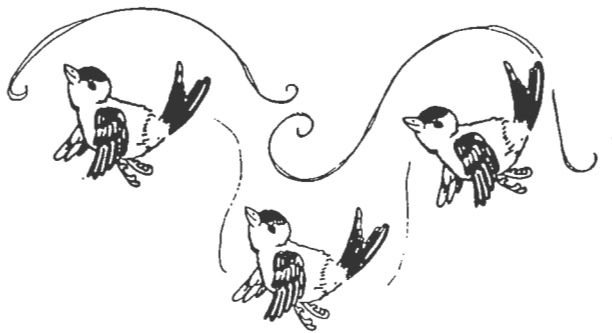
Some prefer to perch on a tree trunk rather than a branch.
(woodpeckers, nuthatches, creepers)

Some even hang upside down on tree trunks.
(nuthatches)

Some stand absolutely still, moving only their eyes or heads.
(hawks, owls, kingfishers, herons)

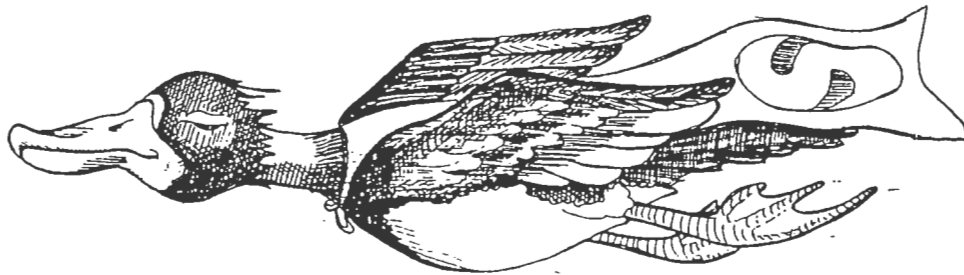


Watch how birds fly through the air.



Some dip up and down like waves.
(goldfinches, woodpeckers)

Some fly very fast in a "beeline."
(jays, ducks, mourning doves)





A few "stand still" or hover in mid-air like a helicopter.
(hummingbirds, some hawks, kingfishers)



Some soar and glide high above the ground and seldom flap their wings. (hawks, cranes, gulls, vultures)

Some surprise you by not flying until they are almost beneath your feet and then take off with a loud "whirr." (grouse, quail, pheasants)




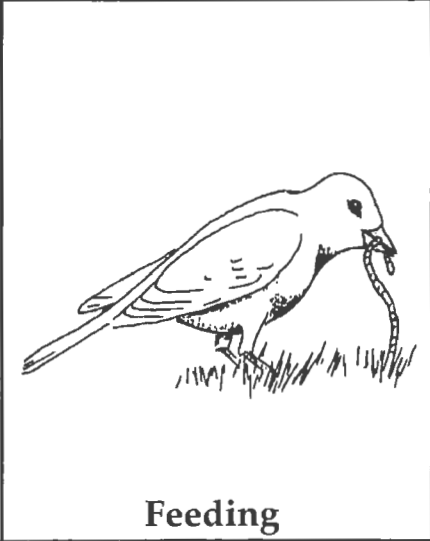


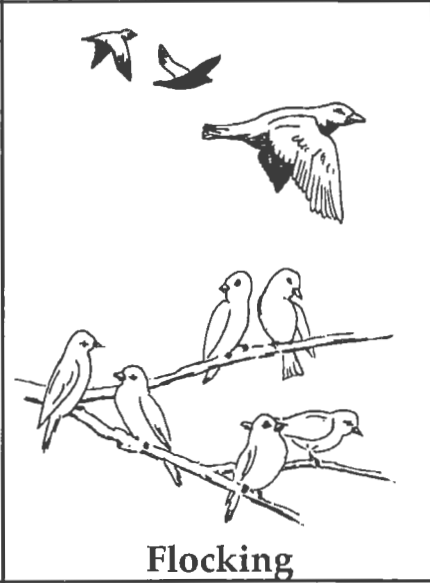
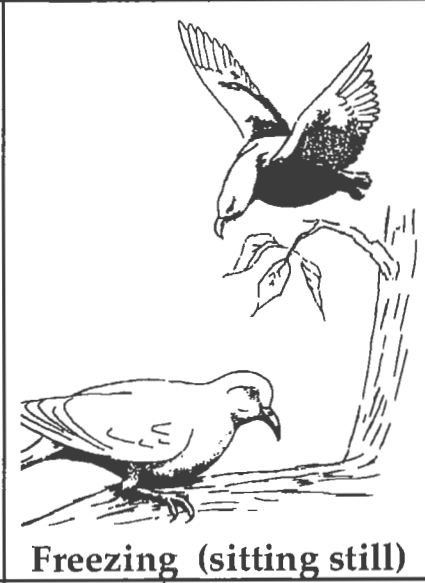


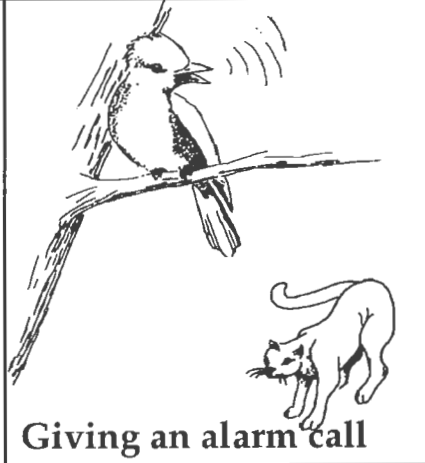
Add any other movements and pictures below to help you in your observations.

Adapted from *Getting to Know the Birds*, a Wisconsin Natural Science 4-H project by Jim Pease. Used with permission.



Activity: Bird Behavior Bingo

Watch a bird's behavior and match three across, down, or diagonally for bingo.

 <p>Hiding</p>	 <p>Feeding</p>	 <p>Preening</p>
 <p>Flying</p>	 <p>Flocking</p>	 <p>Freezing (sitting still)</p>
 <p>Singing</p>	 <p>Bathing (in water or dust)</p>	 <p>Giving an alarm call</p>



Activity: Bird Sounds

Objective: By listening to tape recordings of bird sounds, students will distinguish the bird calls or songs of ten species of Iowa birds.

Materials: Tape recorder, record player or CD player, *A Field Guide to Bird Songs of Eastern and Central North America* cassette or CD of bird calls and songs, and word association sheets

Background: One of the most characteristic features of birds is the sound that they produce. Most birds produce these sounds by passing air across membranes in their air tract, much the way humans produce sounds. However, some birds produce sounds by tapping their bill against a hollow tree (woodpeckers), by vibrating their wings against their body (ruffed grouse), or by having air pass across specially-shaped feathers (snipe). Birds use these sounds to identify and defend a territory, to attract and hold a mate, and to communicate with their young.



Birders commonly use the sounds of birds as a way to locate birds and to identify the species. Good birders routinely locate 70-80 percent of the birds they find by hearing them first. This exercise also forces students to use their hearing, a sense that they often don't use when they are outdoors.

Procedure: Have the students listen to the tapes and highlight the Iowa birds on the activity sheet. On a birdwatching hike, have the students try to identify birds by sound alone. The students can also listen to the bird tapes and try word associations for the calls.





Activity: Word Association Sheet

Bird species

American robin

American crow

Northern Cardinal

Blue jay

White-breasted nuthatch

Gray catbird

Common yellowthroat

Northern flicker

Mourning dove

Barred owl

Red-tailed hawk

Rufous-sided towhee

Birds that say their name:

Black-capped chickadee

Killdeer

Whip-poor-will

Bird call sounds like:

clear caroling short phrases, rising and falling, often prolonged notes, tyeep and tut-tut-tut or cheery-up-cheerily cheery-up-cheerily

a harsh caw-caw

cheer-o-cheer-o-what-what or pretty-pretty-pretty

a harsh jeeah or jay

a nasal ank-ank-ank-ank

a cat-like meow

a bright, rapid whichity-whichity-whichity-witch

a loud wick-wick-wick-wick-wick and a squeaky flick-a-flicka-a-flicka

a mournful whoo-whoo whoo-whoo

a barking call that sounds like Who cooks for you? Who cooks for you all?

a high-pitched squeal slurring downward Keeer-r-r

drink your TEA!

chickadee-dee-dee or a clear whistled fee bee

kill-deer kill-deer

heard at night whip-poor-will whip-poor-will

Follow-Up: Try a bird song quiz or bird song tag team for review.



Nests: Houses Without a Mortgage

All birds incubate their eggs in some sort of nest. Some nests may not look like much to us, but they serve their purpose for that particular bird. Building the nest in a safe place is important because the nest helps protect the eggs and young from wind, rain, storms, and predators. Birds often place their nests near food sources.

Birds use a wide variety of materials for their nests including grasses, twigs, roots, feathers, thistle down, mud, sheep wool, horsehair, lichens, spider webs, leaves, and plant fibers. Some unusual materials used in building nests include cellophane, colored yarn, newspaper, and trash. A pair of warbling vireos built a nest made only of facial tissues!

For many species, nest building is one of the first activities a newly-formed pair of birds performs. Site selection and nest building may be done by the male, the female, or both birds, but generally the female is in charge. Watching a bird build a nest is fascinating. Cliff swallows make up to 1,400 trips back and forth to build their gourd-shaped nest of mud. Once a nest is built, the bird will defend its territory by scolding or even attacking any intruders that get near the nest.

Robins can be unusual nesters. Their twig and mud nest can be found almost anywhere. One pair of robins built nine partly-finished nests on nine successive steps of a fire escape. Robins' nests even turn up in mailboxes!

Ruby-throated hummingbirds use spider webs and lichens in their nest construction, while bluebirds, wrens, tree swallows, chickadees, and crested flycatchers build nests in natural cavities in trees or old woodpecker holes. Owls use abandoned crow nests, old hawk nests, or natural cavities in trees. Nest boxes can be built for these birds. Several books listed in the bibliography include nest box plans.

Some birds, such as nighthawks and whip-poor-wills and woodcock, nest on the leafy floor of woodlands, while killdeer build a nest called a scrape on bare, open ground or gravel. A scrape is a depression in the ground with pebbles scattered around the nest. Killdeer eggs, which look like pebbles and rocks, are camouflaged within the nest.

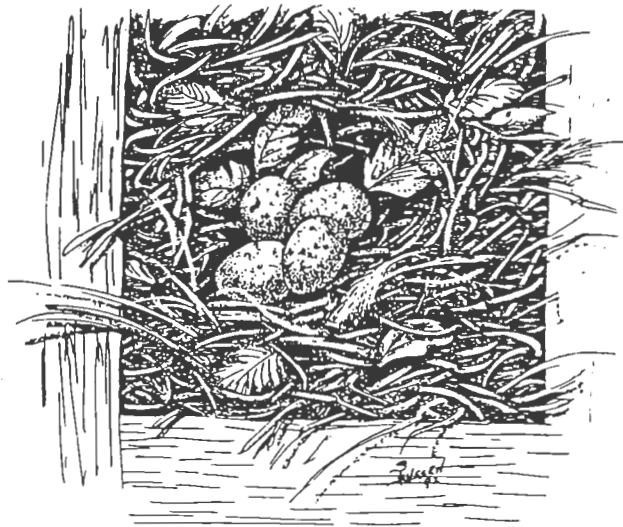
Many birds build very specific types of nests. Baltimore orioles build a hanging basket nest in a tall tree to avoid predators, while red-headed woodpeckers drill a hole into a tree to nest. Kingfishers build a tunnel in a river bank; the actual nest is an enlarged area at the end of the tunnel.



Red-winged blackbirds weave a nest into a stand of tall grasses or cattails, and grebes and coots build floating nests made out of cattails. Mourning doves build a very loose stick nest that looks as if a strong wind would blow it down.

The cowbird is another unique nester. It's called a parasitic nester because it doesn't build a nest. The female cowbird lays her eggs in other birds' nests. Cowbird eggs are incubated for a shorter time than most birds' eggs, so the baby cowbird will hatch before the host's eggs hatch. The host bird ends up feeding and raising the cowbird at the expense of its own nestlings! The yellow warbler and the chipping sparrow are very susceptible to nest parasitism by the cowbird.

Nests are often found on the ground, either having fallen on or belonging to ground nesters. And it's best to leave them undisturbed. Nests and eggs are protected by state and federal laws. If you'd like to collect nests for your classroom, you are required to obtain a salvage permit from the Iowa Department of Natural Resources. Refer to the section in this booklet about wildlife rehabilitation for more information about permits.



House sparrow nest



Activity: Egg Me On!

Objectives: Students will discover the limitations of building bird nests and the intricacy with which they are constructed. Students will compare the different materials that birds use in nest construction.

Materials: *A Field Guide to Birds' Nests* by H. Hal Harrison and *Birds' Nests* by Richard Headstrom; natural materials, such as mud, sticks, grass, horsehair, and bark; forceps or a spring clothespin for each person; nimble fingers (or a beak and feet!).

Background: Students studying bird nesting or spring phenology will find this activity a natural tie-in. You may wish to have on hand (you need a permit) legally-collected examples of nests to stimulate the students' curiosity. An excellent lead-in to this activity is to visit any active birds' nests. A spotting scope or binoculars will aid viewing both the nest and the nestlings. Perhaps a robin is building a nest near your classroom. If so, you might want to watch it as it shapes its nest. Remember that birds, eggs, nests, and feathers are protected by law. Refer to the section in this booklet about wildlife rehabilitation for more information about permits.

Procedure: Begin by asking the students about animals that build nests (squirrels, birds, insects, fish) and for what purposes they're used. Relate nests and their purposes to human houses. Are they similar in structure or function? Show several real nests and look carefully at their structure, size, and materials. If a small bird with just two feet and a beak can make such an intricate structure, certainly we should be able to do even better with our superior intelligence! Ask students to pair off. Each pair of students chooses a species of bird that has been reviewed in class and constructs the nest of that bird. They can use the reference books to determine size, location, and what materials to use. There's one catch: they are only allowed to use their "beaks" (forceps or spring clothespins operated by one hand) and their feet, just as birds do! You may want to have the students use only their forefinger and thumb while the other three fingers are taped together.

Allow 15 to 30 minutes for the students to construct the nests and then conduct a "model homes tour," with each pair of students telling what bird they were, how and why they built their nest where they did, nest size, and what materials they used.

Some excellent discussions can follow as to why all birds don't use one type of nest construction or materials, how some birds (killdeer) don't build much of a nest at all, why some birds are nest parasites (cowbirds), and numerous other topics. End with another look at some actual birds' nests and instill a new-found respect for the intricacy and beauty of their construction.

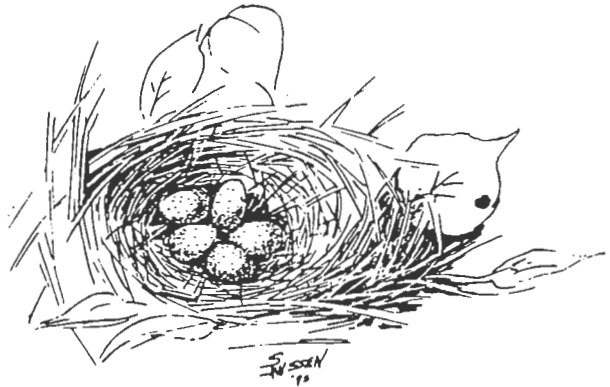


Follow-up: A number of activities are excellent follow-ups to this activity, including bird-banding, working with study skins, and bird watching.

Adapted from *Birds, Beasts, Bugs & Us: Activities For Environmental Education*. by Jim Pease. 1985. Cooperative Extension Service, Iowa State University, Ames, Iowa 50011; activity used with permission.



American goldfinch nest

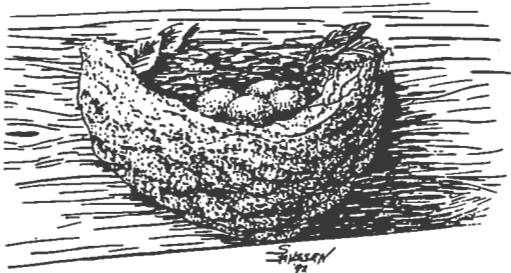


Meadowlark nest

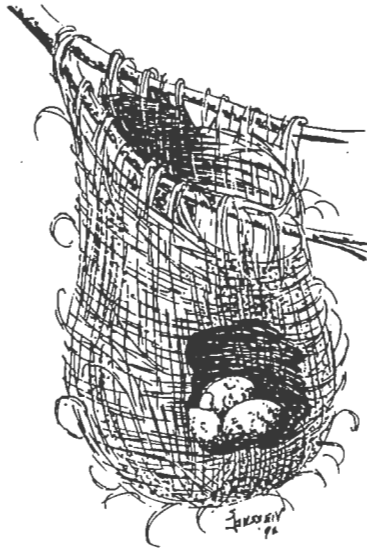


Activity: Match the Type of Nest to the Bird.

- a. Barn swallow
- b. Ruby-throated hummingbird
- c. Red-headed woodpecker
- d. Mourning dove
- e. Red-winged blackbird
- f. Killdeer
- g. Canada goose
- h. Northern oriole
- i. Whip-poor-will



1. _____



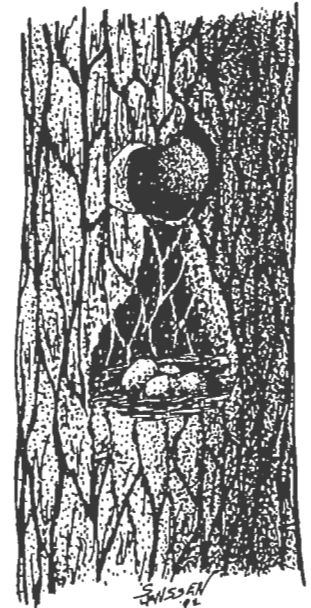
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3. _____



5. _____



4. _____



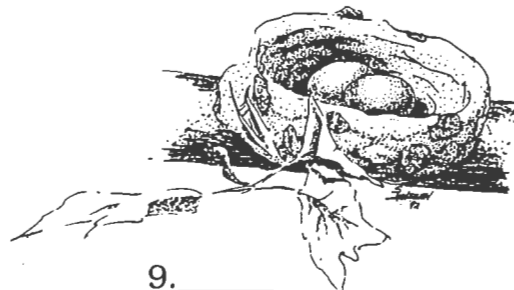
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7. _____



8. _____



9. _____



Activity: Imaginary Birds

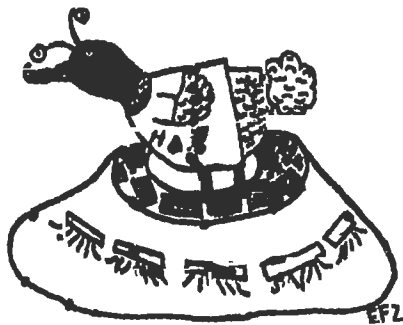
Objective: Students will investigate and illustrate ways birds are adapted to their environment.

Materials: Crayons, markers, oil crayons, and paper

Background: As the students think about the characteristics of birds, show them examples of birds as drawn by wildlife artists such as John James Audubon, Louis Agassiz Fuertes, Peter Parnall, and some of Iowa's own artists such as Maynard Reece, Larry Zach, Jack Hahn, and John Bald. Two books of fanciful birds have been published by Peachtree Publishers in Atlanta, Georgia. *Field Guide to Little-known and Seldom-seen Birds of North America* (1988) and *Another Field Guide to Little-known and Seldom-seen Birds of North America*, (1990) were written by Cathryn, Ben, and John Sill. Another fun book is *Ice Cream Cone Coot and Other Rare Birds* (1971) by Arnold Lobel published by Parents May Press in New York.

Have the students review the activities "What Makes a Bird a Bird," "Where Would a Bird Be Without Its Bill?" and "Discovering Behaviors." Have the students organize the information and compare the various features of birds. Using the characteristics from the activities mentioned, have the students draw or construct imaginary birds, incorporating different adaptations.

For example:
a bird that
flies twice as
fast as an
airplane



Name: *Faster Than Light Saucer*



For example:
a bird you
might want
to eat

Name: *Pie-d Peeper*

Procedure: This activity can be done with students working in groups or individually. Cut out the suggestions and have students draw their imaginary bird from a hat. The students should label their paper with the name of the bird, what it eats, how it eats, how it gets water, what animal will eat the bird, where it lives, how it moves, how it defends itself, and what special adaptations it has to survive. Backgrounds can be added to demonstrate the relationships between the bird and its environment.

After the drawings are completed, ask the students to share them with the class and discuss their bird's characteristics and adaptations.



Activity: Invent a Bird That:

1. You might want to eat
2. You wouldn't want to eat
3. Doesn't look like a bird
4. You wouldn't want to touch
5. Is good at attracting girlfriends or boyfriends
6. Lives on another bird
7. Moves backwards as fast as it moves forwards
8. Weighs more than you do
9. Doesn't lay eggs
10. Flies north for the winter
11. Doesn't fly
12. Makes sounds like the wind
13. Can see both in front and in back of itself
14. Is active only at night
15. Lives in the mud
16. Lives in the desert
17. Lives in the snow
18. Lives underground
19. Flies twice as fast as an airplane
20. Has no feathers
21. Can outrun you
22. Moves very slowly
23. Lives in a large group
24. Eats other birds
25. Eats plants
26. Lives alone
27. Smells good
28. Smells awful



Migration Mysteries

The mystery of bird migration has filled people with a sense of wonder and amazement for thousands of years. Consider, for example, the mystery of a Tennessee warbler which, after a journey of 3,000 miles, may return to the same tree to nest year after year. Greater shearwaters migrate 8,000 miles annually, and mallards have been observed by jets at an altitude of 21,000 feet. Hummingbirds can fly 500 miles in 25 hours at an average speed of 20 mph. How and why do these birds migrate?

Birds migrate, or move periodically from one region or climate to another, for feeding, breeding, or molting. Studying migration patterns is difficult. Many birds migrate at night; many follow certain pathways. The Mississippi Flyway is a very important migratory pathway for waterfowl and songbirds in the Midwest. In a landscape that is mostly agriculturally dominated, the Mississippi River is both a great source of food and cover.

There are several theories to explain why birds migrate. One theory suggests that changes in weather, temperature, and food supplies are important factors in determining when birds start to migrate. Day length also seems to be an important factor. Another theory suggests that it is a genetic or inherited trait; the instinct is to return to the bird's ancient habitats. The main reason for migration, however, seems to be that the species must find enough food. Birds must find a habitat that offers an ample supply of food for the birds to care for their young during the nesting season, as well as a habitat that provides food during winter. Are there a lot of insects and fruits available in the winter in Iowa for birds to eat? The answer is obviously no, so birds that need insects and fruit to eat must leave, adapt, or die. Seed eaters, on the other hand, have no problem surviving the Midwest winters.

How do birds find their way back and forth between their nesting and wintering grounds? Again there are several theories. Some scientists believe birds orient their progress by using the sun. Birds might use polarized light, Earth's magnetic fields, or the stars to find their way. Other scientists think birds follow major landforms such as rivers, mountains, and shorelines.

Birds have many adaptations for migration. They have powerful flight muscles, hollow bones, internal air sacs, and specialized body shapes that enable them to fly high and fast.

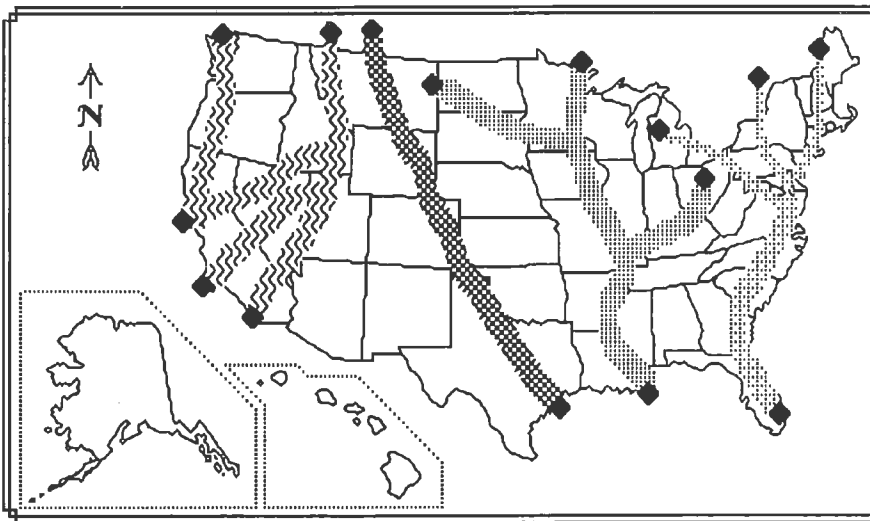
When do birds begin to migrate? Migration times vary according to the types of birds. Shorebirds will start to migrate in early July, while geese leave breeding grounds in late fall. Many birds tend to migrate at night and spend the day feeding and resting. Night flight seems to protect migrating birds from predators. By aiming a telescope and focusing on a full moon, you can watch the silhouettes of the birds as they fly across the silhouette of the moon. Researchers have counted more than 9,000 birds per hour flying through the night sky.






How do we know the same bird will return to the same area each year? Many migration studies involve putting numbered bands on birds' legs so that the movements of individual birds can be followed. Specially-authorized people called banders use a variety of nets, traps, or other means to catch birds so they can place bands on them.

Special numbered bands are attached to the birds' legs. The date, time, and place of capture are recorded, along with the species of bird. These data are recorded and sent to the U.S. Fish and Wildlife Service. If the bird band is found and the numbers have been sent to the Fish and Wildlife Service, they can determine when and where the bird was banded. They also can determine nesting and wintering grounds, as well as flyways. For example, scientists determined from banding reports that the chimney swifts that nest in Iowa spend their winters in the rainforests of the upper Amazon! Through banding records of geese and ducks, major flyway routes have been discovered. Check with your local bird club to meet banders performing research in your area.

Of course, there are hazards during migration. Skyscrapers, picture windows, and radio towers are obstacles that kill thousands of migrating birds each year. The birds also may fly into violent storms and be blown off course. A curve-billed thrasher, which is native to southern Texas and Arizona, was once seen near Iowa City feeding at a feeder for several weeks, and a bean goose which is native to Asia was seen at DeSoto National Wildlife Refuge. These birds were definitely lost!



If you see a banded bird, what should you do? Many ducks, geese, swans, and eagles have nasal, wing, or neck bands with numbers. For banded or marked waterfowl: Waterfowl Biologist, Iowa DNR, 1203 North Shore Drive, Clear Lake, IA 50428 (515/357-3517). For banded American kestrels and bald eagles: Wildlife Diversity Program, 1436 255th St., Boone, IA 50036 (515/432-2823). For other banded birds: 1-800/327-2263. For Bird Banding Office, 12100 Beech Forest Rd., Laurel, MD 20708-4037. (301/497-6800).

-  Pacific Flyway
-  Central Flyway
-  Mississippi Flyway
-  Atlantic Flyway

Major Bird Migration Flyways

These flyways continue north into Canada and the Arctic and south into the Caribbean, Central and South America.



Activity: Migration Mysteries

Objective: Students will describe the migration routes of several Iowa birds by plotting their course on a map of North and South America.

Materials: Outline map of North and South America, bird cutouts, and markers

Procedure: Have the students identify the different countries on their maps. Lightly outline the location of Iowa. Students should read the migration path outlines of the eight Iowa birds and plot the birds' courses using different colored markers to identify the route of each species.

The following eight examples describe the migration patterns of some Iowa birds:

1. *American robin* - Most robins spend the winter in the southern United States and migrate each spring to the northern states and southern Canada where they nest and spend the summer. Although most leave Iowa in the fall, every year a few robins winter in Iowa. Robins that nest in Iowa typically winter in Missouri, Arkansas, Louisiana, Kansas, Oklahoma, Texas, Tennessee, and Mississippi.
2. *Dark-eyed junco* - Juncos nest from the far northern United States north into Canada. In fall, they migrate south, where many winter in Iowa and surrounding states. In spring, they leave Iowa to go back north to their nesting grounds in northern Minnesota and Wisconsin, as well as in the boreal forests of Manitoba and Ontario in southern Canada.
3. *Ruby-throated hummingbird* - This hummingbird nests in the central United States and southern Canada. In late fall it migrates south, eventually crossing the Gulf of Mexico, and winters in southern Mexico, Guatemala, Honduras, Nicaragua, or Costa Rica. In spring, it reverses this migration pattern and returns to Iowa in May.
4. *Upland sandpiper* - This bird nests on grasslands in Iowa and other prairie states. In fall it migrates south, eventually reaching Argentina and Paraguay in South America, where it spends the winter. It returns to Iowa in April of the next spring. It has one of the longest migrations of any Iowa bird.
5. *Tundra swan* - This swan has an unusual migration pattern because it moves not only in a north-south direction but also from west to east. The birds nest in northern Canada and Alaska near the Arctic Ocean. In fall they migrate to the southeast and usually winter along the Atlantic Coast from Maryland to North Carolina. In spring they fly northwest to their breeding grounds. In Iowa we most often see wild swans in the northeastern part of the state, along the Mississippi River. One of the best places to see tundra swans in Iowa is on the Mississippi River near Harper's Ferry.



6. *Bobolink* - The bobolink nests in tall grasses, flooded meadows, and prairies in the Midwest. In the fall it starts its journey to South America, staying mostly east of the Andes Mountains. It winters in South America, from southern Brazil through Bolivia and Paraguay to northern Argentina.

7. *Red-winged blackbird* - This bird signals the arrival of early spring in Iowa. The males show up as soon as the snow melts in late February or early March to stake out their territories. Even in snowstorms, the red-winged blackbird may be seen in many of Iowa's road ditches. In early August large flocks of blackbirds can be seen congregating to get ready for their flight to the southern United States. Most blackbirds from Iowa winter in Missouri, Arkansas, Kansas, Oklahoma, Texas, Kentucky, and Tennessee. During migration and on the wintering grounds, these birds form flocks of hundreds of thousands or even several million birds. These flocks can be a nuisance because they feed on grain that farmers have fed to their livestock. The birds also are a problem because of their droppings; the droppings that accumulate below the winter roosts are messy and they may cause a health hazard.

8. *Baltimore oriole* - Orioles' nests are hard to see in the summer. The nest looks like a gray basket woven of milkweed silk, plant fibers, and hair. It's hidden in tall maple and other trees. The oriole feeds on caterpillars, beetles, and fruit in the summer. In the winter, orioles drink mostly nectar from flowers found in southern Mexico south into Guatemala, Honduras, Nicaragua, Costa Rica, and Panama.

Follow-up: Discuss the effects of the destruction of tropical rainforests on populations of Iowa's nesting songbirds. Pick a country in Latin America and see what Iowa birds migrate there. Our sister state is Yucatan in Mexico. What can you determine about the environment? What dangers do birds face during migration? Have students investigate which bird migrates the greatest distance, the highest altitude, and so on. Several articles have been published about migrating birds flying into the wires of TV towers. Why?

Contact local bird banders to ask about the migratory habits of the birds they have banded. Call the Iowa birdline (319/338-9881) to see if there are any special migrants in the state. During a spring birdwatching activity, monitor the dates from year to year when some Iowa migrants arrive.



Activity: Migration Mysteries





Disappearing Neotropical Migrants

Approximately half of the terrestrial bird species that nest in North America are classified as neotropical migrants. Neotropical habitat or New World tropics are located in Mexico, Central and South America and the Caribbean Islands.

In the spring and summer, many of these birds can be found nesting in Iowa. In the winter, they spend their time in neotropical habitats. Most neotropical migrant birds depend on insects for food, so migration is essential to surviving the winter season.

Breeding bird surveys conducted throughout the United States have shown a marked decline of these neotropical birds. Breeding bird surveys which began in 1966 are conducted every year in the U.S. and Canada. There are 34 different survey routes in Iowa.

According to these survey results, many of our neotropical birds are disappearing. Habitat fragmentation, deforestation, fragmented grasslands, and intensive agricultural practices are the problems. Tropical rainforests once covered 20 percent of the Earth's surface; today only seven percent of the tropical forests are left. Many rainforests are fragmented, where habitat has been broken up into smaller pieces of forest or grassland instead of remaining one continuous habitat. Some tropical lands are being used for intensive agricultural purposes, such as growing bananas and grazing cattle. "Research is beginning to reveal just how devastating the loss of critical wintering areas can be to neotropical migratory birds," says Lisa Hemesath, wildlife diversity biologist with the Iowa Department of Natural Resources. "One study, for example, has found that the elimination of a two-acre plot down south may be the same as destroying up to 20 acres of northern breeding habitat." Due largely to the fact that migratory species are forced into those small winter acreages, deforestation creates a greatly amplified effect.

Agricultural changes in both Iowa and the neotropics play an important part in the decline of many Midwest species. Species such as dickcissels and bobolinks are especially affected. Dr. Louis Best with Iowa State University has documented that many Iowa species nest in row crops, hayfields, road ditches, and grass waterways. Because of farming practices such as cultivation and mowing of hayfields, road ditches, and grass waterways, nest success is low. Predators roam these areas with great success. Brown-headed cowbirds, whose numbers have increased due to fragmentation, because they thrive in agricultural areas, parasitize the nests of other birds. This also contributes to low nesting success. With these conditions in Iowa and with similar problems in the neotropics, many of our songbird species are declining.

What can you and your students do?

Study your local area. Find out what Iowa was like 150-200 years ago and what changes in the forests, wetlands, and prairies have taken place. Make a list of the changes that are positive for migrants and a list of those changes that have been negative.





Landscape your school yard for wildlife to invite birds into your life. Contact your county conservation boards and local Iowa State University Extension for plans to build feeders and nest boxes.

Aid in the establishment of extractive reserves in the tropics. These are areas protected from large agribusiness operations where indigenous people live off the land by harvesting products of the rainforest such as rubber, palm nuts, and brazil nuts. These reserves allow native people to become self-sufficient. For more information, write to the National Wildlife Federation, International Division, Chico Mendes Fund, 1400 16th St. NW, Washington, D.C., 20036-2266.

The Partners in Flight Program sponsors Project Feeder Watch. Participants watch birds at their backyard feeders once every two weeks from November to March. For more information, write to Project Feeder Watch, Cornell Lab of Ornithology, 159 Sapsucker Woods Rd., Ithaca, NY 14850-1999.

Aid in the establishment of wildlife preserves. An international effort by children has led to the creation of a children's rainforest in Costa Rica. For more information, write to the Monteverde Conservation League, P.O. 100165, San Jose, Costa Rica.

Compare and contrast the problems that rainforests face, including habitat fragmentation and destructive agribusiness and farming practices.

Take your students on an imaginary trip to Yucatan, our sister state. Examine the indigenous people and their way of life. Identify the country's natural resources. Find World Wide Web pages on Yucatan and other countries and learn about their natural resource management.

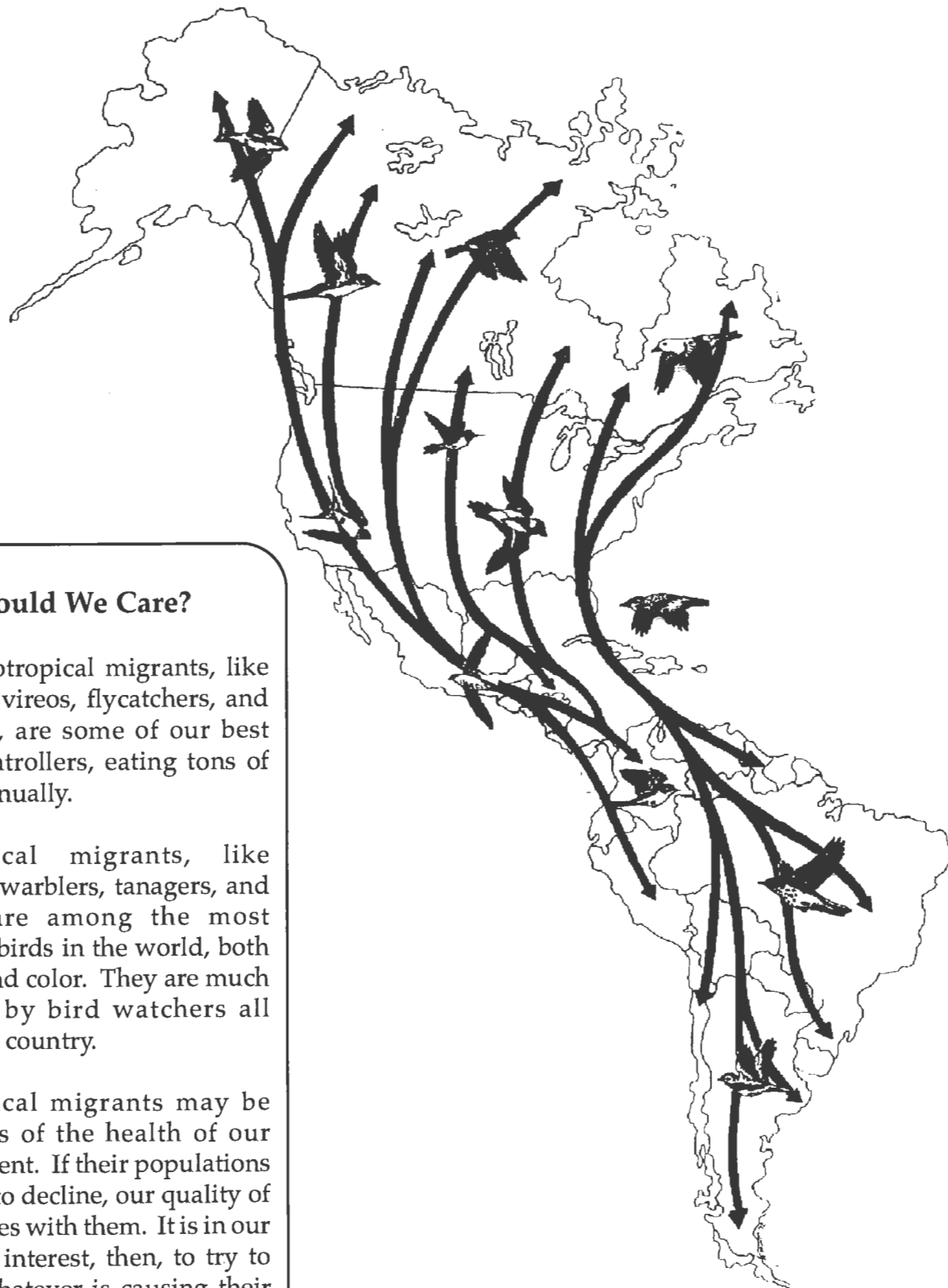
Contribute to Iowa's Wildlife Diversity Program to help biologists study neotropical birds in Iowa. Write to the Wildlife Diversity Program, 1436 255th St. Boone, IA, 50036.

Included in this booklet is a poster of **Birds of Two Worlds**. This poster was produced by the Handley Corporation, U.S. Forest Service, Minnesota Department of Natural Resources' Nongame Wildlife Program, Partners in Flight, Missouri Conservation Department, U.S. Fish and Wildlife Service, and University of Missouri.

**Special thanks to the Iowa Department of Natural Resources
for donating these posters.**



Birds of Two Worlds



Why Should We Care?

Many neotropical migrants, like warblers, vireos, flycatchers, and swallows, are some of our best insect controllers, eating tons of insects annually.

Neotropical migrants, like thrushes, warblers, tanagers, and vireos, are among the most beautiful birds in the world, both in song and color. They are much admired by bird watchers all across the country.

Neotropical migrants may be indicators of the health of our environment. If their populations continue to decline, our quality of life declines with them. It is in our own best interest, then, to try to correct whatever is causing their problems.



Activity: A Trip to the Lied Jungle

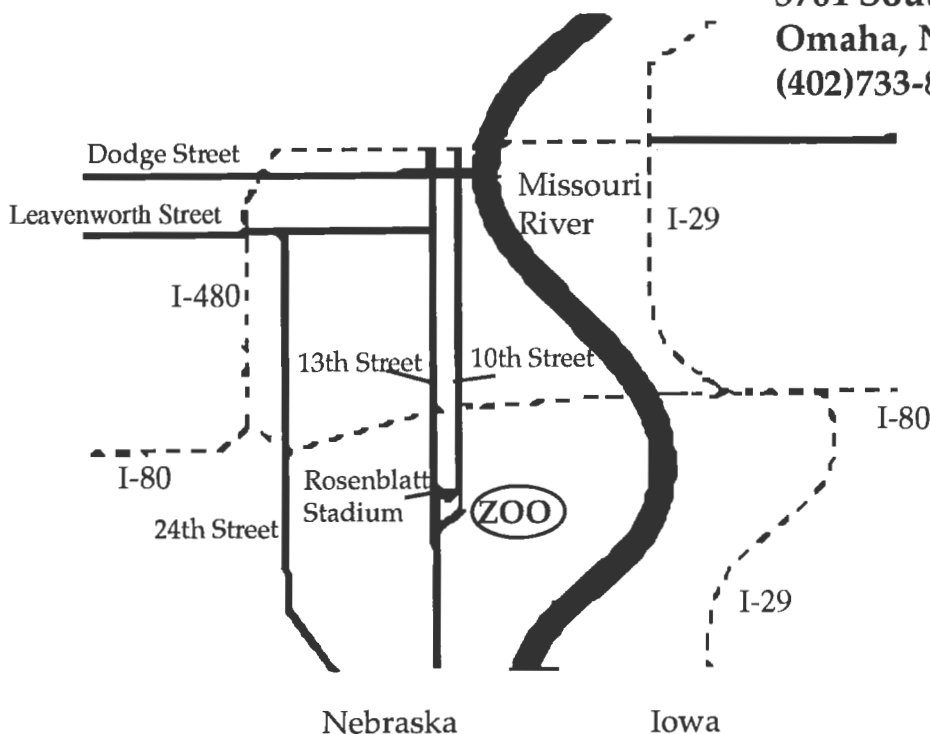
Objective: At the zoo, students will compare and contrast Iowa birds and habitats with neotropical birds, neotropical migrant birds, and their habitats.

Background: The Henry Doorly Zoo's Lied Jungle features three separate reconstructed rainforests representing the areas of South America, Africa, and Asia. The display occupies 1.5 acres under a sky-light roof that is 80 feet in height. The Lied (pronounced *leed*) Jungle contains 2,000 species of tropical plants. More than 200 species of birds occupy the exhibit along with 200 species of mammals, reptiles, amphibians, and insects. Many of the birds, butterflies, tree frogs, and lizards are free-ranging and readily interact with visitors.

The Henry Doorly Zoo's Lied Jungle is open year-round from 9:30 a.m. to 5 p.m. daily. Contact the zoo at 3701 South 10th St., Omaha, NE 68107-2200, (402/733-8401) to inquire about school rates for admission.

Procedure: Explore the jungles with your students to compare and contrast neotropical habitats with Iowa's habitat. Find out which of our birds come from these different habitats and which do not migrate from their tropical homes.

**Henry Doorly Zoo's
Lied Jungle
3701 South 10th Street
Omaha, NE 68107-2200
(402)733-8401**





Activity: International Partnerships for Birds

Objective: Students will use written and artistic skills to describe migratory birds on their wintering grounds in Iowa's sister state, the Yucatan Peninsula of Mexico.

Materials: Maps of the Yucatan Peninsula (Contact PRONATURA - Peninsula De Yucatan, Joann Andrews, Calle 13, No. 203-A, Garcia Gineres, Merida, Yucatan 97070).

Background: Migratory birds cross international borders and, therefore, are an international resource. As such, migratory birds can provide an educational window for study of the tropical forests, geography, ecology, and cultures of the countries which make up their wintering habitat.

Procedure: Start by identifying at least five migratory birds that summer in Iowa. Ask students to identify wintering habitats of these birds. Discuss with the students the basic geography, ecology, and cultures of Yucatan. Are there any students in your class from Mexico? Try to determine the Spanish names of these birds to help students understand that they spend a large part of the year in Mexico. You may wish to contact a local birder or naturalist to schedule a presentation about the birds you are studying.

Studying the international dimensions of migratory birds can quickly lead to a desire to form a partnership with a school and teacher in one of the countries that make up your birds' non-breeding habitat. There are many projects you could conduct with an international partner school.

A good place to start is a pen pal or art exchange with a partner school. Have your students draw or paint pictures of migratory birds you have been studying. Display the students' artwork during the month of May, with a special exhibit on International Migratory Bird Day. Have the students write letters to accompany their pictures to students at their sister school.

Package pictures and letters for shipping. You may wish to include other supplies, such as field guides and educational materials about migratory birds. Include in your shipment a request that your sister school display your students' artwork and draw pictures of birds in their area and letters to send back to your classroom. What a wonderful opportunity to learn more about the birds, people, and cultures of the Yucatan Peninsula!

Note: Initiating an international partnership requires creativity and patience. Communication is key. Currently the best method is e-mail. If possible, identify someone in our sister state with E-mail to help you coordinate with local schools. Be patient. Shipping in and out of Mexico can be time-consuming.

Adapted from *Migratory Birds Issue Pac*, a publication of the U.S. Fish and Wildlife Service (Federal Building, One Federal Drive, Fort Snelling, MN 55111-4056)



Fascinating Falcons

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

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

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



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

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



Iowa's Peregrine Recovery Program

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

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

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

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

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

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

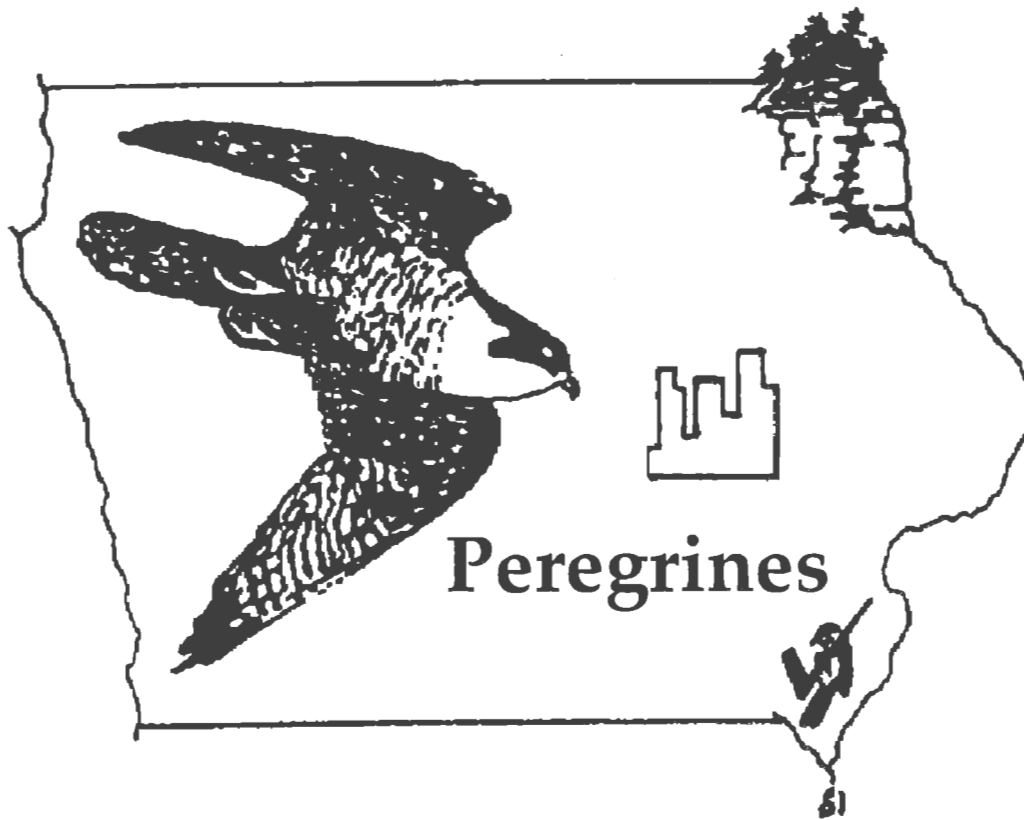
The goal of Iowa's peregrine recovery program was to establish five nesting pairs by the year 2000. Progress toward reaching this goal has been slow, so a Peregrine Falcon Recovery Team was formed. The goal of the group is to establish a sustainable peregrine



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

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

Wildlife Diversity Program





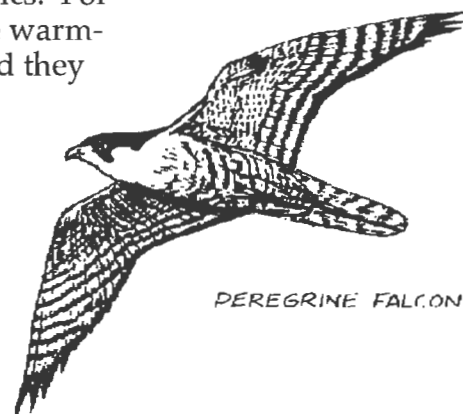
Activity: Suited for Survival

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

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

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

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



PEREGRINE FALCON

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

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

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



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

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

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

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

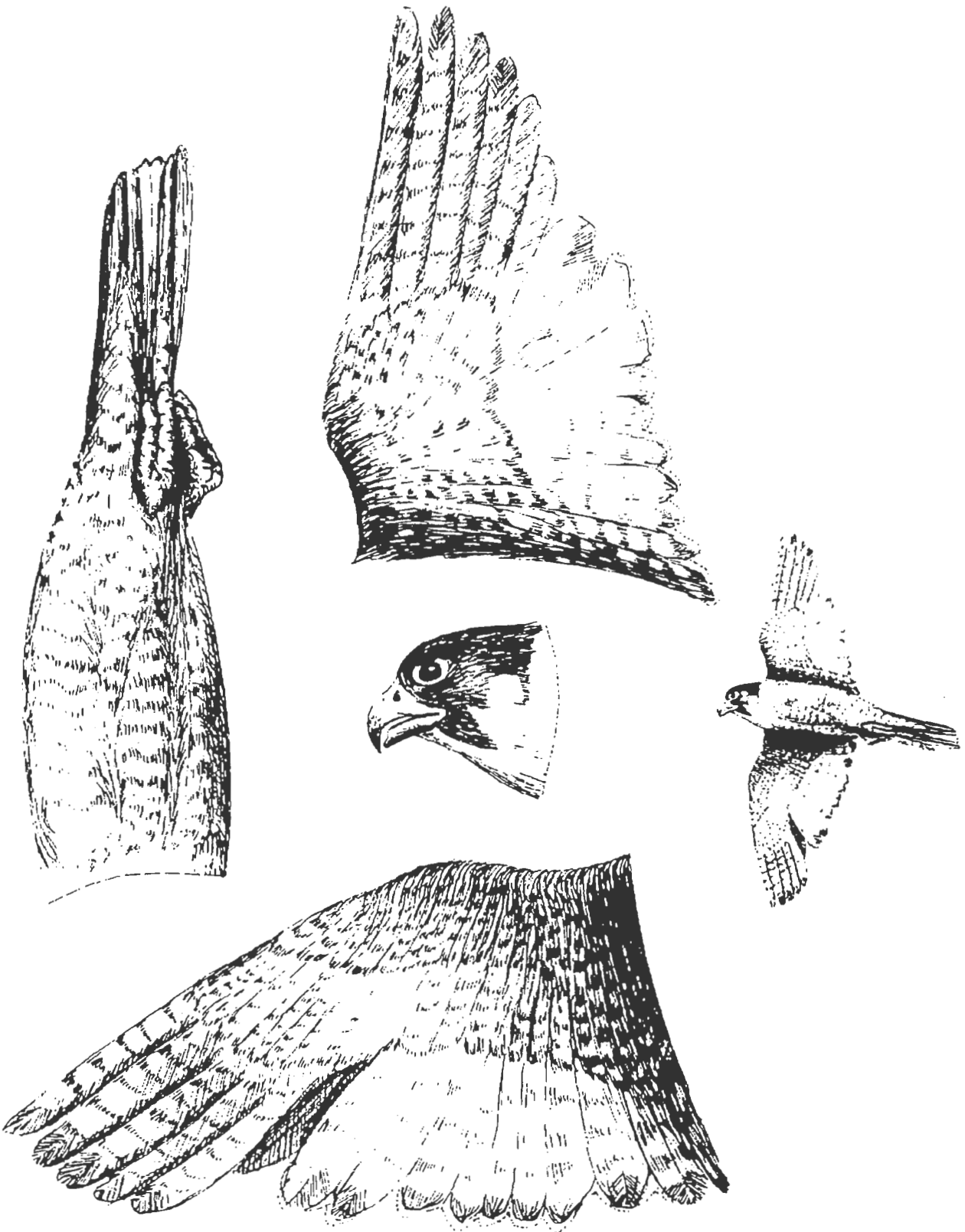
List and compare the characteristics and adaptations of a peregrine falcon to the characteristics and adaptations of a songbird, such as a robin.

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

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



Activity: Peregrine Parts





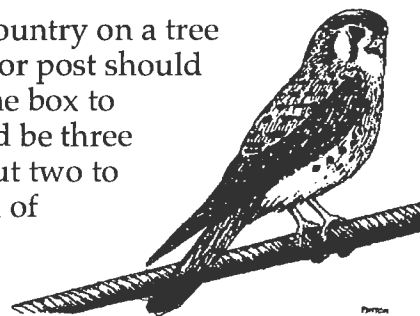
American Kestrel

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

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

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

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



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

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

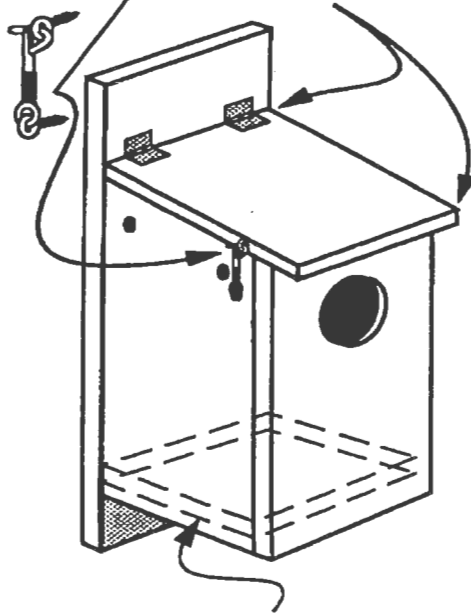


Activity: Build a Kestrel Nest Box

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

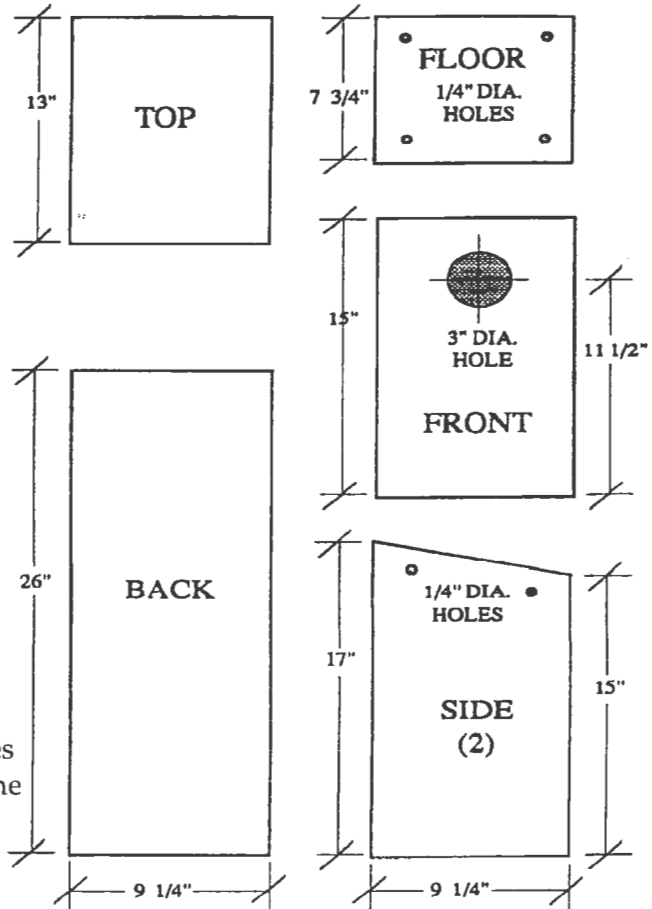
2" spring-loaded safety hook

Bevel front and back ends of lid.



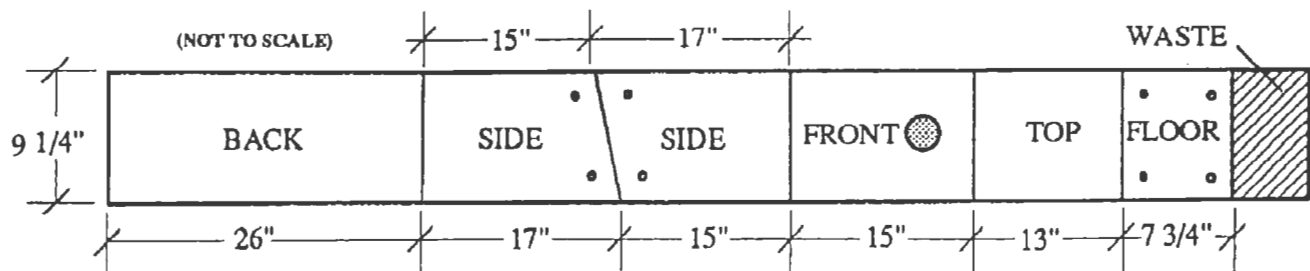
Recess floor 1/2".

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



Lumber: one 1" x 10" x 8' (#2 white pine recommended)

Recommended hardware: 22 -1.5" wood screws (#6), two 2" hinges, and one 2" spring-loaded safety hook





Results of Monitoring Kestrel Nest Boxes in Iowa

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



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

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

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

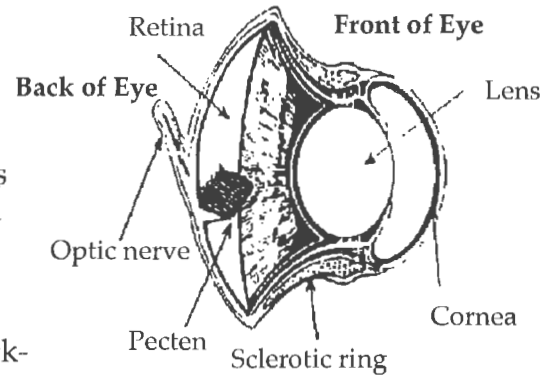
Overall, most nest boxes face south, so most of the nest boxes that have been used by kestrels face south. On two nest box trails where nest boxes are oriented in all four directions, there appears to be no definite direction preference. The type of area in which the nest box is placed appears to be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



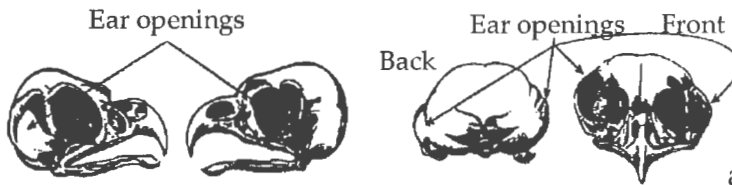
Owls

Owls are nocturnal, meaning they are active at night. They have specially-designed eyes, ears, claws, and wings that allow them to be experts at catching prey.

Owls' eyes are bigger than most other animals' eyes which allows all available light to enter their eyes. This feature makes them the creatures with the best night vision. Because there are so many rods (rods are receptors for light) packed into their large eyes, there is no room for muscles. Therefore, the owl's eyes remain fixed in their sockets. To compensate for this, the owl rotates its head. It can easily look directly over either shoulder. The owl's eyes do not contain cones (cones are receptors for color detection), so it sees only in black-and-white. Owls, like people, have three-dimensional vision which helps locate prey.



The owl's ears are also crucial to hunting in total darkness. The feather arrangement of the facial disc helps gather sound waves and directs the sounds to the ear holes on the edge of the disk. Owls' left and right ears are at different levels so they can catch sounds at slightly different times. This "binaural" hearing allows the owl easily to locate its prey.



fully to better grab onto its prey. Most owls have feathers all the way down their legs to provide warmth in the winter and to assist them with silent flight.

The claws of the owl are called talons. They are sharp and curved. There are four toes on each foot. At the moment of attack, an owl spreads all eight toes

Most birds have feathers that make noise when they fly. But the owl's feathers are fringed along the edges. This reduces air disturbances and reduces the noise of flight so that the owl can hear its prey moving. After capturing its prey, the owl flies back to its roost to eat. It usually swallows its prey whole. If the prey is too large, the owl can tear it into smaller pieces with its sharp, curved beak. The owl's digestive juices cannot break down the fur,



Feather adaptation for silent flight

Detail shows softened edges of feather to aid in silent flight



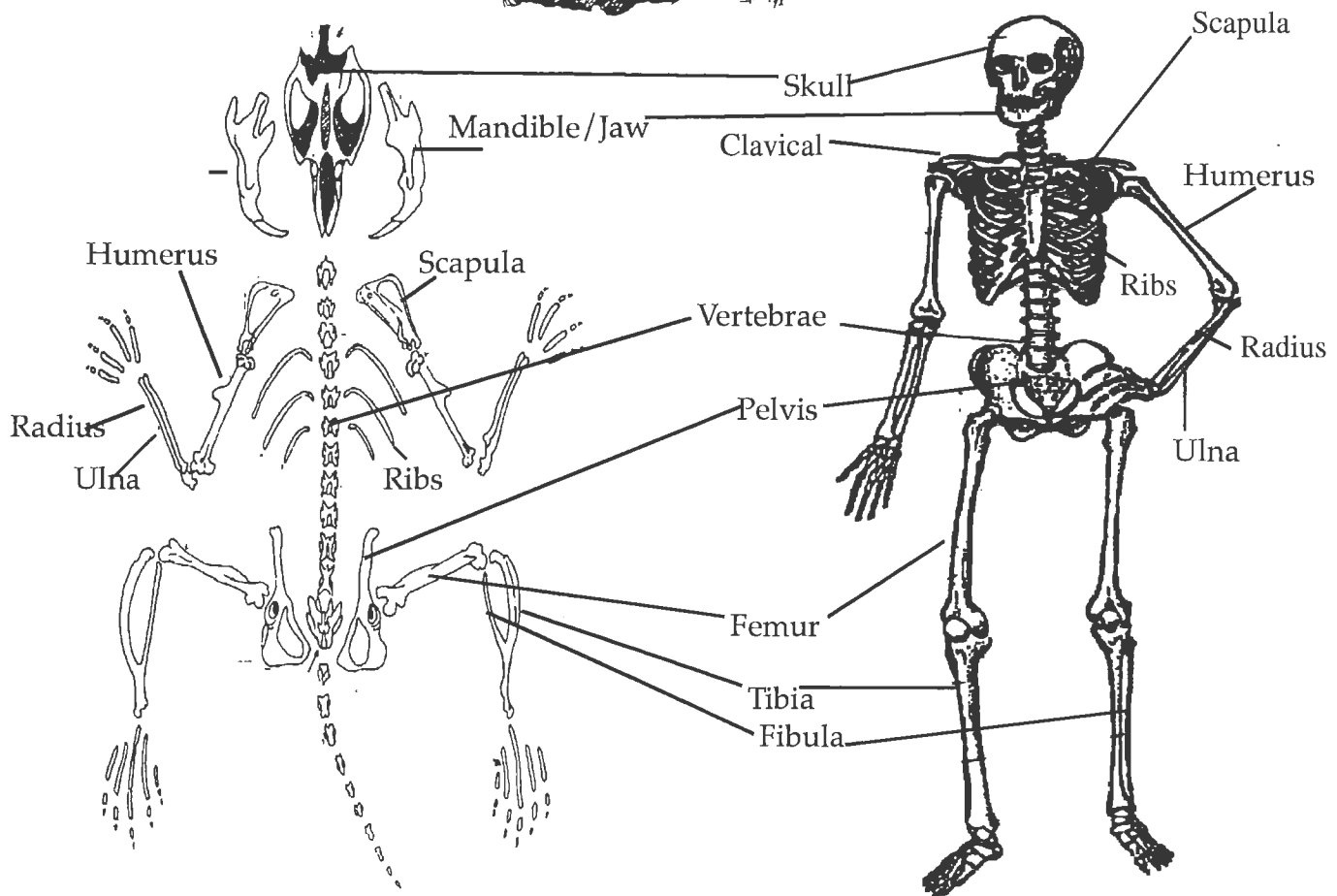


feathers, or bone that it swallows, so those undigestible materials are clumped together in the stomach and then regurgitated through the mouth. These clumps are called pellets and can be very useful in determining an owl's diet which can help determine the distribution of rodents in a given area.

The skeletons of animals such as reptiles, birds, and mammals contain bones that are very similar to humans' skeletal bones. Compare the bones of the small mammals in an owl's pellet to human bones.



Owl Pellet



Mouse Skeleton

Human Skeleton

Adapted from *Material On Owls* from the AIMS newsletter and is used with permission from the AIMS Education Foundation (P.O. Box 8120, Fresno, CA 93747).

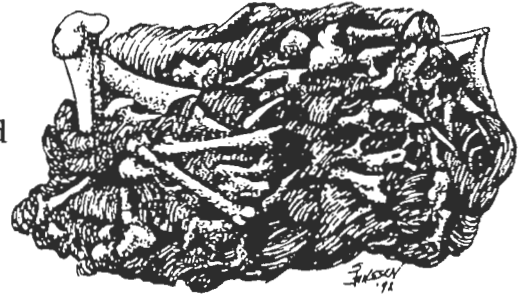
Artwork is used with permission from *Owl Pellet Teacher's Guide* from Mountain Home Biological (P.O. Box 1142, White Salmon, WA 98672).



Activity: Owl Pellets

Objectives: Students will identify the animals whose skeletons are found in owl pellets. Students will investigate a food chain by dissecting and exploring owl pellets.

Materials: Owl pellets, dissecting tools, identification handout sheets, and paper masks. (Owl pellets are easiest to find in the winter when they stand out against the white snow background. Often an owl or groups of owls will use the same tree as a feeding site for many weeks. On a winter outing, encourage students to watch for pellets and save them to use in this exercise later in the year. Dry the pellets and store them in a container. Add a moth ball to control insect larvae living in the pellet. To obtain pellets, contact a local rehabilitator or raptor care clinic. They may also be purchased from some scientific supply houses such as Mountain Home Biological (Box 1142, White Salmon, WA 98672, 509/493-2669, fax 509/493-4321.). Pellets purchased from Mountain Home Biological are sterile. The company also supplies charts, skull sets, and videos.



Background: Many birds-of-prey or raptors produce pellets. Owls are best known for this practice, but some hawks, eagles, gulls, and other birds also produce pellets. The soft parts of their prey are digested in the stomachs of these birds. The fur, bones, feathers, and other hard items are not digested and form a pellet in the gullet of the owl. This pellet is regurgitated from the mouth and can be found under a tree, barn, or wherever the owl may have roosted that night. Owl pellets are made up of bones, teeth, hair, feathers, scales, and insect exoskeletons.

Owl pellets vary in size according to the owl's size, but they are generally oblong in shape and one to two inches in length. The pellets are dry and odorless. They do not contain any fecal matter.

You can often tell where an owl lives or hunts by observing what kind of animal skeletons appear in the pellets. For example, short-eared owls hunt in open fields at dusk, so their pellets contain skeletons of meadow voles, mice, and small birds. Long-eared owls that hunt in the forest eat short-tailed shrews.

Procedure: Lead a general discussion about the foods of birds-of-prey or contact a local naturalist or rehabilitator to talk about owls or hawks with your students. Work in groups of three or four students per pellet. It is recommended that a paper mask be worn to avoid breathing pellet dust. Put the pellet on a white sheet of paper. Ask the students to inspect their pellets and note the size and shape, bones or feathers present, or any other clues that will help the students identify the contents. Begin by gently pulling the pellet apart using a



dissecting needle. Toothpicks also work. Carefully separate the bones from the fur or feathers. Use the identification sheet to lay out and reconstruct the skeletons of the animals. Try to clean the skulls as thoroughly as possible since these are the easiest to identify. Use the types of teeth and their markings to identify the animal. Not all bones and skulls can be identified. After working with the pellets, instruct the students to wash their hands thoroughly with soap and warm water.

Optional:

If proper facilities are available, hair and feathers can be removed more completely by dissolving the pellets with sodium hydroxide (NaOH). Please use appropriate caution when working with NaOH. This method requires adult supervision.

For this technique, 50 gm of NaOH crystals are dissolved in 500 ml of water. Place the pellets in this solution for two to four hours and stir occasionally. This process will sufficiently dissolve hair so that washing the solution through a kitchen strainer completely frees the bones of fur and debris. Washing should be done over a pan to catch any fragments that may pass through the screen. Even very small, delicate bones are unharmed by this process. As in the dissection technique, bones and teeth are sorted by species and are later examined using a hand lens or dissecting microscope and reference materials to identify the specimens.

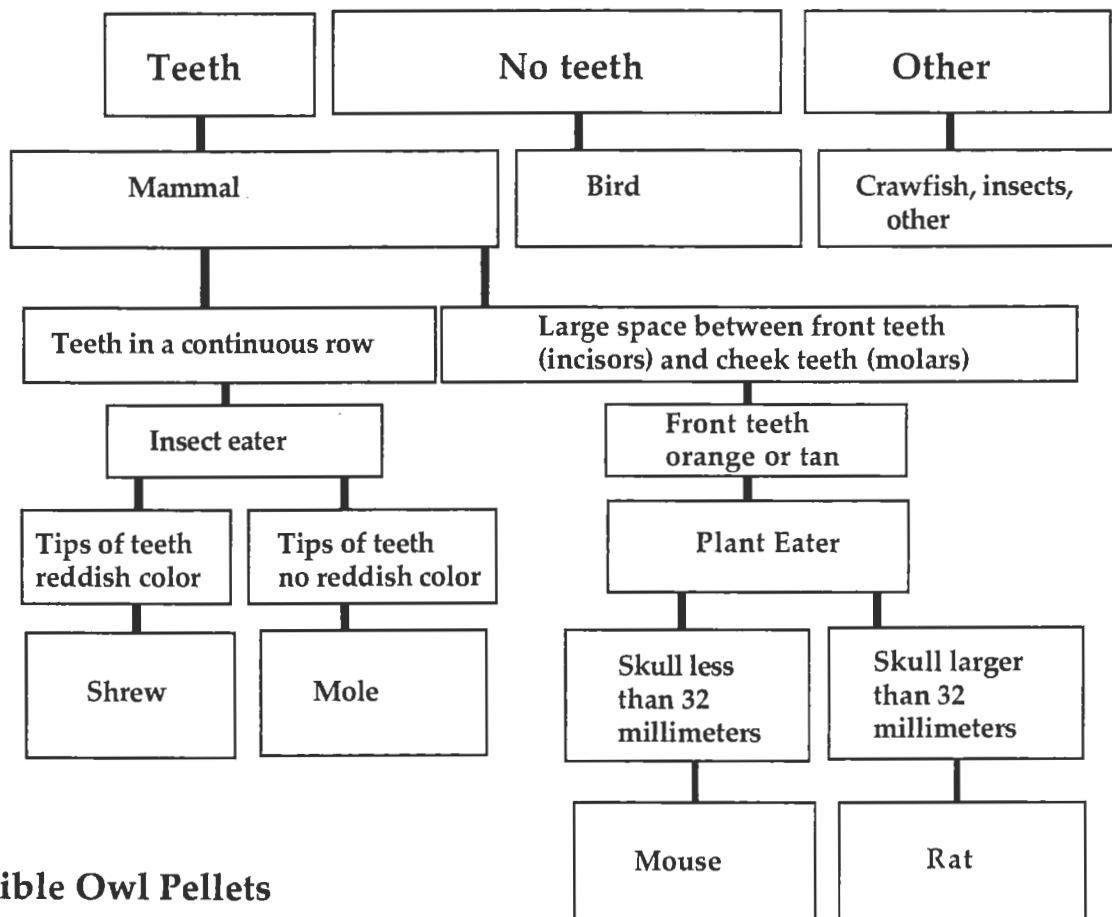
Follow-up: Assume one owl produces one pellet a day. Because owls often swallow their prey whole, each pellet contains virtually complete skeletons of the animals which the owl ate the day before the pellet was formed. Great-horned owls often do not swallow their large prey whole but tear it into chunks to swallow. Find out how many animals your owl has eaten by counting the number of skulls and pairs of jaws. Estimate the owl's annual food consumption. Make a list of the types and quantity of bones the students found (skull, rib, leg bone, etc.) and the number of each. How many individual animals does this represent? How do you know this? Assume that the following types of food are available in the area where this owl lived: grasses, vole, decaying plants, pillbugs, shrews, seeds, and sparrows. Use these creatures to build a picture of the food chains in the owl's habitat.

A word of caution: Many people recommend using masks so students don't breathe the dust from owl pellets. It is also recommended that owl pellets be microwaved at high for 20 seconds or baked for 20 minutes at 350 degrees F. to kill any microbes that might be active. Pellets purchased from Mountain Home Biological have been sterilized by autoclave.



Activity: Owl Pellet Analysis Bone Chart

Pellet Sorting Key: Using skulls found, identify prey consumed.



Edible Owl Pellets

Follow up this activity by making edible owl pellets. Have the students follow the recipes and add an assortment of noodles, fruits, and nuts to represent prey items. These can be sorted and keyed just like actual owl pellets.

Recipe 1

Mix:

2 1/4 cups of Bisquick baking mix
2/3 cup of milk
black food coloring
Add various shaped bits of pasta.
Cook 8-10 minutes at 450 degrees F.

Recipe 3

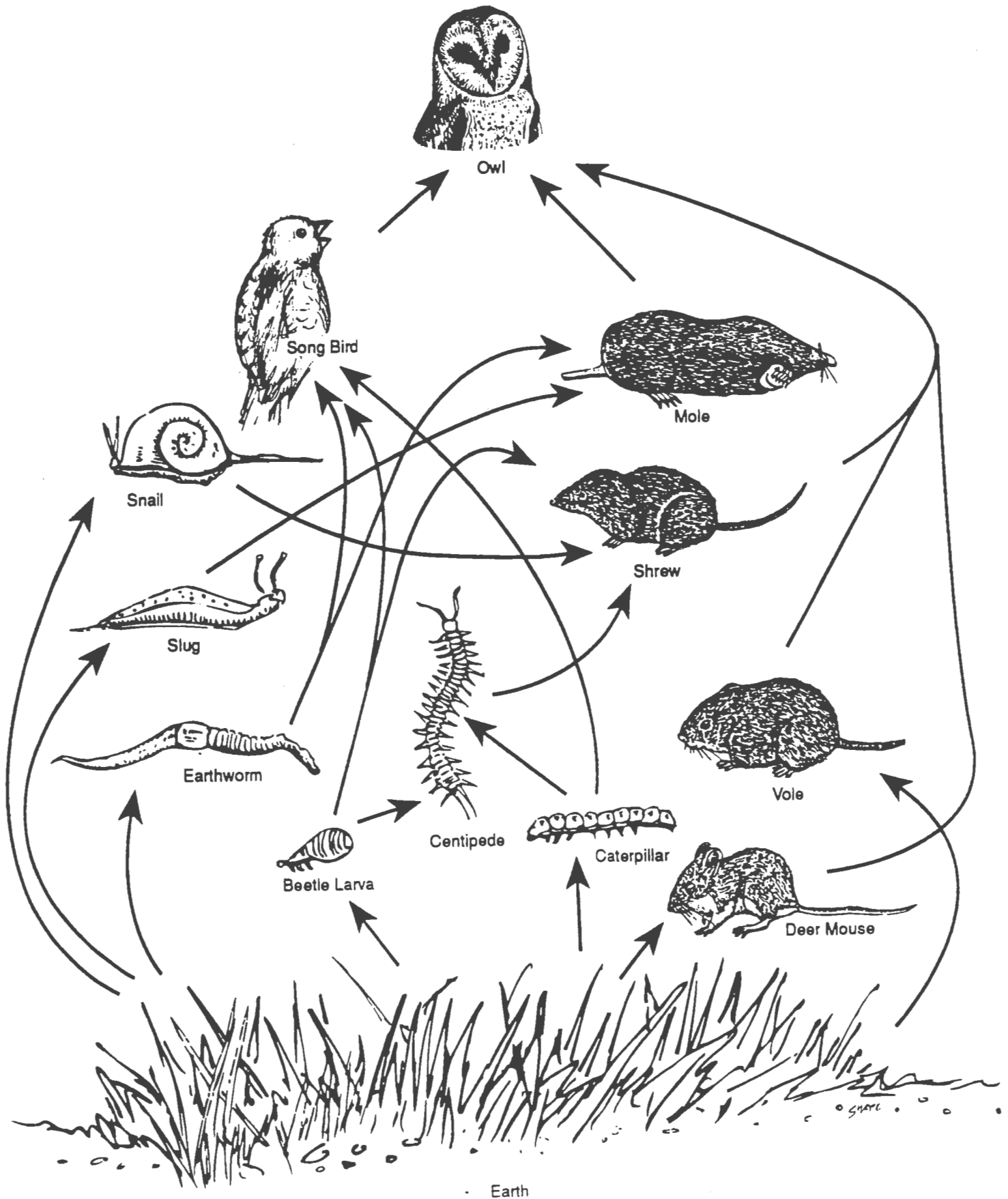
Mix equal parts of peanut butter and honey. Add an assortment of dried fruits, nuts, coconut, and chocolate chips. Shape into pellets and refrigerate until hardened.

Recipe 2

2 1/4 cups of Bisquick baking mix
2/3 cup of milk
1/2 cup of powdered sugar
black food coloring
Mix and add chow mein noodles and bits of Teddy Grahams and animal crackers.
Shape and cook 8-10 minutes at 450 degrees F.



FOOD WEB





Activity: Owl Pellet Analysis Sheet

1. Size of your pellet: length _____ width _____
2. How many skulls were in your pellet? _____
3. What kind of skulls were they? (mammal or bird) _____
4. By looking at the skull, what kind of mammal did the owl eat?

5. What were the diets of the animals whose skulls you found in the pellet?

6. What kind of habitat does this prey animal inhabit (woods, grassland, etc.)?

Class Record

8. Total number of prey animals found (count skulls) _____
9. Total number of pellets examined _____
10. Average number of prey animals in each pellet _____

Tips on Identifying Prey Animals

House mouse - rounded teeth in skull; rear teeth have three rows of cusps



Deer mouse/White-footed mouse - rear teeth have two rows of cusps, one on the outside and another inside

Meadow vole - looking down on the teeth, they form a zigzag pattern



Short-tailed shrew - longer skull; red-stained teeth



Birds - look for their feet and beak in the pellet

Insect parts - the hard backs of beetles and insect mouth parts are often found

Rabbit - larger bones are often broken



Activity: What I found in my owl pellet:

Object	Drawing	Name of Animal	Number Found	Details/ Comments
Skulls and mandibles (jaw bones)				
Leg bones (ulna, radius, humerus, femur, fibula, tibia)				
Ribs				
Pelvis				
Shoulder blades (scapula)				
Vertebrae (back and tail)				
Feet (metacarpals and metatarsals)				
Clavicle (collar bone)				
Other				



Activity: Bone Sorting Guide

Shrew



Skull Top



Mandible/Jaw



Collor Bone/Clavicle



Humerus



Shoulder Blade/ Scapula



Pelvis

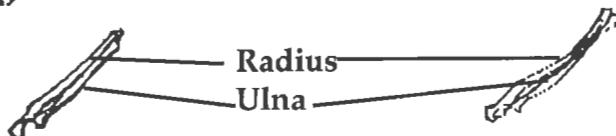


Femur



Fibula

Tibia

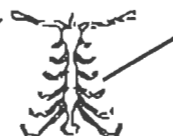


Radius

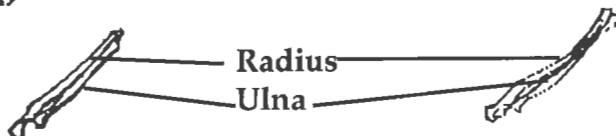
Ulna



Rodent



Ribs



Bird

Radius
Ulna

Skull

Humerus

Ribs

Pelvis

Femur

Fibula
Tibia



Skull Top



GREAT
HORNED OWL

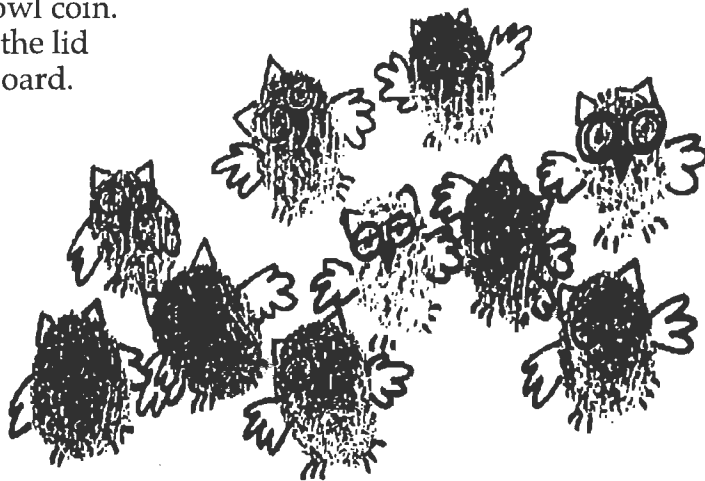


Owl Extras

Long ago, owls were thought to possess magical powers. Some people feared owls, while others worshipped them. Many people have called the owl wise but owls are no smarter than any other bird. The idea most likely came from Greek mythology. Athena, the goddess of wisdom, had an owl as a constant companion. An owl is even pictured on ancient Greek coins dating back to the fifth century B.C.! Discuss the owl and its wisdom. Encourage the students to explain why they think the owl is considered a wise animal. Challenge them to create an owl coin. Recycle margarine lids and use them to draw a circle on tag board. Ask the students to cut out the circle and design an owl coin. When completed, press their designs inside the lid and display the coins on a shelf or bulletin board.

Finger Plays

There was an old owl ("whoo-who")
 Who lived in an oak. (stand like a tree)
 The more he saw, (point to eyes)
 The less he spoke. (point to lips)
 The less he spoke, (point finger to lips as "shhh!")
 The more he heard. (cup hand behind ear)
 Why can't we be (point to self)
 Like that wise old bird? (tap temples)



Book To Read: Read *Owl Moon* by Jane Yolen, a 1988 Caldecot Medal winner (Philomel Press, 1989). In this poetic story, a young girl describes the anticipation and excitement of a night spent owling with her father. The trek through the snow-filled woods, the sighting of the great-horned owl, and the return home all add up to a magical winter evening. John Schoenherr's illustrations are the perfect match to Yolen's storytelling.

Listening Skills: Before beginning to read *Owl Moon*, teach your students to listen carefully and take note of what one needs to go owling: nightfall so that owls are awake, warm clothing to keep warm in the woods, a full moon to help light the way, quietness so you don't scare the owl, bravery so you aren't afraid of night sounds and shadows, patience so you are not disappointed if you don't see an owl, lessons on how to call an owl, hope that an owl will show up, and a flashlight to shine on the owl when it appears. How many different things can you name?

An Owling We Will Go: Plan an imaginary owl hunt. Take the class outside and set a scene similar to the one in the story. Walk the students through an owling adventure, letting your imagination and descriptions provide the scenery. Teach the students how to call an owl and encourage their listening skills.

In Iowa, the barred owl is easy to imitate and will often respond and fly in for a look. Their call sounds like "Who cooks for you? Who cooks for you all?"

This activity is used courtesy of *Copy Cat* (September/October 1992).



How to Use Binoculars

For beginning birders of any age, first attempts to use binoculars (also called field glasses) can be frustrating. A bird that is easily seen with the naked eye is difficult to relocate through field glasses, perhaps giving enough time for the bird to fly away. Only repeated practice makes the process easy.

Finding a moving bird without binoculars isn't very difficult; the human brain naturally picks up small movements in the field of vision. Once the bird is seen, however, the watcher's eyes must hold their position while the binoculars are raised and focused. If the eyes (or the bird) move, don't search with the binoculars. It is always faster to take the glasses down, relocate the bird, and try again.

Practicing with mock binoculars helps to train the eye muscles. Use two paper tubes glued together side by side for your mock binoculars. (Toilet tissue tubes are ideal.)

Practice on a near object. Spot it, then sight it again through the mock binoculars. Distant objects are slightly more difficult to relocate, as are small birds. Practice the process of spot and resight until that part of bird watching becomes second nature.



Focusing the group's attention on a small bird in a large landscape is a challenge made easier by transposing the face of a clock on the area being observed. If the group is looking for a bird in a tree, for instance, the top of the tree would be twelve o'clock. If the bird is closer to the center, give an approximate position relative to the center and its nearest clock position. ("Warbler left of center, about ten o'clock")

Field Glasses

You don't need binoculars to enjoy birds. In fact, watching birds only through field glasses may inhibit you from seeing the rest of the environment - the "big picture" of the bird's world. Still, binoculars are magical. They move you up close to see details you could never see without them. Use binoculars as much as possible to add to your outdoor experience.

If you are purchasing binoculars for bird watching, look for something lightweight. A heavy, high-power pair will be hard to hold steady. Those little birds in the treetops are hard enough to find as it is. Binoculars are usually marked with two numbers. The first number is the power of magnification. Many good birding binoculars are 7 or 8 power. With binoculars of higher power, you may have difficulty focusing on subjects closer than 20 feet. The second number, after the X, measures the width of the lens at the larger end. In general, the wider the lens, the brighter the image. Most birders use 7X or 8X 35 binoculars because of their versatility. Binoculars of 8X50 will bring more light and detail to your eye, but the weight and size may be uncomfortable for long use. Even so, 8X50 binoculars are best scanning for birds over a distant landscape (beach, marsh, open field, or sky). You may be able to use them more comfortably if you can prop your arms on the ground or against a car.

Reprinted with permission from: *Birdwatching for All Ages: Activities for Children and Adults*. 1992. Jorie Hunken. Globe Pequot Press, Old Saybrook, CT 06475



Activity: Birdwatching

Objectives: Students will be able to identify ten birds by size, shape, color, song, habitat, and behavior. Students will be able to discuss and identify bird adaptations.

Materials: Bird field guides, binoculars, clipboards, pencils, checklists, and activity sheets

Background: Birdwatching can be a lot of fun year-round. By visiting different habitats at different times of the year, the students will find different birds. Many birdwatchers or birders have a yearly or life list. These lists can be extensive. Some Iowa birders have big day counts, where birdwatchers try to visit as many habitats and areas as possible all over the state, to observe and count the most species of birds in one day. A successful big day count in Iowa may include 150 or more species. Not all species live in the same habitat, so try to visit several different types of habitats.



© Laura Zerzan From "ECONEWS"

So how do you begin to watch birds? Look at the types of habitats in your area. Determine what season will be best. Spring and fall are good times of the year because many bird species are migrating. The best time to see birds is early morning or late afternoon. Many of the activities in this booklet have been written to facilitate this activity.

Procedure: Arrange the students in small groups with binoculars, pencils, clipboards, checklists, and birdwatching activity sheets. They will fill out the sheet as they walk.

For each bird the students see, observe its body size. Is it sparrow-sized (six inches), robin-sized (ten inches), or crow-sized (20 inches)? Try to pick out field marks to help identify the bird. Does the bird have an eyestripe like a red-eyed vireo or an eye ring like a Nashville warbler? Does it have a crest like a cardinal or does it have a crown stripe like a golden-crowned kinglet? Is the bird plain or is the breast spotted like a wood thrush or streaked like a brown thrasher?

Look at the body shape. Is it chunky like a starling or slender like a cuckoo? Is the tail forked, notched, square-tipped, round-tipped, or pointed? Look at the bill size. Is it an insect-eating beak, a long stabbing beak, thick for nut-cracking, or very long for probing? Are the legs long like a heron or short like a wren?

Does its tail have a a bright-colored flash pattern? Is the tail striped along the side of the tail like a junco or does it have a band at its tip like a kingbird? Do the wings have wing-bars like the goldfinch or none like the robins?



Observe the habitat. Was the bird seen in fields, meadows, or brushy areas? Cities or towns? Deciduous woodlands, freshwater ponds, lakes, or marshes?

How does the bird behave? When it flies, does it dip up and down (undulate) like a goldfinch or fly in a straight line like a dove? Hover like a kestrel or soar like a gull or hawk? Beat its wings slowly like a heron or rapidly like a duck? Does it climb trees like a nuthatch or hop on the ground like a robin? Does the bird flick its tail or dart after an insect like a flycatcher? Is the bird wading in water like a heron or does it run along the shoreline like a shorebird? All of these behaviors are clues to help identify the bird.

After identifying as many characteristics as possible, use the field guides to identify the birds. Select ten common Iowa birds and go birdwatching to find those birds. Despite your best efforts, there will always be some birds you can't identify. With some practice, however, you should be able to identify most of the birds you see. That is part of the challenge of birdwatching.





Activity : Birdwatching ID Sheet

Size: Is the bird larger than a sparrow (six inches), a robin (ten inches), or a crow (20 inches)?

Shape: Body shape: plump, sleek, thin, short, streamlined
Beak shape: thick, thin, long, short, stabbing, straight, curved
Head shape: crested, plain
Tail shape: forked, notched, square-tipped, round-tipped, pointed, long, short
Leg shape: long, short, feathered, featherless
Foot shape: webbed, lobed, talons, perching

Color: Wingbars, rump patch, eye ring or stripe, crown color
Breast pattern: streaked, spotted, plain

Habitats: In what type of habitat is the bird observed?

Behavior: How is the bird acting?

Song: Identify words to the sound.

[illegible]



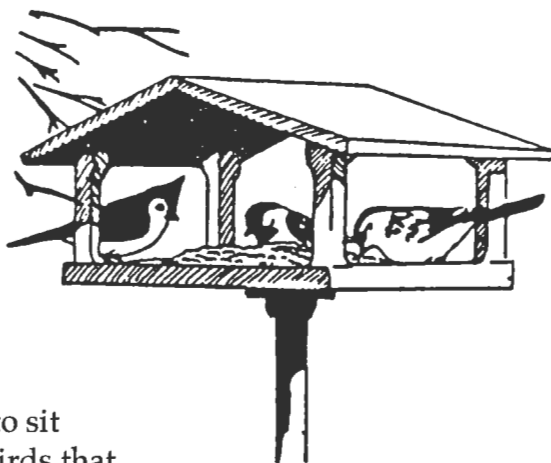
Activity: Counting Birds

Objective: Students will count the birds at bird feeders around the school yard to compare and organize data from these studies.

Background: A wide variety of bird counts are possible. We will introduce two different kinds of counts that are easily adapted to different teaching situations: counts of birds at bird feeders and counts of birds seen at your school yard or along the students' routes as they travel to and from school.

Bird Feeder Counts

Procedure: The first thing you need is a bird feeder. This might be set up outside a classroom window or near the school so students can see the birds while at school. Students may also set-up bird feeders at home and watch them there. It is best to do this activity during the winter when birds are easily attracted to bird feeders.



The actual count of birds at the feeder can be done a number of ways. The usual procedure is to sit quietly near the feeder and count the number of birds that visit during a set period of time. This time period depends on how much time you have available but might be as short as ten or 15 minutes and as long as an hour. It is most interesting if the students count the number of individuals of each species that they see at one point in time and then again in an hour. In one hour, the same sparrow could fly in and out 50 times and should not be counted as 50 different sparrows. There may be some birds that they can't identify, but this would be a good time to learn new birds. Record these unknown birds as unidentified species.

Be sure to have pencils and paper available so the students can write down what they see. It is easy to lose track if the feeder is busy.

Follow-up: At the end of the count period, make a list of the different kinds of birds the students saw and the number of individuals of each kind.

- Was one species more common than others or were they all present in about equal numbers?
- Does the relative abundance of the different species at the feeder match what appears to be the relative abundance of the different kinds of birds in the area? If it doesn't, could this mean that some birds are more attracted to feeders than others?



- Ask the students what the different kinds of birds ate. Did they all take the same food or did some seem to select different kinds of foods at the feeder? If so, which birds showed this behavior and what did they select?
- If your classroom has a computer with a graphics program, you could enter the data into that program and produce graphs or pie charts of the data.

If the students are counting birds at feeders at school and at home, compare the results.

- Which feeders had the most birds and which had the fewest?
- Why do you suppose that happened?
- Did the feeders have similar food available or did one have different kinds of food? Why might this be important?
- Which feeder had the most species? Which had the fewest?
- Are there differences in the habitats around those feeders?
- What effect did surrounding habitats have on the species you saw?

A bird feeder study becomes much more interesting if you can repeat it at least once or perhaps several times over a period of several weeks or months. If so, try to keep the length of time the students watch the feeder the same and count the birds using the same method. However, the time of day they watch the feeders could be different.

When you finish this count, list the birds seen and the number of each species. Next, compare the different counts to see which had the most or fewest individual birds and which feeders had the most or fewest species of birds. Can the students use these numbers to better understand birds and their habits?

- Do different species seem to feed at different times of the day?
- When do the species you saw seem to feed?
- What time of the day had the most species? The fewest?
- If the weather was different on the days you watched the feeders, what effect did it have on the birds you saw? Why do you suppose that happened?

Outdoor Bird Counts

Procedure: These counts are similar to those at a bird feeder except that they are conducted outdoors. These counts may also be conducted at any time of the year. Again, you need a few simple rules related to how long the count will last and where it will take place.

An easy place to start would be to count the birds on your school property. Have the students map out a route that will cover most of the property. Ask the students to carefully walk that route and at certain spots stop and count the birds that they see for five minutes. Make sure that they have paper and pencils to keep track of what they see. It is most interesting to note all of the different species they see, but if that is not possible, count only the most obvious or most easily identified species.



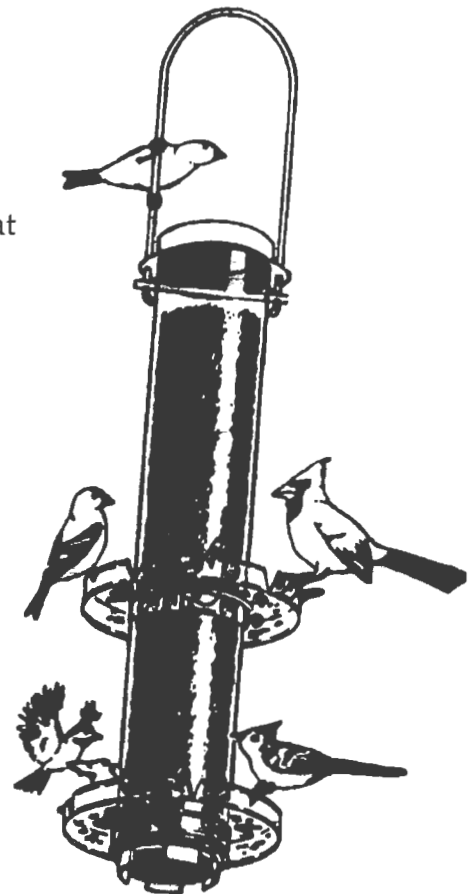
Follow-up: Once the count has been conducted, make a list of the species the students saw and the number of individuals of each kind.

- Which species was the most common?
- Was it the species you expected to be most common?
- If you made a bird feeder count, did both kinds of counts have similar results? If not, can you explain why they were different?

As with bird feeder counts, these counts are much more interesting if they can be done at different times of the year. If so, compare the results from the different seasons.

- Are some species present throughout the year? Which ones?
- Is one species most abundant throughout the year or does that change?
- Which time of year has the most species? The fewest?
- Which species migrate? Where did they come from and where are they going? Which species stay with us throughout the year?
- At what time of year did you find the most birds? Why?
- Which time of year had the fewest? Why?

Countless other exercises are possible by counting birds at bird feeders around the school area. The attached form for the winter bird feeder survey is an example of a statewide survey that is conducted every winter. You and your students might participate in this annual survey.



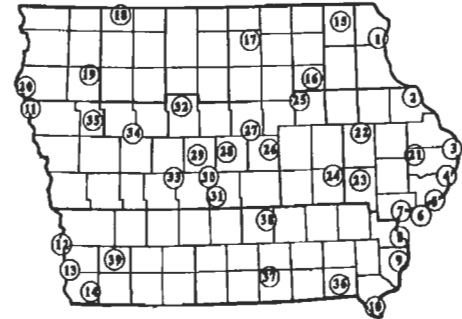


Activity: Bird Counts

Objective: Students will investigate and gather data by participating in an annual bird count.

Background: The annual Christmas bird counts are sponsored by the National Audubon Society. The counts involve 1,350 localities throughout the U.S., and more than 40,000 people participate. The counts are held in late December or early January. In each count, participants attempt to count all of the birds they can locate in a circle 15 miles in diameter. Counts are limited to a 24-hour day.

Materials: Binoculars, warm clothes, and friends



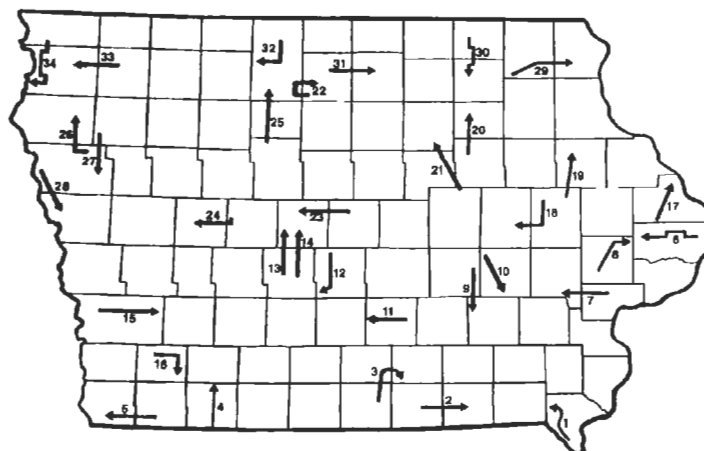
Locations of Iowa Christmas Bird Counts, (1995-96)

Procedure: Contact your local Audubon Society or other bird club for the date and place of the annual Christmas bird count. It's a fun and educational way to get students outside to learn about the birds in the winter.

Breeding Bird Counts

Breeding Bird Surveys were started in 1966 and are based on randomly-selected routes following public roads, along which a volunteer observes and records birds seen or heard. Each route is 24.5 miles long and consists of 50 three-minute stops. These same routes are censused in early summer each year. The results provide our most reliable information on breeding populations. In recent years, this data has shown that populations of some Iowa species, including some neotropical migrants, have declined.

Breeding Bird Routes in Iowa





Winter Bird Feeder Survey

The annual winter birder survey is sponsored by the Iowa Ornithologists' Union.

On two consecutive days during January, decided by the sponsors, observe your feeder. Using this form, describe your feeder and record the birds that visit your feeder. In the space provided, list the highest number of each species you saw together at any one time. For example, if you saw ten juncos at 9 a.m., 11 at 12 noon, and seven at 4 p.m., the number you should record is 11. If males and females can be distinguished (cardinals, downy woodpeckers, etc.), record the combined total. For example, if you saw three male cardinals at 11 a.m. and one male and two females at 2 p.m., record five cardinals—the highest count for the males and the highest count for females combined. Count only on the two consecutive days and record only the birds that you see at your feeder, under your feeder, or in the trees around your feeder. Do not count birds which just fly past your house and do not use your feeder area. We want information only about birds influenced by your feeders. If you cannot get an exact count, record your best estimate. An honest estimate is far more useful than "umpteen" or "too many to count."

**If you see a rare or unusual bird, please report it
to the Iowa Birdline at 319/338-9881.**

Please complete this form carefully.
Feel free to copy this form and distribute this form to others.
Thank you and enjoy yourselves!

Please mail this completed form to:

R.J. Hollis
3351 Lower West Branch Road
Iowa City, Iowa 52245

If you would like a personal reply, please send a stamped, self-addressed envelope. Reply time will be about 12 months.

Results are published in the IOU newsletter.



Bird Feeder Survey

Please complete this form carefully. Feel free to copy the form for friends and patrons. Thank you and enjoy yourselves!

1. Name _____
- 2A. Address _____
- 2B. County _____ 2C. City _____ 2D. Zip _____
3. The feeder survey period this year runs from Thursday through Sunday. Count birds on two consecutive days only. Please record which days you counted birds for us in the space below.
Check one: _____ Thursday and Friday
_____ Friday and Saturday
_____ Saturday and Sunday
4. Is your feeder in town (including suburbs) or in the country?
Circle T or C
5. Check the ONE description which best describes the area within a two-block circle around your feeder:
_____ suburban, houses with shrubs and small trees but few trees wider than 20 inches
_____ suburban bordered by (circle one): timber, grass, field, or row crop
_____ town, neighborhood has many mature shade and street trees
_____ downtown with mostly buildings, sidewalks, roads, parking lots, high rises
_____ pasture
_____ row crop (corn, beans, etc.)
_____ timber
_____ farmstead with mature trees and shrubs around the house
6. Type and number of feeders: _____ Thistle _____ Sunflower (only) _____ Fruit _____ Safflower
_____ Peanuts _____ Mixed seed _____ Peanut butter _____ Suet _____ Cracked sunflower _____ Corn
_____ Millet (only) _____ Unfrozen water _____ Other _____
7. On what date did you start feeding during the year? _____
8. Comments or additional description of your feeder or yard: _____

Highest Number Seen for Each Species During Two Consecutive Days

- | | |
|---------------------------------|------------------------------------|
| _____ Ring-necked pheasant | _____ White-throated sparrow |
| _____ Rock dove (common pigeon) | _____ White-crowned sparrow |
| _____ Mourning dove | _____ Harris' sparrow |
| _____ Red-headed woodpecker | _____ Dark-eyed junco (All races) |
| _____ Red-bellied woodpecker | _____ Red-winged blackbird |
| _____ Downy woodpecker | _____ Grackle (common) |
| _____ Hairy woodpecker | _____ Brown-headed cowbird |
| _____ Flicker (All races) | _____ Purple finch |
| _____ Blue jay | _____ Common redpoll |
| _____ Crow (American) | _____ Pine siskin |
| _____ Black-capped chickadee | _____ Goldfinch (American) |
| _____ Tufted titmouse | _____ Evening grosbeak |
| _____ Red-breasted nuthatch | _____ House (English) sparrow |
| _____ White-breasted nuthatch | _____ (other) _____ |
| _____ Brown creeper | _____ (other) _____ |
| _____ Robin (American) | _____ (other) _____ |
| _____ Cedar waxing | _____ (other) _____ |
| _____ Starling (European) | _____ (other) _____ |
| _____ Cardinal (northern) | _____ (other) _____ |
| _____ Tree sparrow (American) | _____ (other) _____ |
| _____ Song sparrow | _____ Total different species seen |



Let's Take Some Birds to Lunch!

Why feed birds?

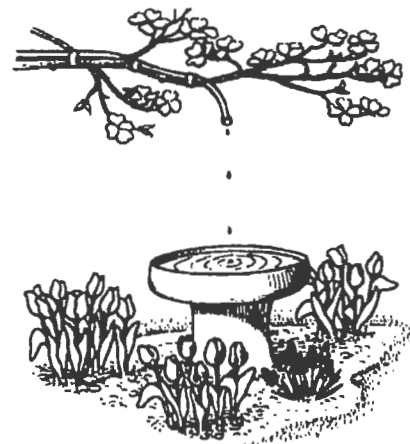
Enjoyment! Birdfeeding is one of the most popular recreational activities enjoyed by U.S. residents. Of all the hobbies Americans enjoy, gardening is the most popular hobby, followed by birdfeeding. In 1991, 2.05 billion Americans fed birds. Birdfeeding is also becoming big business. Each year, more than two billion dollars' worth of bird seed is sold in the U.S. In Iowa, more than 900,000 people feed wildlife and spend about 24 billion dollars on supplies.

Birdfeeding has even changed some migration patterns. Iowa's state bird, the American goldfinch, now spends winters in Iowa because so many people supply them with their favorite foods during the winter months. And cardinals have expanded their winter range into Canada as a result of feeding.

Getting Started

To get started in birdfeeding, you must first consider the basic needs of wildlife. Wildlife, like humans, need something to eat, protective cover where they can raise their young, shelter, and water to drink. The amount and quality of the food, water, and shelter in your yard and neighborhood will influence the number and types of birds that you attract to your bird feeders.

Hedges and conifers provide nesting sites for birds during the summer and shelter during the winter. Certain plants provide food for wildlife. Berries such as mulberry, cherry, and raspberry provide spring and summer meals. Sunflowers and honeysuckle provide food into the fall. Crabapples, rose hips, nut-bearing trees, and vines such as bittersweet and grape are winter crops. Grassy patches and flowers such as black-eyed susan, goldenrod, coneflower, sumac, marigolds, and zinnias provide seeds for birds during the winter. Some sort of watering place is important to attract birds which especially like the sound of trickling water.



The best time to start feeding birds in Iowa is during October or early November. During this time, birds which will spend the winter in the area are setting up their feeding circuits. If you have your feeders up at this time, more birds will include your feeders in their feeding route. Try to locate your feeders where you can easily view them without disturbing the birds. Remember to hang your feeders where you can conveniently refill them. Also hang feeders near cover such as trees or shrubs. These provide perching areas while birds wait their turn to feed. If there are no nearby shrubs, you may provide cover by building a small brush pile or use old holiday trees. Be sure to place your feeders out of the wind if possible.

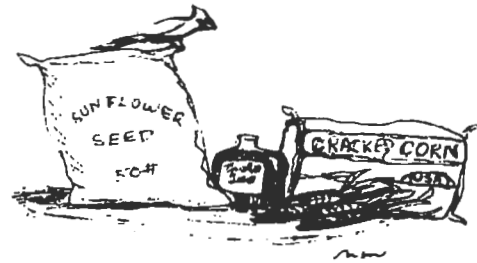


Many people believe that once you start feeding birds you must not stop. All the answers are not known. Recent research has shown that birds use a variety of nearby natural foods in addition to our feeders. If your feeders become empty during a winter vacation, it will probably have little effect on the population of birds. It would be most helpful to plant food-producing vegetation to provide the birds with natural food and cover to supplement your feeders.

Let's Eat

The phrase "eat like a bird" is simply not true. In the winter, a bird will eat 30 to 80 percent of its body weight each day. This is like having an 80-pound child eat 150-200 hamburgers each day!

Studies of birds at feeders have shown that the most attractive food for the widest variety of birds is sunflower seed. Of the different types of sunflower, black oil sunflower tends to be the most popular and it is high in protein and fat. The next most popular food is white proso millet, followed by suet and peanuts. Niger thistle seed is especially attractive to American goldfinches and house finches. It is more expensive, so it is best dispensed in a tube feeder with small holes.



Many commercial bags of bird seed are full of filler seed such as milo, wheat, hulled oats, rice, oats, groats, flax, and rape seed that are not highly preferred by most birds. Although it seems cheaper in price, buying bulk preferred seeds usually saves you money in the long-run.

Feeding Styles

Birds have different types of bodies, bills, and feet so they tend to prefer different feeding styles. Consequently, there are different types of feeders to attract different types of birds.

GROUND FEEDERS will attract cardinals, blue jays, pheasants, quail, pigeons, mourning doves, various sparrows, and juncos. These birds will often feed on seeds spilled from hanging feeders or on a ground-type feeder. These birds can be fed with food placed on the ground or on a simple tray mounted on a stationary object such as a post, stump, or pole. Place this feeder five to ten feet from your house.

PERCH HANGING FEEDERS will attract goldfinches, chickadees, nuthatches, pine siskins, and woodpeckers. These feeders are often free-swinging and used by birds that don't mind swaying in the wind while they feed. The feeders can be tubes or silo-type feeders. These should be placed at least five feet off the ground and out of jumping reach of squirrels.



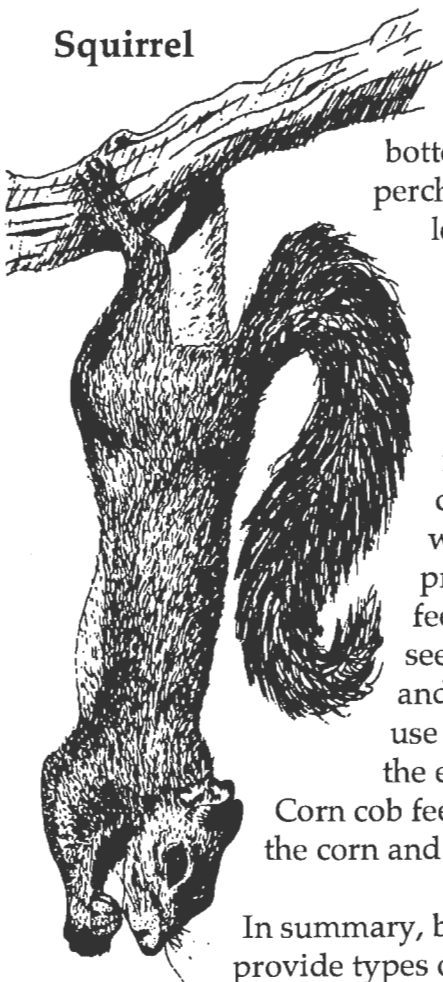
CLINGING FEEDERS provide no perches and come in a variety of forms. Log feeders, an onion bag filled with suet, or a dead tree are examples. Hairy, downy, and red-bellied woodpeckers are attracted to clinging feeders. Their feet are especially adapted for grabbing this type of feeder. Black-capped chickadees and white and red-breasted nuthatches will also frequent these types of feeders.

Feeder Problems

Sooner or later you may encounter some problems with your feeders. Some of the most common problems are house sparrows, starlings, and squirrels.

House sparrows and starlings are not native to the U.S. and will out-compete and even kill many of our native birds. They are not protected by law and can be trapped or otherwise selectively removed. House sparrows do not particularly like

Squirrel



hanging feeders. You may further discourage them from using hanging feeders by eliminating bottom trays and by cutting the perches to less than one inch in length. Another way to discourage

house sparrows is to set up a ground feeding station far away from your hanging feeder and place different foods in both feeders. Your goal is to lure the pests away from your feeder near the house.

Squirrels can jump more than four feet to reach a feeder and can climb any wooden post. Metal posts and clotheslines will slow squirrels down, but they are not always squirrel-proof. With some squirrels, you may have to wire your feeders shut to prevent the squirrels from getting into the seeds. Round or funnel-shaped baffles can be attached above and below the feeders to help keep out squirrels. You can also use tubing to make it difficult for them to reach the feeders. In the end, compromises such as separate feeders seem to work.

Corn cob feeders are simple to make and will encourage squirrels to eat the corn and not plunder the birdfeeder.

In summary, birds tend to feed in different areas, so you may want to provide types of feeders. Supplying preferred foods such as sunflower, millet, suet, and peanuts and landscaping your yard to provide proper habitat will ensure that you will successfully take some birds to lunch!



Starling



Activity: Birdfeeding

Objective: Students will construct various types of birdfeeders and will match birds with their feeder types and food.

Procedure: Ask the students to find pictures of different winter birds. Display the pictures. Talk about feeding birds and display examples of the different types of seeds that birds eat, as well as examples of the different types of feeders (ground, hanging, tree trunk, and squirrel).

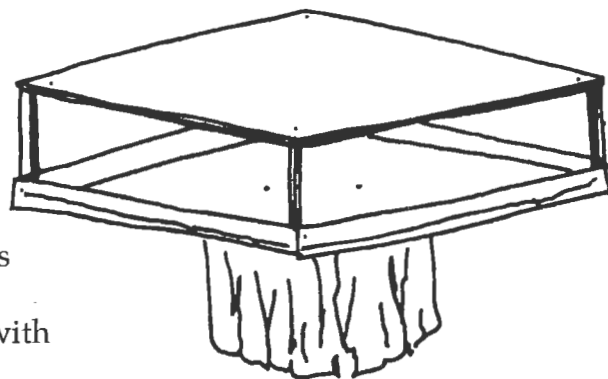
This activity has eight stations and takes approximately three hours to complete. Each student will make a pop bottle hanging feeder and a peanut butter pine cone feeder. Rotate the students through each station so they get an opportunity to make different kinds of feeders. You may modify this activity to make fewer types of feeders. It is often helpful to have one or two adults at each station to help in construction of the feeders.

Ground Feeders

Station 1

This is just one style of a ground feeder. The wood should be precut. A high school shop class or a parent might assist in cutting the wood. Have the students use hammers and wear safety goggles while building the feeders. It is best to attach the bottom of the feeder to the log base before adding the roof; otherwise there is not enough room for the hammer between the roof and the bottom of the feeder. Adult supervision and assistance is needed.

2 pieces of $\frac{1}{4}$ " plywood cut 12" x 15"
2 support pieces of wood cut 5"
2 support pieces of wood cut 4"
(The roof will be slanted.)
1 6" log cut even at both ends for the base of the feeder
2 pieces of $\frac{1}{8}$ " lattice cut 12" for the sides
2 pieces of $\frac{1}{8}$ " lattice cut 15" for the sides
Use finishing nails for most of the construction. Anchor the log to the base with shank-type nails.

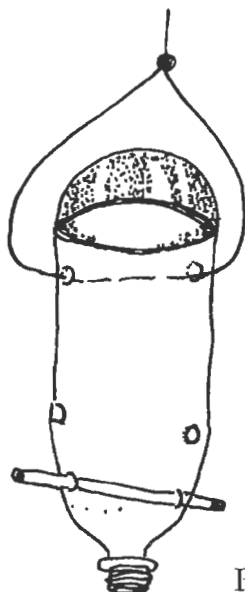


Birds that use ground feeders include blue jays, cardinals, mourning doves, house sparrows, pheasants, and evening grosbeaks. Fill ground feeders with sunflower, cracked corn, or mixed seed.

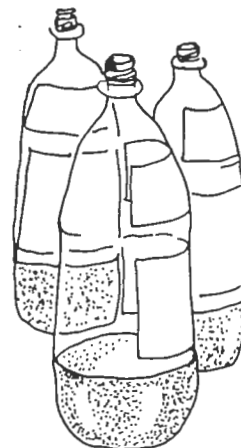


Hanging Feeders

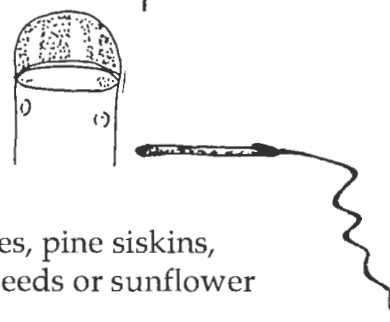
Station 2



To make pop bottle feeders, you will need one two-liter pop bottle **with cap** and one pencil per child. Make sure the pop bottle is clean and dry inside. Before the children start this activity, have an adult melt six holes into the plastic bottle with a soldering iron. (See diagram.) The holes should be the diameter of the pencil. By melting the holes, a lip is formed and the seed doesn't fall out as easily. Have the children put their pencils in the bottom holes. The string should be strung in the top holes. Pipecleaners work well as a large needle to thread the string through the holes.



Place tape over the holes if the students fill the feeders with seed. To fill the feeders, cut a two-liter pop bottle in half and use the mouth of the bottle as a funnel.



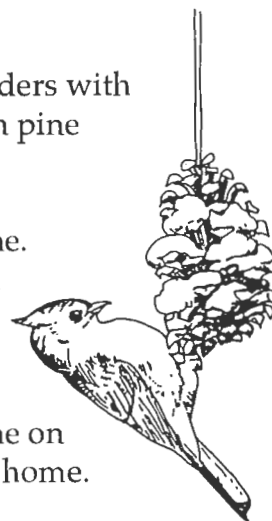
Birds that visit hanging feeders include chickadees, crossbills, American goldfinches, house finches, purple finches, pine siskins, and common redpolls. Fill hanging feeders with sunflower seeds or sunflower hearts.

Tree Trunk Feeders

Station 3

Peanut butter pine cone feeders are easy to make and popular feeders with the birds. Corn cobs picked from farm fields also work well when pine cones are scarce and when working with younger children.

Spread newspapers on the table. Tie a string to the top of the cone. Using a popsicle stick (fingers get messy), smear peanut butter all over the pine cone. After the pine cone is covered in peanut butter, dip it into a bucket of mixed bird seed and roll it around to thoroughly coat the cone with the mixed seeds. It is also helpful to place the pine cone in a bag with the student's name on it. This allows for fewer mix-ups when distributing cones to take home.

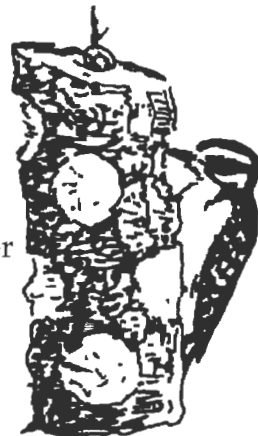




Suet Log

Station 4

Use a dead log approximately four inches in diameter and 16 inches long. Using a 1/2 inch or larger drill bit, drill several holes about 1/2 inches deep along the sides of the log. Safety goggles should be worn, and adult supervision and assistance is best for this activity. On the end of the log, attach a small eye screw to hang from the feeder with wire. Fill the holes with beef suet and hang it from a branch of a tree.



Instead of drilling holes into the log, pop bottle caps may be nailed along the sides of the logs and filled with suet.

Suet Ball

Station 5

Using a hot plate, pan, and spoon, the students can make several types of suet balls. Ask a local grocery store or meat locker to donate beef suet to your class. If the suet is ground first, it will melt better in the pan. Junco jumble is a favorite recipe. *My Recipes Are For the Birds*, written by Irene Cosgrove and illustrated by Ed Cosgrove, contains fun recipes to create unique bird foods. Have the students, with an adult helper, melt the suet and mix the ingredients together. After the mixture is hard, slip the suet mix into an onion bag and hang it on a tree branch.

Junco Jumble

Raw beef suet
1 1/2 cups of cornmeal
1 cup of millet
1 cup of cracked corn
1/2 tablespoon of grape jelly
1 teaspoon of sand or grit



In a pan, melt the beef suet until it is soft. Let it cool slightly. Add other ingredients and mix well. Place the mixture in a pan and refrigerate. When the suet is hard, put it into an onion bag and hang it on the trunk of a tree.

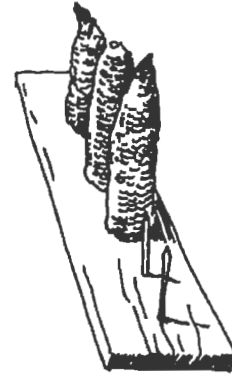
Birds that visit suet feeders include hairy woodpeckers, downy woodpeckers, chickadees, white-breasted nuthatches, and tufted titmice.



Squirrel Feeder

Station 6

Using scrap lumber, nail six-inch-long nails through a wooden plank. Carefully stick ear corn onto the nails, and set the feeder up into a tree or on a fence post. Be sure an adult is present to supervise.



Seed Jar

Station 7

Make a seed jar to help students identify seeds. To make a seed jar, the students will layer a variety of seeds: white millet, red millet, sunflower, cracked corn, and peanut kernels. Use a large jar and layer the different seeds into the jar like a sand painting. After the jar is full, cap the jar. Make sure there is no empty space at the top, to prevent the seeds from mixing when the jar is handled. Use labels to name each layer of seed. It is helpful if the seed is prepackaged in bags that are labeled for the students to use.

Quiet Ideas

Station 8

The quiet station may be set up in another room. Show movies or videos to describe bird feeding. Display pictures of winter birds and play a tape with common Iowa winter bird calls. Bird call tapes are available in most book stores. (See also "Bird Sounds" activity.) The students may draw pictures or they may string cranberries and peanuts on threads to hang on trees for birds. It is helpful if a adult helper has threaded the needles beforehand and is available to help knot the strings.

Follow-up

Evaluate the school grounds (with permission from school administrators) as wildlife habitat, and place the classroom feeders outside the classroom. Students should maintain the feeding stations all winter and spring. Keep a list of birds that visit the feeders. A spring activity might include planting flowers and shrubs in an area that next fall may become a bird feeding station.



Bird Species and Their Food Preferences

Black-oil sunflower

Cardinals, blue jays, chickadees, evening grosbeaks, nuthatches, tufted titmice, purple finches, and downy, hairy, and red-bellied woodpeckers

Sunflower hearts

White-throated sparrows, goldfinches, house finches, cardinals, blue jays, chickadees, evening grosbeaks, nuthatches, tufted titmice, purple finches, and downy, hairy and red-bellied woodpeckers

Peanut hearts

Blue jays, juncos, nuthatches, and downy, hairy, and red-bellied woodpeckers

White proso millet

House sparrows, mourning doves, tree, field and song sparrows, white-throated sparrows, and juncos

Niger thistle

Goldfinches, house finches, and purple finches

Cracked corn

Juncos, mourning doves, blue jays, white-throated sparrows, house sparrows, and grackles

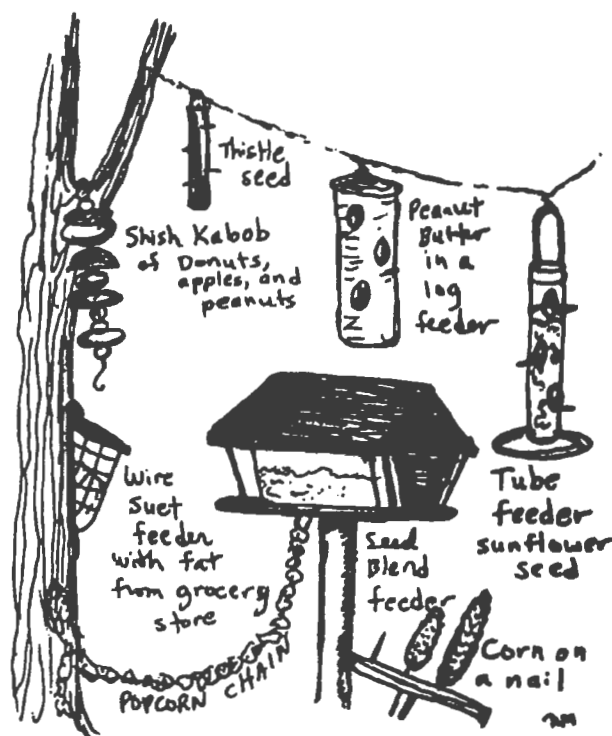
Suet

Downy, hairy, and red-bellied woodpeckers, nuthatches, flickers, and chickadees

Sugar water

Hummingbirds

Seeds that are not preferred are milo, hulled oats, rape seed, wheat, and red proso millet.



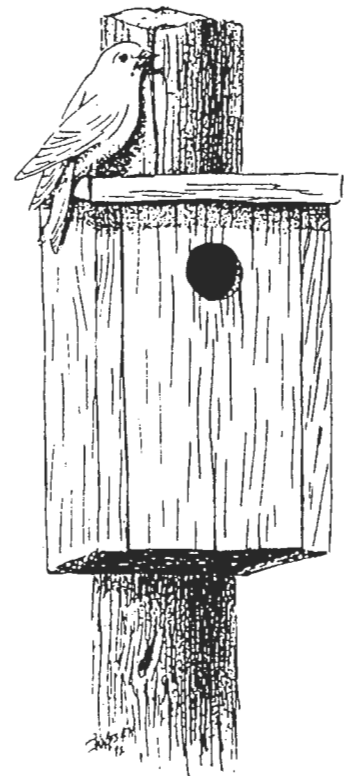


The Bluebird of Happiness

Bluebirds, sometimes referred to as “gems of nature”, have received a lot of attention and help from people in the past 35 years or so. Once commonly found throughout eastern North America, Eastern Bluebird numbers dropped by as much as 90% during the time period of 1930 – 1990.

Why did Eastern Bluebird numbers drop? There were a variety of reasons for this decrease in numbers. Forestry practices, such as clearcutting, removed many trees which had the holes (cavities) that Eastern Bluebirds use for nesting. For the trees with cavities that did remain, Eastern Bluebirds were faced with competition from two new birds, the European Starling and House Sparrow. These birds were introduced into the United States and are successful in outcompeting bluebirds for nest sites and will sometimes kill bluebird nestlings and adults. Another highly effective, non-native predator on bluebirds are cats. It is estimated that as many as 3.7 billion songbirds are killed annually by cats across the United States. Much open grassland habitat (prairie or savanna) was converted to agricultural use or for residential development. During the 1930's, production of pesticides and their use in agricultural production began to expand. This led to the poisoning of the insects that bluebirds feed upon, particularly crickets and grasshoppers. Birds suffered secondary poisoning by eating these animals.

What has been done to help bluebird populations to recover? In 1978, the North American Bluebird Society was founded by Dr. William Zelezny. The Society's goal is to increase the populations of North America's three bluebird species (Eastern Bluebird, Western Bluebird and Mountain Bluebird) and other cavity-nesting birds. Many Iowans share a concern for Eastern Bluebirds, the only species of bluebird that nests in Iowa, and are working to increase their numbers on our landscape.



The Eastern Bluebird is a bit smaller than an American Robin but larger than most of our sparrows. Males have a beautiful blue back and rusty colored throat and breast. Females are a bit duller in color, but do show a bit of blue in their wings and like the male, have a blue tail. Youngsters are gray in color with a speckled breast and bits of blue on their wings and tail.

Eastern Bluebirds are tied to open habitats with a few trees, larger shrubs or fence posts for nesting and perching. This includes orchards, pastures and croplands near wooded area, but in more urban environments, places such as golf courses, cemeteries and parks are used. Eastern Bluebirds use perches when hunting for their favored prey, crickets and grasshoppers. Other items in their diet include beetles, worms and spiders.



Up to a third of Iowa's Eastern Bluebirds overwinter locally, although most leave for more southern states. Eastern Bluebirds do not have insects available during Iowa's winter and instead feed on the fleshy fruit from plants such as red cedar, Virginia creeper, sumacs, and hackberry.

Eastern Bluebirds are cavity nesters although they don't dig their own holes, but use abandoned holes left by woodpeckers or squirrels. These holes keep the bluebird adults and young safe from many predators, especially hawks, owls, crows and jays. With the clearing of forests, loss of orchards, and conversion of fence posts to steel from wood, Eastern Bluebirds have lost many nesting sites and have begun to rely upon nesting boxes provided by people.

In early spring, male Eastern Bluebirds return to set up territories and attract females upon their arrival. The earliest arriving males pick out the best nesting areas, and set up and defend a territory several hundred feet wide to secure access to food for their mates and young. When females arrive, they inspect one to many areas and may start nests in several of these before finishing the one nest that will be used.

Females do most of the nest building, and all of the egg-laying and incubation. The cup-shaped nest is made from materials that are nearby and can include items such as dry grass, strips of dry bark, pine needles, cattail fluff, twigs, straw, and rootlets. Each of the typically four to six pale blue, bluish-white, or rarely white eggs, is laid a day apart. The male feeds the female during the 12-14 day incubation period which begins on the day that the last egg is laid. The young, called nestlings, typically hatch within a 24-hour period with no feathers and eyes closed. To keep the nestlings warm, the female broods (sits atop) them during their first week, particularly at night and during rainy or cold weather. Males are attentive parents and share feeding duties with their mates. At about four days, the nestlings open their eyes and are covered with gray down. By the time they are 16-20 days old, the young fledge (leave the nest). The parents continue to feed the young, now called fledglings, while the fledglings improve their flying and hunting skills. At first, the fledglings will fly only a short distance and try to land on a fence post or tree branch where they'll be fed by one or both of their parents. Within a week or two, the fledglings become better flyers and are able to catch their own food.

As soon as the young leave the nest, the parents begin the construction of a new nest or tidying up of the existing nest, to prepare for their second family. In some cases, youngsters from the first hatch will help in raising the young from the second. In especially good years, with plenty of insects to eat and good weather, bluebirds may even raise a third family in a season.

The various families raised by the parent birds flock together until the fall. Most of Iowa's Eastern Bluebirds then head south to Missouri, Arkansas, Mississippi, and Texas, and return to Iowa the following spring.

Rebecca Christoffel. Christoffel Conservation -March 2014. Rebecca.Christoffel@gmail.com

Special thanks to Rita Gorenson (Member of the Iowa Ornithology Union) for helping make this revision possible.



Activity: Adopt A Bluebird

Objective: Students will take an active role in helping Iowa's bluebird population by constructing bluebird boxes, establishing a bluebird trail, and monitoring a bluebird trail.

Project # 1: Build a Bluebird Box

Objective: Students will construct several bluebird boxes.

Materials: Ask the high school shop class or a parent to donate and cut lumber to the right size. The boards should be $\frac{3}{4}$ inches thick. Pine, cedar, or redwood work best. See the diagrams on the following pages for design specifications. The entrance hole must be $1\frac{3}{8}$ inches to $1\frac{1}{2}$ inches in diameter. If the hole is $\frac{1}{8}$ inch larger, starlings can squeeze into the box. Be sure the distance between the entrance hole and the bottom of the box is six inches so that starlings, cats, raccoons, and other predators will find it difficult to reach in and grab the eggs or babies. Do not add a perch; this will encourage house sparrows to occupy the nest box.

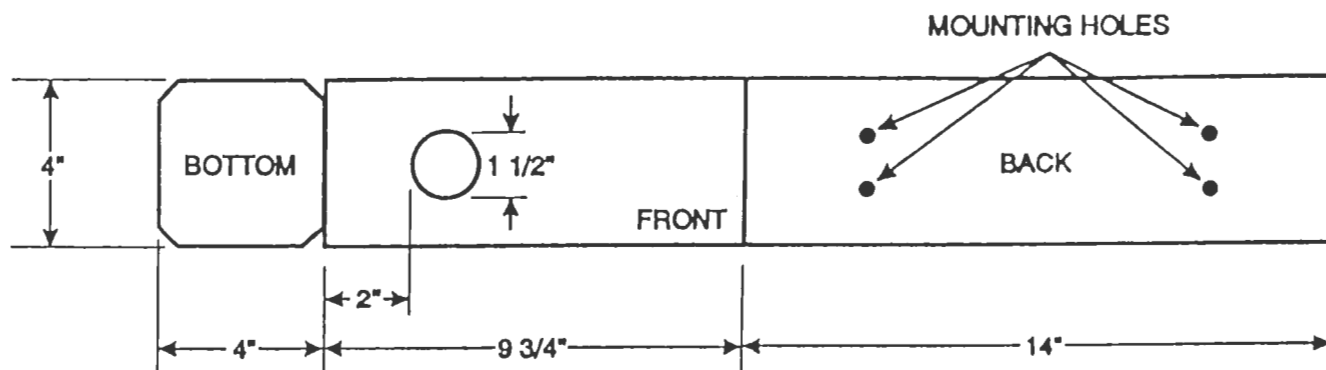
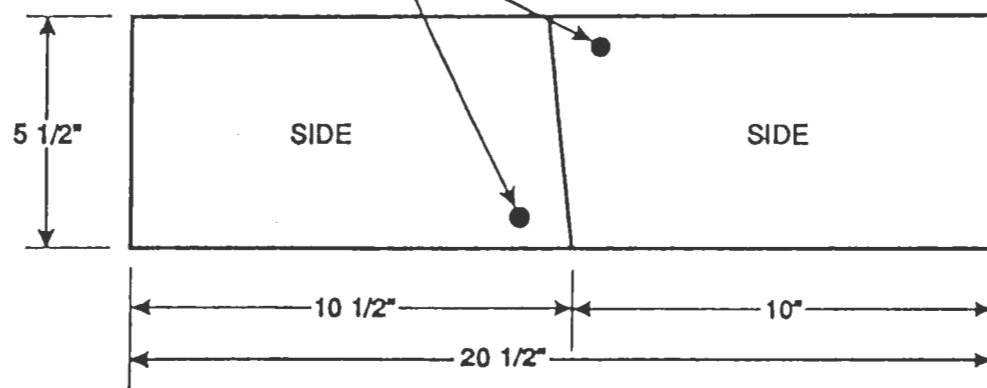
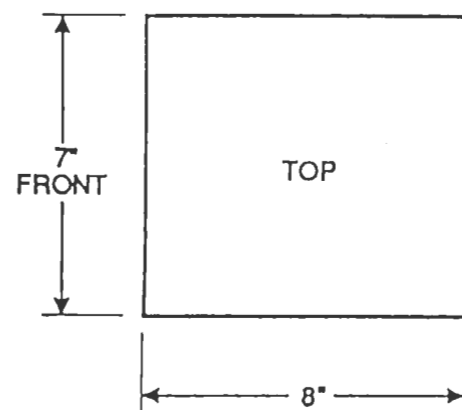
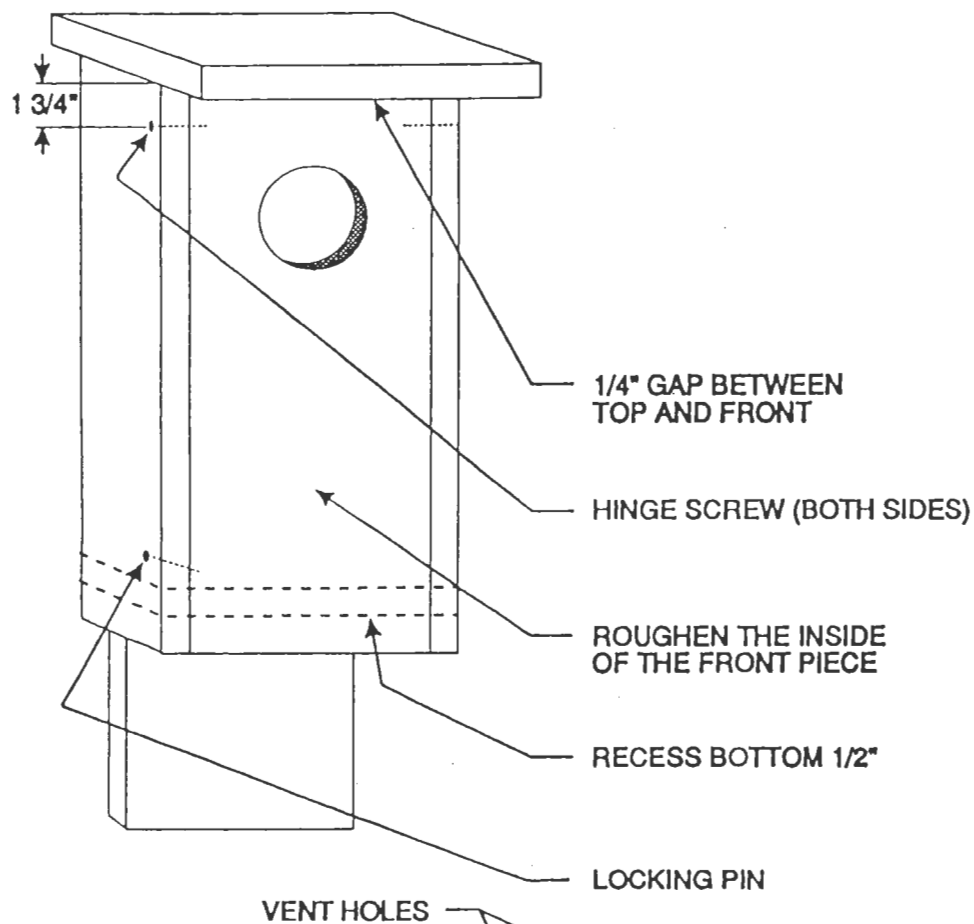
Hammers, screwdrivers, and nails are required for this project. Use ring shank nails or galvanized screws to construct the box. Blunt the nails by striking the point with a hammer; this will minimize wood splitting. Notch the bottom corners to allow for drainage.

Procedure: Students will work in small groups to construct a box. Encourage cooperation among the students. Have several adult volunteers assist the students during construction.

These instructions construct a front opening box. The front should be hinged to the side board to allow easy observation of the birds. Start by placing the side boards on the back board. Be sure the edges are square. Nail the back board to each side piece by placing three nails about three inches apart on each side. Slide the bottom board about $\frac{1}{4}$ inch into the box and nail it securely to the back and sides. Nail the roof onto the sides and back. Slide or place the front board on the front of the box. Using double-headed nails, nail the front to the sides. Only nail the top of the board to the sides. This should allow the front to swing open at the bottom. Use a hook-and-eye bolt to lock the bottom of the front board so it can be opened and closed and then locked.

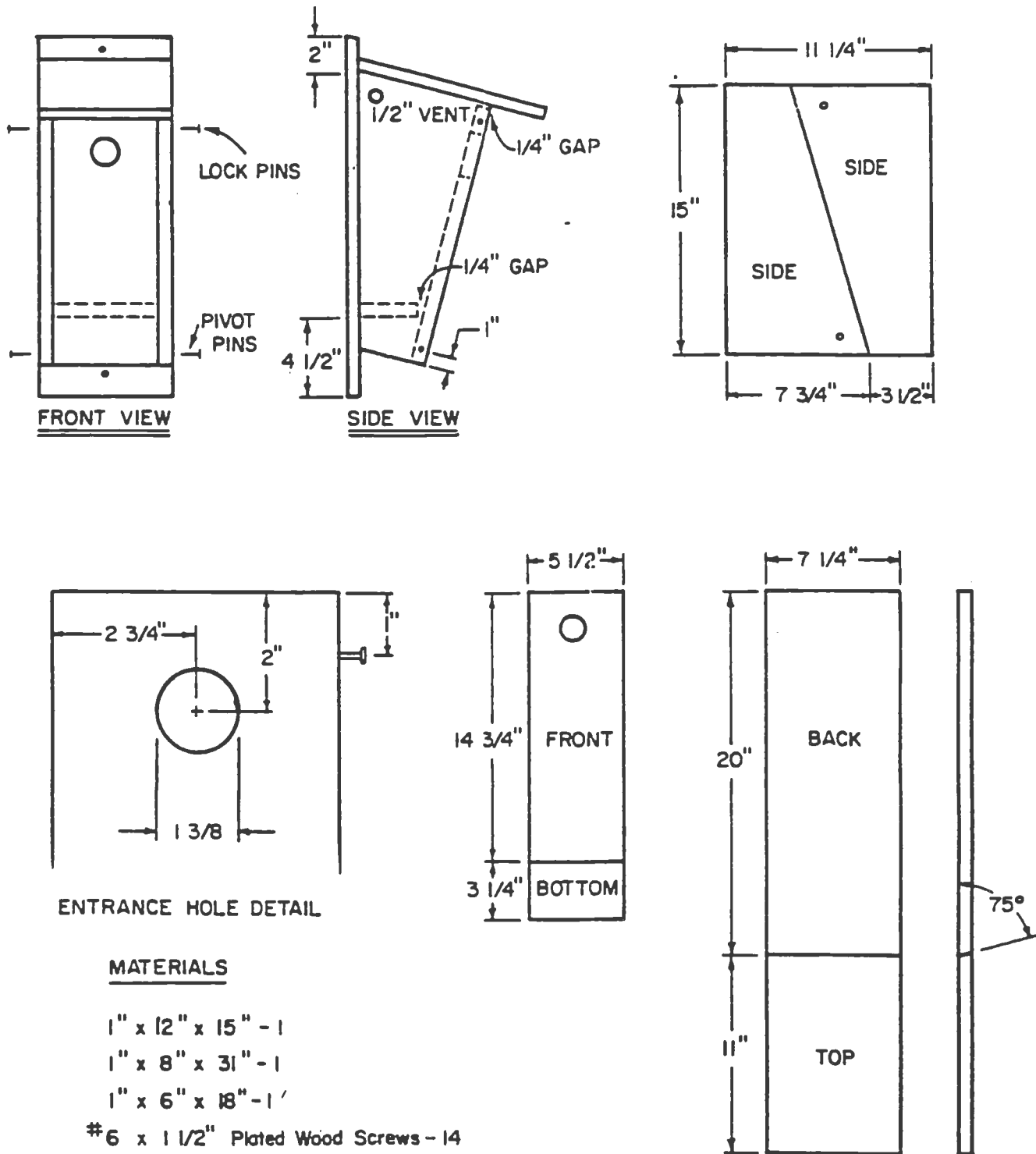


Activity: Bluebird Box Plans Plan One





Activity: Bluebird Box Plans Plan Two



MATERIALS

1" x 12" x 15" - 1

1" x 8" x 31" - 1

1" x 6" x 18" - 1

#6 x 1 1/2" Plated Wood Screws - 14

6d Common Nails - 4

1/4" x 3" Lag Screws - 2 (For Hanging Nesting Box.)



Project # 2: Blazing a Bluebird Trail

Objective: Students will investigate the needs of bluebirds before establishing a bluebird trail.

Procedure: One of the most enjoyable activities that one can undertake to benefit bluebirds and enjoy them is to build a bluebird trail. A trail can consist of any number of bluebird boxes that are placed in appropriate habitat and are monitored and maintained by an individual or group. Trail details and monitoring results can be shared with others through the North American Bluebird Society (<http://www.nabluebirdsociety.org>) or the Cornell Laboratory of Ornithology (birds.cornell.edu/Page.aspx?pid=1478).

But before you blaze your trail, there are some important things to keep in mind. Eastern Bluebirds are birds of open country. Good habitat for them include old pastures, railroad right of ways, edges of rural roads, cemeteries, orchards, big lawns, and parks or old fields. One key feature of good habitat for nesting Eastern Bluebirds is to be free of chemicals used to control insects or weeds, because these same chemicals kill birds and the very insects that the birds eat. You will need to check and monitor houses fairly regularly. Thus, it is often desirable to place houses along an already established foot or bicycle or horse trail for easy access. Iowa is home to many birds that nest in cavities, or holes, and so competition can be stiff for nest boxes. Do not be too disappointed if other birds use at least some of the bluebird boxes that you put out. Use the most current bluebird box plans that are freely available from either the North American Bluebird Society (<http://www.nabluebirdsociety.org>) website to increase the probability that your houses will successfully produce bluebirds. Entrance hole diameter can be used to reduce competition from starlings for houses. Using a box with a 1 1/2" or 1 9/16" inch nest hole will eliminate European Starlings. Many people place a pair of boxes about 25 feet apart so that one may be used by other birds such as tree swallows or house wrens, while Eastern Bluebirds use the other. If House Sparrows try to take up residence in a house, you can remove their nests. House Sparrows and Eurasian Starlings are not protected by law and may be removed from bluebird boxes at any time. However, all other birds such as House Wrens, Black-capped Chickadees and Tree Swallows are protected by federal laws and should not be disturbed once nest building has started.

Eastern Bluebirds are territorial when nesting to protect the resources that they need to successfully raise their young. Because of this, bluebird houses, or pairs of houses spaced about 25 feet apart, should be placed at least 100 yards apart, but preferably 125 -150 yards apart. Boxes should face either east or south to avoid having winds and precipitation enter. It is good to have a shrub or tree 25-100 feet away from the nest hole for the youngsters' first flights.

- Several measures can be taken to reduce predation of the birds, their eggs, and the nestlings.
- Boxes should not be placed near trees, but should be at least 10 feet from any trees. This will keep predators from being able to jump from a tree onto the next box.



- Place a predator guard on the mounting pole below the box. Some people also place a 24-inch piece of hardware cloth around the pole directly under the nest box to protect birds from climbing predators such as cats and snakes. Plans for pole guards are available from the North American Bluebird Society (<http://www.nabluebirdsociety.org>).
- Placing boxes higher (> 6 ft) above ground can also help to reduce predation by cats.
- As added protection, rub the pole with steel wool and apply a layer of car wax or silicone spray to deter predators.

Once the young bluebirds have left the box, remove the nest to avoid parasite problems and to provide a clean site for a new nesting.

In late winter or early spring, check your boxes and prepare them for returning birds. This may include cleaning out mouse nests and replacing nails or worn boards. Contact your local county conservation board, state park, or local park and recreation board about establishing a bluebird trail and monitoring boxes that are already set up in your local parks.

Resources about Bluebirds

Online

Iowa Department of Natural Resources. Bluebird page, <http://www.iowadnr.gov/Environment/LandStewardship/WildlifeLandownerAssistance/TechnicalAssistance/EasternBluebird.aspx>

Mountain Bluebird Trails – Children’s Bluebird Activity Book, <http://www.mountainbluebirdtrails.com/book.htm>

North American Bluebird Society, <http://www.nabluebirdsociety.org/index.htm>

Curricula and Activities

Flying Wild – <http://www.flyingwild.org>

North American Bluebird Society Educational packet, [http://www.nabluebirdsociety.org/PDF/Educational packet.pdf](http://www.nabluebirdsociety.org/PDF/Educational%20packet.pdf)

Citizen Science programs

Great Backyard Bird Count, <http://gbbc.birdcount.org>

Project Feeder Watch, <http://feederwatch.org>

Nest Watch, <http://www.nestwatch.org>



Books

Kirby, P. F. 2013. What bluebirds do. Boyds Mills Press. ISBN: 1620915936 (* Children's book)

Pitts, D. T. 2011. Studying eastern bluebirds: a biologist's report and reflections. Redleaves Publishing. ISBN: 0615411339

Scriven, D. 1998. Bluebird trails: a guide to success, 3rd edition. Bluebird Recovery Program. ISBN: 096396611

Staake, B. 2013. Bluebird. Random House Children's Books. ISBN-13: 9780375870378

Stokes, D. W. and L. Q. Stokes, 1991. The bluebird book: the complete guide to attracting bluebirds. Little, Brown and Company. ISBN: 0316817457

Rebecca Christoffel. Christoffel Conservation, March 2014. Rebecca.Christoffel@gmail.com

Special thanks to Rita Gorenson (Member of the Iowa Ornithology Union) for helping make this revision possible



Project # 3: Monitoring Bluebird Boxes

Objective: Students will gather and organize data after monitoring a bluebird trail.

Procedure: After you have constructed and mounted the boxes, **monitor the boxes once a week.** Divide the responsibility of monitoring the trail among your class members. Recruit a leader, parent, or responsible student to be in charge of the project. Getting a pair of bluebirds to use your box is the hardest part. Check with local bluebird enthusiasts to locate an area which bluebirds are known to frequent. Once you see evidence of nest building activity, try to determine whose nest it is. Observe what type of bird is flying in and out. If this is not possible, here are several hints to identify bluebird nests.

Bluebird nests are built almost entirely of dry grasses and are neatly arranged. House sparrow nests are made of coarse weeds, grasses, straw, and feathers. They are very messy and often fill up the nest box. House wren nests are built of twigs. Tree swallow nests are often made of grasses and the cup has feathers in it. Black-capped chickadee nests often have moss in them, and mouse nests are rolled into a big ball.

Bluebird eggs are light blue. They are rarely speckled. Sometimes bluebird eggs can be white. House sparrow eggs are smaller and usually speckled.

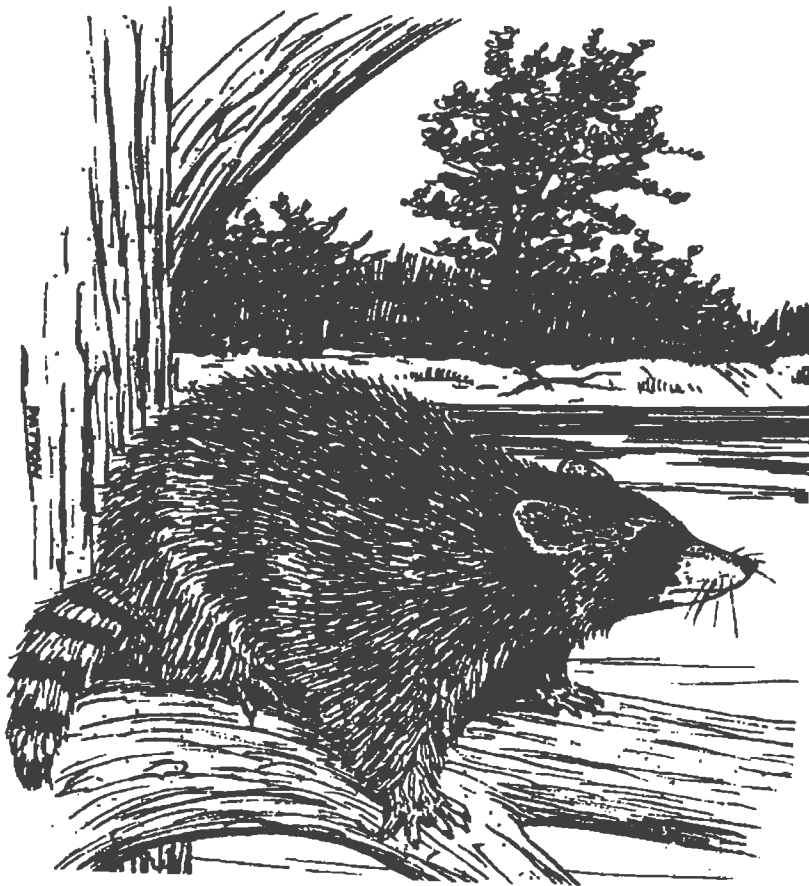
House sparrows are stubborn nesters. Their nest and eggs should be cleaned out regularly. House sparrows are not protected by law.

If you determine you have bluebirds nesting, the box needs to be monitored weekly. Observe the nest box from a distance while the birds are making their nest. After the nest has been completed and the eggs are laid, you may open the box and take a quick look. Try to make your observations quickly. It's a good idea to tap on the side of the box before opening it to let the female bluebird fly out. Sometimes she will sit tightly on the nest, and you'll have to come back later. Use the form on the following pages to record the data.

Both parents take turns incubating the eggs for two weeks. The eggs hatch almost all at once, and the adults begin to search for food for the young birds. Usually bluebirds cannot fly until they are about 20 days old. It is best not to open the nest box after their twelfth day to prevent premature fledging. It is important to record the dates when the eggs are laid and hatched, how many eggs are laid, and how many hatch.



Nest box predation is a problem. Predators of the bluebird include house sparrows, starlings, raccoons, cats, snakes, and blackflies. The house sparrow is the worst avian predator of the bluebird. Sparrows will kill adults, as well as the babies, and take over the box. If the eggs disappear, the culprit is often a snake. Raccoons and cats will reach in and tear up the nest and kill the babies. Printer's tin on the post or automobile grease applied to a pole every week will help cut down on the climbing predators. Cats have been known to sit on top of a box and catch the adult bluebirds as they fly in and out. Blowflies and blackflies can infest the nest and the young nestlings, often killing the young birds. Contact a local bluebirder if you have persistent predation problems.



Raccoon



Activity: Bluebird Box Results

Name _____

Address _____

City _____ State _____ Zip code _____

Phone number _____

_____ Number of bluebird houses monitored

_____ Number of houses occupied by bluebirds

_____ Total number of bluebird eggs laid: _____ blue _____ white

_____ Number of bluebird young hatched

_____ Number of bluebirds presumed fledged or flown from the nest

_____ Number of successful bluebird nesting attempts in occupied boxes

Number of boxes with:

_____ one nest _____ two nests _____ three nests

Number of nest boxes occupied by _____ house sparrows _____ starlings
_____ house wrens _____ tree swallows _____ chickadees _____ others

Please list other species of birds found nesting in the boxes:



A Word About Wildlife Rehabilitation

Wild animals that have become sick, injured, or orphaned sometimes are found by caring people. They want to do something to help, but they don't know what to do. It is important for adults and children to know that keeping a wild animal is not only difficult, it is illegal without special permits and training. A limited number of people have state and federal permits to care for birds and mammals as licensed wildlife rehabilitators.

Wildlife rehabilitators must have state and federal permits in order to perform rehabilitation work. They must keep records of the animals with which they work and submit annual reports to state and federal officials. Wildlife rehabilitators want to help animals. Their first concern is the well-being of the animal. They want to learn about the animals' behavior and biology because wild animals are very different from domestic animals in many ways. Many wildlife rehabilitators want to educate the public about injured wild animals and will visit your classroom to present programs.

If a sick, injured, or orphaned wild bird is found, it is very important that it be handled in a safe manner for the protection of both the person and the bird. Birds like hawks and owls will try to protect themselves with their talons. Other birds like cardinals will bite with their beaks, and waterbirds like herons will strike with their long beaks. All of these birds can seriously injure people. Don't attempt to handle such a bird without considering the risks.

Here are a few rules to follow when determining what to do to help wild animals:

- If you find a baby bird on the ground, it is most likely that the bird has not been abandoned. Close supervision may keep its parents away from the nest site, so observe from a distance. If the nest site has been disturbed, replace the birds and the nest itself or put the bird in a safe place near the nest. It is not true that the parents will not take the young back if it has been touched by humans.
- If you find a bird and it looks injured - bloody, broken wing, injured eye - leave it alone. Let nature take its course.
- Do not try to feed or handle the bird. Call a conservation officer or a licensed wildlife rehabilitator in your area.
- If you must handle the animal, do so with extreme caution. Always protect yourself! Wear heavy leather gloves. Wrap the animal in a towel, jacket, or rug. This will calm the bird. Place it in a carton or box that is a little bigger than the bird, with shredded newspapers or an old towel on the bottom. Make sure the box has ventilation holes and a lid. Put the box in a warm (room temperature), dark, quiet, and safe place, and call your conservation officer for advice.
- Although your intentions may be good, it is illegal for you to keep such an animal without the proper permits!



•If you think you want to use live animals for education, they must first be determined to be unreleasable by a licensed wildlife rehabilitator. You must obtain an educational permit from both the state and federal governments. It is also necessary for any school, university, college, county conservation board, or other organization engaged in natural resource education using mounted specimens to have a salvage permit. These permits are described below, but contact both agencies for more details.

According to Chapter 481A.65 of the Iowa Code, there are three types of permits:

1. Education project permit: To possess live state-protected birds, mammals, amphibians, reptiles, fish, or invertebrates for educational or zoological displays

2. Scientific collector's license: To take, for scientific purpose only, any birds, nests, eggs, mammals, amphibians, reptiles, fish, invertebrates, plants, or parts thereof which are protected by state regulations

3. Wildlife salvage permit: To possess any state-protected birds, mammals, amphibians, reptiles, fish, or invertebrates which have died as a result of natural causes or accidents, or specimens which have been donated by the Iowa Department of Natural Resources

Questions regarding these permits and licenses may be directed to:

License Bureau
Iowa Department of Natural Resources
Wallace Building
Des Moines, IA 50319-0034
515/281-5145

U.S. Fish and Wildlife Service
Law Enforcement, District #3
Federal Building Ft. Snelling
P.O. Box 45
St. Paul, MN 55111
612/725-3776

Federal special purpose permits are required for possession of any birds, their parts, nests, or eggs as protected by the Migratory Bird Treaty Act.

Whether a school or individual should have these types of permits requires some thought. Keeping a collection and caring for animals takes time, money, and a lot of responsibility.

If your students are interested in helping birds and other wildlife, contact your local wildlife rehabilitator. Many rehabilitation groups offer Adopt-An-Animal programs and can use extra assistance.



There are many wildlife rehabilitators in the state: this is only a partial list.

Beth Brown
RR 5, Box 217
Osceola, IA 50213
515/342-2783

McBride Raptor Center
University of Iowa
E216 Field House
Iowa City, IA 52242
319/355-9293

Linda Nebbe
6101 S. Union Rd.
Waterloo, IA 50701

Kay Neumann
25494 320th St
Dedham, IA 51440
712/683-5555

Orphaned & Injured
Wildlife Inc.
Linda Hinshaw
RFD Box 5650
Spirit Lake, IA 51360
712/336-3827

Wildlife Care Clinic
College of Vet. Med.
Iowa State University
Ames, IA 50011
515/294-4900

Marlene Warren Ehresman
3123 Story St.
Ames, IA 50014-3504
515/296-2995

The Raptor Center
University of Minnesota
1920 Fitch Ave
St. Paul, MN 55108
612/624-4745

Iowa Falconers Association
25494 320th St.
Dedham, IA 51440
712/683-5555

Stephanie Romey
822 Ashmore Circle
West Des Moines, IA 50265
515/223-9475

COOPER'S HAWK





Iowa Ornithologists' Union Contact Persons

Des Moines
Audubon Society
Eugene and Eloise Armstrong
RR 1
Booneville, IA 50038
515/996-2726

Ottumwa Bird Club
Darlene Ayres
922 North Green Street
Ottumwa, IA 52501
515/682-1697

Ann Barker
25368 250th Street
Princeton, IA 52768
319/289-3175

Zola Beckman
RR 1
Lake City, IA 51449
712/464-3092

Carl Bendorf
845 Cypress Court
Iowa City, IA 52245
319/351-4958

Dick Bierman
901 Harris
Cherokee, IA 51012
712/255-5552

Department of Natural
Resources Nongame
Wildlife Biologist
1436 255th St.
Boone, IA 50036
515/432-2823

Beth Brown
RR 5, P.O. Box 217
Osceola, IA 50213
515/342-2783

Gerry Brown
RR 2, Box 235
Ottumwa, IA 52501
515/682-4268

Robert Cecil
315 41st Street
Des Moines, IA 50311
515/277-5709

MacBride Raptor Center
University of Iowa
Dave Conrads
E216 Field House
Iowa City, IA 52242
515/335-9293

Donna Day
505 Fifth Street N.
Humboldt, IA 50548
515/332-3398

Jim Dinsmore
4024 Arkansas Drive
Ames, IA 50010
515/292-3152

Rita Efta
RR 1, Box 39
Auburn, IA 51433
712/688-2873

Jim Fuller
6 Longview Knoll NE
Iowa City, IA 52240
319/338-3561

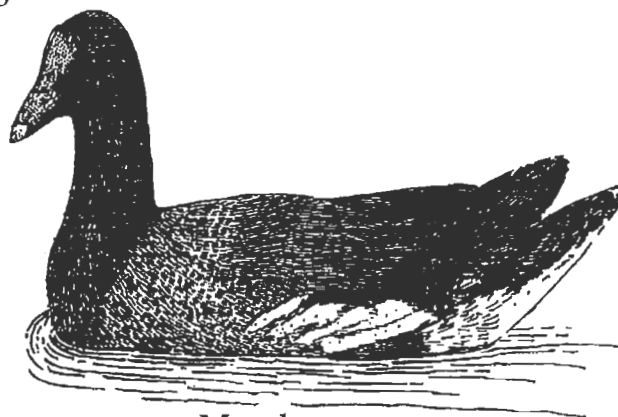
Chuck Fuller
420 South Garfield
Burlington, IA 52601
319/753-0710

Bud Gode
918 Estron St.
Iowa City, IA 52246
319/351-5245

Pocahontas County Chapter
Iowa Ornithologists' Union
Ronald Harms
318 West Garfield
Laurens, IA 50554
712/845-4510

Iowa Department of
Natural Resources
Doug Harr
301-1/2 1st Ave.
Rock Rapids, IA 51246
712/477-2798

Phyllis Harris
Fifth & Maple
Union, IA 50258
515/482-5560



Moorhen



Mary Jo Hartogh
RR 2, Box 115
Elma, IA 50628
515/982-4910

Frances Hensley
5680 Dodds Drive
Bettendorf, IA 52722
319/332-8931

Jacquelyn Hill
2946 Ubben Ave.
Ellsworth, IA 50075
515/836-4579

Rick Hollis
3351 Lower West Branch Road
Iowa City, IA 52245
319/338-4834

Marlys Huff
2158 C Ave.
Garwin, IA 50632
515/473-2187

Maridel Jackson
410 S.W. Westview Dr.
Ankeny, IA 50021
515/964-0140

Tom N. Johnson
P.O. Box 1045
Centerville, IA 52544
515/437-4099

Ann Johnson
532 120th Ave.
Norwalk, IA 50211
515/981-2002

Carl and Linda Kurtz
1562 Binford Ave.
St. Anthony, IA 50239
515/477-8364

Wayne Livermore
4713 Tyler
Sioux City, IA 51108
712/239-1408

Central Iowa Ornithologists
Jim and Pauline Mairs
202 Rainbow Drive
Marshalltown, IA 50158
515/752-2219

Jean Eige
1305 West Church
Marshalltown, IA 50158
515/753-5893

Department of
Natural Resources
Wallace State
Office Building
Des Moines, IA 50319
515/281-8967

Don and Jean Moeller
28238 216th Street
Le Claire, IA 52753
319/289-5807

Waterloo Audubon Society
Francis Moore
336 Fairfield Street
Waterloo, IA 50703
319/232-0217

Bob Myers
1479 K. Ave.
Perry, IA 50220
515/465-3234

Weir Nelson
Wildlife Habitat Shop
1132 Old Marion Road NE
Cedar Rapids, IA 52402
319/393-4927

Omaha Audubon Society
Babs and Loren Padelford
1405 Little John Road
Bellevue, NE 68005
402/292-5556

Jim Pease
103 Science II
Iowa State University
Ames, IA 50011
515/294-7429

Pete and Mary Lou Petersen
235 McClellan Blvd.
Davenport, IA 52803
319/355-7051

Don Poggensee
Lake LaJune Estates
Ida Grove, IA 51445
712/364-3491

SE Iowa Audubon Society
Diane Porter
908 East Briggs
Fairfield, IA 52556
515/472-7256

Beth and Mark Proescholdt
Box 65
Liscomb, IA 50148
515/496-5219

Donna Rourick
1700 Bryn Maur St.
Atlantic, IA 50022
712/243-4687



Song Sparrow



Jim Sandrock
1634 Morningstar Drive
Iowa City, IA 52240
319/338-5774

Gil and Doris Sandvick
RR 1, Box 187
Longrove, IA 52756
319/225-6191

Jim Scheib
10 Longview Knoll, RR 6
Iowa City, IA 52240
319/337-5206

Garnita Seward
RR 2
Eldora, IA 50627
515/486-5930

Henry County
Nature Society
Rolan Shook
307 West Warren
Mt. Pleasant, IA 52641
319/986-5341

Hilda Sickels
4002 Ashby
Des Moines, IA 50310
515/255-6560

W. Ross Silcock
Box 300
Tabor, IA 51653
712/629-5865

Jim Sinclair
810 North B Street
Indianola, IA 50125
515/961-4616

Sue Spieker
1000 Gordon
Norwalk, IA 50211
515/981-0786

Joyce Spillers
622 South Nevada
Davenport, IA 52802
319/322-3300

Sue Stroyls
240 South Cardinal Drive #1
Clarinda, IA 51632
712/542-2490

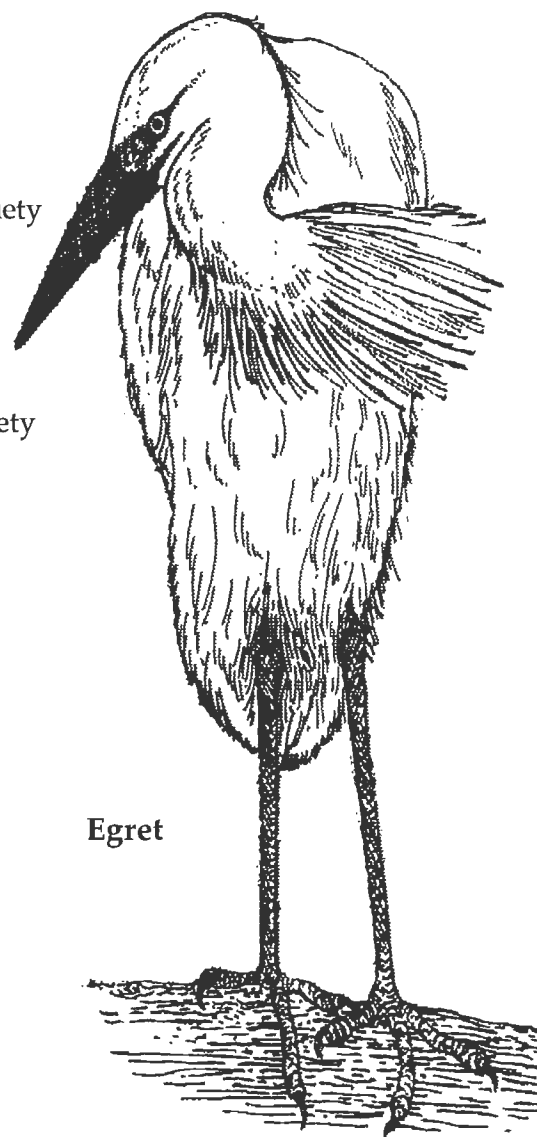
Gerald White
1505 East Fifth Street
Muscatine, IA 52761
319/263-3464

Harold White
W. 802 North 7th Street
Estherville, IA 51334
712/362-7010

Cedar Rapids Audubon Society
Pete Wickham
2201 Fifth Ave. SE
Cedar Rapids, IA 52403
319/363-6884

Big Bluestem Audubon Society
Kay Niyo
1531 Stonebrooke Rd.
Ames, IA 50010
515/233-8803

Hank and Linda Zaletel
1928 6th St
Nevada, IA 50201
515/328-5427



Egret



Resource List - County Conservation Boards

The Iowa County Conservation Board Program, established in 1955, is recognized as one of the most successful county conservation programs in the United States. Iowa county conservation boards are authorized to acquire, develop, and maintain areas devoted to conservation and public recreation. These boards also serve as a primary natural resource management agency in their respective counties, help educate local residents about environmental issues, and manage county wildlife conservation efforts. Many CCBs have naturalists. The naturalist's address is listed when possible.

Adair CCB
705 NE 6th
Box 26B
Greenfield, IA 50849

Adams CCB
RR 3, Box 132
Corning, IA 50841
515/322-4793

Allamakee CCB
868 3rd St. NW
Waukon, IA 52172
319/568-2137

Appanoose CCB
RR 4
Sharon Bluffs Park
Centerville, IA 52544
515/856-8528

Audubon CCB
1887 215th St.
Audubon, IA 50025
712/563-4690

Benton CCB
2113 57th St. Trail
Vinton, IA 52349
319/472-4942

Black Hawk CCB
Hartman Reserve Nature Ctr.
657 Reserve Drive
Cedar Falls, IA 50613
319/277-2187

Boone CCB
610 H Ave.
Ogden, IA 50212
515/353-4237

Bremer CCB
P.O. Box 412
Tripoli, IA 50676
319/882-4742

Buchanan CCB
Box 161
Grand Mound, IA 52751
319/847-7202

Crawford CCB
RR 1, Box 310A
Denison, IA 51442
712/263-2070

Dallas CCB
Forest Park
1477 K Ave.
Perry, IA 50220
515/465-3577

Davis CCB
203 S. Madison
Bloomfield, IA 52537
515/664-2138

Decatur CCB
RR 1, Box 97A
Leon, IA 50144
515/446-7307

Delaware CCB
RR 1, Box 243G
Manchester, IA 52057
319/927-3410

Des Moines CCB
Starr's Cave Nature Center
3299 Irish Ridge
Burlington, IA 52601
319/753-5808

Dickinson CCB
1924 240th St.
Milford, IA 51351
712/338-4786

Dubuque CCB
13768 Swiss Valley Rd.
Peosta, IA 52068
319/556-6745

Emmet CCB
P.O. Box 155
Estherville, IA 51334
712/362-2510

Fayette CCB
18525 Lane Rd.
Fayette, IA 52142
319/422-5146

Floyd CCB
Box 113
Charles City, IA 50616
515/257-6214

Franklin CCB
Box 164
Hampton, IA 50441
515/456-4375

Fremont CCB
1213 Fifth Ave.
Shenandoah, IA 51601-1595
712/246-1736

Greene CCB
114 S. Chestnut
Jefferson, IA 50129
515/386-4629

Grundy CCB
P.O. Box 36
Morrison, IA 50657
319/345-2688

Guthrie CCB
RR 2, Box 4A17
Panora, IA 50216
515/755-3061

Hamilton CCB
2490 Briggs Woods Trail
Webster City, IA 50595
515/832-9570



Hancock CCB
875 State St.
Garner, IA 50438
515/923-2720

Hardin CCB
Calkins Nature Area
Iowa Falls, IA 50126
515/648-3825

Harrison CCB
RR 1, Box 113
Woodbine, IA 51579
712/647-2785

Henry CCB
2522 Fremont Ave.
Mt. Pleasant, IA 52641
319/986-5067

Howard CCB
Courthouse
Cresco, IA 52136
319/547-3634

Humboldt CCB
Courthouse
Dakota City, IA 50529
515/332-4087

Ida CCB
RR 1, Box 31D
Ida Grove, IA 51445
712/364-3300

Iowa CCB
2550 G Ave.
Ladora, IA 52251
319/655-8466

Jackson CCB
201 W. Platt
Maquoketa, IA 52060
319/652-3783

Jasper CCB
115 N. 2nd Ave. East
Newton, IA 50208
515/792-9780

Jefferson CCB
RR 3, Box 11B
Fairfield, IA 52556
515/472-4421

Johnson CCB
2048 Hwy. 6 NW
Oxford, IA 52322
319/645-2315

Jones CCB
12515 Central Park Rd.
Center Junction, IA 52212
319/487-3541

Keokuk CCB
204 S. Stone
Sigourney, IA 52591
515/622-3757

Kossuth CCB
2407 Hwy. 169
Algona, IA 50511
515/295-2138

Lee CCB
P.O. Box 218
Montrose, IA 52639
319/463-7673

Linn CCB
1890 County Home Rd.
Marion, IA 52302
319/398-3505

Louisa CCB
P.O. Box 261
609 Hwy. 61 N.
Wapello, IA 52653
319/523-8381

Lucas CCB
Box 78
Chariton, IA 50049
515/774-2314

Lyon CCB
311 1st Ave. E.
Rock Rapids, IA 51246
712/472-2217

Madison CCB
Box 129
Winterset, IA 50273
515/462-3536

Mahaska CCB
2254 200th St.
New Sharon, IA 50207
515/673-9327

Marion CCB
Cordova Park
1378 Hwy G28
Otley, IA 50214
515/627-5935

Marshall CCB
1302 E. Olive St.
Marshalltown, IA 50158
515/754-6303

Mills CCB
RR 1, Box 36
Pacific Junction, IA 51561
712/527-9685

Mitchell CCB
415 Lime Kiln Rd.
Osage, IA 50461
515/732-5204

Monona CCB
RR 2, Box 139A
Onawa, IA 51040
712/423-2400

Monroe CCB
Lake Miami Park
RR 1
Lovilia, IA 50150
515/946-8112

Montgomery CCB
RR 2, Box 207
Red Oak, IA 51566
712/623-4753

Muscatine CCB
2007 Saulsbury Rd.
Muscatine, IA 52761
319/264-5922

O'Brien CCB
5660 460th St.
Paullina, IA 51046
712/448-2254

Osceola CCB
1511 Skyline Ave.
Ocheyedan, IA 51354
712/758-3709



Page CCB
Courthouse
Clarinda, IA 51632
712/542-3864

Palo Alto CCB
3259 355th Ave.
Ruthven, IA 51358
712/837-4866

Plymouth CCB
25601 C60
Hinton, IA 51024
712/947-4270

Pocahontas CCB
702 NW 7th St.
Pocahontas, IA 50574
712/335-4395

Polk CCB
Jester Park
Granger, IA 50109
515/999-2557

Pottawattamie CCB
223 S. 6th
Courthouse Annex
Council Bluffs, IA 51503
712/328-5638

Poweshiek CCB
2550 G Ave.
Ladora, IA 52251
319/655-8466

Ringgold CCB
RR 1, Box 83A
Mount Ayr, IA 50854
515/464-2787

Sac CCB
2970 280th St.
Sac City, IA 50583-7474
712/662-4530

Scott CCB
Wapsi River EE Center
31555 52nd Ave.
Dixon, IA 52745
319/843-2855

Shelby CCB
Elk Horn Recreation Area
RR 1
Elk Horn, IA 51531
712/764-8345

Sioux CCB
Oak Grove Park
4051 Cherry Ave.
Hawarden, IA 51023
712/552-1047

Story CCB
56461 180th Street
Ames, IA 50010-9451
515/232-2516

Tama CCB
2283 Park Rd.
Toledo, IA 52342
515/484-2231

Taylor CCB
Courthouse
Clarinda, IA 51632
712/542-3864

Union CCB
318 N. Pine St.
Box 291
Creston, IA 50801
515/782-7111

Van Buren CCB
RR 2, Box 81
Keosauqua, IA 52565
319/293-3589

Wapello CCB
1339 US Hwy 63
Bloomfield, IA 52537
515/682-3091

Warren CCB
1565 118th Ave.
Indianola, IA 50125
515/961-6169

Washington CCB
Box 889
Washington, IA 52353
319/653-77657

Wayne CCB
Box 171
Corydon, IA 50060
515/872-2004

Webster CCB
Kennedy Park
RR 2
Fort Dodge, IA 50501
515/576-3230

Winnebago CCB
34496 110th Ave.
Forest City, IA 50436
515/565-3390

Winneshiek CCB
2546 Lake Meyer Rd.
Fort Atkinson, IA 52144
319/534-7145

Woodbury CCB
3801 Memorial Dr.
Sioux City, IA 51103
712/258-0838

Worth CCB
503 1st Ave. N.
Northwood, IA 50459
515/324-1524

Wright CCB
Conservation Park Building
1720 O'Brien Ave.
Clarion, IA 50525
515/532-3185



State

Duane Toomsen
Bureau of Instruction
and Curriculum
Department of Education
Grimes State Office
Building
Des Moines, IA 50319
515/281-3146

Iowa Department of
Natural Resources
Conservation Education Center
2473 160th Rd.
Guthrie Center, IA 50115
515/747-8383

Mines of Spain
E.B. Lyons Nature Center
8999 Bellevue
Dubuque, IA 52001
319/556-0620

Wildlife Extension
Dept. Animal Ecology
124 Science II
Iowa State University
Ames, IA 50011
515/294-7429

Federal

Saylorville Lake
5600 NW 78th Ave.
Johnston, IA 50131
515/276-4656

Coralville Lake
2850 Prairie Du Chien Rd.
Iowa City, IA 52240
319/338-3543

Rathbun Lake
RR #3
Centerville, IA 52544
515/647-2468

Red Rock Lake
1105 Highway T-15
Knoxville, IA 50138
515/828-7522

Walnut Creek
National Wildlife Refuge
P.O. Box 399
Prairie City, IA 50228
515/994-2415

DeSoto National Wildlife Refuge
RR 1, Box 113
Missouri Valley, IA 51555
712/642-2772

Union Slough National
Wildlife Refuge
Box AF
Tipton, IA 50480
515/928-2523

Private Nature Centers

Indian Creek Nature Center
6665 Otis Rd. S.E.
Cedar Rapids, IA 52401
319/362-0664

Eagle Point Nature Center
P.O. Box 95 Clinton, IA 52732
319/242-9088

Science Center of Iowa
4500 Grand Ave.
Des Moines, IA 50312
515/274-4138

Other

Blank Park Zoo
7401 S.W. 9th St.
Des Moines, IA 50315

Camp Hantesa
1450 Oriole Rd.
Boone, IA 50036
515/432-1417

Iowa Arboretum
1875 Peach Ave.
Madison, IA 50156
515/795-3216

Des Moines YMCA Camp
1192 166th Drive
Boone, IA 50036
515/432-7558

Iowa 4-H Education and Natural
Resources Center
4-H & Youth Programs
33 Curtiss Hall
Iowa State University
Ames, IA 50011
515/294-1017

Project ECO
120 S. Kellogg
Ames, IA 50010
515/232-3400

McBride Raptor Center
E216 Field House
Iowa City, IA 52242
319/335-9293



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Field Identification

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Udvardy, Miklos D.F. 1977. The Audubon Society Field Guide To North American Birds, Western Region. Alfred A. Knopf, New York, NY.

Birding Areas

The following guides describe birding areas, how to reach them, and what to expect to see.

Petersen, P. C. 1979. Birding Areas of Iowa. Cedar Rapids, IA. 151 p.

Pettingill, O. S. 1981. A Guide to Bird Finding West of the Mississippi. 2nd ed. Oxford Univ. Press, New York, NY. 783 p.

Dinsmore, S.J., L.S. Jackson, B.L. Ehresman, and J.J. Dinsmore. 1994. Iowa Wildlife Viewing Guide. Falcon Press, Helena, MT.

Birds of Iowa

Black, G. 1992. Iowa Birdlife. University of Iowa Press, Iowa City, IA 52240.

Kent, T. H., and J.J. Dinsmore. 1996. Birds in Iowa. Contact T.H. Kent, 211 Richards Street, Iowa City, IA 52246.

Dinsmore, J. J., T. H. Kent, D. Koenig, P. C. Petersen, and D. Roosa. 1984. Iowa Birds. Iowa State University Press, Ames, IA 50011.

Sherman, Althea, R. 1952. Birds of an Iowa Dooryard. Reprinted in 1996 by Johnson County Songbird Project, 2511 Hwy. 1 SW, Iowa City, IA 52240.

Jackson, L. S., C.A. Thompson, J.J. Dinsmore, J. Fleckenstein, B.L. Ehresman, B. Cecil, L. Hemesath and S.J. Dinsmore. 1996. The Iowa Breeding Bird Atlas. University of Iowa Press, Iowa City, IA 52246.

Reports of Observations

Iowa Bird Life. This quarterly publication of the Iowa Ornithologists' Union devotes part of each issue to a summary of observations on various species throughout Iowa. Similar journals in adjacent states include *The Loon* (Minnesota), *The Passenger Pigeon* (Wisconsin), and *Nebraska Bird Review* (Nebraska).

Field Reports. This publication of the National Audubon Society is a summary of recent distributional records by region of the country. It also publishes the Christmas Bird Count and articles on bird distribution, identification, and equipment.



Miscellaneous Books on Birds and Birding

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- McElroy, T. P. 1974. The Habitat Guide to Birding. A. A. Knopf, New York, NY.
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- Bird Houses, Care, and Feeding**
- Adler, B. 1988. *Outwitting Squirrels*. Chicago Review Press, Chicago, IL.
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- *Managing Iowa Habitats: Attracting Birds to Your Yard*, Pm-1351d (\$0.75)
- *Landscape Plants That Attract Birds*, G1609 (\$1.50)
- *Bird Feeding: Tips for Beginners and Veterans*, G3176 (\$1.50)
- *Shelves, Houses and Feeders for Birds and Mammals*, NCR-338 (\$1.50)

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Slide Program Sources

The Iowa Department of Natural Resources has a songbird slide program available for loan free of charge. Contact the DNR at the Wallace State Office Building, Des Moines, IA 50319.

A variety of slides, programs and videos are available for purchase from the Laboratory of Ornithology, Division of Visual Services, 159 Sapsucker Woods Rd., Cornell University, Ithaca, NY 14850-1999. Phone: 607/254-2450. Fax 607/254-2415. Web Site: <http://www.ornith.Cornell.edu/SLIDES/MAIN.HTML>



Bird Behavior, Bird Families of the World, Bird Orders, Familiar Eastern Birds, Endangered & Extinct Species, Easter Wood Warbler, North American Raptors Master Set, North American Waterfowl Master Set, Egrets, Herons, and Allies, Owls of North America, from The Academy of Natural Sciences of Philadelphia, 19th & The Parkway, Philadelphia, PA 19103. Phone: 215/299-1069.

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Web Sites

Iowa Ornithologists' Union Web Site <http://storm.simpson.edu/~birding/>
The IOU web site has information about birds and birding in Iowa, rare bird alerts for Iowa and surrounding states, guides to locations for good natural history studies, E-mail addresses for bird resource people around the state, information on IOU calendar of events, information on local bird clubs and birding organizations with links to chapter pages available and index to other birding web sites.

Binoculars and Optics: http://www.aib.Com/~edm/opt_fag.html

Pamphlets on Birds and Landscaping for the Birds: <http://www.fws.gov/~r9mbmo/pamphlet/pamphlets.html>



IOWA ORNITHOLOGISTS' UNION

The Iowa Ornithologists' Union (IOU) was organized in 1923. The IOU meets in the spring and fall every year. It publishes two quarterly publications: *Iowa Bird Life* and the *IOU News*. Individuals and organizations may become IOU members by contacting Jim Scheib (10 Longview Knoll, Iowa City, IA 52240).

This booklet was prepared by Linda Zaletel and members of the education committee of the IOU for educational uses in the classroom. Past and present members of the committee have included Bernie Knight, Rick Hollis, Laura Jackson, Beth Brown, John Fleckenstein, and Linda Zaletel. The committee hopes the booklet will be useful and will open up the world of birds to the children of Iowa.

IOWA CONSERVATION EDUCATION COUNCIL

The Iowa Conservation Education Council (ICEC) contributed to the publication and distribution of this booklet.

ICEC has promoted conservation education in Iowa for nearly 40 years. A non-profit organization, it seeks to stimulate closer cooperation among agencies, institutions, and individuals interested in conservation; assists schools in conservation education; and supports the preparation of conservation education materials.

ICEC regularly sponsors conservation education workshops for teachers and other educators. ICEC also publishes educational materials for teachers, sponsors awards and scholarship programs, and encourages conservation education through special projects.

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