



Most Wanted Birds
**REFERENCE
GUIDE**



Susan Spear



Reference Guide

Most Wanted Birds

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This guide will tell you how to start identifying birds, and why it is important to identify them!

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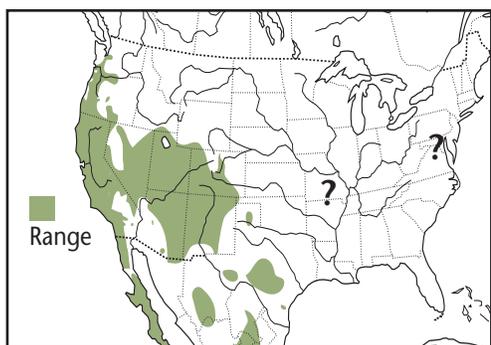
Learning to identify birds takes practice, but by paying attention to certain clues, you'll be a bird sleuth in no time!

Bird Groups

A good way to start identifying birds is to learn to recognize the key characteristics of general groups of birds such as woodpeckers, hawks, owls, wrens, or ducks. Members of these groups share certain similarities and are classified in the same **taxonomic group**, such as order or family. (See "Classifying Birds" page 19.) Most field guides are arranged so that birds in the same family are placed together, so if you can identify which group a bird belongs to, you can narrow down the species to choose from.

Consider Location and Season

One trick to identifying birds more easily is to rule out birds you're not likely to see in your area. This approach can reduce the number of species you have to consider, from the 900 species found in North America to the much smaller number of birds found near you.



Range Map, Western Scrub-Jay

The best way to figure out whether a bird is found in your area is to look at its **range map**.

For example, if you look at the range map for Western Scrub-Jay, you will see that the bird is found in the western United States, but that you are unlikely to see it in Missouri or New Jersey.

Some birds may live in a place only during certain times of the year, so notice the breeding (summer) and nonbreeding (winter) ranges for each bird too.

Use the bar charts located under the heading "View and Explore Data" on <http://ebird.org/content/birdsleuth/> to find out which birds have been sighted in your area.

Bird ID Clues

When looking or listening for birds, six basic clues will help you solve the bird identification puzzle: shape or silhouette, size, field marks, sound, habitat, and behavior.



Pileated Woodpecker



Clues to Bird ID

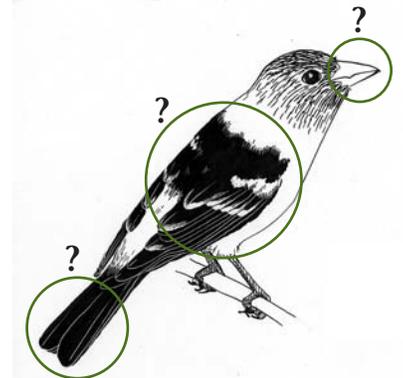
These six clues may seem like a lot of information to gather, but you'll often need only one or two of them to identify a particular bird. Sometimes, the key to identifying a new bird species is simply to know which clue to look for first! Here are some tips to get you started:

1. **Shape or Silhouette:** With practice you will be able to recognize many birds simply by their **silhouette**, or shape and posture. In addition, look at each part of the bird. Is the bill short or long, thick or thin, curved or straight? What shape is the tail? For instance, is it forked? Are the wings pointed or broad, long or short? Some field guides, like the Bird Guide at www.AllAboutBirds.org, allow you to search for birds by shape.

2. **Size:** Ask yourself "How big is the bird?" Use the following guidelines to place your mystery bird into a general size class:

- If it's about the size of a House Sparrow, it's around 5–6 inches.
- If it's about the size of an American Robin, it's around 10 inches.
- If it's about the size of an American Crow, it's around 17–21 inches.

Now, by using descriptions such as "larger than a crow" or "smaller than a sparrow," you have a quick way of describing a bird's approximate size. Compare this size to sizes listed in your field guide, but be cautious—size comparisons can be tricky, especially when you see birds from a distance.



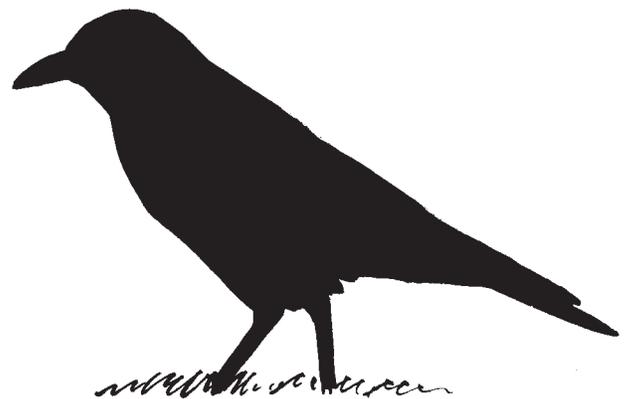
Noticing the size and shape of a mystery bird's beak, wings, and tail might help you identify it!



House Sparrow
(5–6 inches)
small



American Robin
(10 inches)
medium

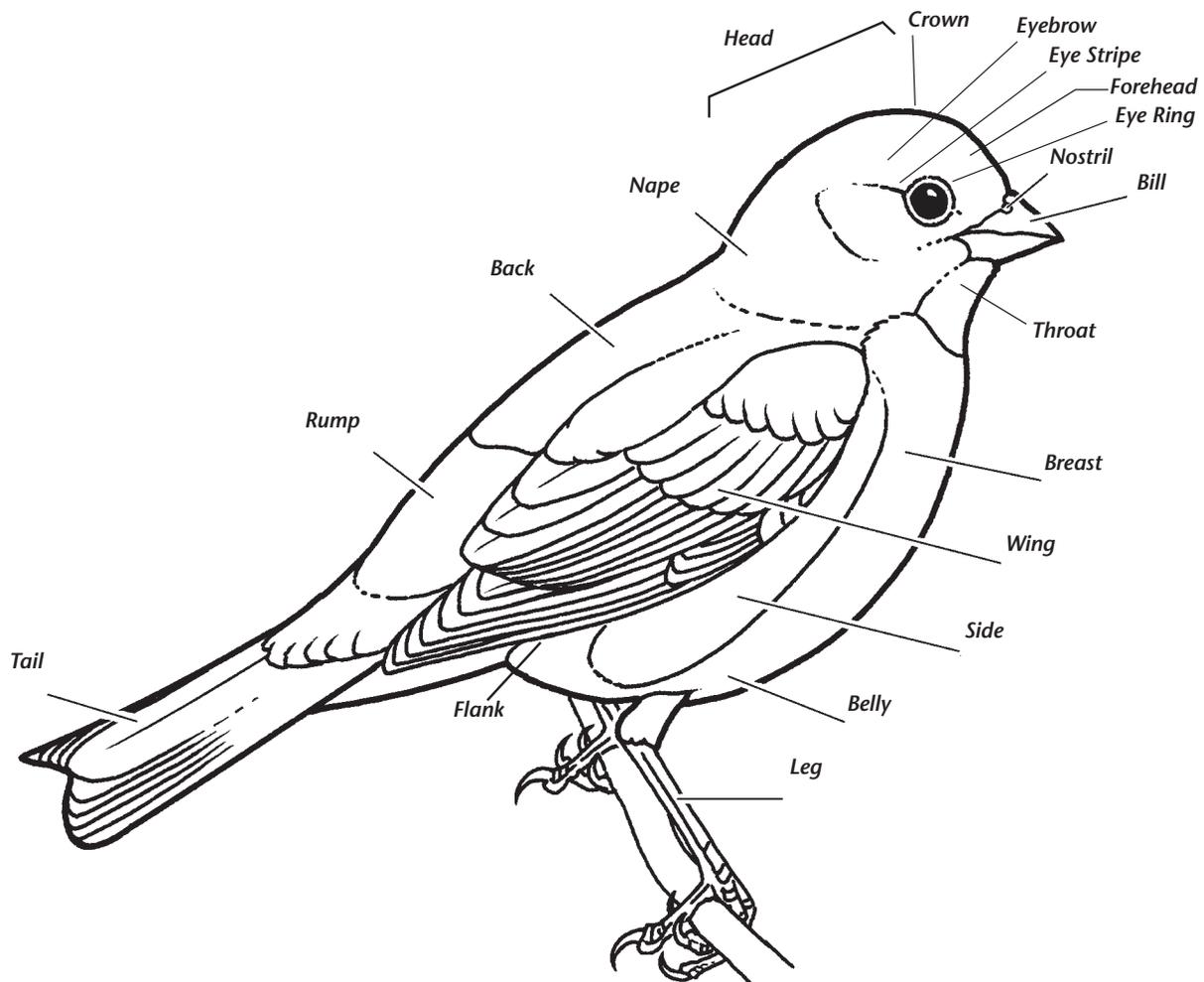


American Crow
(17–21 inches)
large



Clues to Bird ID

3. **Field Marks:** You can use a bird's distinctive colors and patterns for identification. Field marks include features such as breast spots, wingbars (thin lines along the wings), eye rings (circles around the eyes), and eye stripes (lines through the eyes). Check the color of each major body part. Sometimes the color of a bird's eyes or legs alone will help distinguish one species from another. Many times, you can also differentiate bird species by looking at how bold or faint their colors or patterns are. But be careful—a bird's colors can be affected by light conditions or the angle at which you see the bird.



Clues to Bird ID

4. **Sound:** Really good birders can find and identify more birds with their ears than with their eyes! Even beginning birders can use sound as a clue. Read the “Listening In on Birds” article if you’d like to learn more about using bird calls and songs as a clue for bird ID.
5. **Habitat:** Look around you. Is the bird deep in a forest, on your lawn, or in the city? Most birds prefer a certain **habitat**—the place where they find the food, water, and cover that they need. Knowing which birds are most likely to be found in a certain habitat will help you identify the birds you see there.
6. **Behavior:** Notice the bird’s behavior. Is it swimming or wading? Does it climb tree trunks? Does it wag its tail frequently? Does it fly in a straight line, or up and down like a roller coaster? What does it eat and how? The more you watch birds, the more you’ll learn about how different kinds of birds behave.

If you can use several of the clues above, you have a very good chance of finding your bird in the field guide. And with practice, you will be able to notice more of these clues quickly, so that identifying new birds will become easier and easier.



Many birders will never see a Chimney Swift up close or at rest. They will only see them flying at a distance over rooftops in the city. So knowing how swifts fly is very important!





*cheerily, cheerup,
cheerily*

Knowing bird sounds can help you identify birds, even when you can't see them. Experienced bird watchers can identify most birds by their songs or calls alone.

Bird watchers use certain terms to describe different types of bird sounds. For instance, the Chipping Sparrow, Dark-eyed Junco, and Pine Warbler repeat a single note rapidly in a type of song described as a trill. Northern Cardinals, Blacked-capped and Carolina chickadees, and Tufted Titmice produce clear, distinct tones called "whistles." Other sounds are not so beautiful to our ears. Kingfishers produce a harsh rattle, Common Grackles squeak, parrots squawk, and herons and coots utter hoarse croaks.

Some birders like to "translate" bird sounds into human phrases called "mnemonics" so they can remember the sounds more easily. It doesn't take too much imagination to hear a Black-capped Chickadee saying *chick-a-dee-dee-dee* or a Mourning Dove calling *oo-WOO-hoo-hoo-hoo*. It might take a little more imagination to hear a Carolina Wren say *teakettle, teakettle, teakettle*, or to hear the Rufous-sided Towhee's *drink your tea*. Once you've made the connections, however, these phrases can be very helpful in remembering a bird's song.

Some birds are actually easier to identify by ear than by sight. Eastern Wood-Pewees and Eastern Phoebes are flycatchers that look very much alike. However, the pewee's song is a clear *pee-a-wee*, whereas the phoebe's song is a loud, buzzy *FEE-be*.



pee-a-wee

Eastern Wood-Pewee



FEE-be!!

Eastern Phoebe

Listening In on Birds



Which Bird Sounds Like...

1. Caw, caw, caw
2. Cheerily, cheer-up, cheerily (song) or Chup, chup (call)
3. Chick-a-dee-dee-dee
4. Peter, peter, peter
5. Conk-a-REE
6. Perchickereee
7. Cheer, cheer, cheer or purdy, purdy, purdy
8. Oowoo-hoo-hoo-hoo

8. Mourning Dove
7. Northern Cardinal
6. American Goldfinch
5. Red-winged Blackbird

4. Tufted Titmouse
3. Black-capped Chickadee
2. American Robin
1. American Crow

Answers:

Strategies for Learning to Identify Birds by Sound

1. Focus on learning the songs or calls of one or two species at a time.
2. Track down singing birds in the field to discover their identities. Watching a bird sing its song will really help you to remember that song!
3. Listen to recordings of bird songs. Unlike wild birds, you can replay them as often as you want. Visit www.AllAboutBirds.org/Page.aspx?pid=1059 (the Songs and Calls tab under Birding Basics heading) to hear different types of bird sounds. Try playing the recordings for the 10 most common birds in your area, and then go outside and see if you can locate any of those birds just by listening.

More audio guides can be found in your local bookstore, online, or at a bird-feeding supply store. Peterson Field Guides, National Geographic Society Guides, and Stokes Field Guides are all excellent choices.

For smartphone users, there are a variety of apps that enable you to have your bird guide for songs and identification in your pocket. Many of North America's major field guides such as Peterson, Sibley, and Audubon all have apps for smartphone users. For beginning birders, these resources are an easy reference to have on hand at all times.



Real World Sleuths #1: Invisible bird songs revealed!

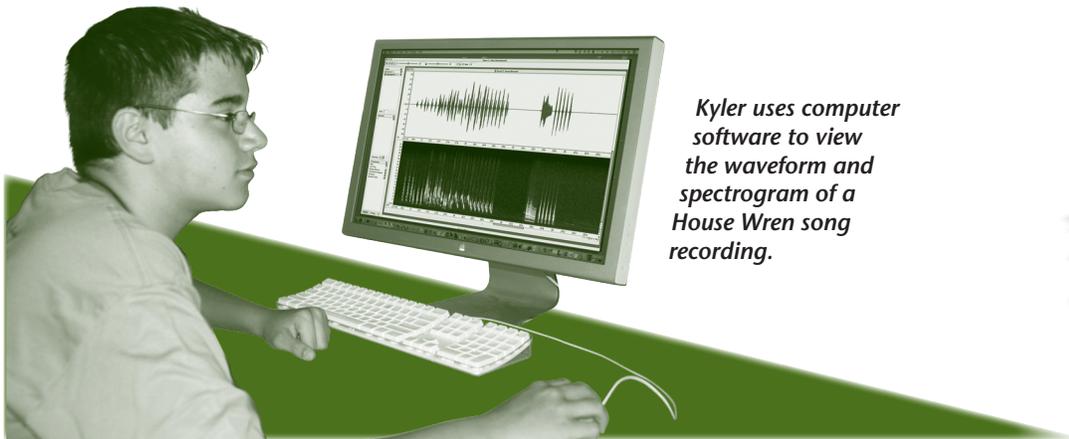
Singing House Wren



Diane Tessaglia-Hymes

At right is an autonomous recording unit, or ARU for short. "Autonomous" means that it works all by itself. Scientists use ARUs like this one to listen in on birds in areas that are dangerous or hard to reach. The ARU is powered by a car battery and has a microphone (hidden by the fake fur) that records sounds onto a computer disk stored in the plastic tube. The fake fur helps to muffle the sound of wind. The ARUs can stay outdoors and record sounds for several months at a time.

Later, the scientists come back for the ARUs to download and listen to the recordings in the lab. They use computer software called Raven to help them analyze the sounds. Raven turns sounds into waveforms and spectrograms, so they are easy to see. This helps scientists learn which kinds of birds were present, how many different birds were present, and other interesting facts about bird populations.



Kyler uses computer software to view the waveform and spectrogram of a House Wren song recording.



1. Cornell Lab of Ornithology researcher Chris Tessaglia-Hymes shows Kaitlynn, Kyler, and Edan how an ARU is attached to a tree.
2. A car battery that is stored in a box attached to a tree powers the ARU for several months.
3. All the sounds are stored on a computer disk inside the plastic tube.



Your notes





How to Get Started Using Binoculars

To get the clearest image with your binoculars, you'll need to adjust them to your eyes. To do this, find a sign or another object that doesn't move, and stand about 30 feet away from it. Then follow these steps:

Step 1: Adjust the eye cups

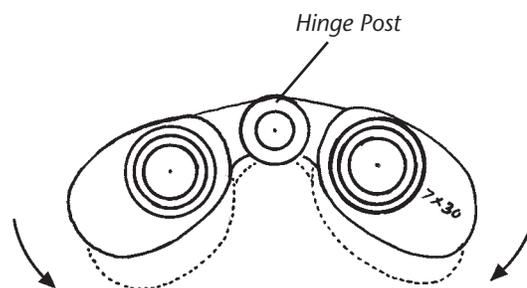
Most binoculars have adjustable **eye cups** on each eyepiece. These eye cups should be **DOWN** if you wear glasses, **UP** if you do not.

Step 2: Adjust the width

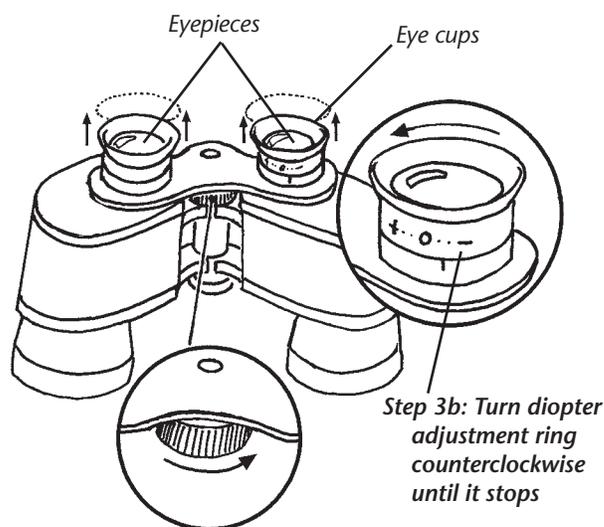
Binoculars have two **eyepieces** connected by a **hinge post** in the middle (see diagram). The eyepieces can move in and out to change how far apart they are. You want to set your eyepieces to match your eyes. To do this, first spread the eyepieces as far apart as they will go, then put the binoculars up to your eyes. Move the eyepieces together until you see the two circles merge into one.

Step 3: Set the focus

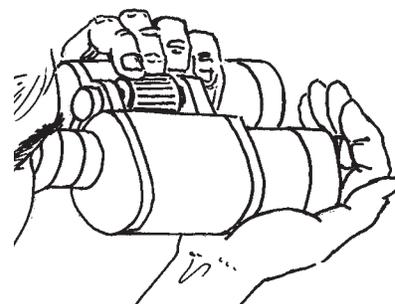
All binoculars have a **focus wheel**, usually in the middle, which changes the focus of both eyepieces at once. You use this wheel to focus your binoculars every time you look at a new bird. In addition to the focus wheel, most binoculars also have a **diopter adjustment ring**, which is a smaller wheel that adjusts a single eyepiece (usually the right one). Often the diopter is found on the eyepiece itself.



Step 2: Form one image



Step 3a: Turn center focus wheel counterclockwise until it stops



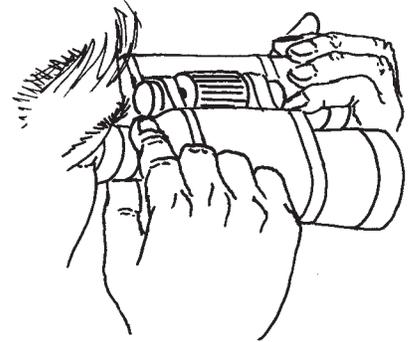
Step 3c: Focus left eyepiece with central focusing wheel

Successful Binocular Spying

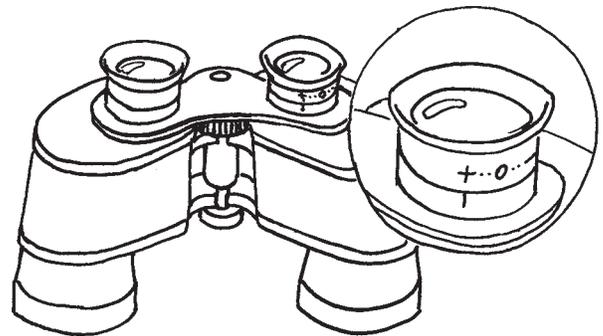
The diopter allows you to set the binoculars for your particular eyes, and you need to set it only once. To do so, start by turning both the diopter and the focus wheel counterclockwise until they stop (3a and 3b). Now, cover the right eyepiece (or the one with the diopter adjustment ring). Looking through the left eyepiece with your left eye, turn the focus wheel until the sign comes into focus. Get it as sharp as you can (3c).

Next, cover the left eyepiece and look at the sign using only the right eyepiece. The sign will probably be a tiny bit blurry, so turn the diopter adjustment ring until it comes into focus. There! You've adjusted your binoculars to compensate for the difference between your two eyes. *Remember your setting in case it gets moved.*

From now on, to focus on something, you'll only need to turn the focus wheel.



Step 3d: Focus right eyepiece by turning the diopter adjustment ring



Step 3e: Note your diopter adjustment ring setting

Tips for Cleaning and Protecting Binoculars

1. Clean the lenses with a soft cloth. Make sure to gently brush off any dirt particles first, so that they don't scratch the glass.
2. Wipe off any metal parts so they don't rust.
3. When you're carrying your binoculars, keep them around your neck. Never swing them by the strap—accidentally banging them into a tree could throw them out of alignment or break them!
4. Protect your binoculars from rain. If water gets inside they can fog up, and mildew might grow in them.
5. If your binoculars do fog up, set them in a warm, dry place for a couple of days to dry out.



Real World Sleuths #2: Kids test binoculars for science!



Rachel, Edan, Kaitlynn, Sonya and Peter are children and friends of Lab of Ornithology staff.

You can see a comparison of binocular brands and models online at http://www.birds.cornell.edu/Publications/LivingBird/winter2005/Age_Binos.html

A group of student bird sleuths came to the Cornell Lab of Ornithology to test binoculars. The students discovered that the best binoculars for adults are not necessarily the best binoculars for kids. They found that these binocular features were very important to them:

Look for binoculars that are: a good fit

Kids' eyes are often closer together than those of adults. Make sure the eyepieces can move close enough together—you should be able to look through them without seeing black circles.

lightweight

Binoculars that feel a little heavy after only a few minutes will be really uncomfortable for longer.

easy to use

Make sure the focus wheel is easy to turn and the binoculars are comfortable to hold.

Other suggestions from the kids...

Beware of cheap binoculars which may have poor optics and loose focus wheels. This can make the birds blurry. Cheap binoculars can also break more easily.

No matter what kind of binoculars you have, the kids recommended that you take care of them by keeping them dry, wiping the lens with a lens cloth, and always wearing them around your neck so they don't drop on the ground.

Sonya was frustrated with a pair of damaged binoculars. The two eyepieces did not focus together, and made her dizzy after a while.



Edan is an experienced bird watcher with his own pair of binoculars. He keeps them in a case when he's not using them.



Your notes



All field guides are made up of a series of **species accounts**, one for each bird species. Each account generally includes a picture of the bird along with the following information:

A field guide usually includes:

- Picture**
 - size
 - appearance
 - field marks
- Range Map**

American Crow
Corvus brachyrhynchos

This cunning, inquisitive, vocal opportunist is one of the most widespread of North American birds. Everybody knows crows. You may have seen one pilfering the dog's food, tearing holes in your garbage bag, or emptying a temporarily neglected lunch bag. It is a mistake to underestimate a crow's ability. Most people have opinions about crows that run the gamut from outright hatred to bemused admiration.

Very similar in appearance to the North-western Crow (*Corvus caurinus*), this species is larger, has a higher-pitched voice, and is less social during the breeding season. The American Crow is also similar in appearance to the Fish Crow (*Corvus ossifragus*), which is smaller and has a distinct nasal voice. Where American Crow overlaps Northwestern Crow (e.g., Puget Sound, Washington) and Fish Crow (Atlantic seaboard and southeastern U.S.), identification is difficult, with voice the most reliable character.

American Crows are found in a wide variety of habitats, particularly in open landscapes, with scattered trees and small woodlots. Clearing of hardwood and coniferous forests, planting of trees around prairie homesteads and urban centers, and tilling of agricultural land has created additional habitat for the species, which is now more abundant than it was when the first European settlers arrived. Large-scale persecution during the nineteenth century and first half of the twentieth made crows shy of people. They learned quickly, however, that there is safety from guns in villages and cities and that food is abundant there.

Crows roost communally; often the same sites are used year after year. Outside of the breeding season, such roosts may contain thousands of local individuals, their numbers often augmented by migrants from northern regions. When these roosts are located in cities, they may become a nuisance requiring management.

- Common Name**
- Scientific Name**
- Species Information**
 - habitat
 - calls/songs
 - field marks
 - behaviors

Text courtesy CIO All About Birds

How Field Guides Are Organized

In most field guides, species are arranged according to an established **taxonomic order**—that is, species that are closely related are found together. For example, all species in the hawk family (Accipitridae) are found in one section of the guide, all species of the woodpecker family (Picidae) are in another, and so on. (See the “Classifying Birds” article for more information.)

Experienced birders can quickly find a species in a field guide by knowing which **taxonomic group** it belongs to and where that group is found in the field guide. As a beginner, you will probably want to use the index in the back of the guide.

How to Use a Field Guide

Most field guides include both common and scientific names in the index. Some list the common names by their “first” names, some by their “last” names, and some by both. For example, the American Robin might be under “A” for American or “R” for robin, or both. Scientific names are listed in the index by genus first, then species.

<i>Roadrunner, Greater</i>	230
Robin, American	380
<i>Rosy-finch, Black</i>	495

<i>American Redstart</i>	414
American Robin	380
<i>American Tree Sparrow</i>	448

Dimorphism

Some kinds of birds have different **plumages** (feather colors and patterns) depending on their age, their gender, the time of year, or even the geographic location. Most field guides include multiple pictures for these species.

For example, Northern Cardinals are **sexually dimorphic** (males look different from females), so field guides always have two images to show the plumage of both male and female. As another example, male and female European Starlings look the same, but have a spotted plumage in the winter months and are mostly black during the breeding season. In this case, field guides have two images to show breeding and nonbreeding plumage.

Find the American Goldfinch in your field guide. You’ll see several different pictures, because this species shows several types of plumage variation:

1. Sexual dimorphism (difference between males and females)
2. Seasonal variation (nonbreeding vs. breeding—also called “winter” and “summer”)
3. Age variation (juvenile vs. adult)



Harold B. Key

We can tell that this American Goldfinch is an adult male in the breeding season.

How to Use a Field Guide

Not all bird species have different plumages. For example, look up the American Crow, a species that shows no variation in plumage at all. This makes it easier to learn what a crow looks like, but it also means that, when you spot a crow, you have little way of knowing whether it is a juvenile or an adult, or whether it is male or female.

Now that you know what's in a field guide, try looking up some birds that interest you to learn more about them!



Joy and Kevin McCowan

We can't tell if this American Crow is a male or female, young or old, or if it is in the breeding season, since crows always look so similar to each other.

Suggested Field Guides

Try finding used field guides online or in bookstores. New guides can be purchased at bookstores, online, or at bird-feed supply stores.

Birds of North America. Kaufman Focus Guides. Houghton Mifflin Company.

Birds of North America. Golden Field Guides from St. Martin's Press.

National Geographic Field Guide to the Birds of North America. National Geographic. National Geographic Society.

Peterson Field Guides of (Western Birds or Birds of Eastern and Central North America). Houghton Mifflin Company.

Stokes Field Guide to Birds (Western Region or Eastern Region). Little, Brown and Company.

www.AllAboutBirds.org: This online resource allows you to search for birds by name, shape, taxonomy, feature images, sounds, and some videos.



Your notes





Identifying “Tricky” Birds

Some bird suspects are particularly hard to tell apart. Even expert bird sleuths can be fooled by these tricky birds! Focus on these field mark clues.

Confusing Species	Field Mark Clues
Hairy Woodpecker Downy Woodpecker	Bill appears longer than the head width in the Hairy Woodpecker, shorter than the head width in the Downy Woodpecker.
Black-capped Chickadee Carolina Chickadee	Look at the species ranges to see which one lives in your area. For places where both are found, look at how much white is on the wing.
American Tree Sparrow Chipping Sparrow Field Sparrow	Notice colors and striping on head (cap, eyeline, brow, chin, eyering), color of bill and lower legs, and presence or absence of a spot on the chest.
House Sparrow Harris’s Sparrow Black-throated Sparrow	Tell these apart by the patterns on the head; the colors of the crown, throat, bill; eye striping; and species ranges.
Brewer’s Blackbird Rusty Blackbird European Starling Boat-tailed Grackle Great-tailed Grackle Common Grackle	Important clues include the overall body size, bill size, tail shape, eye color, songs, and calls. Also notice the range map to see which species are found in your area.
Purple Finch Cassin’s Finch House Finch	Notice the boldness of face patterns, color of cap and throat, pattern on chest and sides, and range.
American Goldfinch Lesser Goldfinch	Look at the species ranges to see which one lives in your area.
American Goldfinch Pine Warbler	The pattern of color on the wings is an important clue. Goldfinches have conical beaks and Pine Warblers, have thin beaks.
Common Redpoll Pine Siskin Female House, Purple, or Cassin’s finch	Bill shape, face, and color patterns are important clues.
Female Red-winged Blackbird Song Sparrow Fox Sparrow	The female Red-winged Blackbird is larger and has a different bill shape than the sparrows.



Identifying “Tricky” Birds

Color Variations

Sometimes a strange-looking bird shows up in your area. For example, you might see a bird that looks like a House Finch except that it is more orange than the one in your field guide. Most likely it really is a House Finch; some species show color variations.

One fairly common variation is **albinism**, a condition in which a bird has all or partially white plumage. If you spot a strange-looking bird with white on it, remember that size, shape, and behavior often will help to identify a bird even when its **plumage** (feather color and pattern) looks odd. Comparing the strange bird with other nearby birds can be helpful. Ask yourself “What bird would I think this was if it didn’t have white feathers?”



John Kinsey

American Robins. The photographer used his observation skills and wrote, “This [white] bird seems to be a female, based on the fact that I observed her trying out several nesting sites over the course of the weekend and she seemed to spend a lot of time with another robin who appears to be a male.”



Ann Morrison

Blue Jays usually have crests, but all the feathers on this bird’s head are molting. If you look closely, you can see its ear opening behind its eye.

Bald-Headed Birds

Each year, bird watchers report several cases of “bald-headed birds,” mostly Blue Jays and Northern Cardinals. These birds are probably just **molting** (replacing their feathers) since most reports of bald birds occur in summer and fall, which are typical molting times. Baldness also may result from feather mites, lice, or environmental or nutritional problems.

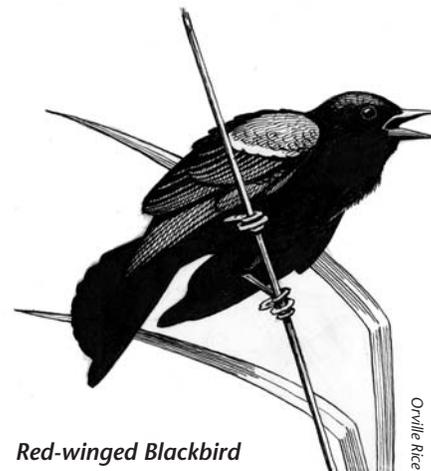




Classifying Birds

Have you ever looked in a field guide and wondered why the brightly colored orioles and meadowlarks are lumped together with black birds like grackles and Red-winged Blackbirds, but other black birds such as starlings and crows are not in that group? The answer is that field guides are arranged so that related birds are placed together. Even though they look similar, grackles and crows are not closely related.

This brings us to a very important question: “How do people classify birds?”



Red-winged Blackbird

History

At least since Aristotle (384 to 322 B.C.), people have been classifying birds or giving them names, trying to put them into logical groups. Exactly how people classify birds depends on which categories they choose. For example, in some societies, birds might be divided into two categories: birds you can eat, and birds you can't!

After Charles Darwin proposed his theory of evolution by natural selection in 1859, scientists began to classify organisms according to a shared common ancestry. In other words, organisms that were thought to be related to one another were put in the same group. This approach was the beginning of modern plant and animal **taxonomy** in which scientists assign scientific names and taxonomic grouping to reflect each species' evolutionary history.

Binomial Nomenclature

Early in the 18th century, explorers traveled the globe, returning to Europe with many new plants and animals. However, scientists in different countries often gave the same organisms different names, which eventually became very confusing.

Finally, Swedish naturalist Carolus Linnaeus (1707 to 1778), a genius at organization, created a system of **binomial nomenclature** (“using two names”) for all plants and animals. This method worked so well that scientists have used it to classify living things ever since.

Linnaeus gave each plant or animal two Latin names: the first was its **genus** (plural “genera”; always capitalized) and the second, its **species** (plural is also “species”; never capitalized). Both the genus and species name must be written together to represent a unique organism—such as *Homo sapiens* (humans!).



Classifying Birds

Together, the genus and species make up the **scientific name** for each species. It is always written using italics (in print) or by underlining (when written by hand). For example, the scientific name of the Canada Goose is *Branta canadensis*.

Field guides give the scientific names after the common names—to eliminate any doubt in anyone’s mind about which bird is being described.

Is that an Osprey?

The “official” English name of this bird is Osprey, but in some parts of both the United States and Canada it is known as the fish hawk. The Swedes call it fiskgjuse; the Germans, fischadler; the Dutch, visarend; the South Africans, visvalk; the Burmese, wun-let; and the Argentines, sangral.

To ornithologists, regardless of the language they speak, the bird’s scientific name is *Pandion haliaetus*. Using the Osprey’s scientific name, ornithologists from all over the world can speak about the same bird species without confusion.



Frederick Truflow

Classification System

As more organisms were described and placed into Linnaeus’ classification system, new categories were added. Today, each species of animal or plant is classified by placing it in a series of categories. As new evolutionary relationships are discovered using genetic and morphological evidence, species are grouped into this classification system according to their relatedness to each other.

Individuals of one type of bird are considered members of the same **species**. Different species that are closely related are grouped into the same **genus**. Closely related genera are placed within a **family**, related families within an **order**, related orders within a **class**, related classes within a **phylum**, and finally, related phyla within a **kingdom**.



Classifying Birds



How closely are we related to the American Robin?



American Robin	Category	Human Being
Animalia (animals)	Kingdom	Animalia (animals)
Chordata (with a spinal cord)	Phylum	Chordata (with a spinal cord)
Vertebrata (skeleton has vertebrae)	Subphylum	Vertebrata (skeleton has vertebrae)
Aves (warm-blooded, feathers, hollow bones, lays eggs)	Class	Mammalia (warm blooded, hair, solid bones, live young)
Passeriformes (perching birds)	Order	Primates (flexible hands and feet, short snout, large brain)
<i>Turdus migratorius</i>	Genus and Species	<i>Homo sapiens</i>

So, how closely are we related to American Robins? We are both animals that have spinal cords and vertebrae. But we are mammals (order Mammalia) like dogs, cats, and rats, whereas robins are birds (order Aves).

Some students remember the Order of Taxonomy in Biology by remembering this: King Phillip Came Over for Good Spaghetti, or Kingdom, Phylum, Class, Order, Family, Genus, Species.



Your notes





Tammie Sanders

Scientists can learn a lot by knowing where the birds are. They want to know what birds are doing, where they are going, and how their populations are changing. But scientists can't be everywhere doing the work that needs to be done. They rely on volunteer **citizen scientists** to help. Regardless of your age, with some practice, you can help with important research. The more people who collect data, and the longer they collect it, the better! We can start to see patterns, discover new questions, and draw new conclusions. Your data can help answer questions such as:

- How are diseases, like West Nile virus and House Finch eye disease, affecting bird populations?
- How do humans affect bird populations?
- How do populations of birds increase, decrease, or move from one location to another?
- How might climate change affect birds?

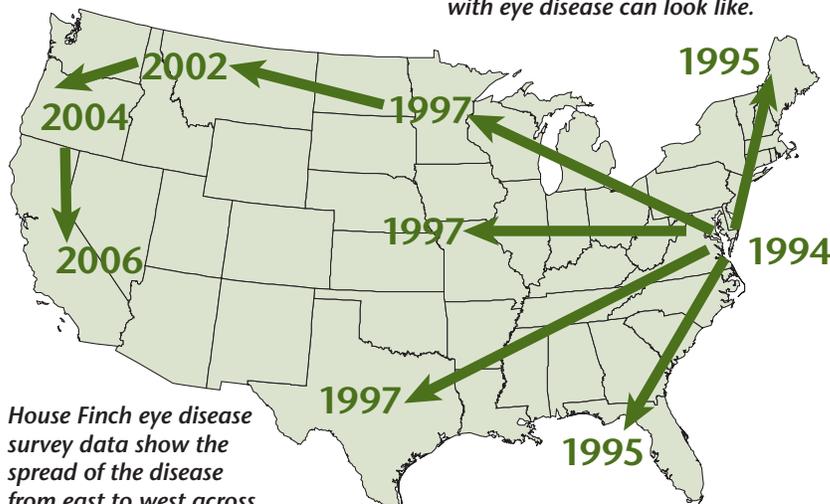
Tracking the Spread of a Disease

Citizen scientists help monitor House Finch eye disease (rather like “pink eye” in birds). **Project FeederWatch** participants noticed the disease in Maryland in 1994. Since then, people all over the country have been sending FeederWatch researchers reports of diseased birds.

Researchers have been able to make maps that show how the disease has spread across the country over time. Scientists had never been able to track the spread of a disease like this before. Since thousands of people in the field sent in reports, researchers could see patterns and learn a lot!



This is what the eye of a House Finch with eye disease can look like.



House Finch eye disease survey data show the spread of the disease from east to west across the United States.

Why Count Birds?



Orville Rice

House Sparrows are almost everywhere!

Keeping an Eye on Introduced Species

House Sparrows and European Starlings were introduced to North America in the 1800s, and are now found in many types of habitats. They can pose a problem for our native birds because they often outcompete native species for nesting cavities. Citizen scientists who participate in projects like **eBird**, **Project Feeder Watch**, and **Nest Watch** can help scientists find out what's happening to populations of these nonnative birds and the native birds they compete with.

Birds such as pigeons and doves have a long history of population movements, increases, and decreases. **eBird** and other projects track the distribution of these birds. Lab scientists want to understand more about distributions, numbers, and habitats used by pigeons and doves, and which species are seen together. Citizen scientists have helped track Eurasian Collared-Doves, which were first seen in Florida in the 1980s. Although this species is originally from Europe, it is now spreading rapidly across North America.

With Citizen Science, Everyone Wins!

Citizen scientists learn about science and nature in their neighborhoods; scientists get data they could never collect on their own. Birds win too, because findings from citizen science projects are helping to shape conservation efforts around the world.

If you collect data on birds for a while, you might get curious about the birds you watch. Just as our scientists ask questions, you might start to ask questions about your local birds. Meanwhile, Cornell Lab of Ornithology scientists will use the data you send, and all of us will understand birds better.

Visit www.birds.cornell.edu/citsi for more information on Citizen Science projects.



Ken Rosenberg

Birds in Forested Landscapes citizen scientists play bird recordings to lure hard-to-find birds into sight.

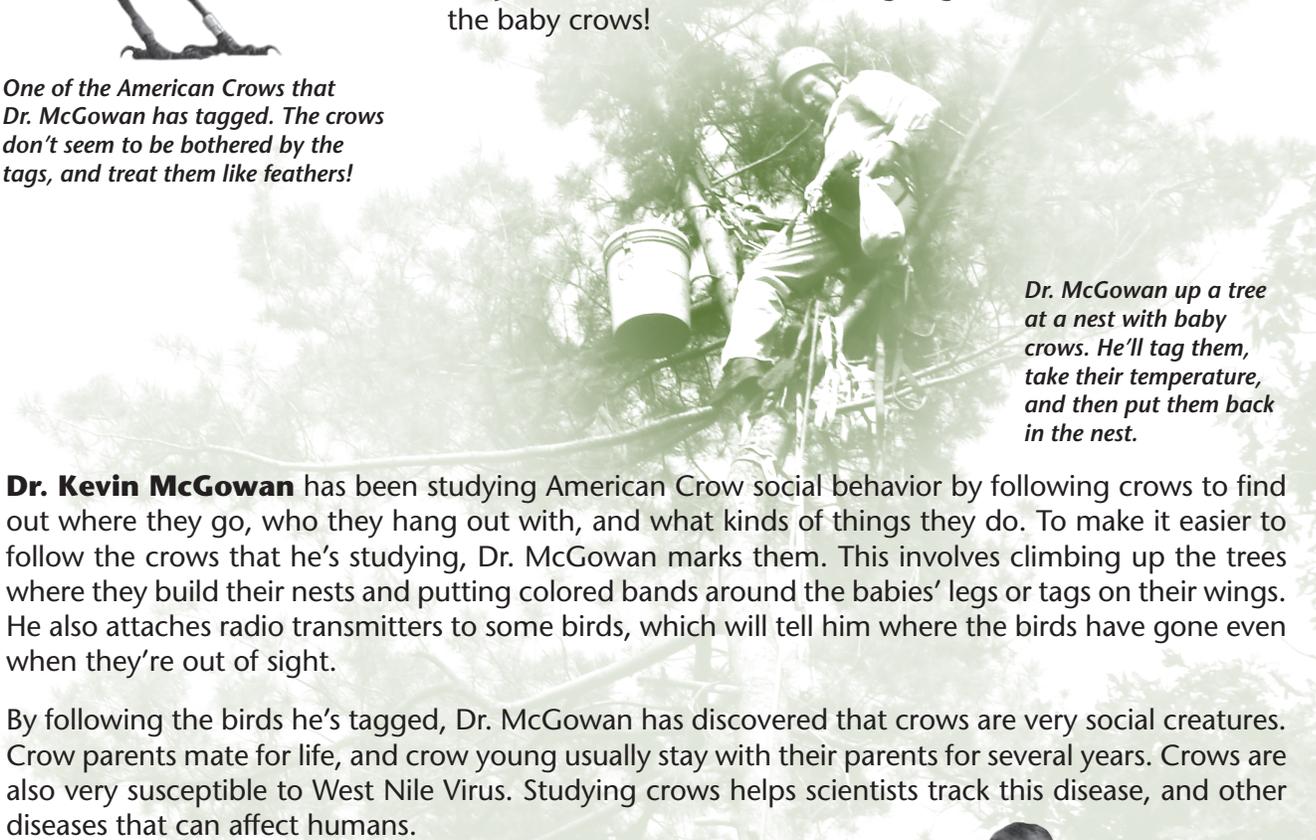


Real World Sleuths #3: Who's watching whom?



One of the American Crows that Dr. McGowan has tagged. The crows don't seem to be bothered by the tags, and treat them like feathers!

Crows know he's coming when they see his car. The ladder strapped to the roof might be a clue. They fly alongside and peer in the windows to make sure it's him. When he gets out to set up his banding and tagging operation, dozens of crows are already cawing in alarm, alerting all the other crows in the neighborhood. They remember him from last spring and summer's research season. They can even recognize him when they see him in other parts of their territory, miles away! Why are the crows so upset? They think Dr. Kevin McGowan is going to rob their nests and eat the baby crows!



Dr. McGowan up a tree at a nest with baby crows. He'll tag them, take their temperature, and then put them back in the nest.

Dr. Kevin McGowan has been studying American Crow social behavior by following crows to find out where they go, who they hang out with, and what kinds of things they do. To make it easier to follow the crows that he's studying, Dr. McGowan marks them. This involves climbing up the trees where they build their nests and putting colored bands around the babies' legs or tags on their wings. He also attaches radio transmitters to some birds, which will tell him where the birds have gone even when they're out of sight.

By following the birds he's tagged, Dr. McGowan has discovered that crows are very social creatures. Crow parents mate for life, and crow young usually stay with their parents for several years. Crows are also very susceptible to West Nile Virus. Studying crows helps scientists track this disease, and other diseases that can affect humans.



Joy and Kevin McGowan (3)

Science Glossary

albinism—a condition in which some or all of a bird’s feathers are white.

arthropods—invertebrate animals, such as insects and spiders, with a segmented body and external skeleton.

behavior—the voluntary and involuntary actions of an organism in relation to the natural elements and other organisms in its environment; an organism’s set of responses to stimuli.

binomial nomenclature—a system using two names to organize all plants and animals into unique categories. First name is the genus, second is the species.

breeding range—the geographic area where a bird species can be found breeding and raising young. This is also called the bird’s “summer range.”

citizen scientist—ordinary citizens who collect data to be used for scientific studies.

classification—how animals are grouped together according to their shared characteristics and evolutionary relationships.

common name—a bird’s common name is its non-scientific name. For instance, *Ceryle alcyon* is also known by its common name, Belted Kingfisher.

diopter adjustment ring—a small wheel that adjusts a single eyepiece on binoculars; usually found on the right eyepiece.

distribution—the geographic locations where a bird is found. Distributions are shown on maps as shaded areas.

evolution—ongoing process by which living organisms change over time in response to changing environments. The diversity of life forms we see today is a result of the evolutionary process.

eyepieces—on binoculars, the parts that are placed up to the eyes.

field guide—an illustrated book with descriptions of birds. Most field guides group birds according to their taxonomic order, instead of alphabetically.

field mark—a bird’s distinctive colors and patterns used in identification. Breast spots, wing bars (thin lines across the wings), and eye rings (light or dark circles around the eyes) are some common field marks.

fledgling—a young bird that has left the nest and is capable of flight.

flight style—the way a bird moves through the air; a description of the way a bird uses its wings, the duration of the flight it makes, and the distance it travels.

focus wheel—the part of a pair of binoculars which changes the focus of both eyepieces at once; usually the large wheel between the two eyepieces.

foraging—the act of searching for food.

genus—a classification category. Members of a genus are closely related and often share similar physical characteristics and/or behaviors. Western Bluebird (*Sialia mexicana*) and Eastern Bluebird (*Sialia sialis*) are two species in the genus *Sialia*. Both have blue plumage with red breast feathers in the males, similar bills, and musical calls in flight.



Science Glossary

habitat—the place where a bird (or other animal) lives which provides the food, water, cover, and space that the animal needs to survive. A habitat has many elements such as light, temperature, moisture, plants, and other animals. Examples include wetlands, open woods, and forest edges.

incubation period—the length of time (in days) that the parent bird sits on its eggs in order to keep them warm until they hatch.

invertebrates—animals without a backbone, such as spiders, insects, snails, and worms.

mnemonics—(also known as a mnemonic device) any learning technique that helps an individual to remember information by associating that information with things that are easier to memorize. The most common mnemonics are vocal.

migrant—a bird that makes seasonal journeys. Most migrants move to their breeding grounds each spring, then back to their nonbreeding grounds in the fall.

molt—the shedding of feathers. Birds can molt some or all of their feathers. Newly grown feathers replace the feathers that are shed.

nestling—a young bird that has not left the nest.

nonbreeding range—the geographic area where a bird can be found during the nonbreeding winter months (also called the “wintering range”). Birds that do not migrate have the same range year-round (year-round range).

passerine—the birds in the large order Passiformes, which have perching feet; this group includes all songbirds.

plumage—a bird’s feather colors and patterns.

range map—map showing the geographic area where a species is found.

scientific name—a bird’s Latin name which has two parts—genus and species. For example, the Belted Kingfisher’s scientific name is *Ceryle alcyon*.

sexual dimorphism—males and females appear different from each other.

silhouette—the shape created by a bird’s outline. Silhouettes are shown as dark shapes against light backgrounds.

species—in the taxonomic order, this category is the final and most specific classification. Birds grouped in the same species can breed with each other and generally share common habitats, appearance, and behavior.

species account—the information about each bird that is provided in a field guide. Most species accounts include a bird’s common name, scientific name, size, visual description, distribution map, habits, sound description, and a picture.

taxonomic order—the scientific categories used to group living organisms: kingdom, phylum, class, order, family, genus, and species. These categories are arranged in a hierarchy, with “kingdom” being the most general and “species” the most specific.

taxonomy—system of assigning names and categories to living organisms based on their evolutionary relationships. “Order,” “family,” and “genus” are examples of a taxonomic categories.



Science Glossary

wetland—land that has very wet soil or standing water. Swamps (with trees) and marshes (without trees) are the two main types of wetlands.

year-round range—the geographic area where a bird can be found year-round. This is the total range for a nonmigratory bird, or the overlap zone between breeding and nonbreeding ranges for some migratory birds.

