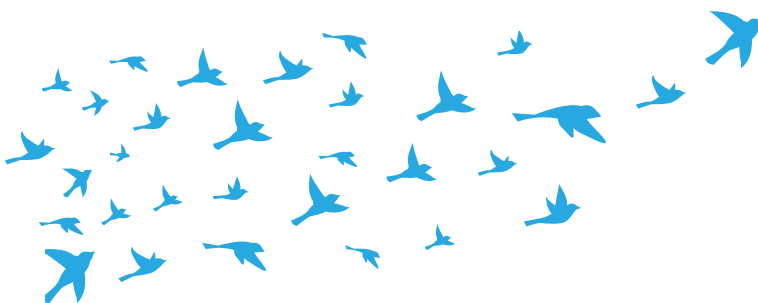


## Bird Watching Tips

Here are some bird watching tips to improve your chances of seeing more birds:

- **Time of day** – Early mornings around sunrise and late afternoons around sunset tend to be times when birds are most active as these are common feeding times. Birds often avoid the heat in the middle of the day.
- **Days of the week** – If you're scouting for birds in popular areas or parks you might find better results visiting during off-peak times such as mid-week when there are less people around to disturb the birds.
- **Be quiet** – Birds are easily startled by loud noises and will seek cover. Birds have much better hearing than human beings so it is nearly impossible to sneak up on them.
- **Avoid sudden movements** – Sudden movements will startle birds just like loud noises do. Move slowly and quietly in order to get closer to a bird. The closer you are, the more slowly and quietly you should move.
- **Have the sun at your back** – Try to always have the sun at your back so that it will be much easier to see birds and their colors. Otherwise you will typically just see a dark silhouette.
- **Pishing** – Bird watchers often use the "pishing" technique of making small squeaky noises in order to encourage birds to come out and investigate the source of the sound.
- **Avoid brightly colored clothes** – Many birds do not have very good color vision which means that bright and white colored clothing will often contrast more with your surroundings and make it easier for birds to see your movements. Darker clothing tends to blend in more with your environment.
- **Listen for chirps and look for crowds** – Small songbirds often join groups of other birds for protection and to find food more easily. These groups are typically quiet but may have 1-2 songbirds making noise that can help lead you to the group.



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## Common Birds Found in the United States

### American Robin

Scientific name – *Turdus migratorius*  
Size – Overall average length 25 cm and average body mass of 77 grams  
Habitat – Cities, towns, lawn, farmland and forests  
Geographic range – North and Central America, Bahamas, Bermuda, and Cuba  
Migration pattern – Sedentary and migratory  
Similar species – Eastern Towhee (*Pipilo erythrophthalmus*)  
The collections at the Smithsonian house specimens of 6 subspecies (or races) of American Robin spanning locations from Canada and Alaska, to Mexico.



### Mourning Dove

Scientific name – *Zenaida macroura*  
Size – Overall length 22.5-34 cm and average body mass 109-116 grams  
Habitat – Shrubland, Wetlands, and Artificial/Terrestrial Forest, agriculture land  
Geographic range – North and Central America, Caribbean, Cuba, Puerto Rico, Columbia  
Migration pattern – Sedentary and migratory  
Similar species – White-winged Dove (*Zenaida asiatica*)  
The Smithsonian collections have specimens of a closely related species, Passenger Pigeon (*Ectopistes migratorius*), that is now extinct. Passenger pigeons were once the most numerous bird in North America.



### American Crow

Scientific name – *Corvus brachyrhynchos*  
Size – Overall length 43-53 cm and average body mass of 250-575 grams  
Habitat – Woodlands, farms, fields, river groves, shores and towns  
Geographic range – United States, Canada and introduced in Bermuda  
Migration pattern – Migratory, sedentary  
Similar species – Northwestern Crow (*Corvus caurinus*), Fish Crow (*C. ossifragus*)  
Several albino American Crow specimens are stored in the Smithsonian's collections. Albino (white) birds are rare in the American Crow population.



### Bald Eagle

Scientific name – *Haliaeetus leucocephalus*  
Size – Overall length 71-96 cm, wingspread 168-244 cm and overall body mass 3.0 to 6.3 kilograms  
Habitat – Marine Intertidal Wetlands, Marine Neritic, Artificial/Aquatic & Marine, Forest, Shrubland and Grassland  
Geographic range – United States, Canada, Mexico, North and Central America  
Migration pattern – Sedentary and migratory  
Similar species – Golden Eagle (*Aquila chrysaetos*)  
Specimens housed in the Smithsonian collections show variation in plumages based on the age of the birds. Only the adults have the white head and white tail.



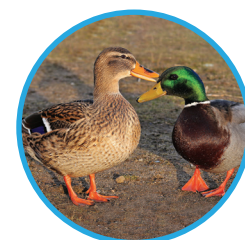
### Red-tailed Hawk

Scientific name – *Buteo jamaicensis*  
Size – Overall length 45-65 cm and average body mass of 1080 grams  
Habitat – Open country, woodlands, prairie groves, mountains, plains and roadsides  
Geographic range – United States, Antigua and Barbuda, Bahamas, Barbados, Belize, Canada, Cayman Islands, Cuba, Dominica, Dominican Republic, El Salvador, Guadeloupe, Guatemala, Haiti, Honduras, Martinique and Mexico  
Migration pattern – Sedentary and migratory  
Similar species – Swainson's Hawk (*Buteo swainsoni*), Red-shouldered Hawk (*Buteo lineatus*), and Broad-winged Hawk (*Buteo platypterus*)  
The Smithsonian bird collections have many specimens that show a wide range of plumage variation within this species.



### Mallard Duck

Scientific name – *Anas platyrhynchos*  
Size – Overall length 50-65 cm and overall body mass 1000-1300 grams  
Habitat – Wetlands  
Geographic range – United States, Canada and Mexico, Europe, Africa, Asia  
Migration pattern – Sedentary, migratory and partially migratory  
Similar species – Black Duck (*Anas rubripes*) and Mottled duck (*Anas fulvigula*)  
The Smithsonian's collections have Mallard specimens dating back to 1842 when a specimen was obtained by Spencer Baird, the second secretary of the Smithsonian, in Pennsylvania.



### Common Starling

Scientific name – *Sturnus vulgaris*  
Size – Overall length 20-23 cm and overall body mass 70-99 grams  
Habitat – Exploits wide range of habitats. Marine Intertidal, Forest, Grassland, Artificial/Terrestrial, Artificial/Aquatic & Marine, Shrubland, urban areas.  
Geographic range – Introduced into United States, Native to Eurasia  
Migration pattern – Sedentary, and migratory in some areas  
Similar species – Brewer's Blackbird (*Euphagus cyanocephalus*), Rusty Blackbird (*Euphagus carolinus*) and Brown-headed Cowbird (*Molothrus ater*)  
Specimens in the Smithsonian collections document this species' native range (Eurasia) as well as the many areas where this species has been introduced (North America)



### Rock Dove (Feral Pigeon)

Scientific name – *Columbia livia*  
Size – Overall length 29-36 cm and overall body mass 340-369 grams  
Habitat – Natural habitat includes caves and Subterranean Habitats, Rocky Areas, Feral form is commensal with man, especially in cities.  
Geographic range – Introduced in North, Central and South America  
Migration pattern – Sedentary  
Similar species – Band-tailed Pigeon (*Columba fasciata*)  
The Smithsonian collections have examples of many of the feral varieties of this non-native species. The main plumage types include natural, checkered, dark, brown, and white.



### Ring-billed Gull

Scientific name – *Larus delawarensis*  
Size – Overall length 43-54 cm and overall body mass 300-700 grams  
Habitat – Wetlands  
Geographic range – North and Central America, Caribbean and expanding  
Migration pattern – Sedentary and migratory  
Similar species – Herring Gull (*Larus argentatus*)  
The Smithsonian's collections have many types of specimens of Ring-billed Gulls including, spread wings, study skins, skeletons, fluid preserved specimens and tissues for DNA analysis.



### Great Blue Heron

Scientific name – *Ardea herodias*  
Size – Overall length 97-137 cm, 160 cm tall and overall body mass 2.1-2.5 kilograms  
Habitat – Wetlands  
Geographic range – North and Central America and northern South America  
Migration pattern – Sedentary and migratory  
Similar species – Sandhill Crane (*Grus Canadensis*)  
The Smithsonian's collections have several specimens of the white morph of the Great Blue Heron. This morph (not albinism) is common in the Florida Keys.



## How Do Birds Stay Warm?

**Feathers:** Feathers are modified scales that cover birds' bodies and provide insulation by trapping air. The two main types of feather structures are downy feathers (plumulaceous) and the stiff part of the feather (pennaceous). The downy feathers trap air close to the bird's body, keeping it insulated. The stiff portions of feathers, the pennaceous part, have tiny structures that interlock to form a wind and waterproof barrier. Many feathers have both downy regions and pennaceous regions on their feathers.

**Generating Body Heat:** When feathers aren't enough, birds generate their own body heat through metabolic processes, or thermoregulation (meaning "to control heat"). Birds are endotherms, meaning that they must maintain a certain core body temperature to survive. Birds generate heat by moving and flying around and shivering, just like humans. While this helps birds stay warm, it requires energy, which requires food. Birds must have access to food to have the energy they need to move about to maintain their body temperature to survive.

**Behaviors and Adaptions:** Birds have adapted different behaviors to help them stay warm. For example:

- **Migrating:** some birds, like snow geese, migrate to escape cold temperatures
- **Grouping:** some birds, like bee eaters, gather in close groups to share and maintain body heat
- **Dwelling in cavities:** some birds dwell in cavities, like tree stumps, to shelter them against the cold
- **Sunning:** some birds, like vultures, spread their wings out in the sun to warm up
- **Food Caching:** some birds, like chickadees and jays, hide or "cache" large amounts of food to have a source of food through the winter
- **Communal Roosts:** some birds, like crows, will roost in large groups to share information about where food can be found
- **Torpor:** like putting your computer to "sleep," some birds can enter a state of inactivity, or torpor, which lowers the bird's body temperature and metabolic rate, saving energy. Some chickadees, doves, and hummingbirds use torpor.

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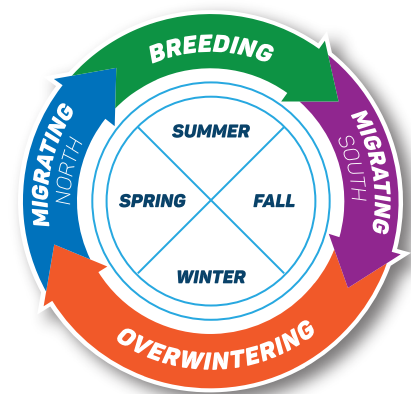
## Migratory Birds

Many migratory birds make fantastic voyages each year. Migration describes the regular annual movements that some animals make between regions where they breed and locations where they spend the rest of the year.

Not all birds migrate, but those that do often go on challenging journeys that stretch hundreds or even thousands of miles between their summer breeding grounds and their wintering grounds. These migrations likely evolved to ensure that birds have a steady food supply throughout the year and avoid harsh climates. Migrations are also one of nature's most remarkable phenomena.

By the late 1900s, scientists were increasingly alarmed by the fast decline in migratory bird populations. Today, more than half of all North American bird species are at risk of extinction, unless we take significant conservation actions.

Scientists and conservationists know that human activities, especially those that affect bird habitats, are the main cause of this decline. But because animals that migrate use many different kinds of habitats throughout their lives, determining what can be done to save these species can be challenging. To understand the impacts that humans have on migratory birds, we need to learn how birds interact with their environment during each part of their full annual cycle. The full annual cycle describes birds throughout their breeding, migration and overwintering periods.



### Full Annual Cycle of the Gray Catbird

The gray catbird is a songbird that is common to wild areas, suburbs and cities across most of the continental United States during the spring and summer months. These birds are called catbirds, because their distinct call sounds a bit like a cat's meow.

Catbirds can be found in many different habitats, so scientists at the Smithsonian Migratory Bird Center have been closely studying catbirds for more than 20 years in the Washington, D.C., metropolitan area.

### Breeding-

Catbirds begin arriving in Washington, D.C., in late April and early May. When they first arrive, there are a lot of catbirds, and the city is full of their songs. Many of the catbirds we see live far north of the city and are just stopping through during their migration. Within a week or two, only the birds that will stay for the whole summer are left in the area.

Female catbirds build their nests in dense shrubs using thin twigs and grasses. Once the nest is complete, the female will lay one to six bright, turquoise-green eggs in the nest. She incubates the eggs, sitting on them to keep them warm, for about two weeks. During this time she has to spend most of her time on the nest, so she is vulnerable to predators. When the eggs hatch, the nestlings (birds that have hatched but have not left their nest) emerge helpless with closed eyes and no feathers. Both parents quickly get to work feeding the nestlings. The parents and young feed on a variety of insects during this time, especially caterpillars. This high-protein diet is necessary, because the nestlings have to grow to the same size as their parents before leaving the nest—a period of less than two weeks!

Once the nestlings are big enough and have grown the feathers they need to fly, they leave the nest. This process is known as fledging. At this point, the young catbirds are called fledglings, and they will join their parents in a hunt for insects to eat. The fledglings are still very weak and need to gain a lot of weight to survive. They are also not great flyers yet and are just beginning to get used to the new world they have launched into. This makes fledglings an easy target for predators, especially outdoor cats, which often spend time hunting for birds in suburban gardens. Most of the fledglings won't survive for more than one week. After a few more weeks when they are strong enough, the fledglings that survive will leave their parents to explore their surroundings.

### Migration-

The environment changes a lot over the course of the summer. Catbirds must shift their diet with the changing season to get ready for migration. By the end of the summer, there are fewer caterpillars and other insects to eat. Luckily, the plants that flowered in spring and early summer will begin to produce berries. Adding fruit to their diet helps catbirds gain a lot of weight in the form of fat. This fat acts like a rechargeable battery during the catbirds' migration—the energy they get from the food that they eat is stored in the fat and provides the power for their migratory journey.

Based on tracking data, including light-level geolocator tags, we know that catbirds from different breeding grounds make their fall migration to different locations. The routes the birds take during migration also differ, even among birds that leave from the same breeding location. For example, some of the catbirds we have tracked from Washington, D.C., followed the Atlantic coastline, while others traveled along the foothills of the Appalachian Mountains—a long mountain chain that runs from Georgia to Maine.

The amount of time birds spend migrating also varies by individual. Some of the birds we have tracked have taken several weeks to complete their journey, while others make the trip in less than one week. Some catbirds even stop for a long time before completing their migration. One of the birds we tracked stopped in the Appalachian Mountain foothills for more than a month before continuing its journey!

### Overwintering-

Using tracking data, we have found that catbirds in Washington, D.C., mostly travel to Florida and Cuba. Tracking data has shown that catbird populations from the midwest and western United States travel to the southern coast of the United States and to Mexico.

The gray catbirds' winter habitats are very similar to the habitats where they spend their summers. Most of the catbirds we have tracked overwinter in habitats with a lot of shrubs. These habitats tend to have a lot of cover to help catbirds avoid predators and a lot of berry-producing plants and insects to supply catbirds with food. If catbirds stayed in the north over the winter, their food supply would be very limited and most of them would not survive.

The climate in areas where catbirds overwinter tends to be mild and comfortable, because it is closer to the equator than the areas where they breed. By spending the winter in the south, the catbirds are not exposed to the dangerous cold of northern winters.

As spring approaches, the catbirds start to become restless. Their sleep cycles change, and they start foraging for food later in the day. The catbirds gain a lot of weight again, this time to power their migration back north. If they stayed healthy through the winter, stored enough energy in the form of fat and survive their journey north, they will return to their summer range to breed.

## Tracking Migratory Birds

Scientists use different types of tracking technologies to determine the location of a bird at a given point in time. Depending on the technology, they can use this information to determine whether a bird is alive and how it moves through its environment. The type of technology scientists use depends on their research question and the limitations associated with the biology of the species they are studying.

### Types of Tracking Devices

- Bird Band- a small metal or plastic tag that is attached to the leg or wing of a wild bird. Colored bands are often added to enable identification without having to recapture the bird.



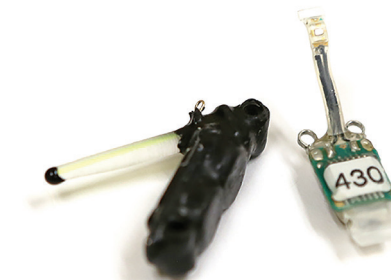
- Passive Integrated Tag (PIT Tag)- an electronic microchip that can be glued to a bird band, attached to a bird's leg or inserted surgically under a bird's skin. PIT tags don't require batteries so they can be used for the entire bird's life but they can only be read a very short distance from receiving stations.



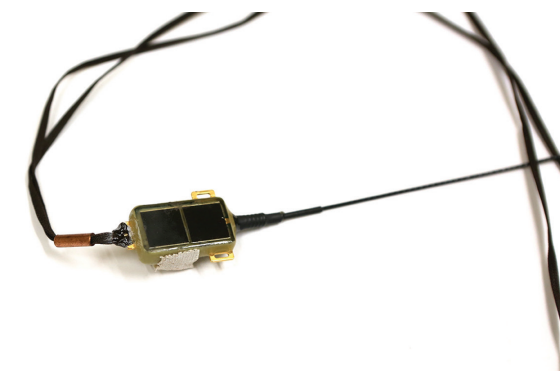
- Radio telemetry- the technique of using the transmission of radio signals to locate a transmitter attached to the animal of interest. It is often used to obtain location data on the animal's preferred habitat, home range and to understand population dynamics.



- Light-level Geolocator- A lightweight, electronic tracking device usually used in bird migration research to map migration routes, identify important staging areas and sometimes provide additional ecological information. A geolocator periodically records ambient light level to determine location.



- Satellite Telemetry- A transmitter is attached to the bird. The transmitter sends its signal to an orbiting satellite. The satellite re-transmits the data to a receiving station, which researchers then access through their computer.



## Migratory Birds Tracking Map

The Smithsonian Migratory Bird Center keeps track of where some birds have traveled while they were wearing a tracking device. All of the information shown on the map is real scientific data collected by scientists who are studying these species.

Visit this website (<https://nationalzoo.si.edu/migratory-birds/migratory-birds-tracking-map>) to see the travel patterns for specific bird species.

