

Houston Urban Conservation Treaty  
for Migratory Birds

**Citizens' Guide to Migration  
and the  
Migratory Birds of the Bayou City**



**Houston Audubon Society**  
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# Citizens' Guide to Migration and the Migratory Birds of the Bayou City

## Table of Contents



<b>The Treaty</b>	1
<b>Conservation Timeline</b>	7
<b>The Journey</b>	25
<b>The Birds</b>	91
<b>Activities for all ages</b>	211
<b>Where to go</b>	319
Houston City Parks	323
Harris County Precinct Parks	332
Special places and organizations	341
Texas Bird Festivals	361
<b>Migration Resources</b>	365
Internet Resources	366
Books	367
How to help injured birds	371
Final words from the north	373





# Citizens' Guide to Migration and the Migratory Birds of the Bayou City



## Citizens' Guide to Migration and the Migratory Birds of the Bayou City

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THE **BROWN** FOUNDATION, INC.





**Feather prints by Jesus Vasquez  
YES College Preparatory School  
Houston, TX**





# Citizens' Guide to Migration and the Migratory Birds of the Bayou City



© Mary Anne Weber

This manual was designed to help you better understand the mystery of migration and why the city of Houston is such an important place for migratory birds.

Within the pages of this guidebook you will find activities for school groups, home-schoolers, and families. You will also discover many of the places in and around the city that migrant birds use throughout the year.

This is just the first step in the discovery of birds and their movements across the hemisphere. Houston is a vibrant city that hosts an amazing array of avian visitors during every season.

Be prepared to start looking up and around as you discover that the Bayou City is a critical rest stop for birds struggling to survive their migration journeys every year.

*Every individual matters.  
Every individual has a role to play.  
Every individual makes a difference*  
Jane Goodall

**For additional copies of this manual and for the schedule of training workshops, please contact:**  
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**Thanks to the local photographers who donated their work. Your dedication and patience brings the color and beauty of birds into our homes and classrooms.**

**A special thank you to the youth of Houston. You continue to inspire me when I teach about birds and migration. I hope this manual will inspire you to look to the skies with wonder and amazement.**

**Thanks to the teachers and educators who work so hard every day to bring the natural world into the classroom and bring the students out into the natural world. We are all better off because of your efforts.**

**Special thanks to James Dong and Maya Putra for your incredible artwork. You are the best examples of the positive power of youth. Keep up the great work.**

"I never for a day gave up listening to the songs of birds, or watching their peculiar habits, or delineating them in the best way I could." - **John James Audubon**

**Look to the sky  
Listen to the woods and fields  
Take not a single sparrow for granted  
Be amazed every day**

**Mary Anne Weber  
Education Coordinator  
Houston Audubon Society**



**This manual is dedicated to Dr. Len Soucy, Director of The Raptor Trust, who has a compassion for, and a knowledge of birds beyond anyone I have ever met, and who so wonderfully shared it with me, many years ago.**

**Special thanks to the birds that share my life and share my teaching. I couldn't do this without you.**

**Spirit  
Padre  
Cody  
Tskili  
Poco  
Tigger**

**Psalm 55:6**

excerpts from *Living on the Wind*  
by Scott Weidensaul

At whatever moment you read these words, day or night, there are birds aloft in the skies of the Western Hemisphere, migrating.

If it is spring or fall, the great pivot points of the year, then the continents are swarming with billions of traveling birds - a flood so great that even the most ignorant and unobservant notice, if nothing else, the skeins of geese and the flocks of robins.



*Red-tailed Hawk "Spirit"*  
by Jim Offeman, pastel

But the migration's breadth goes far beyond these obvious watersheds, shifting endlessly across distance and season. In the middle of July, Hudsonian godwits lift off from the iceberg-choked shores of the Beaufort Sea, heading southeast along the northern rim of Canada to Labrador, then vaulting south in a nonstop flight to Venezuela. In the snow squalls of December, goshawks and golden eagles fly south along the ridges of the Appalachians, over oak trees that rattle their last stiff, dead leaves at the wind. Even within the tropics, a land where migration would seem unnecessary, birds move with the seasonal rains and droughts across hundreds of miles, following the blossoming of flowers or the ripening of fruit.

Even the darkness moves with the passage of birds. On soft spring midnights, the air is alive with the flight notes of unseen warblers and vireos, thrushes and orioles, sparrows and tanagers, filtering down through the moonlight like the voices of stars.

Bird migration is the one truly unifying natural phenomenon in the world, stitching the continents together in a way that even the great weather systems, which roar out from the poles but fizzle at the equator, fail to do. It is an enormously complex subject, perhaps the most compelling drama in all of natural history.

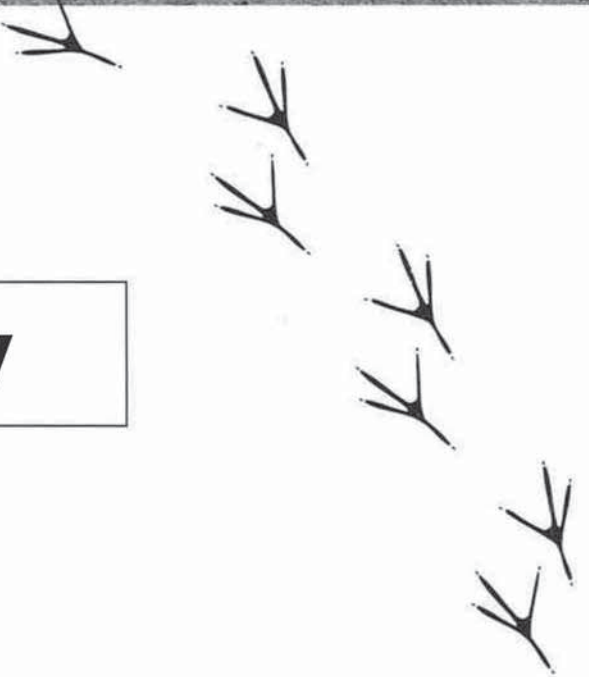
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# The Treaty







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## U.S. Fish & Wildlife Service

### What Is an Urban Conservation Treaty for Migratory Birds?

An Urban Conservation Treaty for Migratory Birds is a partnership agreement between a U.S. city and the U.S. Fish and Wildlife Service, to conserve migratory birds through education and habitat improvement. The Service provides challenge grants and technical assistance. The Treaty city develops and implements bird conservation projects, provides matching dollars and in-kind support, and develops additional partnerships.

### Why an Urban Conservation Treaty for Migratory Birds?

For the vast majority of people, birds represent their most frequent contact with wildlife. Birds are a valuable resource, contributing aesthetically, culturally, scientifically, and economically to America's citizens. Urban areas are critical for migrating birds. Large concentrations of birds migrate along flyways or routes on which many large urban centers have developed. Important bird habitat is often found within these metropolitan areas. With an environmentally aware citizenry dedicated to conserving and enhancing their natural resources, cities can be sanctuaries for migratory birds and other wildlife.



### Mission

To conserve migratory bird populations and their habitats for future generations, through careful monitoring and effective management.

For More Information:  
U.S. Fish and Wildlife Service  
Division of Migratory Bird Management  
4401 N. Fairfax Drive, MS: 4107  
Arlington, VA 22203  
<http://birds.fws.gov>

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# The Houston Plan

## **Houston: The program's fourth pilot city**

The City of Houston has become the fourth city (following New Orleans, Chicago and Philadelphia) to sign on under the U.S. Fish and Wildlife Service's Urban Conservation Treaty for Migratory Birds Program. Houston is the fourth largest city in the U.S. with a population of 1.9 million sharing 617 square miles with one of the most diverse bird populations in North America. Situated near the Gulf Coast and in the middle of the Central Flyway, the Houston area has recorded more than 400 of the nearly 600 species of birds known to occur in Texas. Houston can boast diverse habitats from bayous and prairies to wetlands and forest. Birds use all of these areas, as well as our backyards, parks, and schoolyards. With a continued interest in greenspace preservation and quality of life issues, both birds and Houstonians will be winners.

## **What is the Houston Urban Conservation Treaty for Migratory Birds?**

The Houston Treaty Program is a partnership agreement between the City of Houston and the U.S. Fish and Wildlife Service to conserve migratory birds through habitat restoration and enhancement, public education, invasive species control, and bird hazard reduction. The plan was developed by a diverse group of local organizations as a city-wide effort to benefit birds and all of Houston. Funding provided by the U.S. Fish and Wildlife Service was matched and multiplied by the City, ConocoPhillips Corporation, National Fish and Wildlife Foundation, Bayou Preservation Association, Friends of Hermann Park, Houston Arboretum and Nature Center, Houston Audubon Society, South Texas Chapter of the Telephone Pioneers of America, and the University of Houston - Downtown. Many of these partners are collaborating with other groups to deliver to the citizens of Houston a program that they hope will be the beginning of on-going city-wide effort of migratory bird conservation.

## **How is the effort funded?**

Funding came in the form of a challenge grant from the local office of the U.S. Fish and Wildlife Service and the Service's Division of Migratory Bird Management in Washington, DC. Additional federal funds were provided through the National Fish and Wildlife Foundation. These federal funds totaling \$120,000 were then matched by the City, ConocoPhillips Corporation and the other program partners with cash and in-kind services. The total program effort equals more than \$340,000.

## **For more information:**

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## Houston Audubon Society - Citizens' Guide to Migration and the Migratory Birds of the Bayou City

The mission of the Houston Audubon Society (HAS) is to promote the conservation and appreciation of birds and wildlife habitat. With this in mind, HAS committed to the development and distribution of an educator's guide on the subject of migratory birds. HAS began the development and compiling of the guide in 2003.

Migration has been studied and pondered by man since Biblical times. The Bible and ancient Egyptian tomb paintings are perhaps the oldest recorded references to the migration of birds. Texas is a refuge and bridge for millions of migrants every year. Birds have an enormous biological and economical impact in our community. For these reasons it is imperative that critical habitat is conserved along migratory paths in Texas.

Houston is central in these avian wanderings. The heritage of this city, its land, and wildlife will soon fall into the hands of our school children in the Houston public school system, home schoolers and the thousands who move to our "Bayou City" each year. Conservation efforts have direct impacts on bird populations and the health of the environment for other wildlife species. These efforts will also benefit the health of citizens in Houston. Education is a key component to spread the conservation, habitat restoration message.

The *Citizens' Guide to Migration and the Migratory Birds of the Bayou City* is a quality manual that is interdisciplinary and user-friendly. This guide provides outdoor and indoor activities for K-12<sup>th</sup> graders in the Houston area, natural history data on local migratory birds, links and contact information to local birding organizations, and local places to visit for field trips or family outings. Workshops are available for teachers, park employees, informal and formal educators and the general public. The goal of the workshops is to educate the participants about migration and migratory birds and then demonstrate how to make full use of the curriculum guide. Workshops will include hands-on practical training and educational programs with live birds.

The guides have a positive influence on the residents of Houston in the way they view migratory birds; they promote native habitat creation, hazard reduction and management of non-native, invasive and nuisance animals and plants. The guides teach and encourage bird watching around the city of Houston; provide teacher training and hands-on materials for educators; reach large numbers of traditionally underserved audiences by training teachers and parents to provide continuing experiences that deal with migratory birds in the city; and provide student curriculum and long-term project ideas for students.

In April 2001, the Executive Director of Texas Parks and Wildlife, Andrew Sansom commented "Texas is quite possibly the largest single destination for birdwatchers in the world. State-of-the-art innovations, including the Great Coastal Birding Trail.... help generate nearly \$1 billion a year for our state in economic impact. We must begin to invest in these resources in Texas, because they are a critical component of the state's incredibly rich biological diversity."



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Radar tracking has shown that some 80,000 birds per mile of migration front arrive on the Louisiana and Texas coast each day during peak migration. In large flocks, these birds closely track the bloom of hatching insect larvae on newly leafing trees. The average pair of warbler parents removes caterpillars from more than a million leaves in the ten days it takes to raise a nestful of babies to fledging. Texas is in the center of three of the major migratory routes for birds traveling from the Neotropics. Of the 338 species that are designated Nearctic-Neotropical migrants in North America, 333 of them have records of occurring in Texas. Healthy populations of migratory birds are a key component in the control of insect pests. Birdwatching is the second most popular hobby in the United States and contributes billions of dollars into the economy each year. **"Birds are a valuable resource, contributing aesthetically, culturally, scientifically, and economically to America's citizens."**

## **An Urban Conservation Treaty for Migratory Birds**

*between*

**The U.S. Fish and Wildlife Service -  
Department of Interior  
and  
The City of Houston**



### **Both Parties Recognize that Migratory Birds:**

- Are an excellent indicator of the overall health of an ecosystem and are an irreplaceable part of the natural systems of the earth;
- Are a valuable resource, contributing aesthetically, culturally, scientifically, and economically to America's citizens;
- Represent, for the vast majority of people, the sole everyday contact with wildlife. Birds connect all of us to the environment;
- Cross boundaries and ecosystems. Protecting them must be a cooperative effort among city and state planners, environmental organizations, and federal conservation agencies;
- Face serious challenges. Many species are in decline because of habitat loss, collisions with human-made objects, and contaminants.



"Nature is always hinting at us. It hints over and over again. And suddenly we take the hint."

**Robert Frost** (1874-1963)  
American Poet

# Conservation Timeline





## Bird Conservation Timeline



•4th century BC  
Aristotle, the famous Greek scientist and philosopher, mentions over 170 sorts of bird in his work on animals, and recognizes eight main groups of birds.



•1st century BC  
Pliny the Elder's *Historia Naturalis Book X* is devoted to birds. He designates three different groups of birds based on feet characteristics.



•1544  
William Turner (British Ornithologist) prints a commentary of the birds mentioned by Aristotle and Pliny. This was the first printed book devoted entirely to birds.

•1676  
Publication of Francis Willughby's *Ornithologia* by his collaborator John Ray. This was the beginning of scientific ornithology in Europe and the organization of species according to their physical characteristics.

•1681  
The last Dodo dies on the island of Mauritius.







## Bird Conservation Timeline

11



•1735  
First edition of Carolus Linnaeus' *Systema Naturae*. He laid the foundations for modern taxonomy. He is considered one of the fathers of modern ecology.



•1827-1838  
John James Audubon publishes *Birds of America*.

•1778  
Juan Ignacio Molina publishes *Saggio sulla storia naturale del Chile* which includes the first descriptions of many South American species.

•1797-1804  
Thomas Bewick publishes *British Birds*

•1801  
Alexander Wilson begins his study of North American birds.

•1731-1743  
Mark Catesby publishes his *Natural History of Carolina*, which contains colored plates of the birds of that colony, Florida, and the Bahamas. It was the first published account of the flora and fauna of North America.

**CLOSE FOCUS:**  
The first Earth Day was held on April 22, 1970. Senator Gaylord Nelson was the founder, who began working on a way to get environmental issues recognized on a political level in 1962. In the fall of 1969, the senator announced his plan to have a nationwide grassroots demonstration on behalf of the environment. This gave the American people a forum to express their concerns about what was happening to the land, rivers, lakes, and air. It was a huge success and continues to this day.







## Bird Conservation Timeline

### CLOSE FOCUS:

The Great Auk was a flightless bird that was hunted for food and down feathers for mattresses. It was once found in great numbers on islands off eastern Canada, Greenland, Iceland, Norway, Ireland, and Britain. These birds were excellent swimmers. They laid only one egg each year. They were hunted to extinction, and the last pair was killed July 3, 1844, on an island off of Iceland.

•1844

The last Great Auk is recorded in Iceland.



Passenger Pigeon hunting.

•1861

A fossil of archaeopteryx is found in Germany and links dinosaurs to modern birds.

•1869

Passenger Pigeon is first protected in Michigan. A law is passed that outlaws any firearm discharge within 1 mile of roosts.

•1831-1836

Charles Darwin travels to South America and the Galapagos Islands on board HMS Beagle.

•1883

The American Ornithologists' Union (AOU) is formed.

•1898

Alfonso Herrera, a Mexican biologist publishes a proposal for the protection of useful birds.

•1885

The Bureau of Biological Survey is established. It is now called the U.S. Fish and Wildlife Service.

•1886

The Audubon Society is formed by George Bird Grinnell.





## Bird Conservation Timeline

### CLOSE FOCUS:

The Passenger Pigeon was once the most abundant bird in the world. It is estimated that there were as many as 5 billion passenger pigeons in the United States. These birds lived in large colonies and traveled in huge flocks. It was hunted for food, for hog feed, and shipped into the cities to be sold as food. The Passenger Pigeon laid only one egg at a time. Almost all remaining quarter-million birds were hunted in a single day in 1896 by "sport" hunters who knew it was the last wild flock.

•1900

Lacey Act is the first federal law protecting birds. It prohibits interstate transport of birds killed in violation of state laws.



•1900

The last known wild Passenger Pigeon is killed in Ohio.

•1899

Christian Mortensen of Viborg, Denmark is the first ornithologist to perform large scale banding, also called ringing. He used numbered aluminum rings to band 165 European Starlings caught in nest cavities.

•1905

The National Association of Audubon Societies for the Protection of Wild Birds and Animals is incorporated. This later becomes the National Audubon Society.



•1903

President Theodore Roosevelt designates Pelican Island, Florida as a federal refuge, marking the beginning of the National Wildlife Refuge System.

•1909

The first organized "ringing" (banding) events take place in the United Kingdom.

•1912

A Barn Swallow banded in England is recovered in South Africa.

•1914

The last Passenger Pigeon dies at the Cincinnati Zoo. This species becomes extinct. This last bird, named Martha, was stuffed and mounted, and can be seen at the Smithsonian Institute.





## Bird Conservation Timeline

### CLOSE FOCUS:

An Arctic Tern banded as a chick, not yet able to fly, on the Farne Islands off the Northumberland coast in eastern Britain in the summer of 1982, reached Melbourne, Australia, in October, 1982, a journey of over 22,000 km (14,000 miles).

•1922  
 Alvaro Obregon, the Mexican President, designates Isla Guadalupe as Mexico's first wildlife refuge.

•1922  
 The International Council for Bird Preservation is formed. It is now called Birdlife International.

•1918  
 The last Carolina Parakeet dies in captivity in Cincinnati.

•1931  
 Ernst Schuz and Hugo Weigold publish *Atlas des Vogelzuges*, the first atlas of bird migration.

•1916  
 Great Britain (acting on behalf of Canada) and the U.S. sign the Migratory Bird Convention, a treaty that obligates both countries to protect and preserve migratory birds.

•1918  
 U.S. passes the Migratory Bird Treaty Act enacting the Migratory Bird Convention.

•1917  
 The Migratory Bird Convention Act is passed by Canada thus enacting the Migratory Bird Convention.



•1934  
 Roger Tory Peterson publishes his *Guide to the Birds*, the first modern field guide.

Carolina Parakeets by J. J. Audubon





## Bird Conservation Timeline

### CLOSE FOCUS:

In 1916, the Alligator Bay Rookery in the southwest Everglades was wiped out by hunters due to the absence of Audubon wardens. The Florida Audubon Society did not have the \$750.00 to pay the wardens to continue to protect this rookery, which at the time, was the largest egret rookery in the state. The birds were shot and the habitat burned in the absence of protection.

19

•1966  
The Breeding Bird Survey is initiated.  
Federal Endangered Species Preservation Act is passed.  
Bald Eagle officially declared an endangered species in 1967.

•1962  
Rachel Carson publishes *Silent Spring*.  
This book helped make the public aware of the dangers of pesticides.

•1972  
The pesticide DDT is banned in the U.S., with Canada banning its use shortly after.

•1940  
The Western Hemisphere Convention is adopted to protect migratory birds throughout the Americas.  
Congress passes The Bald Eagle Protection Act making it illegal to kill, harass, possess or sell Bald Eagles.

•1934  
The United States passes the Migratory Bird Hunting and Conservation Stamp Act (Duck Stamp Act) providing funds for wildlife refuges.

•1973  
The Endangered Species Act is enacted.

•1936  
Mexico signs the Treaty for the Protection of Migratory Birds and Game Animals with the U.S.. It was further amended in 1972.

•1986  
The North American Waterfowl Management Plan is published to conserve waterfowl habitats.





## Bird Conservation Timeline



•2003  
Houston awarded the Urban Conservation Treaty for Migratory Birds.

•2000  
U.S. passes the Neotropical Migratory Bird Conservation Act.

1995  
Bald Eagle upgraded from endangered to threatened status.

•1989  
U.S. passes North American Wetlands Conservation Act (NAWCA) authorizing grants for bird habitat conservation.

•1992  
U.S. passes the Wild Bird Conservation Act for protection of parrots and other exotic birds.

•1990  
Partners in Flight is created and dedicated to "keeping common birds common."

**CLOSE FOCUS:**  
Migratory Bird Treaty Act - Unless and except as permitted by regulations made as hereinafter provided, it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof, included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916, the United States and the United Mexican States for the protection of migratory birds and game mammals concluded February 7, 1936, the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972 and the convention between the United States and the Union of Soviet Socialist Republics for the conservation of migratory birds and their environments concluded November 19, 1976.

For more information on the people and events of this timeline:  
[www.searchspaniel.com/index.php/Timeline\\_of\\_Ornithology](http://www.searchspaniel.com/index.php/Timeline_of_Ornithology)





## A Bird Timeline

Wet meadows, mudflats, flooded fields, edges of salt marshes are all habitats for these wintering birds in Texas, Mexico, and South America.

### January

### February

To prepare for migration, birds are eating lots of insects and crustaceans on the wintering grounds in Texas and South America.

### March

Migrant birds are passing through Costa Rica.

### April

Birds are migrating through the United States.

### May

Adults arrive on nesting grounds. Egg laying is completed between late May and late June. Clutch size is 4.

### June

During the incubation period, males incubate the eggs during the day and females at night. Males care for young for 3 weeks; females only attend the young for 1 week.

### July

Females are already heading south. Males will begin to migrate at the end of July. Young are preyed upon by Herring Gulls.

### August

Juveniles are now migrating. Some adults are already migrating through Costa Rica.

### September

Most birds are already in South America. Some birds will spend the winter in Texas.

### November

Birdwatchers visit coastal Texas to look for this bird.

### October

Protection of breeding and wintering habitat is crucial for this small bird with the long migration.



**Least Sandpiper  
By Maya Putra**





"One swallow does not make a summer; but one skein of geese, cleaving the murk of a March thaw, is the spring."

**Aldo Leopold** (1886-1948)  
American Writer and Forester

# The Journey







## ***The Long and Short of It*** (*Nature Trails*, 1996 - Houston Chronicle)

**by John Tveten & Gloria Tveten**

The last week in April marks the peak of the spring bird migration in much of Texas. Hordes of colorful warblers, buntings, tanagers, and orioles swarm across our coast on their return from tropical America, many of them flying nonstop across the Gulf of Mexico from launching points on the Yucatán Peninsula.

### ***Our Life with Birds***

A Nature Trails Book  
*John Tveten & Gloria Tveten*

Texas A & M University Press  
College Station  
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The feats of some of these Neotropical migrants are phenomenal. The tiny blackpoll warbler flies from its breeding grounds in the boreal forests of Canada and Alaska all the way to central South America in the fall and retraces that route in spring. It makes one of the longest flights of any songbird.

The upland sandpiper migrates between the U.S. Great Plains and the pampas of Argentina, while the Arctic tern divides its time between the Arctic and Antarctic regions, flying nearly around the world each year to enjoy the rewards of summer in both hemispheres. Yet, in spite of the monumental distances involved, each returns unerringly to its own ancestral nesting grounds in spring.

Not all birds are long-distance migrants, however. Nor are birds the only animals that travel systemically with the seasons. Our wildlife adopts a wide spectrum of seasonal strategies, each suited to an individual's specific needs.

Many of the colorful warblers spend the winter in the tropics, where they are assured an abundant supply of the insects on which they feed. Although they might survive the cold temperatures of a northern winter, they would quickly starve as rations became impossible to find.

The yellow-rumped warbler, however, supplements its insect diet with wax-myrtle berries and other small fruits, a trait that accounts for the common name of the eastern race, "myrtle warbler." This feeding habit also allows the species to remain throughout the winter in the Houston area.

Birds that feed mainly on seeds can endure colder climates than can birds that rely on ephemeral insects. Many of the seed-eating finches wander to the southern states in winter only when cone crops fail in the evergreen forests of the far North. In the same manner, several species of northern owls move southward when cyclic rodent populations crash.





Loons, grebes, cormorants, and other diving birds desert their freezing domains for open water along southern shorelines or in warmer lakes. Turkey vultures stream southward in fall from across the United States, seeking warmer weather that creates the towering thermals on which they sail in search of food. All of these migrant species are now en route to their breeding territories, some to remain in Texas, some to venture even beyond the Arctic Circle.

Not all birds of a single species share the same migrational strategies. Recent studies have shown that two-thirds of female song sparrows move southward to more benign climates in winter, yet only one-half of the males choose to migrate. Presumably, males remain closer to the choice territories they will defend in spring, thereby gaining an advantage over their competitors.

Birds of the high mountains may follow an entirely different kind of migration strategy. Instead of heading south for the winter, they merely descend to lower elevations, returning again in spring to the windswept heights. They make what has been called a "vertical migration," or "altitudinal migration," rather than a latitudinal one. The distance in miles may be relatively small, but the benefits can be enormous.

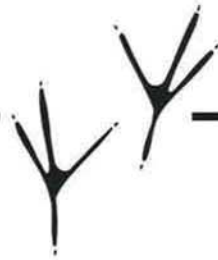
Brown-capped rosy-finches, for example, nest above timberline on the tundra of tall Colorado peaks. In winter, they move down into the valleys, even invading backyard feeders in bustling cities and towns. This, too, is bird migration, although in quite a different form than that of the Blackburnian warbler, which is now returning from the rain forests of Venezuela to find a nesting site in the woodlands of the northern states of Canada.

If it seems impossible that small and seemingly fragile birds can make such long and hazardous journeys, consider the migrations of butterflies. The familiar monarch fans out across the continent in summer, spawning several broods that reach beyond the Canadian border. In the fall, however, the last adults wing their way southward once again, funneling down through Texas to spend the winter in a mountain forest in Mexico that they have never seen.

Other butterflies, too, move northward each spring and summer from population reservoirs that survive the winter in the Deep South, producing progeny as they go. Many will be lost with the first freeze of autumn, but others move southward again as the days grow shorter.

Less predictable are mass dispersals in the face of overpopulation. Butterfly populations sometimes reach epic proportions, particularly after plentiful rains contribute to rapid growth of larval food plants. Emerging adult butterflies then stage enormous flights, sometimes over large distances, to find new habitats.





Even mammals migrate when their lifestyles make such programmed journeys necessary. Huge numbers of Brazilian free-tailed bats inhabit caves in the Texas Hill Country, emerging each summer night to feed on the insects that fuel their flights. In the fall, as insect populations drop, the bats head southward in the manner of the migrant birds, returning to their caves again in spring.

Giant gray whales migrate southward along the Pacific Coast from the seas surrounding Alaska to the warm, shallow bays of Baja California. There they give birth to their young and return northward only when the lengthening days promise an end to icebound seas.

Humans, too, share many of these strategies employed by wildlife, spending the winter months in the South and returning home to cooler climates as spring approaches. Birds, bats, and butterflies, however, find their way without benefit of road signs or maps, making wildlife migration one of the true wonders of the natural world.

***Our Life with Birds***  
A Nature Trails Book  
*John Tveten & Gloria Tveten*

Texas A & M University Press  
College Station  
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John and Gloria Tveten spent nearly 25 years writing a weekly column for the Houston Chronicle. Their "Nature Trails" column was a reflection of their passion for the natural world.

The Tvetens were recently awarded the 2004 Houston Audubon Society Media Award. This award honors persons in the media that are extraordinary communicators of the natural world.

The Tvetens are residents of Baytown, Texas, and continue to write, photograph, explore the natural world, and share their passion with others.



*excerpts from:*

**Migration and The Migratory Birds of Texas:** *Who They Are And Where They Are Going*  
Third Edition

By Clifford E. Shackelford, Edward R. Rozenburg, W. Chuck Hunter and Mark W. Lockwood  
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### **Why is there an interest in migratory birds in Texas?**

Of the 338 species that are listed as Nearctic-Neotropical migrants in North America (north of Mexico), 333 of them (or 98.5%) have been recorded in Texas. This means that of the 621 species of birds documented in Texas, 54% of them are Nearctic-Neotropical migratory birds. Texas is important to these migrants, and these migrants are important to Texas.

### **What exactly is a Nearctic-Neotropical migrant?**

These species are collectively known by a host of other names. The species that comprise this group basically breed in temperate latitudes (i.e., U.S. and Canada), but leave for the winter for tropical latitudes further south (i.e., Central and South America). Their migratory habits are part of their lives and heritage.

### **What are migratory bird treaties?**

In 1918, the United States and Great Britain (for Canada) ratified the Migratory Bird Treaty that closed hunting for certain groups of birds that migrated across their mutual borders. Hunting was permanently closed on insectivorous birds and other non-game birds. Game birds (including ducks, geese and cranes) were given protection except for an annual hunting season that could not exceed three and a half months. Additional treaties were signed with Mexico (1936), Japan (1972), and the USSR (1976) protecting migrants between the United States and those countries. These treaties protect most naturally-occurring species, while most introduced species are not protected in the U.S. (e.g., House Sparrow, European Starling, and Rock Dove [feral pigeon]).





## How does migration affect the bird life in Texas?

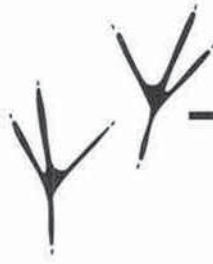
The upper coast of Texas is in a truly unique position to observe migration. The state occurs directly in the center of the Central Flyway. Most birds that move along this route travel through Texas, and eventually through the Upper Coast of Texas. Birds traveling the Atlantic Flyway during the fall reach the Florida panhandle, then may turn west and follow the Gulf Coast to Texas. Birds of the Mississippi Flyway follow that great river system to the Gulf, then either cross it or turn west as well. The Pacific Flyway funnels birds between the Rocky Mountains and the Pacific Ocean. The Rockies end at Big Bend in Texas. Birds may be funneled to Big Bend, where they can cross over the state and follow the Rio Grande or other watercourses to the Coast. Texas has recorded over 615 species of birds, more than any other state. These are mostly migrant birds that have followed one or more of these flyways into our state.

## How are migratory birds important to man?

Migratory birds have considerable economic impact in North America. Since European settlers first came to the New World, they hunted various birds, such as ducks and geese, rails, doves and shorebirds, for food and sport. During the late 19th century, many species were hunted to near extinction for the market as food and feathers for adornment on women's hats. As their numbers dwindled, controls and seasons were instituted to stop their decline and stabilize populations. Laws established to protect non-game birds and regulate hunting of game birds include the Migratory Bird Treaties mentioned above. Today, regulated hunting is a major industry in many areas of the United States. Most non-game birds were recognized to be welcome allies against insect pests. Most of the migratory birds of North America are insect eaters. Healthy, stable populations of these "songbirds" help to keep insect pests within tolerable limits. There are numerous instances where flocks of birds have descended on areas threatened with disastrous insect infestations, and virtually eliminated the threat. All birds have increasing recreational value as bird watching and other forms of nature related activities become more popular. Ecotourism, including bird watching, camping, hiking, nature study, and photography have become part of a multi-billion dollar industry. Throughout the United States, more people engage in nature tourism than either hunting or fishing. Together, hunting, fishing, and ecotourism are part of an industry that is worth over \$100 billion annually in the United States alone. It pays in many ways to protect and maintain our natural assets.







# The Migratory Flyways of North America

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**Central Flyway**



**Atlantic Flyway**

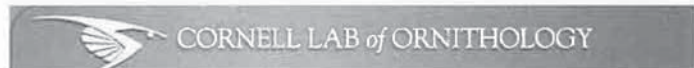


**Pacific Flyway**



**Mississippi Flyway**

# Migration Mysteries - FAQs



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Cornell Lab of Ornithology  
159 Sapsucker Woods Road  
Ithaca, New York 14850  
607.254.BIRD

## How do scientists know where birds go in winter?

Traditionally, the only way to find out where an individual bird went was to capture and mark it, then wait for someone to find it again by chance. Though the odds are small, sometimes birds are recovered far from where they were originally captured. For example, over a period of 40 years, biologists at the Long Point Bird Observatory in Ontario, Canada, placed aluminum bands on the legs of 39,044 Swainson's Thrushes. Only two of these thrushes were recovered on their wintering grounds, by members of the Asheninka native community in northern Peru!

### Migratory Marvels

Body lengths traveled by a Rufous Hummingbird between Alaska and its winter range in Mexico:

**49 million**

Miles to the gallon used by a Blackpoll Warbler on migration if it burned gasoline instead of body fat:

**720,000**

Miles traveled by an Arctic Tern on its annual round trip between Arctic breeding grounds and Antarctic seas:

**22,000**

Estimated number of birds detected by radar passing over Cape Cod, Massachusetts, on a single autumn night:

**12 million**

*Sources: Smithsonian Migratory Bird Center, Living on the Wind by Scott Weidensaul.*

In recent years, satellite transmitters have given scientists an unprecedented opportunity to track birds around the globe. The transmitters emit signals that are picked up by space satellites and reported to a computer back on earth. Using this technique, scientists have documented a Peregrine Falcon migrating from Alberta, Canada, to Mazatlán, Mexico. They have tracked Swallow-tailed Kites from Florida and Georgia to previously unknown wintering grounds in Brazil, some 5,000 miles away. A Swainson's Hawk traveled from California to the pampas of Argentina, where it revealed a gathering of thousands of other Swainson's Hawks, including hawks that had been banded in California, Colorado, and Saskatchewan, Canada.

In most cases, ornithologists know little about exactly where birds from particular regions spend the winter. Often the best information they have is based on where the species is found at different times of the year. North American birds vary widely in their travels.





Some 200 Neotropical migrant species, including many shorebirds, hawks, hummingbirds, and songbirds, spend the winter in Latin America or the Caribbean. Others migrate within North America, such as American Robins and American Goldfinches. Some, such as Northern Cardinals and Western Scrub-Jays, stay resident year-round. The migration of other species, such as Red-breasted Nuthatches, varies depending on the region and annual changes in food supplies.

The wintering ranges of many bird species are still poorly mapped. The Cornell Lab of Ornithology's citizen-science participants have contributed to a better understanding of migration by documenting changes in bird numbers at their feeders and by reporting their sightings to the Lab.

**Many of the birds I usually see at this time of year have disappeared. What happened to them?**

There are many reasons why birds may suddenly disappear. If the species is migratory, it may have departed early. Each year, the timing of migration varies within a window of several weeks, depending on natural food supplies and the weather. In other cases, birds that normally spend the fall in your area may have moved in response to fluctuations in pine cone crops or seeds. It's also possible that some birds are still in your area but have molted into a less recognizable fall plumage. American Goldfinches, for example, replace their bright yellow feathers with drab ones.

Disease outbreaks may also affect bird numbers. House Finch eye disease has taken a toll on House Finches in some regions, and in some Midwestern states, decreases in the numbers of American Crows have coincided with outbreaks of West Nile virus.

Human activities may also influence the number of birds in your area. Applications of toxic pesticides have sometimes contributed to poisonings of birds locally. If nearby fields have been mowed or developed, or forests razed, the birds may have moved elsewhere.

Keep in mind that bird populations fluctuate naturally with the seasons, and from one year to the next. Ornithologists use long-term data to see whether declines in bird species are cause for worry or are within the range of normal variation. For the latest results, visit the Project FeederWatch web site at [www.birds.cornell.edu/pfw](http://www.birds.cornell.edu/pfw).

©Bird Notes from Sapsucker Woods







## **Neotropical Migratory Bird Basics** *by Mary Deinlein*

### ***First of all, what is a Neotropical migratory bird?***

A Neotropical migratory bird is a bird that breeds in Canada and the United States during our summer and spends our winter in Mexico, Central America, South America or the Caribbean islands. According to a more strict definition used by some scientists, Neotropical migratory birds are Western Hemisphere species in which the majority of individuals breed north of the Tropic of Cancer and winter south of that same latitude. (The Tropic of Cancer is a line of latitude 23 degrees north of the equator which marks the northern extent of the tropics.)

### ***How many kinds of Neotropical migratory birds are there?***

According to the strict definition given above, there are about 200 species of Neotropical migratory birds. The majority are songbirds (such as warblers, thrushes, tanagers, and vireos), but there are also many shorebirds (such as sandpipers, plovers, and terns), some raptors (such as hawks, kites, and vultures), and a few types of waterfowl (such as teal).

### ***How far do Neotropical migratory birds travel?***

Migration distances vary greatly between species and between individual birds of the same species. The shortest migrations are made by birds that breed in the southern United States and winter in Mexico or the West Indies, a trip which can be as short as a few hundred miles. Examples of birds that make such relatively short migrations include all Black-capped Vireos and Lucy's Warblers, and some Painted Buntings, Northern Parulas, and Gray Catbirds.

Some of the longest migrations are made by shorebirds that nest in the arctic tundra of northernmost Canada and winter as far south as Tierra del Fuego (the southernmost part of South America), a one-way distance of up to 10,000 miles (16,000 kilometers). Red Knots and White-rumped Sandpipers are two species that make this remarkable journey.

Other birds that winter in South America, and thus travel great distances, include: Common Nighthawks, Swainson's Hawks, Red-eyed Vireos, Purple Martins, Barn and Cliff Swallows, Blackpoll, Cerulean, and Connecticut Warblers, Scarlet Tanagers, and Bobolinks. A round-trip migration distance for many of these species is as much as 13,600 miles (22,000 kilometers).

Although not technically a Neotropical migratory bird, no discussion of long-distance bird migration is complete without mention of the champion globe-trotter of all, the Arctic Tern. With nesting grounds as far north as land extends and wintering sites on the opposite end of the earth, Arctic Terns cover 22,000 miles (35,400 km) annually. Given that the sun never sets while these terns are nesting, nor during the time they spend near the South Pole, Arctic Terns enjoy more hours of daylight than any other species.



**Examples of one-way migration distances**

<b>Species</b>	<b>Miles</b>	<b>Breeding Range</b>	<b>Wintering Range</b>
Black-capped Vireo	400-1,250	Oklahoma, Texas	w Mexico
Lucy's Warbler	500-1,500	sw U.S.	w Mexico
Painted Bunting	300-3,000	s and se U.S.	Mexico to Panama, West Indies
Northern Parula	300-3,000	se Canada, e U.S.	Florida, West Indies, Mexico to Nicaragua
Wood Thrush	600-3,750	se Canada, e U.S.	Mexico to Panama
Scarlet Tanager	600-4,350	se Canada, e U.S.	nw South America
Cerulean Warbler	2,175-4,500	se Canada, e U.S.	nw South America
Blackpoll Warbler	2,500-5,000	Alaska, Canada, New England	n South America
Purple Martin	600-6,000	s Canada, U.S., Mexico	Brazil, Bolivia to n Argentina
Cliff Swallow	1,250-6,800	Alaska, Canada, U.S., n Mexico	s Brazil, Bolivia to c Argentina
Common Nighthawk	2,500-6,800	most of Canada and U.S.	Colombia to c Argentina
Bobolink	5,000-6,800	s Canada, n U.S.	s Brazil to n Argentina
Swainson's Hawk	3,750-7,500	sw Canada, w U.S.	s Brazil to c Argentina
Lesser Yellowlegs	1,500-9,300	Alaska, n Canada	s U.S., West Indies, South America
Red Knot	1,500-10,000	n Canada	coasts from c U.S. to southern tip of South America

**Abbreviations:**

n=north e=east c=central se=southeast  
 s=south w=west nw=northwest sw=southwest





### ***Why do Neotropical migratory birds fly so far?***

Because it's too far to walk. Now, seriously, the best explanation for why birds fly such great distances is it allows them to take advantage of seasonally abundant food and to avoid times when or places where food and other resources are scarce. You may have guessed that they migrate south to avoid the cold of our winter, but there are many species of birds which can and do tolerate cold temperatures, as long as food is plentiful. The types of food that Neotropical migratory birds need, such as flying insects, caterpillars, fruits and nectar, are super-abundant during our spring and summer, but are not sufficiently available through the winter.

Ultimately, the reason why migration persists is because it increases "breeding success", that is birds are able to raise more young on average by migrating than they would if they remained in the tropics. The abundant, protein-rich food, longer daylight hours, greater area over which the birds can spread, and, possibly, fewer predators account for the potential to raise more young.

### ***At what time of day or night do birds migrate?***

Most long-distance migratory songbirds and shorebirds, and some waterfowl, migrate at night when conditions are more favorable (cooler temperatures and calmer air) and predators are few.

Whereas the nocturnal migrants (that is the ones that migrate at night) travel through the air by flapping their wings, birds such as hawks and vultures fly by soaring and gliding on rising currents of air. These soaring birds must migrate by day, since the rising currents of air which enable them to soar form only during the day as the sun's rays heat the earth. Swallows, swifts, and nighthawks are also diurnal migrants (that is, they migrate by day) because they feed on flying insects that are active only by day.

### ***How high do birds fly when they are migrating?***

Like airplane pilots, birds choose a flight altitude depending on at what height the best wind conditions are found. This can vary according to time of day, time of year, features of the earth below, and the weather. Because winds at higher altitudes are stronger than winds closer to the earth's surface, birds fly higher with tailwinds (winds blowing in the direction in which the bird is migrating) and lower with headwinds (winds blowing in the opposite direction).

In general, nocturnal migrants travel at higher altitudes than diurnal migrants. Of the nocturnal migrants, most shorebirds and waterfowl fly higher on average than do songbirds. Most birds tend to fly higher when crossing large bodies of water than when flying over land. In general, nocturnal migrants travel at higher altitudes than diurnal migrants.





Most birds migrate within the following ranges of altitudes:

	<b>Feet</b>	<b>Meters</b>
Songbirds	500 - 6,000 *	150 - 2,000 *
Shorebirds	1,000 - 13,000	300 - 4,000
Waterfowl	200 - 4,000	60 - 1,200
Raptors	700 - 4,000	200 - 1,200

\*75% of songbirds migrate between 500 and 2,000 feet (150- 600 m)

(Birds are capable of flying at much higher altitudes. Bar-headed Geese are known to cross the Himalayas at 29,500 feet (9,000 m). The world record holder is a Ruppell's Griffon Vulture seen at 37,000 feet (11,300 m.) A Mallard, which struck an airplane at 21,000 feet (6,400 m), holds the record for the highest documented flight altitude for a bird in North America.)

***How fast do birds fly when they are migrating?***

Ninety percent of migrating birds fly at airspeeds between 15 and 45 miles per hour (25-70 kilometers per hour). Slower and faster flight speeds have been recorded, but they are exceptions. In general, larger birds fly faster than smaller birds. Below are typical flight speeds, given in miles per hour and kilometers per hour:

	<b>Miles/Hour</b>	<b>Km/ Hour</b>
Songbirds	10 - 30	15 - 50
Shorebirds	20 - 40	30 - 65
Waterfowl	30 - 50	50 - 80
Raptors	20 - 45	30 - 70

The speed and direction of the wind influences how fast a bird travels. Strong tailwinds (winds blowing in the direction in which the bird is flying) mean faster travel, while headwinds slow a bird's progress.



***How long does it take birds to migrate between their breeding and wintering grounds?***

A one-way migration can take anywhere from several weeks to 4 months. The pace of migration tends to be faster in the spring, with the pace picking up as a bird gets closer to its breeding area. For example, a Blackpoll Warbler heading from Florida to Alaska may take as long as a month to cover the first 1000 miles (an average of about 30 miles a day), whereas the final 2500 miles may take only 2 weeks (an average of 180 miles per day). For most birds, the pace in the fall tends to be more leisurely and more evenly paced.

Typically, migration is accomplished in a series of flights lasting from several hours to several days. Between flights, birds make pit stops for resting and "re-fueling" which last anywhere from a day to a few weeks. Below are examples of approximate daily migration distances given as either an average or a range:

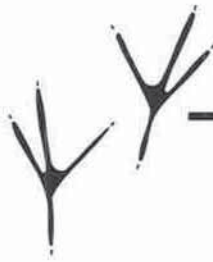
<b>Species</b>	<b>Miles/Day</b>	<b>Km/ Day</b>
American Redstart	20 - 100	30 - 160
Barn Swallow	90	150
Blue-winged Teal	100	160
Swainson's Thrush	125	200
Swainson's Hawk	106	170
Red Knot	90 - 600	140 - 960
Broad-winged Hawk	60 - 300	100 - 480

Average daily migration distances understate the amazing capabilities of migratory birds— capabilities that are put to the test when birds are faced with crossing large bodies of water. For instance, when traveling to South America in the fall, Blackpoll Warblers depart from New England and the southern coast of Canada on a non-stop flight which takes a minimum of 72 hours. That's 2,000 miles (3,200 km) in three days, or an average of 660 miles per day (1,000 km/day). This degree of exertion is equivalent to a human running 4-minute miles (15 mi/hr; 24 km/hr) for 80 consecutive hours.

***How do birds know when to migrate?***

Long distance migrants have an internal clock that controls the onset of migration and the pre-migration preparations. Environmental factors set this clock and keep it fine-tuned. It is thought that certain changes in a bird's environment stimulate the production of hormones, which in turn lead to changes in the behavior and physiology of the bird, preparing them for migration.





### ***How do birds know when to migrate? (continued)***

Southbound migration timing may be fine-tuned by changes in day length. The environmental factors operating on the wintering grounds, where day length is relatively constant, are more subtle and less well understood.

### ***How do they know where to go?***

The answer to this question is different for different types of birds, and for birds that migrate short distances (such as within the United States) rather than longer distances. For most waterfowl species and many short distance migrants, young birds learn migration routes and breeding and wintering locations from older, more experienced birds, which are most often family members.

For most long distance migrants, birds are born genetically programmed to fly in a certain direction for a certain amount of time. The first migration is completely under genetic control. As birds gain experience, they incorporate learned information. For instance, if they find a particular breeding or wintering location that is good, they may return to this location in the future by relying on learned information.

### ***How do they know which direction to fly?***

Experiments done with Indigo Buntings have revealed one of the cues that migratory birds use to navigate: stars. Buntings specifically use the pattern of stars around the North Star. If young buntings are prevented from seeing the night sky during a critical stage in their development, they will not be able to orient properly for migration. This ability, therefore, is learned rather than genetically programmed. Other nocturnal migrants probably also use stars for compass direction.

Although the intricacies of how birds navigate remains a mystery, this much seems to hold true: all migratory birds use a variety of cues, and different species seem to rely on some cues more than others. This can vary according to the immediate circumstances, for example, if it is a cloudy night and the stars are obscured, a nocturnal migrant may rely more on other sources of information. Other cues used by migratory birds include: the earth's magnetic fields, location of the setting sun (and the pattern of polarized light created), topographic features of the landscape (coastlines, rivers, mountain ranges, for example), and prevailing wind patterns (wind patterns are seasonal; during migration the wind tends to blow in roughly the appropriate direction for migration).

[http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Fact\\_Sheets/](http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Fact_Sheets/)





## Conceptos básicos sobre las aves migratorias Neotropicales

Escrito por Mary Deinlein  
Traducido del inglés por Claudia Caicedo

### ***Primero que todo, ¿qué es un ave migratoria Neotropical?***

Un ave migratoria Neotropical es un ave que se reproduce en los Estados Unidos y el Canadá durante el verano, generalmente entre mayo y septiembre, y que pasa el resto del año en México, Centroamérica, Suramérica o las islas del Caribe. Conforme a una definición más estricta utilizada por algunos científicos, las aves migratorias Neotropicales son las especies del hemisferio occidental de las cuales, la mayoría de individuos se reproduce al norte del Trópico de Cáncer e invierna al sur de dicha latitud. El Trópico de Cáncer es la línea de latitud, a 23 grados al norte de la línea ecuatorial, que marca el límite norte de la zona tropical.

### ***¿Cuántas clases de aves migratorias Neotropicales existen?***

Según el sentido estricto de la definición dada anteriormente, existen alrededor de 200 especies de aves migratorias Neotropicales. La mayoría son aves cantoras (como los chipes, los zorzales, las tanaras y los vireos), pero también incluyen a muchas aves playeras (como los playeritos, los chorlitos y las golondrinas), algunas aves rapaces (como los gavilanes, los milanos y los zopilotes) y algunos tipos de aves acuáticas (como las cercetas).

### ***¿Qué tan lejos viajan las aves migratorias Neotropicales?***

Las distancias migratorias varían enormemente entre las diversas especies y entre los individuos de una misma especie. Las migraciones más cortas las realizan las aves que se reproducen en los Estados Unidos y que pasan el invierno en México o las Antillas; un viaje que puede ser tan corto como unos cuantos cientos de kilómetros.

Entre las aves que realizan una migración tan relativamente corta se incluyen el vireo gorrinegro (*Vireo atricapillus*), el chipe de Lucy (*Vermivora luciae*) y algunos miembros del colorín sietecolores (*Passerina ciris*), de la parula nortea (*Parula americana*) y del pájaro-gato gris.

Algunas de las mayores migraciones son llevadas a cabo por las aves playeras que anidan en la tundra ártica del extremo norte canadiense y que pasan el invierno en lugares tan al sur como la Tierra del Fuego (el extremo sur de Suramérica), cuya distancia en una sola dirección se aproxima a las 16.000 kilómetros. El playero gordo (*Calidris canutus*) y el playerito rabadilla blanca (*Calidris fuscicollis*) son dos de las especies que realizan esta asombrosa travesía.





Otras aves que invernán en Suramérica y que, por consiguiente, atraviesan enormes distancias incluyen el chotacabras mayor (*Chordeiles minor*), el gavilán de Swainson (*Buteo swainsoni*), el vireo ojirrojo (*Vireo olivaceus*), el martín azul (*Progne subis*), la golondrina tijereta (*Hirundo rustica*), la golondrina risquera (*Hirundo pyrrhonota*), el chipe gorrinegro (*Dendroica striata*) el chipe cerúleo (*Dendroica cerulea*) el chipe de Connecticut (*Oporornis agilis*), la tangara escarlata (*Piranga olivacea*) y el tordo arrocero (*Dolichonyx oryzivorus*). La distancia migratoria de ida y vuelta que cubren muchas de estas especies es hasta de 22.000 kilómetros.

Aunque técnicamente no sea un ave migratoria Neotropical, ninguna exposición sobre la migración de las aves a grandes distancias sería completa sin mencionar al campeón de todos los trotamundos, la golondrina marina ártica (*Sterna paradisaea*). Con lugares para anidar tan al norte como el límite de la tierra misma y lugares para pasar el invierno norteco en el extremo contrario del planeta, la golondrina marina ártica lleva a cabo una travesía de 35.400 kilómetros anualmente. Dado que el sol nunca se pone mientras estas golondrinas anidan, ni durante el tiempo que pasan cerca al Polo Sur, la golondrina marina ártica disfruta de más horas de luz que cualquier otra especie.

### ***¿Por qué las aves migratorias Neotropicales viajan tan lejos?***

Por ser demasiado lejos para caminar. Ahora, en serio, la mejor explicación de por qué las aves atraviesan distancias tan enormes es que hacerlo les permite aprovechar la abundancia de alimento según la estación del año y evitar las épocas o los lugares en que dicho alimento y otros recursos escasean. Es posible que usted haya adivinado que las aves migran al sur para evitar el frío norteco, pero existen muchas especies que pueden tolerar y, de hecho toleran, las frías temperaturas, siempre y cuando haya alimento abundante. Los tipos de alimento que necesitan las aves migratorias Neotropicales, tales como los insectos voladores, los gusanos, las frutas y el néctar de las flores, son sumamente abundantes durante la primavera y el verano del norte, pero no se hallan disponibles en suficiente cantidad durante el invierno.

En últimas, la razón por la cual la migración persiste es porque incrementa el "éxito reproductivo", es decir, que migrando las aves pueden criar en promedio a un número mayor de polluelos que permaneciendo en los trópicos. El alimento abundante y rico en proteínas, los días con más horas de luz, un área mucho mayor sobre la cual pueden esparcirse las aves y, posiblemente, el menor número de depredadores dan razón del potencial de criar a más pequeños.

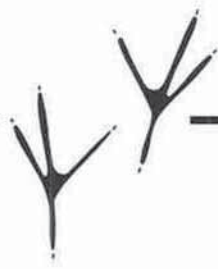




**ejemplos de las distancias unidireccionales de la migración**

<b>Especie</b>	<b>Kilómetros</b>	<b>Rango en Verano</b>	<b>Rango en Invierno</b>
Vireo atricapilla	640-2,000	Oklahoma, Texas	w Mexico
Vermivora luciae	800-2,400	sw U.S.	w Mexico
Passerina ciris	480-4,800	s y se U.S.	Mexico a Panama, West Indies
Parula americana	480-4,800	se Canada, e U.S.	Florida, West Indies, Mexico a Nicaragua
Hylocichla mustelina	960-6,000	se Canada, e U.S.	Mexico a Panama
Piranga olivacea	1,000-7,000	se Canada, e U.S.	nw South America
Dendroica cerulea	3,500-7,200	se Canada, e U.S.	nw South America
Dendroica striata	4,000-8,000	Alaska, Canada, New England	n South America
Progne subis	950-9,600	s Canada, U.S., Mexico	Brazil, Bolivia a n Argentina
Petrochelidon pyrrhonata	2,000-11,000	Alaska, Canada, U.S., n Mexico	s Brazil, Bolivia a c Argentina
Chordeiles minor	4,000-11,000	la mayoría de Canada y U.S.	Colombia a c Argentina
Dolichonyx oryzivorus	8,000-11,000	s Canada, n U.S.	s Brazil a n Argentina
Buteo swainsoni	6,000-12,000	sw Canada, w U.S.	s Brazil a c Argentina
Tringa flavipes	2,400-15,000	Alaska, n Canada	s U.S., West Indies, South America
Calidris canutus	2,500-16,000	n Canada	costas de c U.S. a extremidad meridional de América del sur

Abbreviations:  
 n=norte e=este c=central se=suroriental  
 s=sur w=oeste nw=noroeste sw=suroeste



### ***¿A qué hora del día o de la noche migran las aves?***

La mayoría de aves cantoras, playeras y acuáticas que atraviesan grandes distancias migran durante la noche cuando las condiciones son más favorables (las temperaturas son más frescas y el aire más calmado) y hay menos depredadores.

Aunque las aves migratorias nocturnas (es decir, aquellas que migran durante la noche) viajen por el aire aleteando, algunas aves como los gavilanes y los zopilotes lo hacen deslizándose sobre las ascendentes corrientes de aire. Estas últimas aves deben migrar durante el día, dado que las corrientes de aire ascendentes que les permiten deslizarse solamente se forman durante el día, a medida que los rayos del sol calientan la tierra. Las golondrinas, los vencejos y los chotacabras también son aves migratorias diurnas (es decir que migran durante el día) pues se alimentan de insectos voladores que sólo son activos de día.

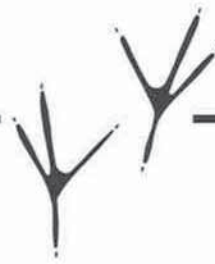
### ***¿A qué altura vuelan las aves cuando migran?***

Tal como los pilotos de aviones, las aves eligen la altitud de vuelo dependiendo de la altura en que se encuentren las mejores condiciones del viento. Esto puede variar según la hora del día, el tiempo del año, las características terrestres y el clima. Puesto que los vientos a mayores altitudes son más fuertes que los vientos más cercanos a la superficie de la tierra, las aves vuelan mucho más alto con vientos de cola (vientos que soplan en la misma dirección en la que migran las aves) y más bajo con los vientos de frente (vientos que soplan en la dirección contraria).

En general, los migrantes nocturnos viajan a mayores altitudes que los migrantes diurnos. De los primeros, la mayoría de las aves playeras y acuáticas vuelan en promedio a mayor altura que las aves cantoras. Y, la mayoría de las aves tiende a volar más alto al cruzar sobre grandes cuerpos de agua que cuando lo hacen sobre tierra.

Algunas de las mayores altitudes de vuelo las alcanzan las aves playeras y algunas aves cantoras que viajan a largas distancias sobre el agua y sin parar. Por ejemplo, el chipe gorrinegro (*Dendroica striata*), el playero gordo (*Calidris canutus*) y el chorlo dorado americano (*Pluvialis dominica*) con frecuencia viajan a 1.500 metros de altura y en algunas ocasiones a más de 3.600 metros, cuando viajan sobre el Océano Atlántico desde la costa del sur canadiense y desde Nueva Inglaterra hasta Suramérica.





La mayoría de las aves migran dentro de las siguientes altitudes:

	<b>Meters</b>
Aves cantoras	150-2.000*
Aves playeras	300-4.000
Aves acuáticas	60-1.200
Aves rapaces	200-1.200

- un 75% de aves cantoras migra a una altura entre 150-600 metros

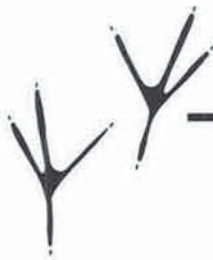
(Las aves cantoras tienen la capacidad de volar a alturas mucho mayores. Es sabido que un tipo de ganso (*Anser indicus*) cruza los Himalaya a 9.000 metros. El ave que cuenta con el récord mundial es un tipo de zopilote (*Gyps rueppellii*) que ha sido visto a 11.300 metros. Sin embargo, un pato de collar (*Anas platyrhynchos*), que chocó contra un avión a 6.400 metros posee el récord de la mayor altura documentada para un ave en Norteamérica).

### **¿A qué velocidad vuelan las aves cuando migran?**

El 90 por ciento de las aves migratorias vuela a velocidades entre 25 y 70 kilómetros por hora y aunque se han registrado velocidades tanto mayores como menores, las mismas constituyen excepciones. En general, las aves más grandes vuelan más rápido que las más pequeñas. A continuación se presentan las velocidades de vuelo típicas:

	<b>Kilómetros/ Hora</b>
Aves cantoras	15-50
Aves playeras	30-65
Aves acuáticas	50-80
Aves rapaces	30-70

Tanto la velocidad como la dirección del viento influyen en la rapidez con que vuelan las aves. Unos vientos de cola fuertes (en la misma dirección en que vuela el ave) significan un desplazamiento más rápido, mientras que los vientos de frente aminoran el avance de las aves.



### ***¿Cuánto tiempo se tardan las aves migrando entre las zonas en que se reproducen y las zonas en que pasan el invierno norteano?***

La migración en una sola dirección puede durar desde varias semanas hasta 4 meses. El ritmomigratorio tiende a ser más rápido cuando las aves migran al norte y aumenta a medida que las aves se acercan al área en que se reproducen. Por ejemplo, un chipe gorrinegro (*Dendroica striata*) que se dirija de la Florida a Alaska puede tardarse hasta un mes atravesando los primeros 1.500 kilómetros (un promedio de unos 50 kilómetros diarios), mientras que en los últimos 4.000 kilómetros puede tardar sólo 2 semanas (un promedio de 300 kilómetros diarios). Para la mayoría de las aves, el ritmo en el otoño tiende a ser más relajado y parejo.

Típicamente la migración se logra en una serie de vuelos que duran desde varias horas hasta varios días. Entre un vuelo y otro, las aves hacen escala para descansar y "reenergizarse", lo que puede tardar desde un día hasta unas cuantas semanas.

A continuación se presentan unos ejemplos de distancias migratorias diarias aproximadas:

<b>Especie</b>	<b>Km/Día</b>
Pavito migratorio ( <i>Setophaga ruticilla</i> )	30-160
Golondrina tijereta ( <i>Hirundo rustica</i> )	150
Cerceta aliazul ( <i>Anas discors</i> )	160
Zorzalito de Swainson ( <i>Catharus ustulatus</i> )	200
Gavilán de Swainson ( <i>Buteo swainsoni</i> )	170
Playero gordo ( <i>Calidris canutus</i> )	140-960
Gavilán aludo ( <i>Buteo platypterus</i> )	100-480

En el promedio de las distancias migratorias diarias se subestiman las asombrosas capacidades de las aves migratorias; capacidades que son puestas a prueba cuando las aves tienen que enfrentarse a atravesar grandes cuerpos de agua. Por ejemplo, al viajar a Suramérica en el otoño, el chipe gorrinegro (*Dendroica striata*) parte de Nueva Inglaterra y el extremo sur de la costa canadiense y emprende un viaje sin escalas que tarda un mínimo de 72 horas. Lo que equivale a 3.200 kilómetros en tres días, o a un promedio de 1.000 kilómetros diarios. Este grado de esfuerzo es equivalente al de un ser humano que corre 24 kilómetros por hora durante 80 horas consecutivas.





### ***¿Cómo saben las aves cuando migrar?***

Las aves que cubren en su migración grandes distancias cuentan con un reloj interno que controla el inicio de la migración y la preparación anterior a la misma. Varios factores ambientales regulan este reloj y lo mantienen afinado. Se cree que ciertos cambios en el entorno o ambiente de un ave estimulan la producción de hormonas, las que a su vez dan lugar a cambios en el comportamiento y la fisiología del animal, preparándole para la migración.

El momento de migrar al sur puede afinarse mediante los cambios de duración de la luz solar. Los cambios ambientales que tienen lugar en las zonas de invernación, donde la duración del día es relativamente constante, son más sutiles y mucho menos comprendidos.

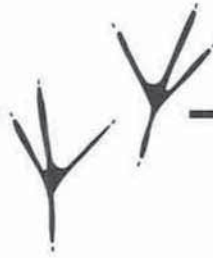
### ***¿Cómo saben adonde ir?***

La respuesta a esta pregunta varía dependiendo de los diferentes tipos de aves y de si las aves migran a distancias cortas (como dentro de los Estados Unidos) en vez de a grandes distancias. Para la mayoría de especies de aves acuáticas y de aves que migran a distancias cortas, las aves más jóvenes aprenden las rutas migratorias y la ubicación de los lugares de reproducción e invernación de las aves mayores y más experimentadas que casi siempre son miembros de la familia.

Para la mayoría de aves que migran a grandes distancias, las aves nacen programadas genéticamente para volar en cierta dirección y por cierto período de tiempo. La primera migración está completamente controlada genéticamente, pero a medida que las aves adquieren experiencia, van incorporando la información aprendida. Por ejemplo, si ellas encuentran una ubicación particular que sea buena, para reproducirse o pasar el invierno nortero, podrán retornar a esta misma ubicación en el futuro utilizando la información aprendida.

### ***¿Cómo saben en que dirección volar?***

Algunos experimentos llevados a cabo con el colorín azul (*Passerina cyanea*) han revelado una de las pistas empleadas por las aves migratorias para orientarse: las estrellas. Los colorines utilizan específicamente los patrones de estrellas alrededor de la estrella polar. Si a los pequeños colorines se les impide ver el cielo nocturno durante una etapa crítica de su desarrollo, no podrán orientarse apropiadamente para la migración. Por lo tanto, esta habilidad en lugar de ser programada genéticamente es aprendida. Otras especies migratorias nocturnas probablemente usen las estrellas como brújula.



Aunque saber cómo navegan las aves siga siendo un misterio, lo siguiente parece ser cierto: todas las aves migratorias emplean una serie de pistas y las diferentes especies parecen depender más de ciertas pistas que de otras. Sin embargo, esto puede variar según las circunstancias inmediatas. Por ejemplo, si hay una noche nublada y las estrellas no pueden verse claramente, un ave migratoria nocturna puede valerse más de otras fuentes de información. Entre otras de las pistas utilizadas por las aves migratorias se incluyen: los campos magnéticos de la tierra, la ubicación del sol poniente (y el patrón de luz polarizada creado), las características topográficas del paisaje (por ejemplo, las líneas costeras, los ríos, las cadenas de montañas, etc.) y los patrones predominantes del viento (los patrones del viento son estacionales; durante la migración el viento tiende a soplar prácticamente en la dirección apropiada para ello).

### ***Suggested Reading (Bibliografía) - Neotropical Migratory Bird Basics Fact Sheet***

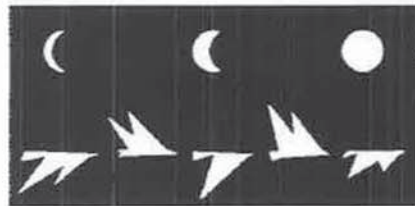
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## **Have Wings, Will Travel: Avian Adaptations to Migration** *by Mary Deinlein*

### ***Avian Aeronautics***

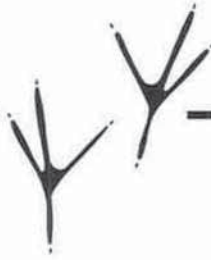
Flight affords the utmost in mobility and has made possible the evolution of avian migration as a means of exploiting distant food resources and avoiding the physiological stress associated with cold weather. Variations in the patterns of migration are nearly as numerous as the birds that migrate. While some species move only a few kilometers up and down mountain slopes, others will travel hundreds or even thousands of kilometers, often traversing vast bodies of water or tracts of inhospitable terrain.

One record holder in long-distance travel is the Arctic Tern (*Sterna paradisaea*) which makes an annual round-trip of about 30,000 kilometers between opposite ends of the globe, from Arctic breeding grounds to Antarctic seas. This feat is possible because terns are adapted for feeding at sea, allowing them to refuel en route. Even more amazing are the aerial voyages of the landbirds and shorebirds whose transoceanic flights must be accomplished non-stop. The Pacific Golden-Plover (*Pluvialis fulva*) flies continuously for more than 100 hours to travel the 5,000 to 7,000 kilometer distance from northern Siberia and Alaska to Hawaii and other islands in the Pacific Ocean.

Several species, including the Blackpoll Warbler (*Dendroica striata*), American Golden-Plover, (*Pluvialis dominica*), and Red Knot (*Calidris canutus*), take an over-water route in the autumn from the coast of New England or southern Canada to the Caribbean and South America, a distance of 3,000 to 4,000 kilometers. The Blackpoll Warbler's over-water flight to South America keeps it aloft for 80 to 90 continuous hours, an effort which researchers Tim and Janet Williams conclude "requires a degree of exertion not matched by any other vertebrate; in man the metabolic equivalent would be to run a 4 minute mile for 80 hours. If a Blackpoll Warbler were burning gasoline instead of reserves of body fat, it could boast of getting 720,000 miles to the gallon." Even the tiny Ruby-throated Hummingbird (*Archilochus colubris*), weighing only about as much as a penny, makes the 1,000 km, 24-hour spring flight across the Gulf of Mexico from the Yucatán Peninsula to the southern coast of the United States.

***SO HOW DO THEY DO IT? What specialized adaptations allow birds to accomplish such prodigious feats of endurance?***





### ***Bird Basics***

To understand how superbly adapted birds are to their highly mobile way of life, one must first consider the quintessential characteristics that distinguish birds from all other animals. Feathers, the trademark of the Class Aves, provide the insulation necessary to maintain a high "engine" (body) temperature, ranging from 107 -113 F across species. Additionally, the long feathers of the wings act as airfoils which help generate the lift necessary for flight. Well-developed pectoral muscles power the flapping motion of the wings. A streamlined body shape and a lightweight skeleton composed of hollow bones minimize air resistance and reduce the amount of energy necessary to become and remain airborne.

Keeping the hard-running avian engine running smoothly requires super-efficient circulatory and respiratory systems. Birds have a large, four-chambered heart which proportionately weighs 6 times more than a human heart. This, combined with a rapid heartbeat (the resting heart rate of a small songbird is about 500 beats per minute; that of a hummingbird is about 1,000 beats per minute) satisfies the rigorous metabolic demands of flight. The avian respiratory system-- the most efficient in the animal kingdom-- consists of two lungs plus special air sacs, and takes up 20% of a bird's volume, compared to 5% in a human. Unlike mammalian or reptilian lungs, the lungs of birds remain inflated at all times, with the air sacs acting as bellows to provide the lungs with a constant supply of fresh air.

### ***Migratory Mania***

In addition to these general avian characteristics, migratory birds exhibit a suite of specialized traits. Migrants generally have longer, more pointed wings than non-migratory species, a feature which further minimizes air resistance. Also, the pectoral muscles of migrants tend to be larger and composed of fibers which are more richly supplied with nutrient- and oxygen-carrying blood vessels and energy-producing mitochondria, making the pectoral muscles of migrants especially efficient at energy production and use.

Many migrants face the additional challenge of flying at high altitudes. Most songbirds migrate at 500 to 2,000 feet, but some fly as high as 6,800 feet; swans have been recorded at 8,000 feet and Bar-headed Geese (*Anser indica*) flying over the Himalayas at 9,000 meters. Accounting for their ability to withstand the low levels of oxygen available at such altitudes, the blood of migratory birds is characterized by two specialized adaptations. The oxygen-carrying capacity of the blood is enhanced by a high concentration of red blood cells. Secondly, instead of one form of hemoglobin in the red blood cells as is typical in non-migrants and other classes of vertebrates, some migratory birds possess two forms of hemoglobin which differ in their oxygen carrying and releasing capacities. This guarantees an adequate oxygen supply over a wide range of altitudes and allows birds to adapt rapidly to varying levels of oxygen availability.





### ***Preparing for take-off***

Like Clark Kent in a telephone booth, migrants change rapidly into a "superbird state" in preparation for migration. This transformation is triggered by an internal annual "clock," which is set by day length and weather.

When it comes to fueling migration, fat is where it's at. Fat is not only lighter and less bulky than carbohydrates or protein, but also supplies twice as much energy. Not surprisingly, then, preparation for migration entails a rapid weight gain program geared to increasing fat reserves. This program combines both behavioral and physiological changes. A dramatic increase in appetite and food consumption, termed hyperphagia, begins about 2 to 3 weeks before migration and persists throughout the migratory period. Accompanying this veritable feeding frenzy is an increase in the efficiency of fat production and storage. As a result, a migratory bird can increase its body weight through fat deposition by as much as 10% per day (usually 1-3%). Additionally, in birds that are in migratory disposition, the pectoral muscles become larger and well-supplied with enzymes necessary for the oxidation, or "burning," of fat.

Longer migration distances require greater amounts of fat. Non-migratory passerines maintain a "fat load" of about 3-5% of their lean body weight. In preparation for migration, short- and medium-distance migratory songbirds attain a fat load of between 10 and 25%, while long-distance migrants reach fat loads of 40 to 100%. Maximum fat loads are attained just prior to flights over major topographic barriers, such as deserts, high mountains, or large bodies of water.

A typical Blackpoll Warbler at the end of its breeding season weighs about 11 grams, equivalent to the weight of 4 pennies. In preparing for its transatlantic trek, it may accumulate enough fat reserves to increase its body weight to 21 grams. Given an in-flight fat consumption rate of 0.6% of its body weight per hour, the bird then has enough added fuel for approximately 90 hours of flight for a journey which, under fair conditions, requires about 80 to 90 hours. In human terms, this fuel strategy would be equivalent to a 150 pound person gaining 15 pounds of pure fat per day until tipping the scale at 300 pounds, and then shedding 1.8 pounds per hour through vigorous exercise. The 14 grams of fat in a single Snicker's candy bar would provide one and a half times the amount of energy necessary for the Blackpoll Warbler's flight from New England to South America.

Readiness for migration entails other behavioral modifications. Before migrating in the fall, many migrants, which ordinarily eat insects, will switch to a diet of berries and other fruits. At this time when food intake needs are increasing and insect numbers are decreasing, fruits are abundant and high in carbohydrates and lipids, which are readily converted to fat.





Many migrants that typically are not gregarious will flock together prior to, or during, migration. This social behavior may result in improved predator avoidance, food finding, and orientation. Some species also fly in formation, a strategy that improves aerodynamics and reduces energy expenditure.

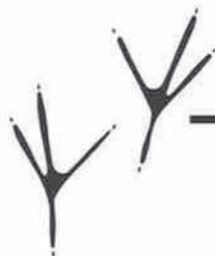
A radical shift from being active exclusively during the day to migrating at night occurs in many species during migration, including most shorebirds and songbirds. Possible advantages to flying at night include decreased vulnerability to predators, reduced threat of dehydration or overheating, a greater likelihood of encountering favorable winds and a stable air mass (rising hot air and more variable wind directions occur during the daytime), and time during the day to forage.

Migratory birds kept in captivity exhibit behavior termed Zugunruhe, or migratory restlessness. This behavior, characterized by rapid fluttering of the wings while perching, begins at the same time that conspecifics (individuals of the same species) in the wild are setting off on migration, and persists for the same length of time required for the wild counterparts to complete their migration. The captive birds even orient themselves in the appropriate direction in which they would be migrating. Over the past 15 years, this behavior has allowed researchers to demonstrate experimentally that many of the important physical and behavioral correlates to migration are under at least partial genetic control. For instance, when migratory Blackcaps (*Sylvia atricapilla*) were mated with non-migratory individuals of the same species, 30% of the offspring exhibited Zugunruhe. When individuals which displayed high levels of Zugunruhe, consistent with their long migratory routes, were bred with conspecifics with short migration routes, the offspring displayed intermediate levels of Zugunruhe. The results from these and other cross-breeding experiments support the hypothesis that migration and its associated patterns--such as distance and timing-- are inherited traits, at least in some species. These experiments apply to species with relatively fixed migration routes. Many species have facultative migration patterns, moving only when food supply is low, or when weather turns bad. Research has shown that access to food for these species greatly affects Zugunruhe.

Despite this advanced understanding of some of the mechanisms behind avian migrations, the annual odysseys of billions of birds remain one of the most mysterious and amazing phenomena in the animal world.

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## **Si se tienen alas, a volar se dijo: las adaptaciones de las aves para la migración**

**Escrito por Mary Deinlein  
Traducido del inglés por Claudia Caicedo**

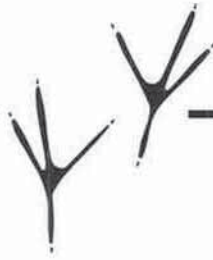
### ***La aeronáutica de las aves***

Volar proporciona la mayor movilidad y ha hecho posible la evolución de la migración aérea como un medio para aprovechar los recursos alimenticios distantes y evitar la tensión fisiológica asociada al clima frío. Las variaciones en los patrones migratorios son casi tan numerosas como las aves migratorias mismas. Mientras que algunas especies se desplazan sólo unos cuantos kilómetros hacia arriba o hacia abajo en las pendientes montañosas, otras viajan cientos de miles de kilómetros y, por lo regular, cruzan enormes cuerpos de agua o trechos de hinóspito terreno.

Una de las aves que ostenta el récord en viajes a gran distancia es la golondrina marina ártica (*Sterna paradisaea*), ya que, anualmente realiza un viaje de ida y vuelta de aproximadamente 30 mil kilómetros entre los extremos del planeta, desde las tierras árticas en las que se reproduce hasta los mares antárticos. Ello es posible porque la golondrina se ha adaptado para alimentarse en el mar, lo que le permite reabastecerse en curso. Lo más sorprendente son los viajes aéreos de las aves playeras y de tierra adentro cuyos vuelos transoceánicos deben realizarse sin detenerse. El chorlo dorado asiático (*Pluvialis fulva*) vuela continuamente por más de 100 horas para cubrir la distancia de 5 a 7 mil kilómetros entre el norte de Siberia y Alaska hasta Hawai y otras islas en el Océano Pacífico.

En el otoño, varias especies, incluidas el chipe gorrinegro (*Dendroica striata*), el chorlo dorado americano (*Pluvialis dominica*) y el playero gordo (*Calidris canutus*) siguen una ruta sobre el agua desde la costa de Nueva Inglaterra o el sur del Canadá hasta el Caribe y Suramérica cubriendo así una distancia aproximada entre los 3 y 4 mil kilómetros. El viaje de las reinitas sobre el agua y hasta Suramérica las mantiene en vuelo entre 80 y 90 horas continuas, lo que requiere un grado de esfuerzo inigualado por ningún otro vertebrado; en términos humanos el equivalente metabólico sería correr a una velocidad máxima durante 80 horas. Si una reinita estuviera gastando gasolina en lugar de reservas de grasa podría jactarse de obtener un rendimiento de 720 mil millas por galón. Incluso el pequeñísimo colibrí garganta de rubí (*Archilochus colubris*), cuyo peso equivale a una moneda de un centavo, en la primavera, cruza en 24 horas los mil kilómetros del Golfo de México, desde la península de Yucatán hasta la costa sureste de los Estados Unidos.





### ***Rasgos básicos de las aves***

Para poder comprender cuán espléndidamente adaptadas están las aves a una forma de vida sumamente móvil, deben tenerse en cuenta primordialmente las principales características intrínsecas que distinguen a las aves de los demás animales. Las plumas, distintivo de la Clase Aves, les ofrece el aislamiento necesario para mantener una alta temperatura "de la máquina" (corporal) que va desde los 40 hasta los 45 grados Celsius en las diversas especies. Además, las largas plumas de las alas les sirven como planos aerodinámicos que ayudan a generar la fuerza de ascenso necesaria para poder volar. Unos músculos pectorales bien desarrollados ("la pechuga") adheridos a una estructura aérea única llamada el furculum ("el huesito de los deseos") habilita el aleteo o movimiento de las alas. La aerodinámica forma del cuerpo y el liviano esqueleto compuesto de huesos huecos minimizan la resistencia al aire y reducen la cantidad de energía necesaria para convertirse y mantenerse aéreo.

Mantener afinada la máquina aérea exige unos sistemas circulatorio y respiratorio sumamente eficientes. Las aves tienen un corazón grande con cuatro cavidades que, proporcionalmente, pesa seis veces más que el corazón humano. Esto, combinado con un ritmo cardíaco rápido (el ritmo cardíaco en reposo de un ave cantora pequeña es de casi 500 latidos por minuto y el de un colibrí es de casi mil latidos por minuto) satisface las rigurosas demandas metabólicas del vuelo. El sistema respiratorio característico de las aves—el más eficiente del reino animal—consiste en dos pulmones y unos sacos de aire especiales y ocupa 20% del volumen de las aves, en comparación con un 5% en los humanos. A diferencia de los pulmones de los mamíferos o de los reptiles, los pulmones de las aves permanecen inflados todo el tiempo y los sacos de aire actúan como fuelles que le proveen a los pulmones un suministro constante de aire fresco.

### ***La manía migratoria***

Además de estas características generales de las aves, las aves migratorias exhiben una serie de rasgos especializados. Las migratorias tienen las alas más largas y puntiagudas que las especies no migratorias, un rasgo que minimiza aún más la resistencia al aire. Además, los músculos pectorales de las aves migratorias tienden a ser más largos y compuestos de fibras mucho más copiosamente provistas de vasos sanguíneos que transportan oxígeno y nutrientes y de mitocondrias productoras de energía, lo que hace que los músculos pectorales de las aves migratorias sean especialmente eficientes en cuanto a la producción y el uso de energía se refiere.





Muchas aves migratorias encaran el desafío adicional de volar a grandes alturas. La mayoría de aves cantoras vuelan a alturas entre los 500 y los 2 mil metros, pero algunas vuelan tan alto como a los 6.800 metros. Por ejemplo, se ha documentado el vuelo de cisnes a 8 mil metros y de una especie de ganso (*Anser indica*) sobre el Himalaya, a los 9 mil metros. Teniendo en cuenta su habilidad para soportar los bajos niveles de oxígeno a tales alturas, la sangre de las aves migratorias se caracteriza por dos adaptaciones especiales. Primero, la capacidad de transportar oxígeno es realizada por una alta concentración de glóbulos rojos. En segundo lugar, en lugar de una forma de hemoglobina en los glóbulos rojos, tal como es típico de las aves no migratorias y de otras clases de vertebrados, algunas aves migratorias cuentan con dos formas de hemoglobina que difieren en cuanto a su capacidad de transportar y de liberar oxígeno. Esto garantiza un suministro adecuado de oxígeno en una diversidad de alturas y les permite a las aves adaptarse rápidamente a los variables niveles de disponibilidad de oxígeno.

### ***La preparación para el despegue***

Cuando del combustible para la migración se trata, es a la grasa a lo que nos referimos. La grasa no sólo es más liviana y menos voluminosa que los carbohidratos o las proteínas, sino que suministra el doble de energía. No sorprende, entonces, que la preparación para la migración implique un programa de ganancia de peso rápido orientado a incrementar las reservas de grasa. En este programa se combinan cambios tanto fisiológicos como del comportamiento. Dos o tres semanas antes de la migración tiene lugar un aumento drástico en el apetito y el consumo de alimentos llamado hiperfagia que continúa a lo largo del período migratorio. Sumado a este frenesí alimenticio hay un incremento en términos de la eficiencia de producción y almacenamiento de grasa. Como resultado, mediante el depósito de grasa un ave migratoria puede incrementar el peso de su cuerpo hasta en un 10% diariamente (por lo regular de 1-3%). Además, para las aves que se encuentran en disposición migratoria, los músculos pectorales se agrandan y reciben un suministro mayor de las enzimas necesarias para la oxidación o el consumo de grasa.

Para cubrir mayores distancias en la migración son necesarias mayores cantidades de grasa. Las aves paseriformes no migratorias mantienen una "carga de grasa" equivalente a casi un 3-5% del peso de su cuerpo sin grasa. Durante la preparación para la migración las aves migratorias cantoras, que cubren distancias cortas y medias, acumulan una carga de grasa entre un 10-25%, mientras que las que viajan largas distancias alcanzan cargas de grasa desde un 40 hasta un 100%. Las cargas de grasa máximas son obtenidas justamente antes de los vuelos sobre las principales barreras topográficas, como los desiertos, las altas montañas o los grandes cuerpos de agua.





Un chipe gorrinegro típico pesa al final de su etapa reproductiva casi 11 gramos, lo que equivale al peso de cuatro monedas de un centavo. Al prepararse para realizar su travesía transatlántica, puede acumular suficientes reservas de grasa como para incrementar su peso hasta 21 gramos. Dada la tasa de 0.6% de consumo de grasa del peso de su cuerpo por hora en vuelo, esta ave tiene, pues, suficiente combustible adicional para unas 90 horas de vuelo que en condiciones apropiadas tarda entre 80 y 90 horas. En términos humanos, esta estrategia energética equivaldría a que una persona que pese 150 libras aumente diariamente 15 libras de pura grasa hasta alcanzar las 300 libras y, luego, gaste 1.8 libras por hora mediante el ejercicio vigoroso. Los 14 gramos de grasa contenidos en una barrita de chocolate Snicker's proveerían una vez y media la cantidad de energía necesaria para el vuelo del chipe gorrinegro desde Nueva Inglaterra hasta Suramérica.

Estar apto para la migración implica otras modificaciones del comportamiento. Antes de emigrar en el otoño, muchas aves migratorias, que por lo regular se alimentan de insectos, adoptan una dieta de frutillas. En esta época, en que las necesidades de consumo alimenticio aumentan y las cantidades de insectos disminuyen, abundan las frutas ricas en carbohidratos y lípidos ya transformados en grasa.

Muchas aves migratorias que típicamente no son gregarias se agrupan antes o durante la migración. Este comportamiento social puede dar lugar a mejores formas de evitar a los depredadores, hallar alimento y orientarse. Algunas especies también viajan en formación, una estrategia que mejora la aerodinámica y reduce el gasto de energía.

Durante la migración, muchas especies experimentan el cambio radical de mantenerse activas durante el día exclusivamente a emigrar durante la noche, incluidas la mayoría de aves playeras y cantoras. Entre las posibles ventajas de volar durante la noche se incluyen la menor vulnerabilidad a los depredadores, el menor riesgo de deshidratación o recalentamiento, la mayor probabilidad de encontrar vientos favorables y una masa de aire estable (el ascenso del aire caliente y la mayor variación de dirección de los vientos ocurren durante el día), así como más tiempo durante el día para alimentarse.

Las aves migratorias mantenidas en cautiverio manifiestan un comportamiento denominado Zugunruhe, o inquietud migratoria. Este comportamiento, caracterizado por un rápido aleteo en reposo, comienza al mismo tiempo en que los demás individuos libres de la misma especie se preparan para la migración y persiste por el mismo período de tiempo requerido para que sus contrapartes silvestres lleven a cabo la migración. Las aves cautivas incluso se orientan en la dirección apropiada en que emigrarían. Durante los últimos 15 años este comportamiento les ha permitido a los investigadores demostrar en forma experimental que muchas de las adaptaciones físicas y del comportamiento importantes para la migración son controladas, al menos en parte, genéticamente.





Por ejemplo, al cruzar individuos migratorios de una especie de chipe (*Sylvia atricapilla*) con individuos no migratorios de la misma especie, un 30% de sus descendientes exhibieron Zugunruhe. Al cruzar individuos que exhibían altos niveles de Zugunruhe, consistentes con sus largas rutas migratorias, con individuos de la misma especie cuyas rutas migratorias son cortas, su descendencia exhibió niveles intermedios de Zugunruhe.

Los resultados de estos y de otros experimentos con mezclas de especies respaldan la hipótesis de que la migración y sus patrones asociados- tal como la distancia y el tiempo- constituyen rasgos hereditarios, al menos en algunas especies. Estos experimentos se han aplicado con especies cuyas rutas migratorias son relativamente fijas. Muchas especies cuentan con patrones migratorios flexibles y se desplazan solamente cuando el suministro de alimentos es bajo, o cuando el clima es adverso. Las investigaciones han demostrado que para estas especies, el acceso al alimento afecta en gran medida el Zugunruhe.

A pesar de la comprensión tan avanzada de algunos de los mecanismos presentes en la migración de las aves, la odisea anual de millones de aves sigue siendo uno de los fenómenos más misteriosos y sorprendentes del reino animal.

### **Further Reading (Lecturas complementarias) - Have Wings, Will Travel: Avian Adaptations to Migration Fact Sheet**

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## **Travel Alert for Migratory Birds: Stopover Sites in Decline** *by Mary Deinlein*

### ***Importance of Stopover Sites***

Imagine you have been traveling in your car for hours. You are hungry, thirsty, tired, and need to stop soon for a break. Suppose you've made this trip before, and you're counting on that certain gas station and food mart that has come to your rescue in the past. You know you're getting close--you recognize that bend in the road ahead--and you breathe a sigh of relief as the store comes into view. You're cutting it close this time; the fuel gauge is verging on empty! Ominously, you see a sign on the store front as you pull up to the gas pumps. The sign reads CLOSED! You are miles from the next station! What are you going to do?

As a human in this predicament, you may be able to get on the cellular phone and call for help, or a passing motorist might assist you. A migrating bird faced with such a dilemma may not have any viable options. A one-way trip for most Neotropical migrants (birds that breed in the United States and Canada and winter in Latin America and the Caribbean) is at least a couple thousand kilometers (over one thousand miles). Although birds accumulate fat reserves of up to 50% of their body weight in preparation for departure, the rigors of long distance flight require most birds to rest and refuel several times before they reach their final destination. Without places along the way that provide an adequate food supply for the quick replenishment of fat reserves, shelter from predators, and water for rehydration--places referred to as stopover sites--these travelers are doomed!

Declines in the numbers of many Neotropical migratory bird species have been detected over the past several decades. When scientists began to decipher the possible reasons for these declines, fingers were pointed at two main causes: fragmentation of breeding habitat and destruction of tropical forests on the wintering grounds. More recently, attention has been given to the importance of habitat during the intermediate stage in the annual, three-part life cycle of migratory birds.

Migration naturally entails risks and has its costs. The phenomenon has evolved because the benefits have outweighed the costs, whether by virtue of greater reproductive success in the insect-rich temperate zone or increased survivorship over the winter in the warm tropics. Nonetheless, death during migration takes a heavy toll. It is estimated that half of all migrants heading south for the winter will not return to breed in the spring. Predation and bad weather are two natural causes of mortality during migration. Collisions with tall buildings, windows, and other structures; being shot or trapped by hunters; and getting struck by automobiles are a few of the numerous human-made dangers. The continued loss and degradation of stopover habitat, however, is potentially the greatest threat of all.





### ***Stopover Hot Spots***

A consideration of the movement patterns of songbirds and shorebirds as they migrate across North America reveals where, on a broad scale, many of the important stopover areas are during this portion of the trip. Songbirds returning from Latin America to breed in the eastern United States and Canada take either an overland route through Mexico or an overwater route across the Gulf. For the birds that make the minimum 18-hour flight over the water, the coastal woodlands and barrier islands along the northern Gulf coast mark the first opportunity for landfall. This coastal area therefore contains key stopover sites for many migrants. The remainder of their trip northward consists of a series of nocturnal flights, each lasting four to six hours and spanning an average of 50-75 kilometers (30-50 miles). These flights are punctuated by stopovers ranging from 1 to 5 days. As the birds move north in waves, they fan out across the eastern U.S., feeding on the all-you-can-eat buffet of insects that hatch out in synchrony with the unfurling of new leaves. This broad-front movement pattern means that songbird stopover sites are widely dispersed across the wooded areas of the eastern U.S. in the spring.

In the fall, the Atlantic coast takes on greater significance as a migration highway. Migrant traffic is particularly heavy along the coast from southernmost Canada to North Carolina, as many birds depart from along this stretch on nonstop flights over the western Atlantic Ocean to the Caribbean and points farther south. Prevailing northeasterly winds make such marathon flights possible. Bottle-necks of migrating birds occur at the tips of the Cape May and Delmarva peninsulas as birds funnel into these relatively small land masses to refuel and await good weather before crossing the Delaware Bay and the Chesapeake Bay. These peninsulas, therefore, harbor important stopover sites. For those birds heading south in the fall across the Gulf of Mexico, the Gulf coast is again an important area for stopovers.

Stopover sites in a large portion of the western United States are restricted to relatively defined areas. Songbirds looking for stopover sites in this part of the country rely heavily on shelter belts and hedgerows in agricultural areas, and desert oases and riparian corridors in the more arid regions. In the fall, higher elevation sites--especially mountain meadows--become important because of the abundant populations of insects which peak late in the season. Also in the fall, at lower elevations, foothill riparian areas provide important fruiting plants for birds such as tanagers and grosbeaks.

Critical stopover sites for shorebirds are easier to pinpoint because migrating shorebirds congregate conspicuously at a number of key locations across the globe. In North America, the following stopover sites each support at least several hundred thousand shorebirds every year: the Copper River Delta in southern Alaska; Gray's Harbor in Washington; the Bay of Fundy in Nova Scotia and New Brunswick; the Cheyenne Bottoms in Kansas; the Delaware Bayshore of New Jersey and Delaware; and the prairie pothole region of the northern U.S. and southern Canada. These sites, along with a handful of others, are cornerstones of the Western Hemisphere shorebird migration system.





### ***The Hilton versus the Bates Motel: Quality Differences in Stopover Sites***

Unless constrained by bad weather or insufficient fat reserves, birds are selective and they will search for a preferred habitat type in which to stop over. When and where a migrant makes a stopover, and the length of time spent at a particular stopover site, depends on several factors, including the condition of the bird (especially the amount of fat reserves), weather, wind direction, availability of a suitable place to land, and habitat quality. Based on observations made of migratory landbirds arriving on the northern coast of the Gulf of Mexico, researchers from the University of Southern Mississippi have shown how these factors interrelate. If the winds are from the south and the weather calm as the birds reach the coastline, most will continue flying farther inland, if they have sufficient fat reserves. Those that promptly stop in the coastal forests under such fair wind and weather conditions do so because they are running out of steam, i.e., fat. When winds are from the north or there are thunderstorms in the area, most birds, whatever their fat levels, will be forced to land along the coast. Birds with lower energy reserves will remain in the stopover area for more than a day in order to put on more fat, while those in better condition will set off again the night following their arrival, provided the wind and weather are favorable.

The same researchers found that birds that make stopovers on the Louisiana coast gain weight quickly. The average stopover there is two days, and the birds gain 3-5% of their body weight per day. Birds of the same species that land on islands off the coast of Mississippi tend to be in poorer condition than those that land on the Louisiana mainland, and yet most birds leave the islands the night following their arrival. Those that stay remain for one or more days, but rarely do they gain weight. The difference between whether the birds stay or quickly move on, and whether those that stay gain weight or not, is due to the quality of the habitat. The vegetation differences between the two locations mean differences in the types of insects that are available as food: the insects adapted to the tough, dry needles and leaves of the Mississippi pines and shrubs are less digestible and lower in caloric value than the insects--especially the moth larvae--which are abundant in the more lush Louisiana forests. These findings demonstrate that if appropriate habitat is not available for a needed stopover, birds must either fly farther, even if a weakened condition makes it unlikely that they will survive, or remain in poor habitat and risk starving or becoming easy prey for a predator.

### ***The Diagnosis***

In his book, *Where Have All the Birds Gone*, John Terborgh states, "Migration is a chain whose strength is that of its weakest link." Since birds spend as much as half of the year or more en route between breeding grounds and wintering areas, the habitats they depend on during this period are critical links to their survival. Loss and degradation of stopover habitat not only can result in more birds dying while on migration, but it can also have serious repercussions in terms of nesting success. For example, birds heading north are already constrained by the relatively short amount of time available to get to the breeding grounds, establish a territory, pair with a mate, and get on with the further demands of raising young. Late arrival, or arrival in poor condition, on the breeding grounds because of inadequate food and rest en route, is likely to jeopardize a bird's ability to reproduce.





### ***The Prognosis and the Prescription***

The importance of coastal habitats as stopover sites for birds is pitted against the desirability of coastal areas as prime real estate. Half of the total United States population now lives within 50 miles of the coast. Projections for the year 2010 predict this number will increase by 60%. This population pressure, combined with accelerating rates of coastal erosion and rising sea levels caused by global warming, poses a monumental conservation challenge.

Inland stopover areas will continue to be affected by land use policies, especially with regards to development, ranching, agriculture, forestry, and oil exploration. A balance between economic needs and the needs of migrants will have to be sought in order for the grand phenomenon of avian migration to continue. Economic growth based on birdwatching and ecotourism is proving to be a successful alternative in a number of key stopover areas across the globe.

The Western Hemisphere Shorebird Reserve Network, the American Bird Conservancy in conjunction with the National Audubon Society, and the Nature Conservancy have programs aimed at identifying and protecting critical stopover sites. If you enjoy the spectacular sights and melodious sounds of the many migratory birds that grace us with their presence each year, do what you can to support these international efforts.

Private landowners can contribute to the cause by providing appropriate trees and shrubs and maintaining wetlands on their property. Numerous local and national organizations, such as the National Wildlife Federation, can offer guidance on how to make your yard hospitable to birds. Collectively such efforts can have a great effect. Remember that reverberations from what happens locally to migratory birds can be felt across the hemisphere!

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**Se alerta a las aves migratorias:  
disminuyen los lugares para hacer escala  
Escrito por Mary Deinlein  
Traducido del inglés por Claudia Caicedo**

***La importancia de los lugares para hacer escala***

Imagine que usted ha estado viajando en su automóvil durante horas. Tiene hambre, sed, cansancio y necesita detenerse pronto y descansar. Suponga que ya ha realizado este viaje y que está contando con cierta estación de gasolina y con cierto lugar para comer que le han sido de ayuda en el pasado. Usted sabe que se acerca –reconoció la curva que se aproxima en la carretera– y respira con alivio a medida que el sitio de comida se hace visible. Esta vez realmente se salvó; ¡el medidor indica casi vacío! Por si fuera poco, cuando se dirige hacia los dispensadores ve un aviso en el frente de la tienda que dice: ¡CERRADO! Y, usted se encuentra a varias millas de la próxima estación. ¿Qué puede hacer?

Como un ser humano en esta clase de predicamento, usted podría dirigirse a su teléfono celular y solicitar ayuda, o podría pedirle ayuda a algún motorista que pase. Sin embargo, un ave migratoria que encare el mismo dilema podría no tener ninguna opción viable. Para la mayoría de las aves migratorias neotropicales (las aves que se reproducen en los Estados Unidos y el Canadá e invernan en América Latina y el Caribe), un viaje en una sola dirección es de, por lo menos, varios miles de kilómetros (más de mil millas). Aunque durante su preparación para el despegue las aves acumulen reservas de grasa equivalentes hasta un 50% del peso de su cuerpo, los rigores de volar sobre grandes distancias exigen que las aves descansen y se reabastezcan varias veces antes de llegar a su destino final. Sin lugares a lo largo de la ruta que ofrezcan un suministro adecuado de alimento para reponer rápidamente las reservas de grasa, así como refugio de los depredadores y agua para rehidratarse –lugares conocidos como sitios para hacer escala– estos viajeros están condenados a su suerte.

Durante las últimas décadas se ha detectado una disminución de las cantidades de muchas especies de aves neotropicales. Cuando los científicos comenzaron a descifrar las posibles causas de dicha disminución, señalaron dos factores como principales: la fragmentación del hábitat en que se reproducen las aves y la destrucción de los bosques tropicales en los lugares que invernan. Más recientemente, se la ha brindado atención a la importancia del hábitat durante la etapa intermedia del ciclo anual y en tres etapas de las aves migratorias.





La migración naturalmente implica riesgos y tiene un precio. El fenómeno ha evolucionado porque los beneficios han superado a los costos, ya sea en virtud de un mayor éxito reproductivo en la zona templada, rica en insectos, o de una mayor supervivencia en el invierno en los cálidos trópicos. Sin embargo, durante la migración la muerte cobra un alto precio. Se estima que la mitad de todas las aves migratorias que se dirigen al sur para pasar el invierno no retornará a reproducirse en la primavera. La depredación y las inclemencias del clima son dos causas naturales de mortalidad durante la migración. Las colisiones contra altos edificios, ventanas o contra otra serie de estructuras, recibir disparos o ser atrapadas por cazadores y atropelladas por automóviles constituyen unos cuantos de los numerosos peligros causados por los humanos. Sin embargo, la continua pérdida y la degradación del hábitat que las aves usan para hacer escala es, potencialmente, la mayor de todas las amenazas.

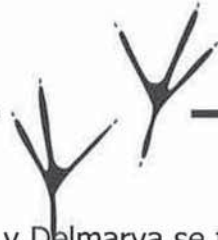
### ***Los lugares "más calientes" para hacer escala***

La observación de los patrones de desplazamiento de las aves cantoras y de las aves playeras a medida que emigran a través de Norteamérica revela donde se encuentran, a gran escala, muchas de las áreas importantes en que las aves se detienen durante este trayecto del vuelo. Las aves cantoras que regresan de América Latina a reproducirse en la región oriental de los Estados Unidos y el Canadá toman, o bien una ruta en la que cruzan sobre el territorio mexicano continental, o bien una ruta sobre el agua y cruzan sobre el Golfo de México. Para las aves que realizan el vuelo mínimo de 18 horas sobre el agua, los bosques costeros y las islas frente a la costa norte del Golfo constituyen la primera oportunidad de aterrizar. Por consiguiente, en esta área costera hay lugares clave en los que muchas aves migratorias pueden hacer escala. Lo que les falta para terminar su viaje hasta el norte consiste en una serie de vuelos nocturnos cuya duración es de cuatro a seis horas cada uno y en los que cubren una distancia promedio de 50 a 75 kilómetros. Estos vuelos son interrumpidos en los lugares para hacer escala entre uno y cinco días. A medida que las aves se desplazan en oleadas hacia el norte, se despliegan a lo largo de la región oriental de los Estados Unidos y se alimentan del "bufet" de insectos nacidos en sincronía con el surgimiento de las hojas nuevas.

Este amplio patrón de desplazamiento significa que en la primavera los sitios en que las aves cantoras pueden hacer escala se encuentran bien dispersos a lo largo de las áreas forestales del este estadounidense.

En el otoño, la costa Atlántica adquiere mucha mayor importancia como ruta migratoria. El tráfico migratorio se intensifica considerablemente a lo largo de la costa desde el sur del Canadá hasta Carolina del Norte, dado que muchas aves parten desde esta franja y cruzan sin detenerse sobre el Atlántico occidental hasta el Caribe y hasta puntos mucho más al sur. Los vientos predominantes que se dirigen al noreste hacen posible tales maratones de vuelo.





En las puntas de las penínsulas de Cape May y Delmarva se forman cuellos de botella, a medida que las aves se concentran en estas masas de tierra relativamente pequeñas con el fin de recargarse y esperar por un buen clima antes de cruzar las bahías de Delaware y de Chesapeake. Por consiguiente, en estas penínsulas se encuentran importantes sitios para hacer escala. Para aquellas aves que el otoño se dirigen hacia el sur en a través del Golfo de México, la costa del golfo es, una vez más, un área de gran importancia para hacer escala.

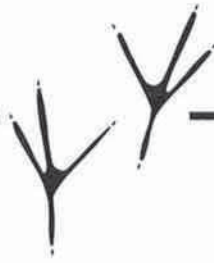
Los lugares para detenerse en gran parte de la región occidental de los Estados Unidos están restringidos a áreas relativamente limitadas. Las aves cantoras que buscan sitios para descansar en esta parte del país dependen, en gran medida, de los rompevientos y las cercas vivas en las áreas agrícolas, y de oasis y corredores ribereños en las regiones más áridas. En el otoño, los sitios en las mayores alturas -especialmente en las praderas de las montañas- adquieren importancia debido a la abundancia de poblaciones de insectos en apogeo al final de la estación. También en el otoño, a menores alturas, las áreas ribereñas a los pies de las montañas proveen plantas que les brindan frutillas a las tangaras y los picogrueros.

Los lugares "más calientes" para que las aves playeras hagan escala son más fáciles de indicar pues las aves playeras migratorias notoriamente se congregan en varios sitios clave a lo largo del planeta. En Norteamérica, cada uno de los siguientes lugares para hacer escala sostiene, al menos, a varios cientos de miles de aves playeras anualmente; el delta del río Copper en el sur de Alaska; la bahía de Gray en el estado de Washington; la bahía de Fundy en Nueva Escocia y New Brunswick; la costa de la bahía de Delaware en los estados de Nueva Jersey y Delaware y la región de las praderas del norte estadounidense y el sur canadiense. Estos lugares, así como otra buena cantidad de ellos, constituyen piedras angulares en el sistema migratorio de las aves playeras del hemisferio occidental.

### **Un hotel de cinco estrellas o un hospedaje de caminos: las diferencias en cuanto a la calidad de los lugares para detenerse**

A menos que se encuentren limitadas por el mal clima o por no tener suficientes reservas de grasa, las aves son selectivas e indagan por un tipo de hábitat preferible para detenerse. Cuando y donde hace escala un ave migratoria, así como el tiempo que se queda en un lugar particular, depende de varios factores, incluidas las condiciones del ave (especialmente, la cantidad de reservas de grasa), el clima, la dirección del viento, la disponibilidad de un sitio apto para aterrizar y la calidad del hábitat. Con base en observaciones de aves migratorias que llegan a la costa norte del golfo de México, investigadores de la Universidad del Sur del Mississippi han demostrado la interrelación entre estos factores. A medida que las aves llegan a la playa, si los vientos provienen del sur y el clima está en calma, la mayoría continuará volando tierra adentro, siempre y cuando tenga suficientes reservas de grasa. Aquellas que se detienen muy rápido en los bosques de la costa, habiendo buen viento y buenas condiciones climáticas, lo hacen porque se les agota la energía, es decir la grasa. Cuando los





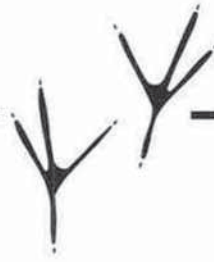
tormentas eléctricas en el área, la mayoría de las aves -sin importar su nivel de reservas de grasas- verá forzada a aterrizar a lo largo de la costa. Las aves con menores niveles de energía permanecerán en el área por más de un día con el fin de almacenar grasa, mientras que aquellas en mejores condiciones partirán de nuevo la noche siguiente a su llegada, siempre y cuando el viento y el clima les sean favorables.

Los mismos investigadores encontraron que las aves que hacen escala en la costa de Luisiana adquieren peso con gran rapidez. La estadía promedio es de dos días y las aves aumentan diariamente entre 3-5% el peso de su cuerpo. Las aves de la misma especie que aterrizan en las islas de la costa de Mississippi tienden a estar en peores condiciones que aquellas que lo hacen en el territorio continental de Luisiana y, sin embargo, la mayoría de las aves abandonan las islas la noche siguiente a su llegada. Aquellas aves que se quedan, permanecen por uno o más días, pero es raro que ganen peso. La diferencia entre la permanencia de las aves o la continuación de su viaje rápidamente, y de que las aves que permanecen ganen peso o no, se debe a la calidad del hábitat. La diferencia entre las dos partes en cuanto a la vegetación también implica diferencias en cuanto a la clase de insectos disponibles para alimento; los insectos adaptados a las fuertes y secas agujas y hojas de los pinos y arbustos del Mississippi son mucho menos digeribles y más bajos en calorías que los insectos especialmente que las larvas de polillas abundantes en los frondosos bosques de Luisiana. Estos hallazgos demuestran que, sin un hábitat apropiado disponible para hacer la escala necesaria, las aves deberán, o bien, volar más lejos incluso si su debilitada condición imposibilita su supervivencia o permanecer en hábitats poco aptos y arriesgarse a morir de hambre o convertirse en presa fácil de los depredadores.

### ***El diagnóstico***

John Terborgh en su libro *Where Have All the Birds Gone* afirma: "La migración es una cadena cuya fortaleza es aquella de su más débil eslabón." Dado que las aves gastan casi la mitad del año o más en travesía entre los lugares de reproducción y las áreas para invernar, los hábitats de los cuales dependen las aves durante este período constituyen vínculos críticos para su supervivencia. La pérdida y la degradación del hábitat para hacer escala puede dar como resultado, no sólo muchas más muertes de aves durante la migración, sino también repercusiones serias en términos de su éxito para anidar. Por ejemplo, las aves que se dirigen hacia el norte ya están limitadas por el tiempo relativamente corto para llegar hasta las zonas de reproducción, establecer un territorio, aparearse y continuar con las mayores demandas de criar polluelos. La llegada tardía o en malas condiciones a las zonas de reproducción, a causa de la inadecuada alimentación y el poco descanso durante la travesía, probablemente amenace la capacidad de reproducción de un ave.





### ***La prognosis y el remedio***

La importancia de los hábitats costeros como sitios para que las aves hagan escala se opone a la preferencia a hacer uso de las áreas costeras como propiedad raíz de alto costo. Hoy en día, la mitad de la población total de los Estados Unidos vive dentro de un margen de 50 millas a partir de la costa. Según proyecciones para el año 2010, se pronostica que esta cifra aumentará en un 60%. Esta presión poblacional, combinada con las aceleradas tasas de erosión costera y los crecientes niveles del mar causados por el calentamiento del planeta le plantean un desafío monumental a la conservación ambiental.

Las áreas para hacer escala tierra adentro continuarán siendo afectadas por las políticas relativas al uso de la tierra, especialmente en lo concerniente al desarrollo, la creación de fincas, la agricultura, el manejo forestal y la exploración petrolera. Debe procurarse pues, hallar el balance entre las necesidades económicas y las necesidades de las aves migratorias, de manera que el gran fenómeno de la migración de las aves pueda seguir teniendo lugar. El crecimiento económico basado en la observación de las aves y en el ecoturismo está demostrando ser una alternativa exitosa en una serie de áreas clave para hacer escala en todo el planeta.

La Red Hemisférica de Reservas para las Aves Playeras (Western Hemisphere Shorebird Reserve Network), American Bird Conservancy en cooperación con National Audubon Society y Nature Conservancy tienen programas orientados a identificar y proteger los lugares clave para hacer escala. Si usted disfruta la espectacular vista y los melodiosos sonidos de muchas de las aves migratorias que nos brindan la gracia de su presencia cada año, trate de hacer lo que esté a su alcance para respaldar estos esfuerzos internacionales.

Los propietarios de propiedades privadas pueden contribuir a la causa proveyendo árboles y arbustos adecuados y manteniendo humedales en sus propiedades. Varias organizaciones locales y nacionales, como National Wildlife Federation pueden ofrecerle orientación para convertir su jardín en un lugar hospitalario para las aves. Esta clase de esfuerzos puede, colectivamente, tener un gran efecto. ¡Recuerde que lo que le suceda localmente a las aves podrá repercutir en el resto del hemisferio!

### ***Lecturas complementarias:***

Kerlinger, P. 1995. How Birds Migrate. Stackpole Books, Mechanicsburg, PA.

Moore, F.R. and T.R.Simons. 1992. Habitat Suitability and Stopover Ecology of Neotropical Landbird migrants. pp 345-355. In Ecology and Conservation of Neotropical Migratory Birds. (J.M.Hagan and D.W.Johnson, eds.) Smithsonian Institution Press, Washington, DC.

[http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Fact\\_Sheets/](http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Fact_Sheets/)





## Migratory Bird Mortality

*Many Human-Caused Threats Afflict our Bird Populations*

### Are Birds in Danger?

Of the 836 species of birds protected under the Migratory Bird Treaty Act, about a quarter are known to be in trouble. There are 78 bird species listed as Endangered and 14 species listed as Threatened in the U.S.. An additional 144 species are on the National list of Birds of Conservation Concern 2001 (some whose populations are declining precipitously). It cannot be assumed that the remainder of U.S. birds are safe, as population data on essentially a third of these species are lacking, making status determination very difficult if not impossible. The problems that birds face in the U.S. are symptomatic of the problems they face globally.

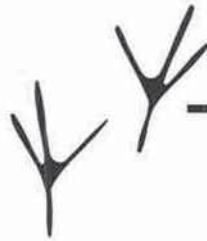
### What Are the Human-Caused Threats to Birds?

Birds face tremendous challenges to their survival every day. The majority of these challenges are related to human activities. Vast numbers of birds are killed due to collisions with human structures and equipment, poisoning by pesticides and contaminants, and attacks by cats and other introduced predators.

Diseases such as botulism, avian cholera, salmonellosis, and emerging West Nile virus can also have significant population impacts. Human activities, such as overuse of pesticides (enhancing the survival of pesticide-resistant mosquitoes), for example, can help spread certain diseases.

The greatest threat to birds, and all wildlife, continues to be loss and/or degradation of habitat due to human development and disturbance. For migratory birds and other species that require multiple areas for wintering, breeding, and stopover points, the effects of habitat loss can be complex and far-reaching.

Added to deaths from natural causes, such as adverse weather, predation, or starvation, human-related bird deaths may result in greater mortality than a population can withstand. In other words, it is the cumulative or combined impact of all mortality factors that concerns scientists most. Thus, anything done to reverse human-related bird deaths - and thus potential impacts to bird populations - are of considerable interest to the U.S. Fish and Wildlife Service.



## How Many Birds are Killed?

The U.S. Fish and Wildlife Service estimates that a minimum of 10 billion birds breed in North America. Fall populations may be on the order of 20 billion. These figures represent only educated guesses. Mortality figures are also difficult to determine. Based on modeling and other approaches, estimates have been made for some of the most visible threats.

**Collisions.** Building window strikes may account for 97 to 976 million bird deaths each year. Communication towers conservatively kill 4 to 5 million birds annually (possibly closer to 40 to 50 million; a nationwide cumulative impacts study should help resolve this question). Strikes at high tension transmission and distribution power lines very conservatively kill tens of thousands of birds annually. Taking into account the millions of miles of bulk transmission and distribution lines in the U.S., and extrapolating from European studies, actual mortality could be as high as 174 million deaths annually. Electrocutions probably kill tens of thousands of birds, but the problem is barely monitored. Cars may kill 60 million birds or more each year, private and commercial aircraft far fewer, while wind turbine rotors kill an estimated 33,000 birds annually.

**Poisoning.** In one recent study, pesticides were estimated to result in the direct deaths of at least 72 million birds annually. This is an underestimate of the total deaths, given that delayed deaths from poisoned prey, orphaned chicks, and neurological problems were not included, and the study site was limited. Oil spills may kill hundreds of thousands or more, depending on the severity and timing of the spill. Up to two million birds are killed annually in oil and wastewater pits, mainly in the western states.

**Cats.** Many citizens would be surprised to learn that domestic and feral cats may kill hundreds of millions of songbirds and other avian species each year. A recent study in Wisconsin estimated that in that state alone, domestic rural cats kill roughly 39 million birds annually. Add the deaths caused by feral cats, or domestic cats in urban and suburban areas, and this mortality figure would be much higher.

**By-Catch.** Tens to hundreds of thousands of seabirds are estimated to die in U.S. fisheries each year. Monitoring for this, however, is again limited.







## What Are We Doing to Reduce Mortality?

While the “incidental, accidental or unintentional take” of migratory birds is not permitted by the Service and is a criminal violation of the Migratory Bird Treaty Act, the Service attempts to work with those industries and individuals whose actions result in bird deaths, rather than pursuing criminal prosecution first.

For over 25 years, the Service has been a *co-founding partner of the Avian Power Line Interaction Committee* helping develop two voluntary guidance documents to reduce bird strikes and electrocutions. More recently, the Service *co-founded the Avian Subcommittee of the National Wind Coordinating Committee*, working to reduce bird strikes at wind turbines, and they *founded and chair the Communication Tower Working Group*, working to reduce bird strikes at communication towers. They also *co-chair the Interagency Seabird Working Group*, implementing a national plan of action to reduce seabird by-catch in long-line fishing gear.

Because of jurisdictional and ownership issues, working to reduce cat-caused mortality, building window strikes, and oil spills is a more complex undertaking. Here, they *support initiatives such as the Cats Indoors Program and the Fatal Light Awareness Program*, which encourages building owners to turn off skyscraper lights during spring and fall night-time songbird migrations. For threats that can be addressed by individual citizen action, they design public education materials with related messages such as encouraging homeowners to reduce home pesticide use and consumers to select environmentally-friendly products, such as shade-grown coffee.

Declining bird populations are probably most often the result of combined or cumulative impacts of all mortality, thus addressing each of the contributing factors is a priority.

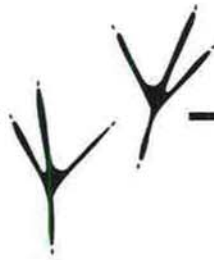
## What Else Is Needed to Reduce Mortality?

Research is critical. In the case of collisions, for example, we don’t understand specifically how light attracts birds to communication towers, tall buildings, wind turbines, transmission towers, or other lit structures. We need to learn if deterrents such as low-frequency sound, colored markers, or structural modifications reduce avian collisions. We also lack an understanding of how birds select stopover areas during spring and fall migrations. Without it, we cannot effectively manage habitats and recommend against building new structures in critical bird-use areas. Above all, the cumulative impacts of collisions on bird populations must be assessed - they are currently unknown. With the exponential increase in new structures, avian monitoring must be a priority. All of this information should be transmitted to land managers, industry representatives, and affected agencies.

**For More Information: U.S. Fish and Wildlife Service,  
Division of Migratory Bird Management 4401 N. Fairfax Drive, Room 634  
Arlington, VA 22203 703.358.1714 <http://birds.fws.gov>**







# Ways Citizens Can Contribute to the Conservation of Wild Birds

## Create Backyard Habitat

Creating backyard habitat is something nearly everyone can do.

*Provide food.* Provide plenty of natural bird food by planting native plants that bear small berries or that support ample insect populations. A bird feeder is also useful for attracting many birds. Position feeders to avoid deadly window collisions.

*Plant shelter.* Birds require dense cover, like shrubs and evergreen trees, especially during winter.

*Furnish water.* Commercial bird baths, small pools, and natural ponds are surefire ways to attract birds, especially if water is dripping or moving continually.

*Supply nest sites.* Put up a birdhouse for cavity-nesting birds like chickadees and wrens, and platforms for robins and barn swallows.

For more information on creating habitat, contact your state wildlife agency or National Wildlife Federation's Backyard Habitat Program at 703.438.6000 or [www.nwf.org/backyardwildlifehabitat](http://www.nwf.org/backyardwildlifehabitat).

## Think Before You Spray

Each year 4 million tons of pesticides are applied in the United States exposing 672 million birds to the harmful effects of those chemicals. One-tenth of those exposed, or 67 million birds are estimated to die as an immediate result. Before using pesticides consider the following alternatives.

Exercise prevention first. For example, drain away standing water in your yard; elevate stacks of wood off the ground and move them away from your house; use naturally pest- and disease-resistant native plants; and rotate vegetables in your garden from year to year.

Use non-chemical controls. Mulch, spade, hoe or pull weeds in the garden. Frequently mow and water (if supplies permit) your grass to encourage a resistant, healthy lawn.

Use low-impact pesticides. If you must use chemicals, use the most specific chemical pesticides for your needs. Always follow label instructions.

For more information on pesticides, contact the U.S. Fish and Wildlife Service's Division of Environmental Quality at 703.358.2148 or [www.fws.gov](http://www.fws.gov) or [www.audubon.org/bird/at\\_home/alternatives.html](http://www.audubon.org/bird/at_home/alternatives.html)





## Be a Responsible Cat Owner

Biologists estimate that free-ranging cats kill hundreds of millions of birds each year. The number of pet cats in the United States has grown from 30 million in 1970 to 60 million in 1990. In addition, millions of strays and feral cats roam our cities, suburbs, and rural areas.

Remember cats need care all their lives. Keep only as many cats as you can manage. If you no longer want your cat, do not release it into a rural area. Contact your local animal shelter or welfare organization instead.

Keep your cat indoors whenever possible. It's safer for your cat as well as for wildlife.

Spay or neuter your cat. There are already millions of kittens and cats that need homes and human care.

Locate bird feeders away from heavy cover so cats cannot surprise unsuspecting birds.

For more information on bird-friendly cat ownership, contact the American Bird Conservancy's Cats Indoors! Campaign, at 202.452.1535 or [www.abcbirds.org](http://www.abcbirds.org).

## Buy Shade-grown Coffee

You can help conserve vital rainforest habitat and protect more than 150 forest-dependent migratory bird species just by drinking shade-grown coffee.

In many parts of the neotropics, shade-grown coffee farms are the only forest-like habitat remaining. Due to the increasing demand for coffee worldwide, many of these traditional farms have been converted to "sun coffee" plantations, which are devoid of trees.

Unfortunately, sun-grown coffee, while yielding higher short-term output, requires higher levels of fertilization and plant replacement, suffers increased risk of failure due to drought, leads to soil damage, and means the destruction of the forest, a long-term resource for native peoples. Loss of the canopy also means loss of habitat for migratory birds; studies have found that the diversity of migratory birds plummets when coffee plantations are converted from shade to sun.

When purchasing coffee, check the label or ask your grocer for certified shade-grown coffee.

For more information on shade-grown coffee, visit the Coffee Section on the International Migratory Bird Day website at <http://birds.fws.gov/coffee.html>, or Smithsonian Migratory Bird Center's Coffee Corner at [www.si.edu/smbc/coffee.htm](http://www.si.edu/smbc/coffee.htm).





## Buy a Duck Stamp

One of the easiest and most effective actions anyone can take for birds is to purchase a Migratory Bird Hunting and Conservation Stamp, commonly known as the Duck Stamp. This stamp, required for hunters of migratory birds, but also popular with stamp collectors, art enthusiasts, and wildlife fans, is available for \$15 from national wildlife refuges, post offices, and Wal-Mart, K-Mart, and other sporting goods stores around the country. Ninety-eight cents of every dollar raised by Duck Stamp sales are used to buy wetland habitat, which benefits migratory waterfowl and a host of other bird and wildlife species.

To request more information on the Duck Stamp, call the U.S. Fish and Wildlife message line at 800.344.WILD, or visit <http://duckstamps.fws.gov>.

## Get Involved in Community Planning

Community decision-makers are usually receptive to input from citizens, especially if they have a good understanding of the issues.

Listen to what your county commissioners or land use planners are saying about future use and zoning of lands in your area. Make sure those plans consider the interest of wildlife, as well as other members of the community. Remember that "green space" raises all property values and improves the quality of life for everyone.

## Join a Conservation Group

A good way to become more informed about birds is to join a related organization; options span a broad spectrum, from animal welfare leagues to sporting groups to garden clubs. Simple interaction with other people who share your basic interests is likely to give you a more informed viewpoint about bird conservation and amplify your opinions.

## Volunteer at a Refuge or Park

Make a truly significant contribution by volunteering at a wildlife refuge, park, or other wildlife sanctuary. You may be able to help with litter control, trail maintenance, guiding tours for civic or school groups, developing a bird or tree list, or starting a nest-box program. Few facilities would turn down an offer of some additional help.

Join or start a support or "Friends" group at your nearest national wildlife refuge or park. These groups provide a consistent source of volunteer support. The help you provide can make a real contribution to the future of wild birds.

For more information about "Friends" groups, contact U.S. Fish and Wildlife Service at 703.358.1744.





## Participate in Citizen Science

Help scientists track the status of bird populations. Participate in Christmas Bird Counts, the Great Backyard Bird Count, the North American Migration Count, Project Feeder Watch, and other projects.

To find out more about citizen bird science, visit <http://birdsource.org>, a website managed by the National Audubon Society and the Cornell Laboratory of Ornithology.

To participate in a Christmas Bird Count in Houston, visit [www.houstonaudubon.org](http://www.houstonaudubon.org).

## Donate Binoculars

Give new life to your old binoculars by passing them on to new birding enthusiasts. If your old binoculars are in good condition or only need a little work, they can be refurbished and given to a budding birdwatcher.

Check with local centers or bird groups for binocular recycling programs.

The Birder's Exchange ([www.americanbirding.org/consbex.htm](http://www.americanbirding.org/consbex.htm)), distributes binoculars and other gear internationally. The Optics for the Tropics program ([www.OpticsfortheTropics.org](http://www.OpticsfortheTropics.org)) matches monetary donations with equipment for Caribbean Ornithologists.

## Celebrate International Migratory Bird Day!

Share your interest, enjoyment, and concern with others. Find and attend an IMBD event in your community, or better yet, start something yourself. Integrate IMBD into a conversation, lecture, class, newsletter, or exhibit; host a bird walk or shade-grown coffee hour; or purchase IMBD products for use or sale.

Celebrating IMBD is a good way to generate community spirit, ensure a better environment, and raise awareness about and promote the conservation of migratory birds and the habitats they need to survive.

For more information on IMBD, call 703.358.2318 or visit <http://birds.fws.gov/imbd>. To purchase IMBD products, call 1.866.344.3330 or visit <http://www.BirdDay.org>.

**International Migratory Bird Day is held annually on the second Saturday in May.  
It is an invitation to celebrate your support of migratory bird conservation.**

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## Helping Migratory Birds

[www.houstonaudubon.org](http://www.houstonaudubon.org)

## Houston Audubon Society



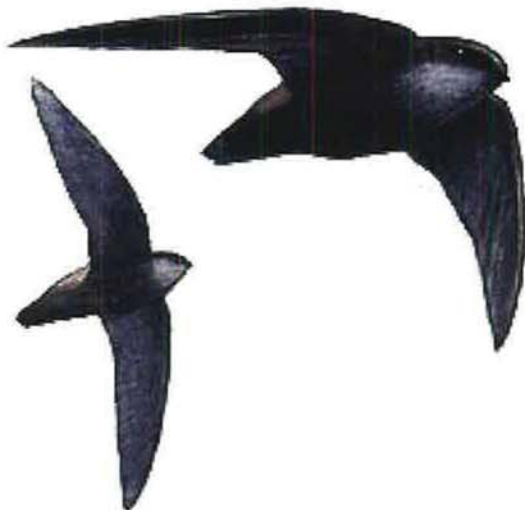
### Chimney Swifts by Susan Billetdeaux



The Chimney Swift is a member of the swift family which also includes the Black Swift and the White-throated Swift (the common swift west of the Rockies). Chimney Swifts range throughout eastern North America from North Dakota to Maine and south to the Gulf Coast. They winter in Peru. Their closest relative is the hummingbird.

#### Description

The Chimney Swift is a small bird, roughly 5" long and dark-gray in color. As with all swifts, it has a short bristle-tipped tail and slender, curved-back wings. In flight the swift calls with a twittering of rapid, repeated chips. The Chimney Swift can be distinguished from swallows and martins by its lack of forked tail and its narrow, long wings on a relatively small body. The swift is often described as a "flying cigar".







## **Nesting Habits**

Chimney Swifts begin to arrive in Houston in March. A few still nest in large hollow trees; however, most nest in chimneys. Both sexes help in nest-building. They hover by trees and break off twigs which are then fastened together with saliva to form a semicircular basket and attached to the chimney wall. By mid-June 3 to 6 pure white eggs are laid. Incubation takes 18 days and then the young usually stay in the nest for 24 days. At first they exercise their wings while staying in the chimney by bracing their tails against the walls and flapping their wings. Both the father and mother help with incubating and raising the young. Sometimes other adult swifts will also help with feeding duties. The young are ready to leave the nest usually in late July to early August. Swifts flock together after the nesting period. They begin to leave in the fall with most gone by late October.

## **The Chimney Swift and Man**

Chimney Swifts are highly beneficial birds from man's point of view. They are voracious eaters of flying insects including mosquitoes, flies, ants and termites. Unlike martins, they don't mind if a yard has tall trees. Their only requirement to nest is a chimney (non-ceramic) or chimney-like structure. If you would like to have Chimney Swifts nest in your chimney, remove any grate that may be on the top during the nesting season (March - October). The only precaution you must take is to make sure the chimney flue stays closed. When there are young in the chimney, you may hear some fluttering from time to time which sounds very close to the flue. This is caused by the young exercising their wings and is no reason to panic. Swifts leave very little debris in the chimney from their nesting activities and are very clean birds.

If you decide you do not want swifts to use your chimney you should close off the chimney entrance with a wire grate. This procedure should be done in the November - February period, when there are no swifts in our area. It is against the law to tamper with the swifts and their nests once they have started using your chimney.

## **Chimney Swift Towers**

Sometimes it is impossible for swifts to use your chimney, either because of its design or because of problems with predators. In the past few years several designs have been developed for chimney swift towers. Plans for towers and more information about Chimney Swifts may be obtained from:

## **For More Information**

<http://www.concentric.net/~Dwa/>

<http://www.chimneyswifts.org/>

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## Helping Migratory Birds

[www.houstonaudubon.org](http://www.houstonaudubon.org)

### Hummingbirds

#### Species Found in Houston

##### **Ruby-throated Hummingbird**

Particularly common in Houston during fall and spring migration (August - October and March - May). Some remain here and breed in the summer, and there are a very few who over-winter. Both sexes have green plumage, but only the adult male has a crimson throat.



##### **Rufous Hummingbird**

Small numbers occur in the winter (October - March). The male is easily recognized by his brilliant orange-red plumage. The female has a green back with an orange wash along the sides.

##### **Black-chinned Hummingbird**

May be found in the winter. The male is similar to the Ruby-throated Hummingbird, but his throat is purplish-black rather than red. Females and immatures are notoriously difficult to distinguish from the ruby-throat. According to Brent Ortego, a local expert on hummingbirds, 85% of the time someone sees what one thinks is a ruby-throat in winter, it is actually a black-chinned.

##### **Other Species**

Several other species may occasionally be found in Houston in the winter. These include the Allen's, Anna's, Broad-tailed, and Buff-bellied Hummingbirds.

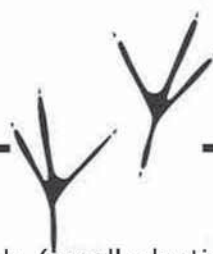
##### **Feeding Habits**

Hummingbirds live on a combination of flower, nectar and minute insects. Often they eat insects found in the nectar, and they also catch insects in the air. In winter, hummingbirds are known to follow sapsuckers around to feed on tree sap extracted from sapsucker drilling holes.

##### **Feeders**

Feeders are a very useful supplement to the hummingbird's natural foods. There are several excellent brands on the market. Be sure to use one that can be easily cleaned. In our humid weather sooty mold easily grows on feeder parts and is harmful to hummingbirds. For that reason feeders need to be cleaned every few days. The feeder does not need to be large as usually only one bird at a time will feed at it. Also, there is no point in putting out a huge supply of nectar as you will be changing it anyway when you clean the feeder.





Some feeders come supplied with bee guards (small plastic plugs with a grid design). Studies have shown that bee guards have sometimes caused injury to hummingbird bills so we don't recommend their use. If the design of the feeder is such that a bee guard is required, cut out the center of the guard with wire clippers to avoid possible injury. Do Not Use Red Food Coloring! As long as there is some red on the feeder, the hummingbirds will find it. It is not necessary to buy commercial hummer nectar, as it is very easy to make. Simply mix hot water and sugar.

### **Proportions for Hummer Nectar**

4 parts water to 1 part sugar. Remember: no red food coloring and no sweetener except sugar (no honey and no artificial sweetener!).

### **Feeder Placement**

Hummingbirds will more readily use a feeder if it is close to hummer-attracting plants. Try to put it in an area which receives some shade. In particular, glass feeders should not be placed where they will get afternoon sun as in the summer the nectar temperature would become unbearably hot. Hummingbirds appreciate having a nearby shrub or tree to perch in. They are very aggressive about protecting a feeder. Therefore if you want to provide nectar for several hummingbirds, try to place several small feeders in widely separated areas rather than using one large feeder.

### **Winter Feeding**

It is not necessary to take down your feeder in the winter, since there are always some birds who stay here in the winter months. But if you choose to keep it up past October, you must be particularly careful to keep it filled as birds will rely on it more than in other times of the year. Hummingbirds are able to survive extremely cold temperatures if their food source is maintained. Hummingbirds survived the Christmas freeze of 1989 when temperatures dropped to 8 degrees, but the feeders needed to be replaced every couple of hours to keep the nectar from freezing. Under normal Houston winter conditions it is only necessary to bring the feeder indoors on nights when a freeze is predicted. But remember to put it back out first thing in the morning!

### **The Nesting Hummingbird**

Hummingbirds are known to nest inside Houston's city limits, but only rarely. You should count yourself fortunate indeed if a hummingbird chooses your yard for a nest. Your chances are better if your yard is fairly heavily wooded with both mature trees and thicket-style shrubbery. Willow trees are especially useful, as the hummingbird uses the willow silk found around its seeds to line her nest. Hummingbirds also seem to prefer a site with a permanent water source, such as a pond or creek. After mating, the male is not involved in nesting duties. The female alone builds the nest and raises the young.



## The Hummingbird Garden

Planting a hummingbird garden is the ideal way to attract hummingbirds and much more effective than using feeders. In designing a hummingbird garden, you should pay particular attention to the times of year various flowers bloom. In Houston it is especially important to have flowers in the fall and winter, since that is when we have the greatest hummingbird concentrations and the largest number of species. In the following list the main blooming period for each plant has been added. However, variable factors such as temperature, location of plant, type of soil, etc., also need to be considered, so these dates should only be used as general guidelines. Some of the plants listed, such as pentas, hamelias, firespike, and some salvias will have winter blooms if temperatures are mild or the plant is protected.

Small Flowering Trees		
Red Buckeye: spring	Mexican Buckeye: spring	Mimosa: late spring
Coral Bean: spring	Silver Bell ( <i>Halesia diptera</i> ): spring	Vitex: summer
Shrubs		
Flowering Quince: winter	Shrimp Plant: winter, spring	Coralberry: spring
Hardy Hibiscus: summer	Buddleia: summer	Weigela: summer
Cape Honeysuckle: all year	Hamelia: summer, fall	Firespike ( <i>Odontonema strictum</i> ): fall
Lantana: summer, fall	Justicia: spring	Flame Acanthus: summer
Vines		
Carolina Jessamine: winter	Wisteria: spring	Coral Honeysuckle: spring
Cypress Vine: summer	Cross Vine: summer	Bougainvillea: summer
Perennials		
Gulf Coast Penstemon: spring	Iris: spring	Columbine: spring
Hardy Salvias: some all year	Turk's Cap: summer, fall	Jacobinia: spring
Pentas: all year (if protected)	Pickerel Rush: summer	Cardinal Flower: fall
Cigar Flower ( <i>Cuphea ignea</i> ): summer, fall	Fountain Plant ( <i>Russelia equisetiformes</i> ): all year (if protected)	Lion's Tail ( <i>Leonotus leonurus</i> ): fall





## Helping Migratory Birds

## Houston Audubon Society

[www.houstonaudubon.org](http://www.houstonaudubon.org)

### Purple Martins

by Susan Billetdeaux

The Purple Martin is the largest North American swallow. Adult males are purplish-black and darker on the wings and tail. Females and immatures have dusky throats, light bellies, and dull purplish-black upperparts. Martins feed mainly on day-flying insects, including beetles, wasps, dragonflies, and mosquitoes. Martins do not use feeders but are known to appreciate crushed bits of eggshell put out on a flat surface.

#### Breeding

The Purple Martin breeds in South Canada and throughout the United States. It avoids mountainous areas and is often curiously local within its range. All purple martins winter in South America. They breed in the East mainly in man-made houses, whereas on the Pacific Coast they continue to use tree cavities. Martins begin to arrive in the Houston area in January. The scouts, who are generally older males, come first, then younger males followed by females. Nesting activities start in February. Martins start to leave in August with all birds gone by October. Large congregations of martins may be found in Houston in late summer as they prepare for fall migration. One area which provides excellent viewing is just south of Interstate 10, between Gessner and the Sam Houston Tollway. Best times of day to observe them are early morning and at dusk.

#### Nesting

Both sexes build a nest composed of grass, leaves, twigs, and other convenient materials such as paper and string. Four to five slight glossy white eggs are laid from mid-April through May. Incubation takes 15-20 days. Females do most of the incubating, while males assist in feeding duties. The young remain in the nest for 24-28 days. Families stay together for 3 weeks afterwards. Martins are generally single-brooded unless no chicks survive.



## Purple Martin Houses

The ideal martin house should be lightweight, cool, attractive, durable, and resistant to parasites. The exterior color should be white to reflect heat. It should have guard rails to protect young birds and bright interiors to discourage starlings. The best compartment size is 6"x6"x6" with the hole 2 1/8" in diameter. The house should have good ventilation and drainage with sub-floors to discourage mites. A good way to discourage parasites is to scatter 1 tablespoon of powdered sulfur in each compartment just prior to nesting.

Martin houses should be located in an open area with at least 15 feet clearance from trees and buildings. The pole should be 12 to 20 feet in height, with some sort of mechanism to lower the house for cleaning. Poles should be equipped with predator guards to protect against cats, squirrels, raccoons, and other nest-robbers. To discourage house sparrows, keep the compartments cleaned of nest material before the martins arrive. In addition, door plugs should be used on the compartments in the off season.



## Gourds

Gourds, both natural and plastic, make excellent housing for martins. Research has shown that martins using properly prepared and mounted gourds have higher reproductive success than with conventional houses. The fact they swing is something martins like and predators don't. Also their shape discourages predators. New plastic gourds snap together to make cleaning easy. Gourds attached to the bottom of regular houses may increase your chances of attracting martins.

## For More Information

<http://www.purplemartin.org/>

<http://www.purplemartins.com/>





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## Helping Migratory Birds

[www.houstonaudubon.org](http://www.houstonaudubon.org)

### Gardening for Wildlife

by Susan Billetdeaux



No matter what type or size yard you have, you can convert it to one that not only will be a haven for wildlife but will also give you countless hours of enjoyment. From lizards, treefrogs, and toads to butterflies, birds, and small mammals, Houston has a wide diversity of animals who will appreciate and reward your efforts. Many species are efficient partners in controlling unwanted insects. For instance, opossums happily crunch away on Texas roaches and Gulf Coast toads help control all sorts of garden pests. Chimney Swifts and bats are among the most efficient mosquito-devourers around.

#### General Guidelines

- Mulched areas are more attractive than grass. Leaf litter provides cover for small lizards and toads and also creates space for ground-foraging birds.
- If you already have a lawn, the easiest way to start is by creating island groves of mulched beds containing a combination of trees, shrubs, and flowers.
- If your yard doesn't have any tall trees, this does not necessarily mean it can't be attractive to wildlife. Areas of thicket-like shrubbery will provide cover along with food and breeding sites.
- When choosing plants, aim for those which bear fruit at different times of the year. For instance, the yaupon is an excellent small tree for berries in the fall and winter, while red mulberry is probably the most outstanding tree in the spring for the number of different bird species attracted to its fruit.
- Avoid pruning your shrubs into formal shapes. These become too dense for most wildlife to use.
- If you have palm trees, don't prune off the dead fronds at the base of the crown. They provide ideal nesting sites for several species of birds and bats.
- Refrain from using pesticides. Not only can they be harmful to wildlife, but they also destroy their food sources.

#### For More Information

##### **School Habitat Guidebook - Environmental Institute of Houston 281.283.3950**

This guidebook will provide excellent activities for your students, case studies, grant opportunities and field trip suggestions.

<http://www.npsot.org/> - The Native Plant Society of Texas

<http://www.birds-n-garden.com/>

[http://www.birdcrossstitch.com/garden/TexasGardening.html#texas\\_sites](http://www.birdcrossstitch.com/garden/TexasGardening.html#texas_sites)



## Recommended Plants

### Tall Trees for Shelter, Nesting Sites and Food

Species	Notes
Oaks: Shumard, Red, Live, Nuttall, Swamp Chestnut, Bur, Overcup	acorns are an outstanding food source
Magnolia	winter shelter; seedpods are a food source for many species, including the Pileated Woodpecker
Pines	pinecones are a winter food source; trees provide nesting habitat for cavity dwellers
Red Cedar	berries are a winter food source, particularly for Cedar Waxwings
Sweet Gum	winter food source, larval butterfly food
American Holly	winter food source, larval butterfly food
Hackberry	larval butterfly food, winter food source
Maples: Sugar and Red	important food source and spring nectar source
Black Cherry	berries are a summer food source; leaves are larval food for many butterflies

### Small Trees/Large Shrubs

Species	Notes
Hollies: yaupon & possum haw	yaupon is evergreen, possum haw deciduous; both have winter berries
Wax Myrtle	winter berries, particularly for Yellow-rumped Warbler; male and female plants needed
Rusty Blackhaw Viburnum	summer berries
Carolina Buckthorn	fall berries
Mexican Plum	summer fruit
Red Mulberry	spring fruit; larval butterfly food source
Anacua	summer berries, evergreen in mild winters
Vitex	summer flowers for butterflies and hummingbirds





### Small Spring-Flowering Trees (understory plants)

Parsley Hawthorn	Silverbell ( <i>Styrax americana</i> )	Fringe Tree
Texas Buckeye	Snowbell ( <i>Halesia diptera</i> )	Dogwood

### Shrubs for Sunny Areas

Elderberry: summer berries	Beautyberry: fall berries	Buttonbush: summer flowers
Lantana: summer flowers and fruit	Cassia corymbosa: larval butterfly source	Blackberries/ Farkleberries
Cape Honeysuckle: hummingbirds	Buddleia: hummingbirds and butterflies	Hamelia: hummingbirds

### Shrubs for Shade

Beautyberry: fall berries	Coralberry: winter berries	Mock Orange ( <i>Philadelphus coronarius</i> ):
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### Vines

Passionflower Vine: larval butterfly food	Carolina Jessamine: winter flowers for hummingbirds	Cross Vine: summer flowers for hummingbirds	Coral Honeysuckle: flowers for hummingbirds and butterflies
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### Perennials

Hardy Sal-	Turk's Cap	Goldenrod	Gaillardia	Shrimp Plant
Penstemon	Mexican Milk-	Coneflowers	Ruellias	Cupheas
Wild Parsley	Louisiana Iris	Cardinal Flower	Verbena	Pentas

### Water

Water is a key element in your landscape design. It can be as simple as an extra-large plant saucer used on the ground for a bird bath or as elaborate as a pond and waterfall. If using a saucer, you should be sure to position it away from dense shrubbery where a cat could hide. Bird baths on the ground also need to have a large rock placed in them to prevent tree frogs from drowning. A small pond is easy to make with the help of a flexible pond liner and will attract numerous types of birds along with dragonflies, frogs and toads. Small native fish, such as gambusia, will keep mosquitoes from becoming a problem.



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## The Branch School Urban Wildscape

<http://www.thebranchschool.org>



### Concept:

The Branch School has a wooded 2.25 acre campus just NW of the I-10W / Beltway 8 junction. By 2000, two school parents had become seriously interested in outdoor education at the school. They planned lessons in subjects from composting to insects, and planted native Texas plants in one area of campus. Their project absorbed workweeks of time researching, procuring, planting, and maintaining the area, and they felt its potential could be expanded. They concluded that an expansion would need professional help, and wrote a grant to the Susan Vaughan Foundation to fund a professional design and the installation of a Wildscape to be integrated in classroom lessons. The grant funded a Wildscape that would meet Texas Parks and Wildlife and National Wildlife Federation standards for certification. In addition, the grant funded other outdoor learning venues, including bulb, flower, and vegetable beds. The grant was awarded in fall 2002 and the new Wildscape was completed in winter 2004. At completion, the school successfully applied for recognition from Texas Parks and Wildlife and from the National Wildlife Federation as a Wildscape. It received a "Best of Texas" award for having over 75% native plantings in the wild areas (about a quarter of the total campus), in addition to both TP&W and NWF Wildscape certification. The Wildscape areas are at the front of the campus and along the north side to the playground area. Part is accessible to the children during recess, and part is fenced and requires adult supervision. Children have access to bug-catchers and magnifying glasses to follow up on their curiosity when they see something interesting. The plantings were chosen to provide food for a wide range of native species. The water sources were kept shallow because of the preschool: pebbles keep a 9" deep fountain from having no more than 1" free water. The water level is maintained by valve-controlled continuous makeup from a nearby faucet.

### How it's used:

The Wildscape area is close to the children's play area at school and is used most school days for exploration by at least one class. There is a "Watch Our Wildscape" (WOW!) bulletin board in an adjacent play porch to capture their discoveries so they can be shared with the school community. Students raise tadpoles and release toads and frogs into the Wildscape, "host" Monarch and other butterflies in patches of Mexican milkweed and watch for their life stages, and measure growth of various Wildscape communities to become familiar with natural cycles. The outdoor classroom curriculum extends from the school's educational philosophy, which is to facilitate learning through "discovery, discipline, and demonstration." The school has an "outdoor classroom curriculum coordinator" who organizes volunteer help to plan a curriculum and deliver weekly lessons to elementary classes and some preschool classes. A few examples of outdoor classroom topics include: nature observation, plant/insect relationships, bats, bulbs, food webs, soil science, tree uses and growth patterns, and insects. For example, lessons on insect body parts will include example insect citizens from our Wildscape who spend a morning in 2" square magnifying boxes so the children can count legs, etc.





Each class has a gardening project (flower or vegetable) in fall, winter, and spring that teaches them some basic gardening skills and an appreciation for vegetables they probably didn't like prior to growing their own. Students participate in building and unpacking compost piles and maintain a worm bin to learn about decomposition and recycling in nature.

Access to a living Wildscape and their own gardens has benefited students in many ways: some who live in condominiums have regular contact with wildlife they would otherwise miss; children "own" their own gardens and learn where food comes from; and all see scientific principles demonstrated in the wild community on their campus.

### **Resources:**

There are lots of useful local organizations interested in supporting gardening or habitat programs. Here are the main ones used by The Branch School:

- **Harris County Extension Office** (281-855-5600 or <http://urbantaex.tamu.edu> or <http://harris-tx.tamu.edu> ). They can fund "container gardening" programs for school children to learn gardening techniques with minimal schoolground resources, and provide a "Kidsantz" unit on fire ants that has fit well into Outdoor Classroom units on insects and life cycles.
- **Urban Harvest** (<http://www.urbanharvest.org> ). Dr. Jean Fefer and Bob Randall have both taught classes and mentored gardeners on organic techniques.
- **Texas Parks and Wildlife** (<http://www.tpwd.state.tx.us/> ) Diana Ross mentors gardeners on habitat development and was a big help with applications for certification as wildscape site.
- **Junior Master Gardener** program (<http://jmgkids.com>). This group puts on programs at the Children's Museum for children to enjoy and as in-service for teachers. There is a JMG program for children's groups that is supported by two excellent books of educational activities.
- **Native Plant Society of Texas** – Houston Chapter (Glenn Olsen, 281-345-4151) This group has monthly meetings with interesting topics, is a source of shared native plants, and can provide advice on planting.
- **Houston Arboretum and Nature Center** (713-681-8433) has teaching units and other resources that can be checked out for use.
- **National Wildlife Federation** (<http://www.nwf.org>, 512-476-9805) has useful newsletters and website.
- **Janet Roberts, Home & Habitat LLC** ([janetroberts.hh@sbcglobal.net](mailto:janetroberts.hh@sbcglobal.net), [www.homeandhabitat.com](http://www.homeandhabitat.com), (713-647-9000) designed and installed The Branch School Wildscapes. Her crew also maintains the wildscape with campus visits about twice every 3 months.
- **Ann Hightower, The Branch School Outdoor Classroom coordinator** ([annhightower@houston.rr.com](mailto:annhightower@houston.rr.com), 713-529-5337)

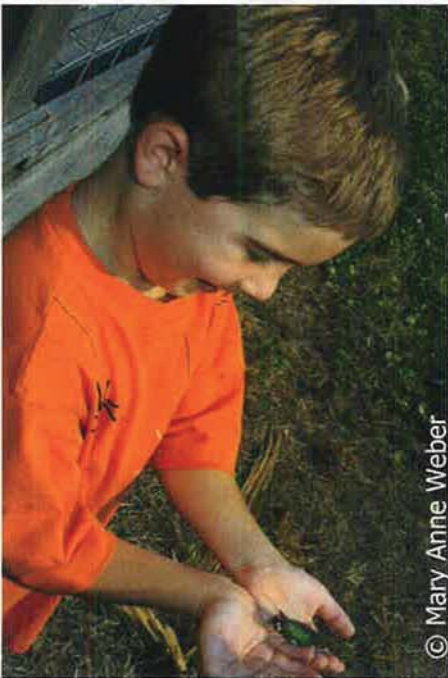


© Len Soucy

## Studying Migratory Birds

# Bird Banding

by Sumita Prasad  
Director of Birding  
Fermata, Inc.  
[www.fermatainc.com](http://www.fermatainc.com)



© Mary Anne Weber

Jadan Weber (6 yrs old) releasing banded Ruby-throated Hummingbird at the Smith Point Hawk Watch Magnificent Migrations Celebration



© Mary Anne Weber





# **BIRD BANDING**

## **by Sumita Prasad**

### **History:**

Widespread banding began in North America in the early 1900s. However, these efforts yielded few results because the public was unaware of banding and, therefore, there were not many recaptured birds. There was also some concern over the disappearance of the Passenger Pigeon and species of shorebirds and waterfowl, largely as a result of hunting. It became evident to conservationists that there was a need for a continental plan for conserving and managing birds.

To address this need, the Migratory Birds Convention was finalized by Canada and the United States in 1916. The Convention set out a system for the protection of migratory birds and for the regulated hunting of birds in both countries. That system was extended to all of North America in 1936, when the United States signed a similar treaty with Mexico.

The U.S. Bird Banding Laboratory and the Canadian Bird Banding Office were established in 1920 and 1923 respectively, as the centers for the administration of banding. Since that time, the work of the Bird Banding Laboratory, now part of the U.S. Geological Survey and the Bird Banding Office, now part of the Canadian Wildlife Service, Environment Canada, has been closely coordinated.

### **The Banding Process:**

Birds are captured alive with the use of nets, traps, and other trapping devices. Experienced banders remove birds from these devices and promptly take measurements of the bird and place suitably sized aluminum bands on the bird's leg. There are 23 standard size bands and 5 specially sized bands made to accommodate the smallest hummingbird to the large Trumpeter Swan. All bands are provided by the Bird Banding Laboratory and are inscribed CALL 1-800-327 BAND and WRITE BIRD BAND LAUREL MD 20708 USA followed by a unique 8 or 9 digit number. Banders are required to follow a code of ethics that ensures the safety of birds.

### **Bird Banding Regulations:**

Because banding birds requires capturing birds and handling them before the banding takes place, the banding of birds in the United States is controlled under the Migratory Bird Treaty Act and requires a federal banding permit. Texas also requires a state permit and is regulated by Texas Parks and Wildlife Department. Only official federal bands may be legally placed on birds that are released to the wild within the United States.





**Bird banding data are useful in both research and management projects. Individual identification of birds makes possible studies of dispersal and migration, behavior and social structure, life-span and survival rate, reproductive success and population growth.**

### **Dispersal and Migration**

Banders participate in studies of dispersal and migration by sending in their banding data to a central site, the Bird Banding Laboratory. When banded birds are captured, released alive, and reported from somewhere else, we can reconstruct the movements of the individual bird. In this way, we have learned that some species go south in one pathway and return north by another pathway. Nesting and wintering grounds have been located for some species, and specific nesting grounds have been connected to specific wintering areas. Through banding we gain insight to the importance of specific habitats and can evaluate the health of an environment.

### **Behavior and Social Structure**

Many researchers use banding as one tool in their studies of bird populations and communities. Some things that may be studied with banded birds include territorial behavior, mate fidelity, territory size and fidelity and reproductive behavior.

### **Determining Life Span**

Banding allows the determination of the minimum length of time that an individual bird lives. Tagging birds with a unique individual marker allows us to later re-identify that bird. We have learned, for example, that it is not uncommon for individuals of some species to live 10 to 20 years or more in the wild. Small songbirds that we may think of as short-lived may live a surprising length of time. We have a record of a hummingbird living as long as 12 years!

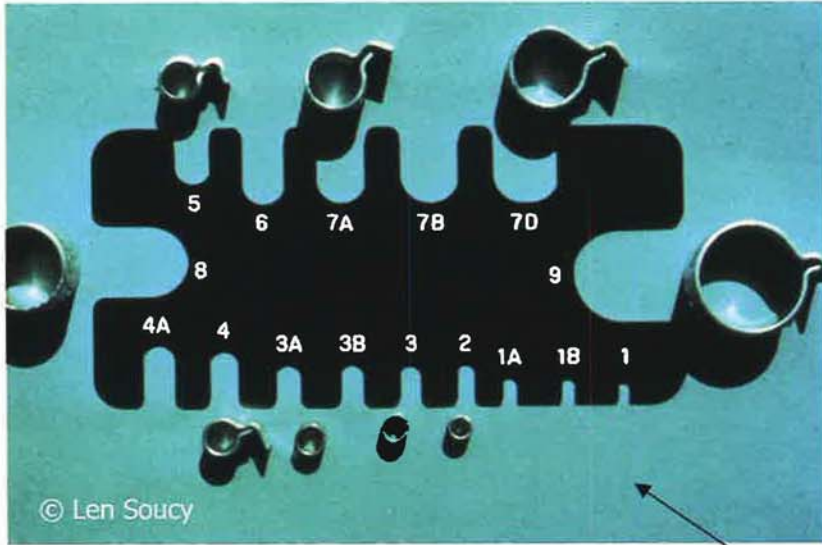
### **Population Studies**

Banding and marking birds can also be used to estimate the numbers of birds in a population using a mark-recapture technique. Birds are marked in one time period, and then recaptured or re-sighted in a later time period. The number of birds marked in the first period and the ratio of marked to unmarked birds in the population in the second period allow the total population of birds to be estimated.

### **Estimating Survival and Productivity**

Banding data allows for the comparison of normal, wild banded birds with birds that may have had their survival altered by exposure to oil or other hazards. Survival and Productivity can be studied by using a constant effort banding site. The Monitoring Avian Productivity and Survivorship (MAPS) program is a cooperative research effort of the Institute for Bird Populations and banders throughout North America.



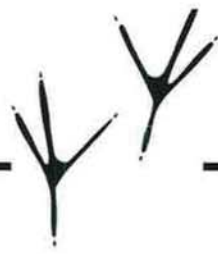


Tools of a Master Bander

Leg gage for measuring the foot of the bird to make sure the correct size band is placed on the bird.

Bird band showing number and address to send the band if it is found.





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## Banding a Ruby-throated Hummingbird photos © Mary Anne Weber



Hummingbirds are trapped at specially designed feeders. After being captured, they are put in soft bags and taken to the banding station.



Measurements are taken and recorded. Birds are aged, identified as either male or female, weighed, and their overall health is checked.



Birds are released as soon as all the data has been gathered.



"Every human being looks to the birds. They suit the fancy of us all. What they feel they can voice, as we try to; they court and nest, they battle with the elements, they are torn by two opposing impulses, a love of home and a passion for far places. Only with birds do we share so much emotion."

**Donald Culross Peattie** (1898-1964)  
American Naturalist and Writer



# The Birds

These pages will introduce you to some of the birds that visit the city of Houston during the year. Some are here in winter, some only in the summer, and some just use the area as a rest stop along an annual migratory route.







L 5" WS 9" WT 0.46oz (13g)

Length of bird

Wingspan of bird

Weight

## Introduction

Out of the abundance of bird species that travel down the Flyways and stop to spend time in our city, we have chosen 26 species to highlight in this manual. The following pages will give you information on when to look for these birds, and the best type of habitat where they can be found.

There are many ways to incorporate these pages into your lesson plans on birds. You will quickly discover that the study of birds is multi-disciplinary, and will engage a student's imagination and creativity. Here are some suggestions for projects and activities using these pages:

- There are enough birds for a typical classroom to allow each student to concentrate on a particular species. Students can use the fact pages as a starting point for their own research project. Play the Bingo game in the activity section, and ask your students to create their own set of questions for additional games.
- Each bird is illustrated by a photograph taken by a local photographer, and an artistic rendering done by two local high school students. Students can search for additional images in books and on the internet to help them create their own artwork. Remember that some of the birds will look different at different seasons of the year, and students should pay attention to when the birds can be found in Houston, so that their artwork reflects what we normally see.
- The maps provided for each bird reflect its annual movement. Students can make comparisons between the different birds to discover which birds nest the furthest from Houston, and which birds migrate the furthest distance from Houston. For many of the birds, information is provided on flight speed and average journey length. Students may want to chart some of this information, and compare body size or weight with distance traveled. They can also come up with their own comparisons.
- Studying the maps will lead to a variety of geography lessons. Students can research the nesting location and wintering location for a particular bird. They will want to find out about the native peoples, land, language, economy, and other interesting facts. Students can compare this to the habitats used in Houston.





- Language arts lessons can be incorporated as students learn the names of these birds in other countries and languages. Some students may recognize their names, or have family members who recognize these other names. Students may want to research the meaning behind these names.
- Information is given on the fact sheets about who gave the particular bird its scientific name. Students should understand the importance and history behind an organism's scientific name. Biographical information is given about the individual who named the bird in the vocabulary section. Students may choose to do a research project on some of these early ornithologists. They may also want to research the meaning of the scientific name or common name. For instance, the word tanager is a Brazilian Tupi Indian name. The warbler's common name comes from *warble*, which means "a tune, or to sing sweetly". The scientific name of the American Goldfinch means "sad thistle eater".
- The *Observation Notes* page is provided so that students can make sketches or comments about when and where they see that particular bird. This will help to keep track of birds seen at a particular location. When students watch a bird, encourage them to make a note about the habitat the bird was found in, and how the bird was behaving. They can then compare their information to the fact sheets in this manual.
- Flight speed and journey length are provided for many of the birds. Remember to instruct your students that these are averages. Birds that nest further south may not fly as far as the same type of bird nesting farther north. Students may want to chart the flight speeds and compare speed to size. Here are some additional figures:

	<b>Distance Covered</b>	<b>Flight Duration</b>	<b>Miles per Day</b>
<b>Peregrine Falcon</b>	<b>1000 miles</b>	<b>21 days</b>	<b>47</b>
<b>Arctic Tern</b>	<b>8750 miles</b>	<b>114 days</b>	<b>77</b>
<b>Yellow-rumped Warbler</b>	<b>453 miles</b>	<b>2 days</b>	<b>226</b>

- Students can also generate a calendar that reflects all 26 birds, and when they are found in the city.
- Be creative and imaginative in the expansion of the study of these birds, and the many others that visit the city.





**Observation Notes:**



**American Goldfinch**  
By  
**James Dong**



© Alan Murphy



# American Goldfinch



*Carduelis tristis*

L 5" WS 9" WT 0.46oz (13g)

## Description:

These small birds are often called wild canaries. They have short, conical beaks ideal for seed eating. Males in breeding plumage are bright yellow with black caps and black wings. Young, females, and winter males are dull, olive-gray. Two white wing bars are distinctive marks for identification. Linnaeus gave this bird its scientific name in 1758.

## Food:

American Goldfinches eat a wide variety of seeds from grasses and trees such as birch, alder, and elm. Niger thistle seed and black-oil sunflower are favorite feeder foods. During the nesting season, American Goldfinches eat more insects, such as caterpillars and grasshoppers. Young are fed a milky seed pulp that is regurgitated by the parents. This is a **diurnal** bird which means they are active during they daytime.

## Habitat:

Winters in weedy, open areas, and moves into urban and suburban areas to eat at feeders. Often found in sweetgum trees, feasting on the seed balls.

## Behavior Notes:

This small gregarious finch is one of the latest nesting birds in temperate regions. This may be in response to availability of thistles and wildflower seeds that will be the main food supply for young birds in the nest. It is the only member of its family to have a second molt in the spring. This unique change transforms the bird from winter plumage to breeding plumage. Houston is a winter home to the American Goldfinch and, thus, we usually only see the olive-gray coloration. American Goldfinches fly with a distinct undulating pattern.

## Voice:

Birdwatchers like to refer to this bird as the "potato-chip" bird. The high-pitched series of notes often sound like *swee-swee*. The flight song sounds like *po-ta-to-chip* or *per-chic-o-ree*.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐							●	●

## Migration Notes:

Travels and forages in flocks.

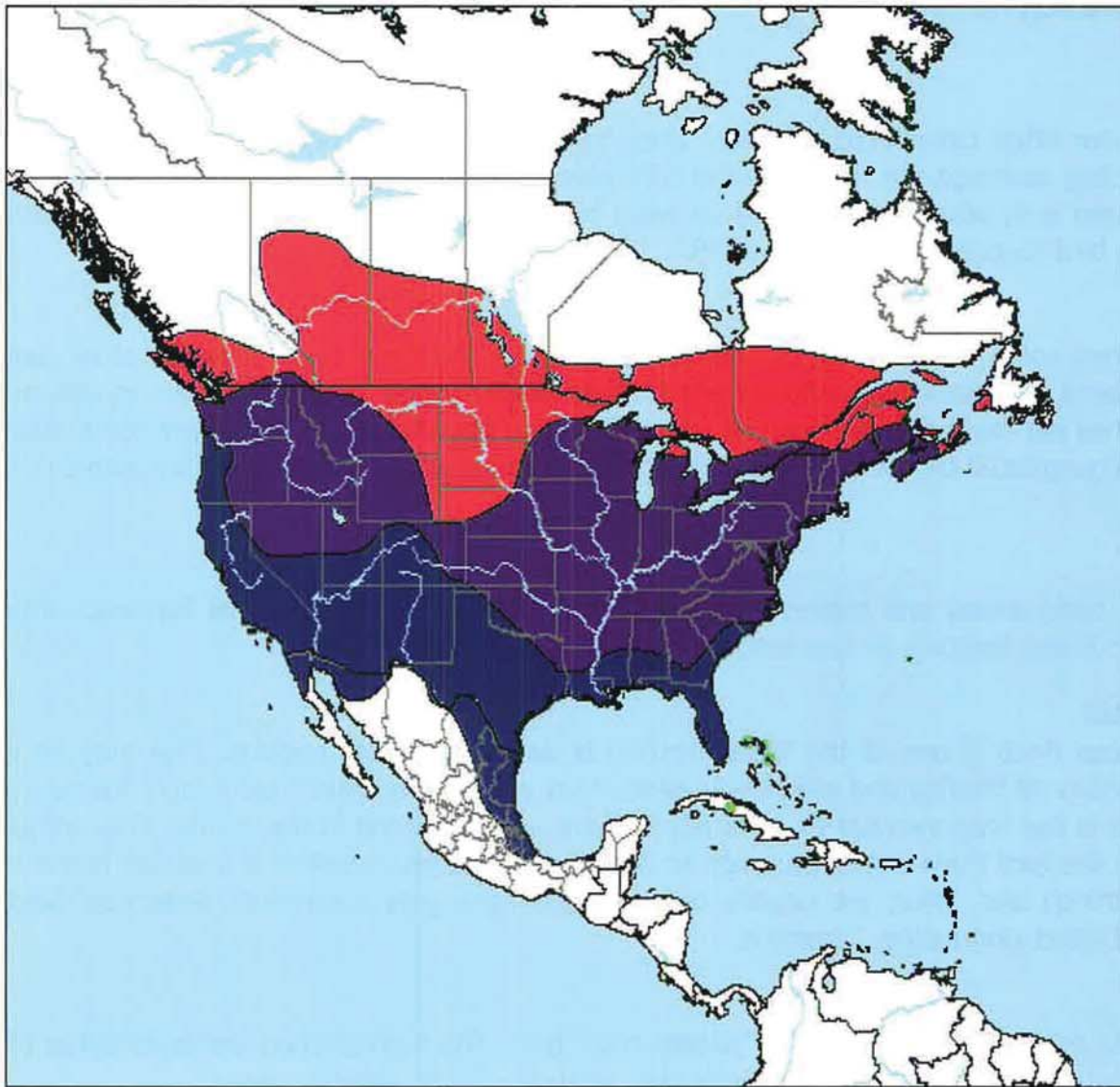
Average flight speed: 19 - 30 mph

Time of movement: **nocturnal**

**Other names:**  
Jilguero Canario (Mexico)  
Chardonneret Jaune (Quebec, Canada)



## American Goldfinch *Carduelis tristis*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



Map created September 2003

Copyright © 2004 NatureServe, 1101 Wilson Boulevard, 15th Floor, Arlington Virginia 22209

Ridgely, R.S., T.F. Allnutt, T. Brooks, D.K. McNicol, D.W. Mehiman, B.E. Young, and J.R. Zook. 2004 Digital Distribution Maps of the Birds of the Western Hemisphere, version 1.0. NatureServe, Arlington Virginia, USA.

<http://www.natureserve.org>

"Data provided by NatureServe in collaboration with Robert Ridgely, James Zook, The Nature Conservancy - Migratory Bird Program, Conservation International - CABS, World Wildlife Fund - US, and Environment Canada - WILDSpace."

"Data provided by NatureServe in collaboration with Bruce Patterson, Wes Sechrest, Marcelo Tognelli, Gerardo Ceballos, The Nature Conservancy - Migratory Bird Program, Conservation International - CABS, World Wildlife Fund - US, and Environment Canada - WILDSpace."





**Observation Notes:**



**American Kestrel**  
**By**  
**Maya Putra**



## American Kestrel



*Falco sparverius*

L 9" WS 22" WT 4.1oz (117g)

### Description:

This cavity nesting, robin-sized bird of prey is the most widespread falcon in North America. The male has blue-gray wings, a reddish-brown tail, and a lightly spotted chest. Females are heavily streaked on the chest, with reddish-brown wings and banded tails. Females are larger than the males. The American Kestrel was given its scientific name by Linnaeus in 1758.

### Food:

This falcon feeds on a variety of small mammals, large insects, reptiles, amphibians, and small birds. The American Kestrel hunts most frequently in the morning and late afternoon.

### Habitat:

You can find this falcon in open areas with short ground vegetation, pastures, and parkland. Kestrels perch on telephone lines, power poles, and the tops of trees, where they can enjoy an unobstructed view of their surroundings. On breeding grounds, Kestrels use natural cavities in trees, abandoned woodpecker holes, cavities in buildings, cliffs, or man-made nest-boxes.

### Behavior Notes:

The American Kestrel surveys for prey from tall perches. Kestrels will often hover and drop on prey. Kestrels depart on their migration at the end of the summer molt, and use mountain updrafts and thermals along the route to save energy. Northern populations migrate as far south as Panama, Cuba, the Cayman Islands, Bermuda, and the Bahamas.

### Voice:

A loud series of "klee-klee-klee" notes.

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐				◑	●	●	●	●

### Migration Notes:

Populations in the northern breeding areas migrate to the south in winter, whereas southern breeding pairs may stay in the same area year round.

Average flight speed: 45 - 60 mph

Time of movement: **diurnal**

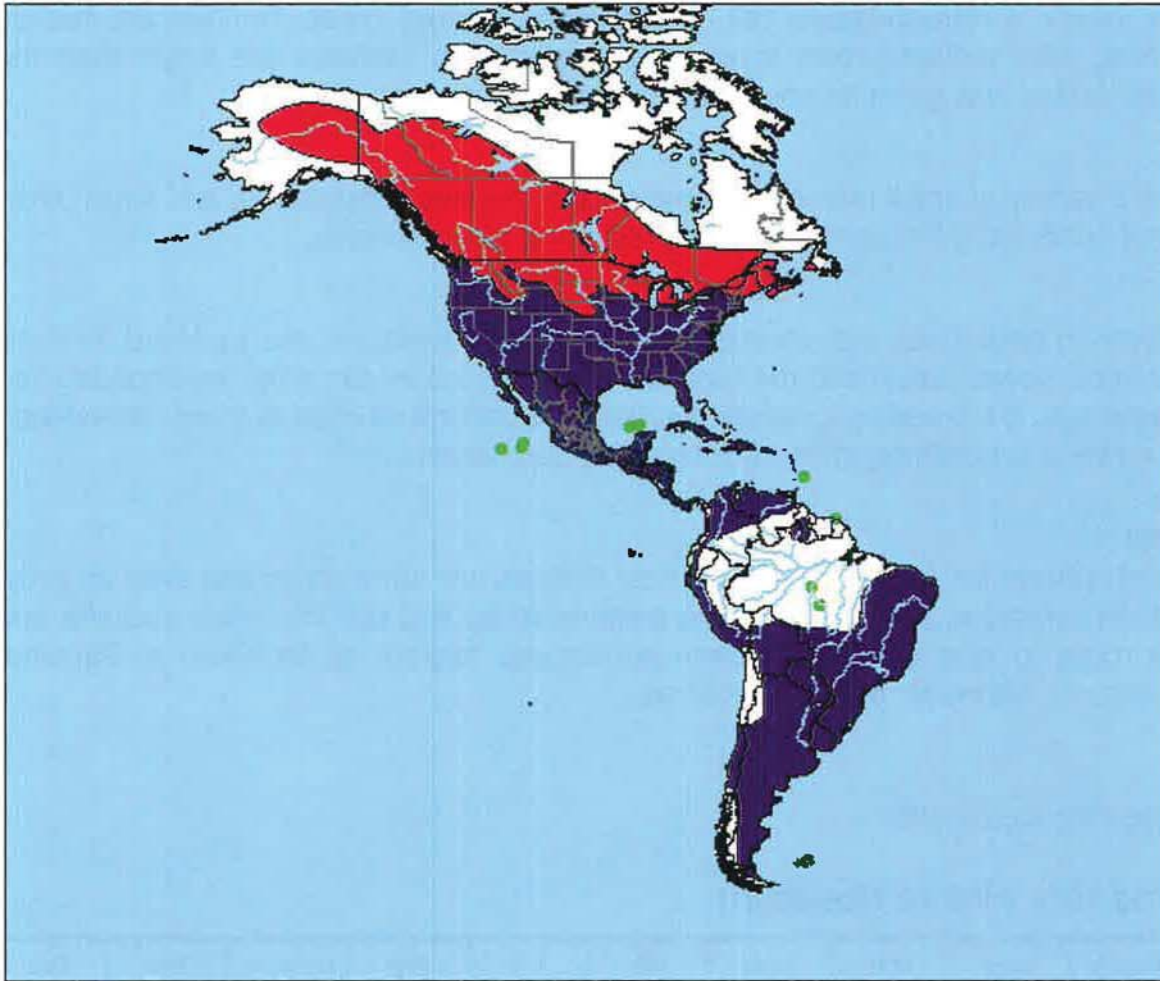
Journey length: 0 - 3,700 miles

#### Other names:

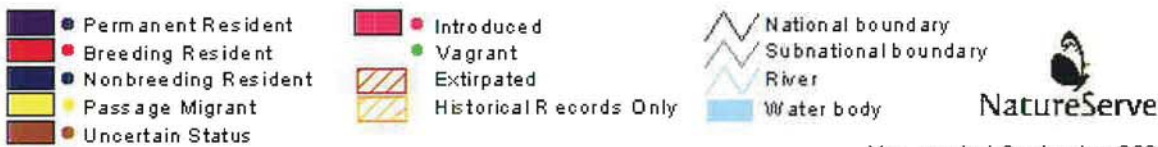
Halcón Cernícalo (Mexico)  
Crécerelle Américaine (Quebec, Canada)  
Cernícalo Americano (Costa Rica)



**American Kestrel**  
*Falco sparverius*



750 0 750 Kilometers



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**Observation Notes:**



**American Redstart**  
**By**  
**James Dong**





# American Redstart



*Septophaga ruticilla*

L 5.25" WS 7.75" WT 0.29oz (8.3g)

## Description:

This is a small songbird. The male is black with orange patches on sides of chest, on the wings, and the tail. The female and first year males have a gray head and back with yellow patches on the sides, wings, and tail. The scientific name for this bird was given by Linnaeus in 1758.

## Food:

This warbler feeds on insects and small fruits. The American Redstart will catch insects in the air. They are aided by long rictal bristles around their mouth that help them to catch their prey.

## Habitat:

You can find the American Redstart in moist second growth deciduous forests with abundant shrubs.

## Behavior Notes:

When American Redstarts forage for food, they will often flash their tails and wings to startle insect prey. These warblers will search for food from the ground to the tops of the forest canopy. They are often called the "Christmas" bird in their winter range, because they are commonly seen during that holiday season. They have also been called the "latrine" bird, because of their practice of seeking out garbage dumps to search for flies. Fragmenting of forests and conversion of mixed deciduous forest to pine stands are leading causes of reduction in population size. Females incubate the eggs, and both parents feed the young. Young leave the nest 8-9 days after hatching. American Redstarts are **diurnal** birds.

## Voice:

A series of sharp notes, some songs with a distinctive accented ending. Most characteristic is *tsee, tsee, tsee, tsee, tsway*. The male usually sings alone during the breeding season and spring migration. Call is a squeaky, clear chip.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	◑					◐	◑		

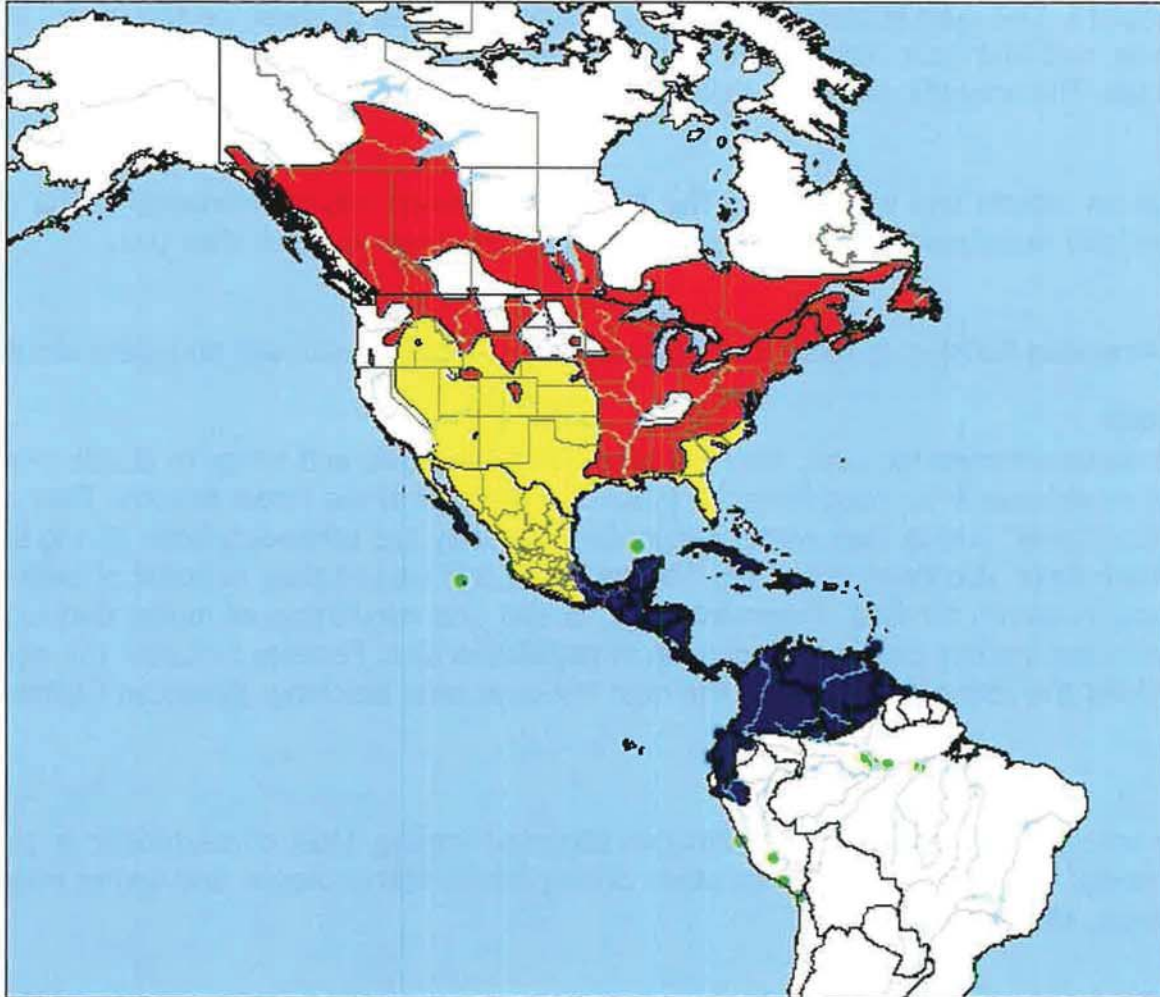
## Migration Notes:

Average flight speed: 20 - 35 mph  
Time of movement: **nocturnal**  
Journey length: 1,500 - 4,700 miles

### Other names:

Pavito migratorio (Mexico)  
Fauvette Flamboyante (Quebec, Canada)  
Candelita (Cuba, Puerto Rico)

**American Redstart**  
*Setophaga ruticilla*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**





**Black-and-white Warbler**  
By  
**James Dong**



© Alan Murphy





# Black-and-white Warbler

**Mniotilta varia**

**L 5.25" WS 8.25" WT 0.37oz (10.7g)**

### Description:

The Black-and-white Warbler is only 5.25 inches in length. The male is distinctly marked with black and white stripes. The female is similar, but duller in color. The male has a black throat; the throats of the female and the immature are white. Linnaeus gave this warbler its scientific name in 1766.

### Food:

The Black-and-white Warbler is a **diurnal** predator for a variety of invertebrates. They feed on arthropods, especially caterpillars, ants, flies, and spiders.

### Habitat:

Look for this bird in parks, suburban areas, woodlots, and forests.

### Behavior Notes:

This bird "creeps" while searching for insect prey. While foraging, the Black-and-white Warbler uses its decurved bill to probe among bark fibers. Lepidoptera larvae are important prey during the spring migration. Because this bird searches under bark for insects, it does not need to wait until the leaves come out in spring to migrate. It is one of the first warblers to return from the tropics each year. The genus name *Mniotilta* means "moss plucking", and refers to this foraging behavior.

### Voice:

Call note is a sharp chip or pit. The main song is a very high-pitched and repetitive *wee-see, wee-see, wee-see*.

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	●	◑			◐	●	◑		

### Migration Notes:

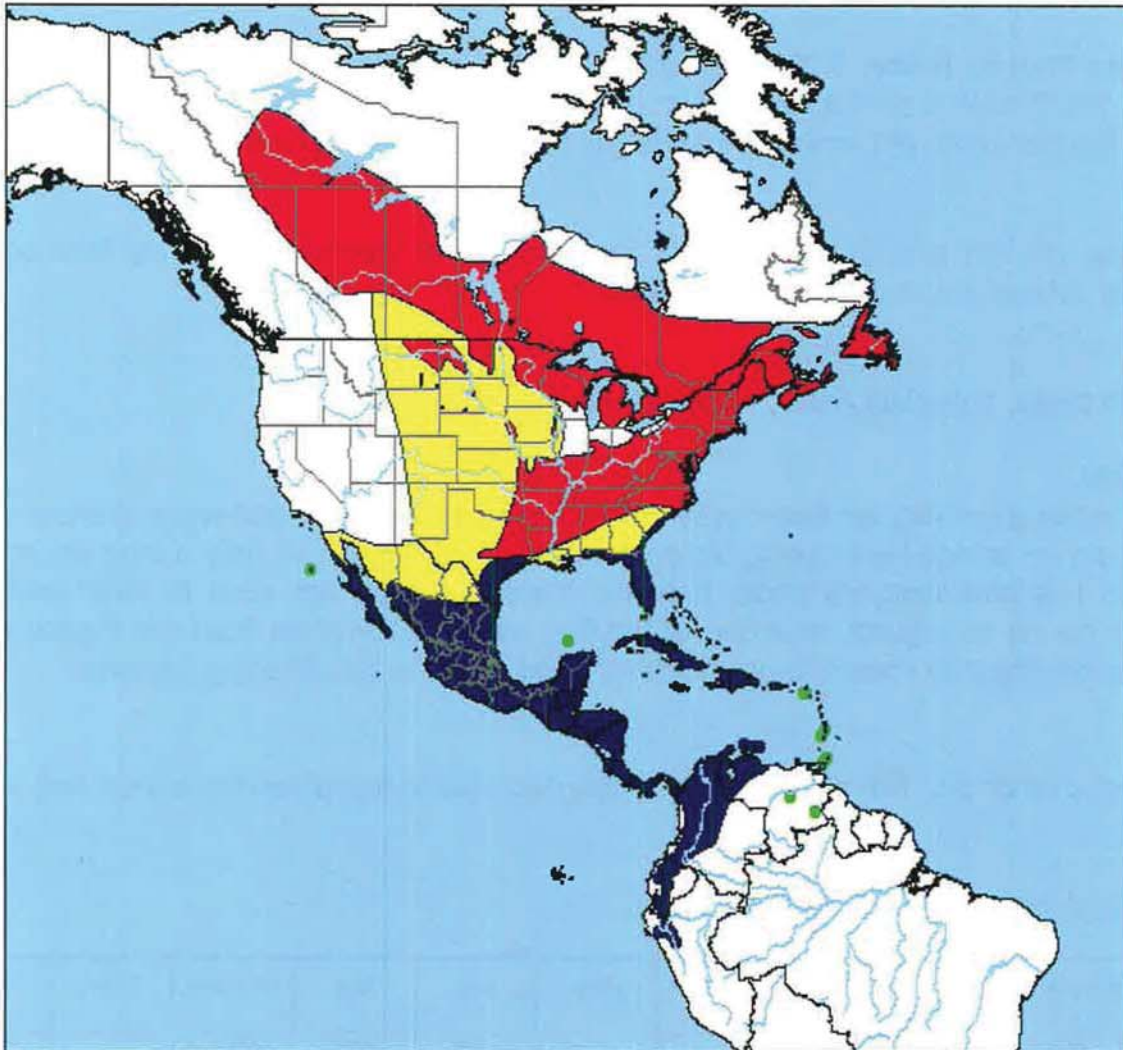
Trans-gulf migrant, capable of crossing the 1,000-km distance to the Yucatan Peninsula in about 20 - 30 hours of non-stop flight.

Average flight speed: 20 - 37 mph  
 Time of movement: **nocturnal**  
 Average daily distance: 20 miles/day  
 Journey length: 300 - 4,700 miles

**Other names:**  
 Chipe Trepador (Mexico)  
 Fauvette Noire et Blanche (Quebec, Canada)  
 Reinita Trepadora, Mezelilla (Spanish)



## Black-and-white Warbler *Mniotilta varia*



750 0 750 Kilometers



- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body

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**Observation Notes:**



**Blue-gray Gnatcatcher**  
By  
**James Dong**



**Banded Blue-gray Gnatcatcher**  
© Mary Anne Weber



# Blue-gray Gnatcatcher



*Polioptila caerulea*

L 4.5" WS 6" WT 0.21oz (6g)

## Description:

The tail of this passerine makes up 45% of the total length of the bird. It is small and bluish-gray with a prominent eye ring. The tail is long and black with white outer edges. It was given a scientific name by Linnaeus in 1766.

## Food:

Spiders and small insects are the main prey. They feed on larvae, insect eggs, and adult insects. The gnatcatcher feeds on insects taken off foliage or caught by hovering in the air. This bird moves its tail constantly while foraging.

## Habitat:

Look for this bird in moist wooded habitats and parks.

## Behavior Notes:

The **diurnal** Blue-gray Gnatcatcher can often be observed fanning its tail and showing off the white edges. This bird hops along branches, and has a light, fluttering flight. The gnatcatcher has the unique habit of ripping up a completed, or partly built nest, and reusing the materials to build a new nest. Both parents incubate the eggs and feed the young. Young leave the nest 12 -13 days after hatching.

## Voice:

Calls are high-pitched and nasal. Songs are a complex series of rambling phrases.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐				◑	●	●	●	●

## Migration Notes:

Trans-gulf migrant. Birds leave breeding areas when young are independent. Peak of gulf migration during September. Birds that nest in the southern U.S. may not migrate.

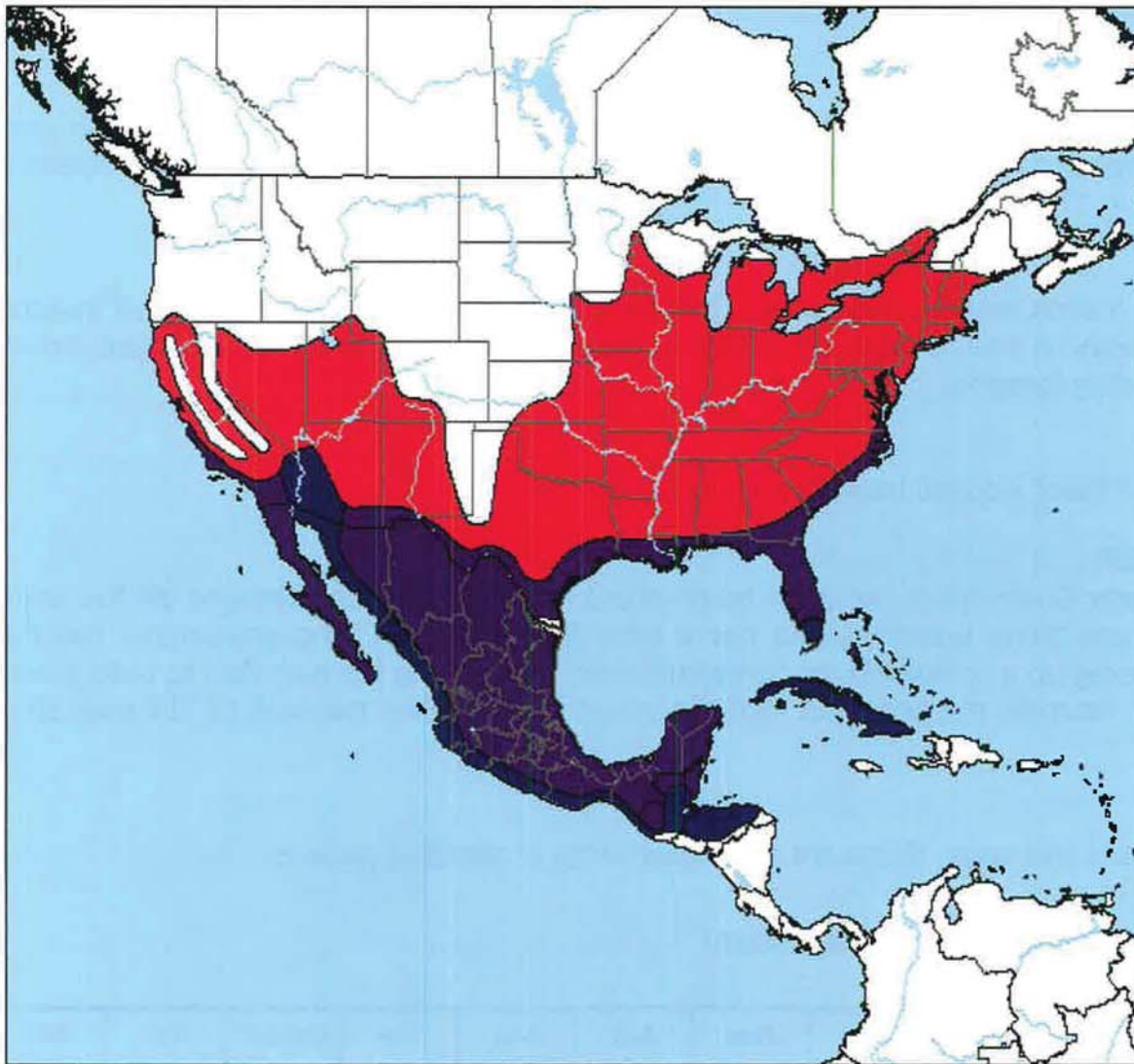
Average flight speed: 20 - 37 mph  
Time of movement: possibly **diurnal**  
Journey length: 60 - 1,250 miles

### Other names:

Perlita Gris (Mexico)  
Gobe-mouches, Gris-blue (Quebec, Canada)  
Perlita Grisilla (Guatemala)  
Rabuita (West Indies)



## Blue-gray Gnatcatcher *Polioptila caerulea*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- ▨ Extirpated
- ▨ Historical Records Only

- ▬ National boundary
- ▬ Subnational boundary
- ▬ River
- ▬ Water body



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**Observation Notes:**



**Cedar Waxwing  
By  
Maya Putra**





# Cedar Waxwing



*Bombycilla cedrorum*

L 7.25" WS 12" WT 1.1oz (32g)

## Description:

Cedar Waxwings have a distinct black mask that is edged in white, and the tail has a bright yellow tip. They are mostly grayish-brown with a yellow belly, and may have red wax-like droplets on the tips of the secondary wing feathers. Vieillot gave this bird its scientific name in 1808.

## Food:

Waxwings are heavily frugivorous and are well known for devouring a variety of fleshy fruits. They also eat some insects. In summer they feast on elm leaf beetles, carpenter ants, sawfly larvae, cicadas, canker worms, and caterpillars. During a Texas winter, waxwings feed on yaupon, juniper, and pyracantha berries.

## Habitat:

Look for waxwings in open wooded habitats, orchards, suburbs, parks, gardens, and fields with trees and shrubs.

## Behavior Notes:

Waxwings catch insects in the air, glean insects from foliage, and pluck fruit while perched. They will also hover briefly to snatch fruit. They swallow the entire fruit. Due to a heavy reliance on fruit, waxwings can be highly nomadic and very gregarious in winter. The drops of wax-like material on the secondary wing feathers are thought to convey information to potential mates about age and future reproductive success. Waxwings nest late in the season to take advantage of ripening crops of fruit to feed the young in the nest. We usually see these diurnal birds, traveling in flocks. One bird will act as a lookout while others feed.

## Voice:

Calls are a high pitched "bzeee" note.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐								●

## Migration Notes:

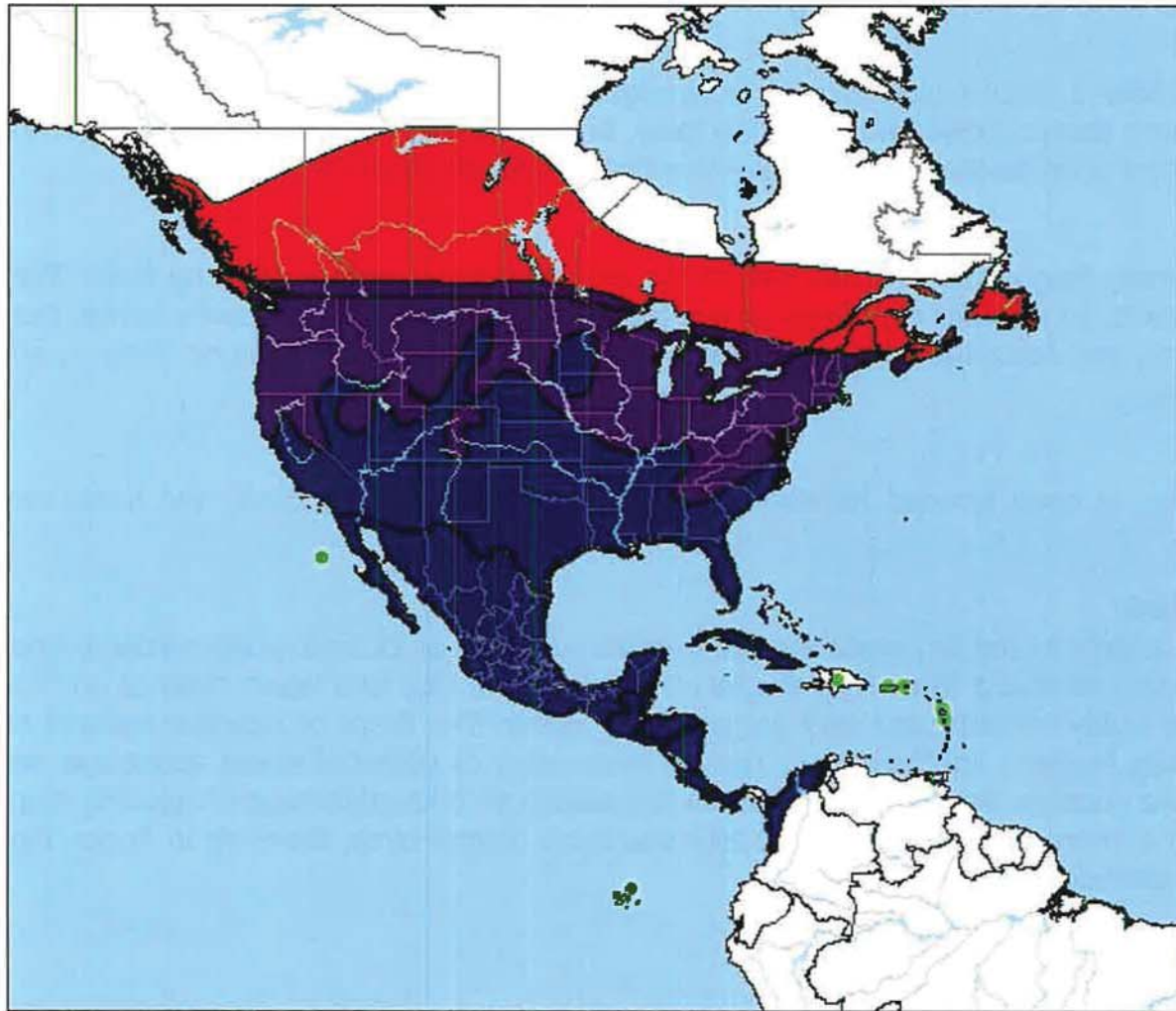
Waxwings are facultative migrants, meaning they make long migrations only when necessary.

Average total distance: 1,250 miles  
Time of movement: nocturnal  
Journey length: 0 - 3,400 miles

**Other names:**  
Ampelis Americano (Mexico)  
Jaseur des Cèdres (Quebec, Canada)  
Picotera (Puerto Rico)



**Cedar Waxwing**  
*Bombycilla cedrorum*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**



**Chestnut-sided Warbler**  
**By**  
**Maya Putra**







## Chestnut-sided Warbler

*Dendroica pensylvanica*

L 5" WS 7.75" WT 0.34oz (9.6g)

### Description:

This diurnal passerine is distinctive with its yellow cap, white breast, and reddish streaks down the sides. Males have a black moustache stripe. The Chestnut-sided Warbler usually holds its tail upward above the wingtips. This warbler was named by Linnaeus in 1766.

### Food:

This bird is mostly insectivorous. They feed on insects and insect larvae, small spiders, and seasonal fruit. They will also land on the ground to eat ants. Watch for this bird gleaning prey from the undersides of leaves at low to medium levels in shrubs and trees.

### Habitat:

This bird can be found in parks and green spaces with thickets and scrubby habitat.

### Behavior Notes:

While foraging, this warbler will often hold its tail upright. It rarely walks, mostly hopping to find insect prey underneath leaves. On the breeding grounds, nests are built by the females. The compact, cup-shaped nests are made out of fine grasses, shredded weed stems, bark fibers, and plant down. The 3 -5 eggs are laid between late May and June. The female does all the incubation for 11 - 12 days. Young leave the nest between 10 and 12 days after hatching. Chestnut-sided Warblers are solitary and territorial in winter, but will often join mixed flocks during migration.

### Voice:

The males sing two songs, one with an accent at the end, the other without. The most familiar song sounds like "pleased, pleased, pleased, to meetcha".

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
			◐	●					●		

### Migration Notes:

This warbler is a long-distance Neotropical migrant. It takes both a circum-gulf and trans-gulf route, and winters in Central America from Mexico to Panama.

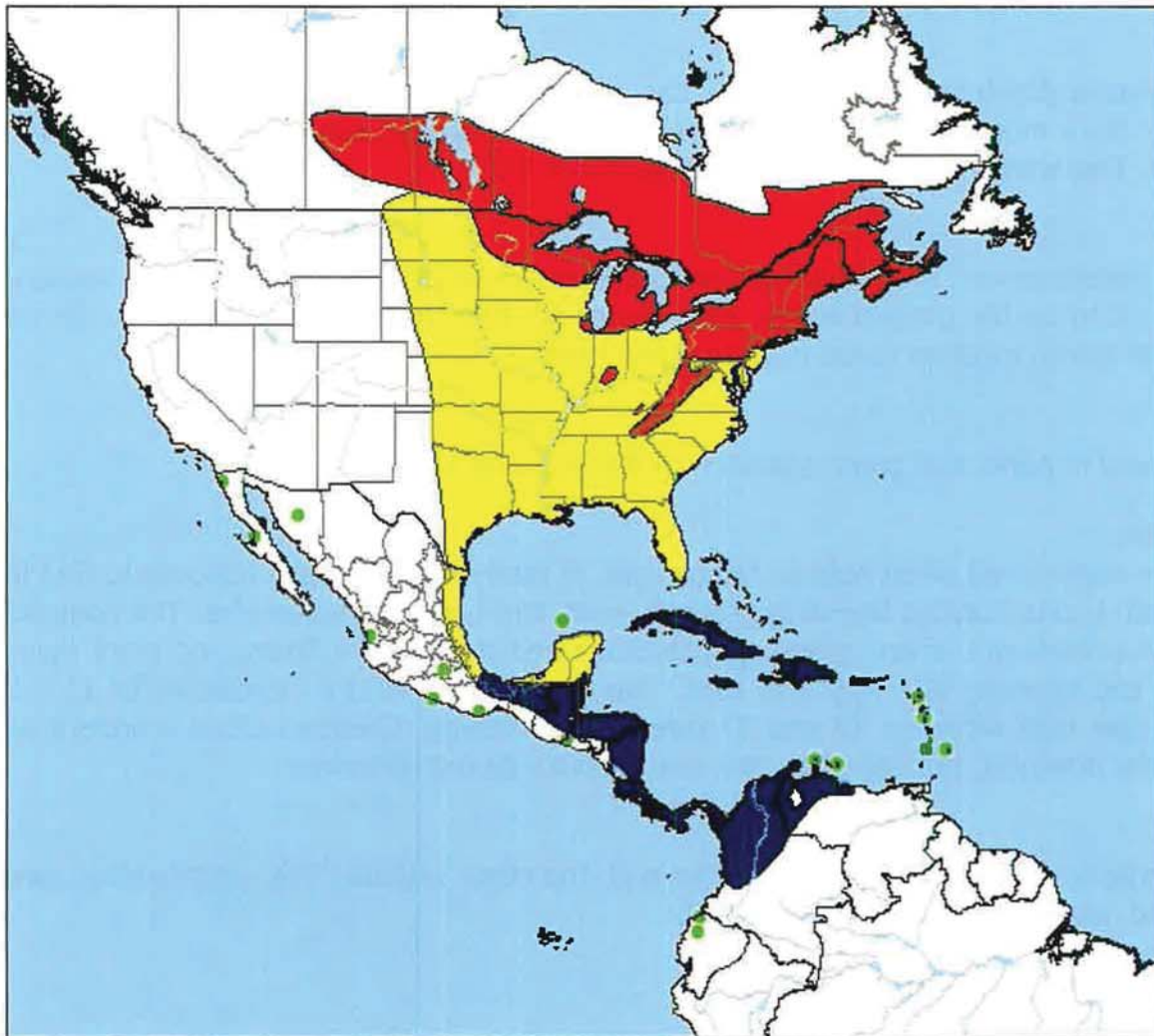
Time of movement: **nocturnal**  
 Journey length: 1,850 - 4,000 miles

#### Other names:

Chipe Gorriamarillo (Mexico)  
 Fauvette à Flancs Marron (Quebec, Canada)  
 Reinita de Costillas Castañas (Costa Rica)



## Chestnut-sided Warbler *Dendroica pensylvanica*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- ▨ Extirpated
- ▨ Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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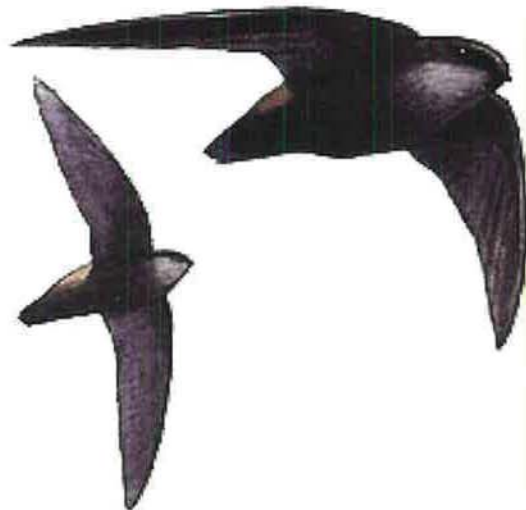


**Observation Notes:**



Chimney Swift nest

**Chimney Swift**  
**By**  
**James Dong**





# Chimney Swift



*Chaetura pelagica*

L 5.25" WS 14" WT 0.81oz (23g)

## Description:

Chimney Swifts are about 5-6 inches long, with a wingspan of 12-14 inches. They are a dark bird with a cylindrical body shape. The wings are long and pointed. They beat their wings rapidly, and look almost bat-like. Their tails are short with spiny tips. The scientific name was given by Linnaeus in 1758.

## Food:

Swifts are **diurnal** insectivores. While flying, they catch insects such as flies, wasps, beetles, ants, and bees. They forage in open areas above forests, ponds, lakes, and residential areas.

## Habitat:

Look for swifts in parks, backyards, and open areas near water. They nest in accessible chimneys around towns and in large trees with cavities.

## Behavior Notes:

Chimney Swifts rarely perch. They fly high above the ground in backyards and parks, searching for prey. They catch small insects in their bill, and look like "flying cigars". They use their long claws to cling to vertical surfaces in chimneys and hollow trees. Nests are made of small sticks, and are stuck to the inside walls of cavities with the swifts' glue-like saliva. Young leave the nest and cling to vertical surfaces after 14 -19 days. The young are able to fly 30 days after hatching. They drink by flying low over water sources and dipping their bills into the water. When food supply is low and temperatures drop, swifts may enter a state of torpor to conserve fat reserves.

## Voice:

Rapid, uneven chattering and chip notes.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
			●	●	●	●	●	●	◐		

## Migration Notes:

Complete, long-distance migrant. Takes a trans-gulf route in fall and a circum-gulf route in spring. Winters in the Amazon Basin of South America.

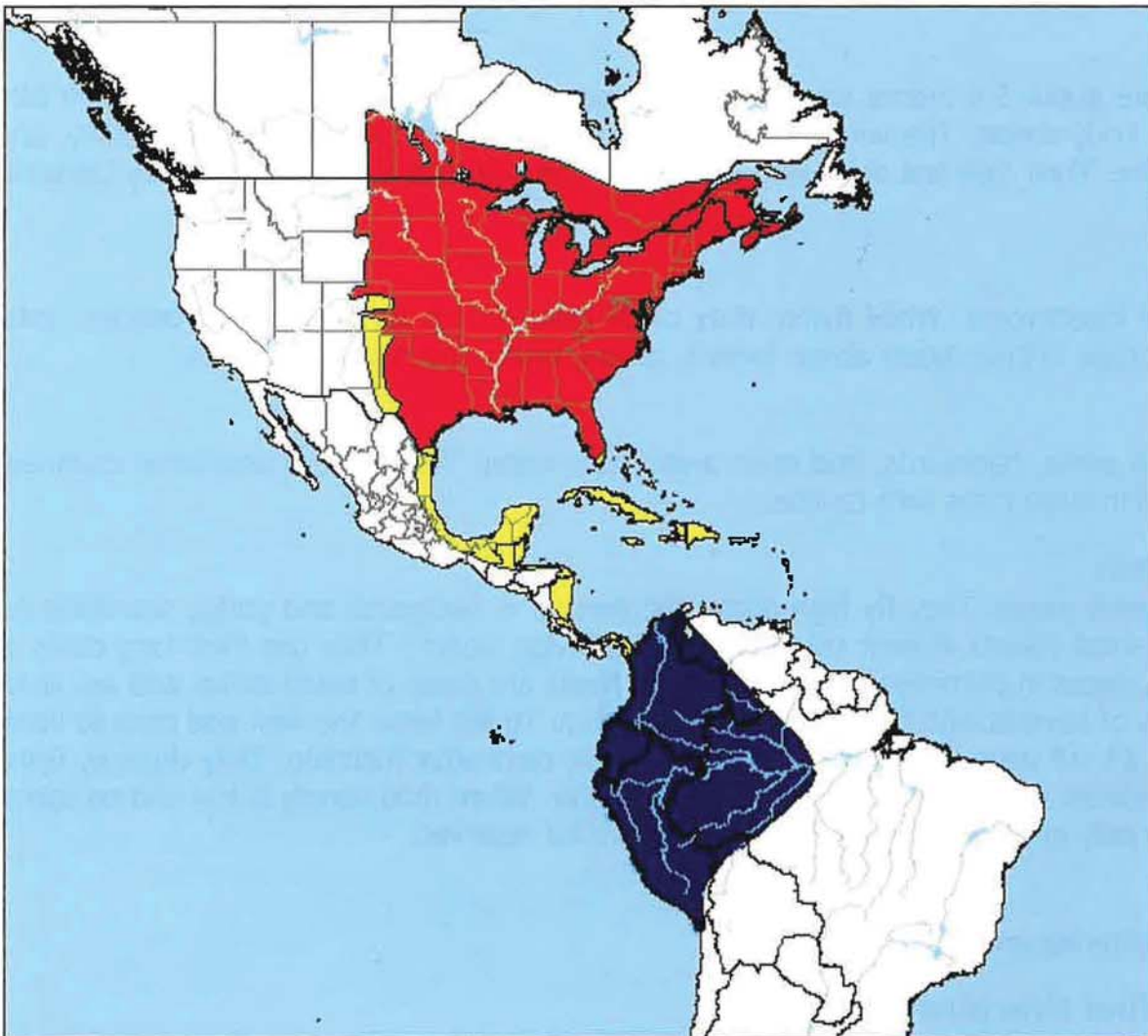
Average flight speed: 18 - 37 mph  
Time of movement: **diurnal**  
Average daily distance: 62.5 miles/day  
Journey length: 1,900 - 6,000 miles

### Other names:

Vencejito de Paso (Mexico)  
Martinet Ramoneur (Quebec, Canada)  
Vencejo de Paso (Costa Rica)  
Vencejo de Chimenea (Guatemala)



**Chimney Swift**  
*Chaetura pelagica*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body

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**Observation Notes:**



**Common Nighthawk**  
**By**  
**James Dong**



© Alan Murphy



# Common Nighthawk



*Chordeiles minor*

L 9.5" WS 24" WT 2.2oz (62g)

## Description:

The Common Nighthawk is a medium-sized bird with a large head and a small bill. The color and feather pattern help to camouflage this bird when perched. A white patch at the end of the wings can be seen when this bird flies. Forster gave this bird its scientific name in 1771.

## Food:

Common Nighthawks are insectivores. They catch insects such as queen ants, beetles, and true bugs while flying. They also eat flies, wasps, crickets, and mosquitoes.

## Habitat:

Look for this bird in parks, backyards, and open areas near water. Common Nighthawks need open areas to forage for insects. They can be seen flying around lights at recreational fields that attract insects.

## Behavior Notes:

Common Nighthawks are **crepuscular** foragers. They catch insects while in flight. They drink by skimming the surface of a water source. These birds nest on gravel rooftops, beaches and burned woodlands. They lay eggs directly on the ground or surface without building a nest. The female incubates 2 eggs. Both parents care for the young until they are independent at 30 days old.

## Voice:

Call is a loud, nasal "peent" sound. Males also perform an aerial display dive for females during the breeding season, and produce a booming sound with their wings.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
			☾	●	●	●	●	●	☽		

## Migration Notes:

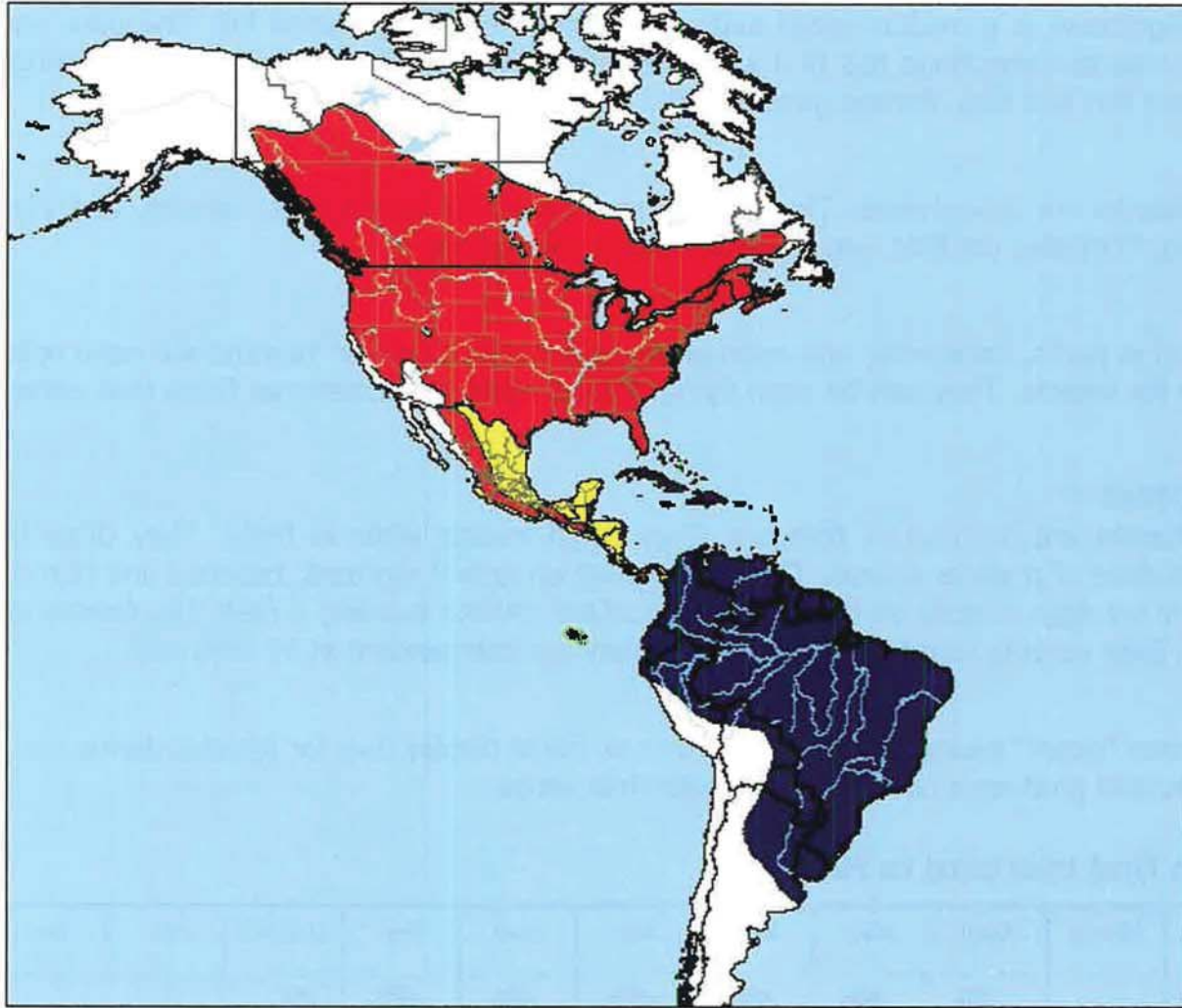
The Common Nighthawk is a long-distance migrant. They migrate mostly in the early evening. Usually takes a circum-gulf route to the wintering grounds in South America. Gregarious during fall migration.

Time of movement: **nocturnal** and **diurnal**  
Journey length: 2,500 - 6,800 miles

**Other names:**  
Chotacabra Zumbon (Mexico)  
Engoulevant Commun (Quebec, Canada)  
Añapero Zumbón (Costa Rica)  
Tapacaimas Zumbón (Guatemala)



## Common Nighthawk *Chordeiles minor*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**



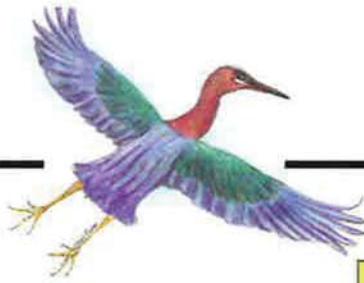
**Green Heron**  
**By**  
**Maya Putra**



© Wayne Nicholas



# Green Heron



*Butorides virescens*

L 18" WS 26" WT 7oz (210g)

## Description:

Green Herons are small and stocky with long yellowish legs, a long dark bill, and a greenish black head. The neck is reddish brown and the eyes are orange or yellow. Linnaeus gave this bird its scientific name in 1758.

## Food:

Green Herons are carnivores, invertivores and piscivores. They feed on small fish, frogs, small animals, insects, crustaceans, and invertebrates. They feed during the day (**diurnal**), and in the morning and afternoon (**crepuscular**).

## Habitat:

These birds can be found along bayous, streams, creeks, ditches, marshes, and ponds.

## Behavior Notes:

The Green Heron is one of the few birds that uses tools. It is often seen standing motionless, along the stream bank, using bait to catch fish. Earthworms, leaves, feathers, and sticks are commonly used to attract prey.

## Voice:

Alarm call is a loud "skeow". The Green Heron also makes a series of "kuk-kuk-kuk" sounds.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	●	●	●	●	●	●	◑		

## Migration Notes:

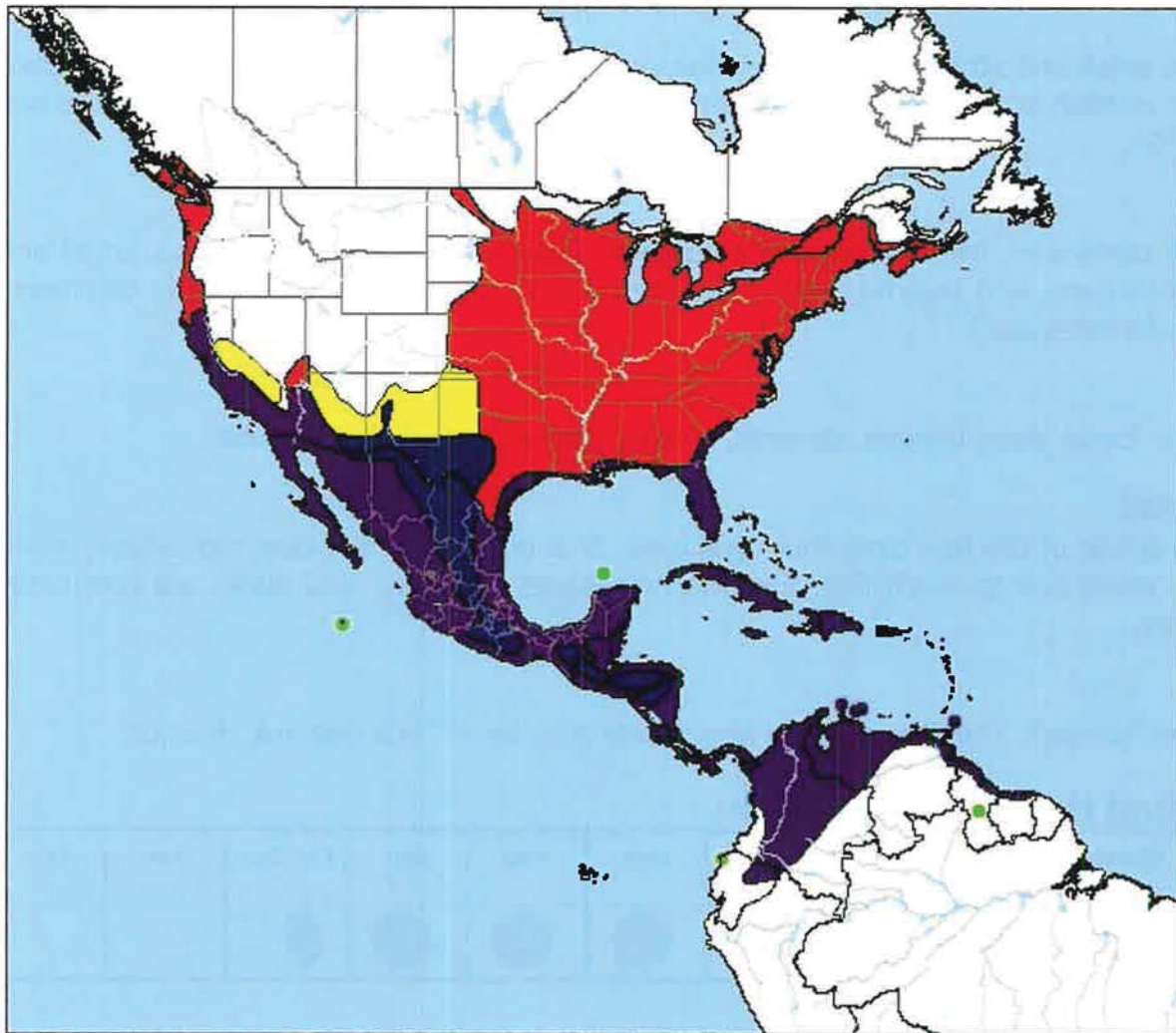
Pond and water freezing from changing temperatures are strong controls on food availability and on migration timing. This heron arrives on spring breeding grounds earlier than larger herons, perhaps due to crepuscular feeding habits. Not all populations are migratory. Some birds in the west and south remain in the same area year-round.

Time of movement: usually **nocturnal**

**Other names:**  
 Garcita Oscura (Mexico)  
 Héron vert (Quebec, Canada)  
 Chicuaco Cuello Rojo (Venezuela)



**Green Heron**  
*Butorides virescens*



750 0 750 Kilometers

- |                      |                         |                      |
|----------------------|-------------------------|----------------------|
| Permanent Resident   | Introduced              | National boundary    |
| Breeding Resident    | Vagrant                 | Subnational boundary |
| Nonbreeding Resident | Extirpated              | River                |
| Passage Migrant      | Historical Records Only | Water body           |
| Uncertain Status     |                         |                      |

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<http://www.natureserve.org>

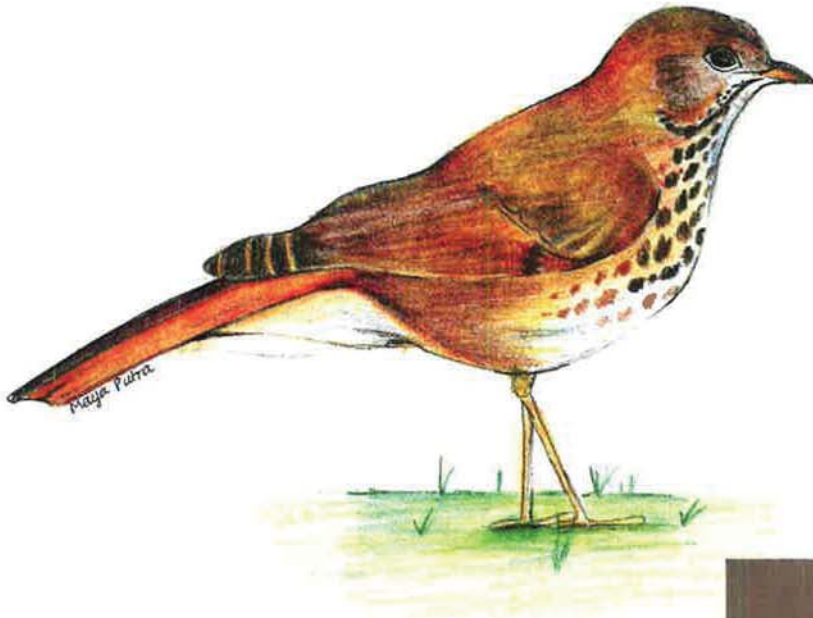
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**Observation Notes:**



**Hermit Thrush  
By  
Maya Putra**



© Kathy Adams Clark



# Hermit Thrush



*Catharus guttatus*

L 6.75" WS 11.5" WT 1.1oz (31g)

## Description:

This is a medium-sized passerine with an olive-brown back and reddish tail. It has black spots on the chest. The Hermit Thrush has a white eye-ring. Pallas gave this bird a scientific name in 1811.

## Food:

The Hermit Thrush is a frugivore and an invertivore. During the breeding season they eat mostly insects and small invertebrates. During migration and the winter they feed on seasonal fruits in addition to insects.

## Habitat:

This bird can be found in moist, deciduous woodlands, thickets, suburban yards, and forested parks.

## Behavior Notes:

The Hermit Thrush catches insects on the ground and under vegetation. They hop around lifting leaf matter and digging in leaves. This is the only thrush that winters in the northern states. They can be seen flicking their tails and wings as they forage for food. They are named for their shy and reclusive manner. They are both **crepuscular** and **diurnal**.

## Voice:

This bird gives a low *chuck* or *tuck-tuck-tuck* call when searching for food.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐							◑	●

## Migration Notes:

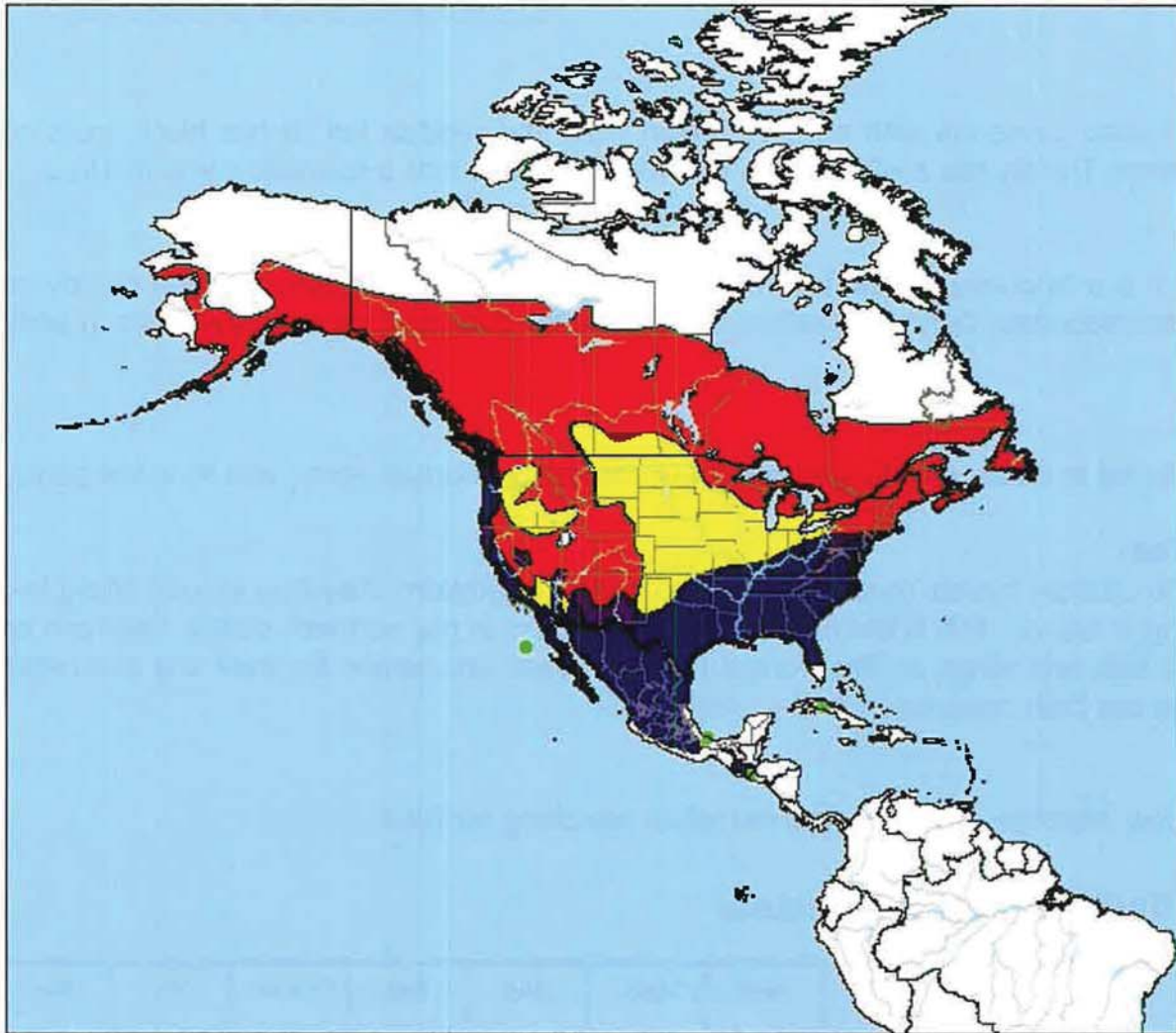
The Hermit Thrush is an altitudinal migrant in the southwest part of its range. It is a short-distance migrant that rarely crosses the Gulf of Mexico. This bird is threatened by increasing forest fragmentation.

Time of movement: **nocturnal**  
Journey length: 125 - 5,000 miles

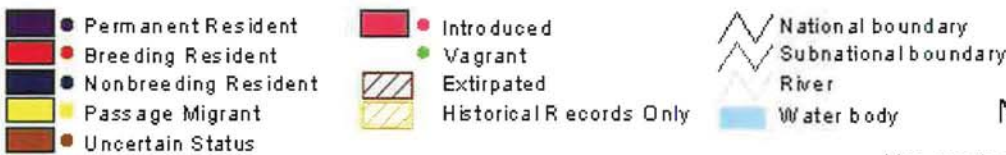
**Other names:**  
Zorzalito Colirrufo (Mexico)  
Grive Solitaire (Quebec, Canada)  
Tordo de Cola Rojiza (Guatemala)



## Hermit Thrush *Catharus guttatus*



750 0 750 Kilometers



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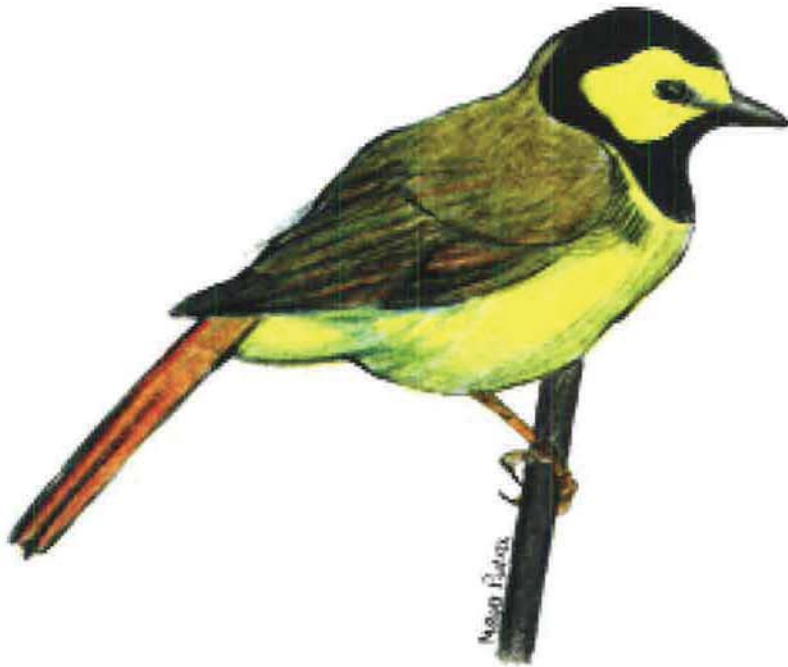
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**Observation Notes:**

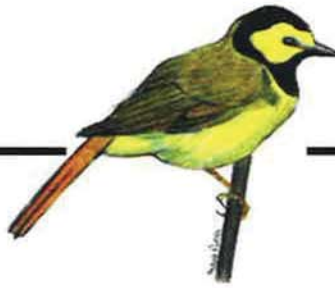


**Hooded Warbler**  
**By**  
**Maya Putra**





# Hooded Warbler



*Wilsonia citrina*

L 5.25" WS 7" WT 0.37oz (10.5g)

## Description:

This small woodland passerine is a threatened species in many parts of its range. This is due primarily to habitat loss, forest fragmentation, and conversion of forests to plantations. They are also parasitized by the Brown-headed Cowbird. It is olive-green on top and yellow below. Males have a bright yellow face with a black hood. Females do not have the hood, or show a slight trace of one. Both have conspicuous white tail spots that can be seen as they fan their tails. Boddaert gave this bird a scientific name in 1783.

## Food:

Hooded Warblers are invertivores. They eat a variety of insects and spiders by gleaning them from fallen leaves and on low branches. During the nesting season, female birds glean insects near the ground, while males prefer to hunt in higher vegetation. They will also catch insects in the air.

## Habitat:

This bird prefers to stay hidden in the undergrowth of moist woodlands. Watch for them in city parks and natural areas with thickets and wet areas.

## Behavior Notes:

Chenier stopover sites are important for this bird. They seek out lush habitats with hackberry and live oak trees. They frequently fan their tails while moving through the foliage. This bird is **diurnal**.

## Voice:

Song is a loud whistle that sounds like "ta-wit,ta-wit,ta-wit,tee-yo".

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	●					◐	◑		

## Migration Notes:

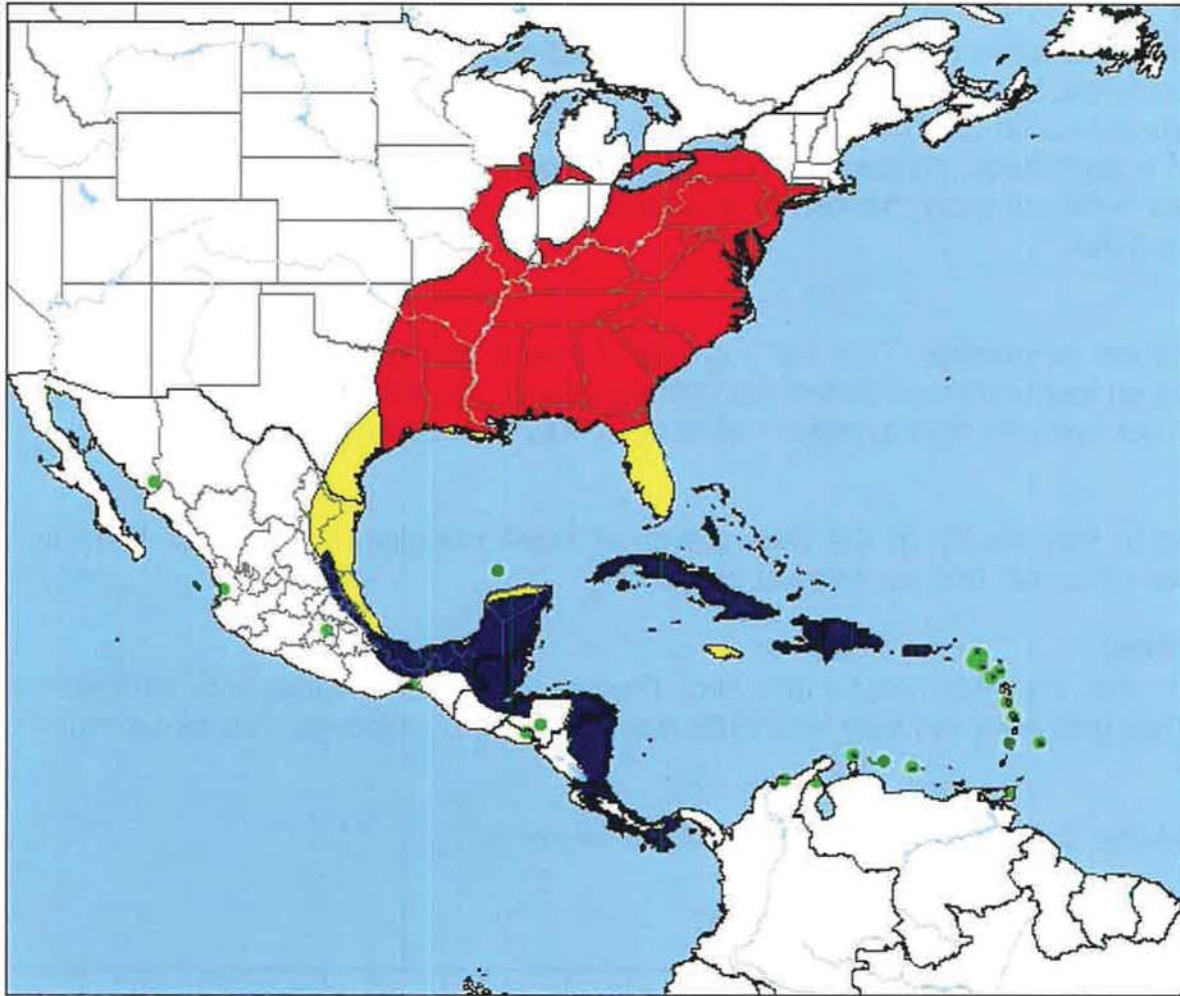
Neotropical, complete migrant. Many are trans-gulf migrants in Fall and circum-gulf in the Spring. Males are strongly territorial on their wintering grounds.

Time of movement: **nocturnal**  
Journey length: 2,500 - 4,350 miles

**Other names:**  
Chipe Encapuchado (Mexico)  
Fauvette à Capuchon (Quebec, Canada)  
Reinita de Capucha (Guatemala)



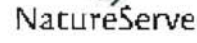
**Hooded Warbler**  
*Wilsonia citrina*



750 0 750 Kilometers

- |                      |                         |                      |
|----------------------|-------------------------|----------------------|
| Permanent Resident   | Introduced              | National boundary    |
| Breeding Resident    | Vagrant                 | Subnational boundary |
| Nonbreeding Resident | Extirpated              | River                |
| Passage Migrant      | Historical Records Only | Water body           |
| Uncertain Status     |                         |                      |

Map created September 2003



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**Observation Notes:**



**Least Sandpiper  
By  
Maya Putra**



© Wayne Nicholas



# Least Sandpiper



*Calidris minutilla*

L 6" WS 13" WT 0.7oz (20g)

### Description:

The Least Sandpiper is aptly named, as it is the smallest of American shorebirds at a mere 6 inches. It is brownish on the upper parts, with yellowish legs, a short bill, and streaks on the breast. Vieillot gave this bird its scientific name in 1819. Predation by gulls is a big problem for birds when they are young.

### Food:

The Least Sandpiper feeds heavily on insects, but when in coastal areas will also feed on a variety of crustaceans, mollusks, and marine worms. These birds have a circadian phenology and can be active at all hours of the day.

### Habitat:

This sandpiper can be found breeding on the boggy tundra. During the rest of the year it can be found near marshes, flooded fields, and both fresh and saltwater mudflats.

### Behavior Notes:

On the tundra breeding grounds the Least Sandpiper performs aerial displays while broadcasting their songs. This small bird sails up to 20 feet in the air while fluttering its wings, singing its trilling song. Birds that are not breeding, spend the summer in the winter range in North America. Females incubate at night, males incubate during the day. Males spend more time with the young than the females. Young birds can fly, 2 weeks after hatching.

### Voice:

Flight call is a clear trilled and musical "treeep".

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	●				●	●	●	●	●

### Migration Notes:

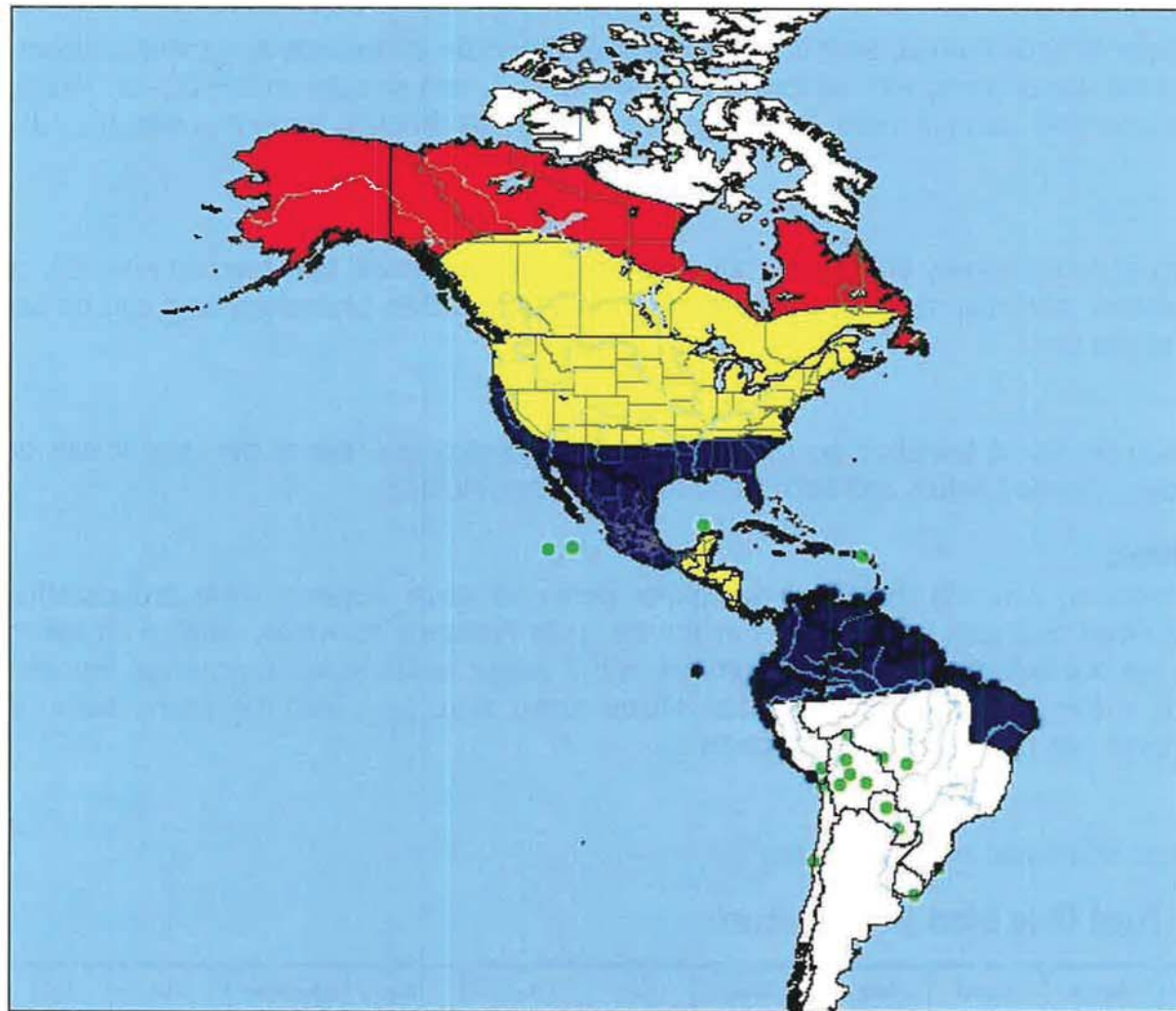
Birds migrate northward in April and May, to arrive on the nesting grounds in May and June. Females migrate south before the males, and juveniles leave after the males.

Time of movement: **nocturnal**

**Other names:**  
 Playerito Mínimo (Mexico)  
 Bécausseau Minuscule (Quebec, Canada)  
 Correlimos Enano (Guatemala)  
 Playero Enana (Chile)



**Least Sandpiper**  
*Calidris minutilla*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- ▨ Extirpated
- ▨ Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**



**Mississippi Kite  
By  
James Dong**



# Mississippi Kite



*Ictinia mississippiensis*

L 14" WS 31" WT 10oz (280g)

## Description:

The Mississippi Kite was given a scientific name by Wilson in 1811. Long, pointed wings and a long, black tail give this hawk a streamlined falcon-shape. They appear entirely dark overhead, with a lighter head. This kite has a short, outermost primary that is distinctive, and the wings are broadest at the wrist.

## Food:

As these graceful, acrobatic hawks head south towards South America, they consume cicadas, lizards, grasshoppers, other insects, mice, small snakes, frogs, and bats. They often catch their prey in the air, or snatch it from limbs and foliage.

## Habitat:

These kites typically nest in trees in riparian habitats. During August, watch overhead as these hawks soar on thermals over the city parks and suburban areas.

## Behavior Notes:

During migration, kites use communal night roosts, and forage in flocks in the morning. Strong winds and weather fronts increase flock size. The young kites are cared for by both parents, and can fly when 34 days old. They continue to rely on the parents for several weeks after leaving the nest.

## Voice:

This bird gives out a thin, high whistle that sounds like *pe-teew* or *pee-teeer*.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
							●	◐			

## Migration Notes:

The Mississippi Kite is a long-distance complete migrant. They travel in loose flocks, and usually take a circum-gulf route. Thousands can be seen in migration at two special hawk watches. Smith Point Hawk Watch on the east side of Galveston Bay and Hazel Bazemore Hawk Watch in Corpus Christi. For more information visit these websites: [www.gcbo.org](http://www.gcbo.org) and [www.ccbirding.com/thw/](http://www.ccbirding.com/thw/)

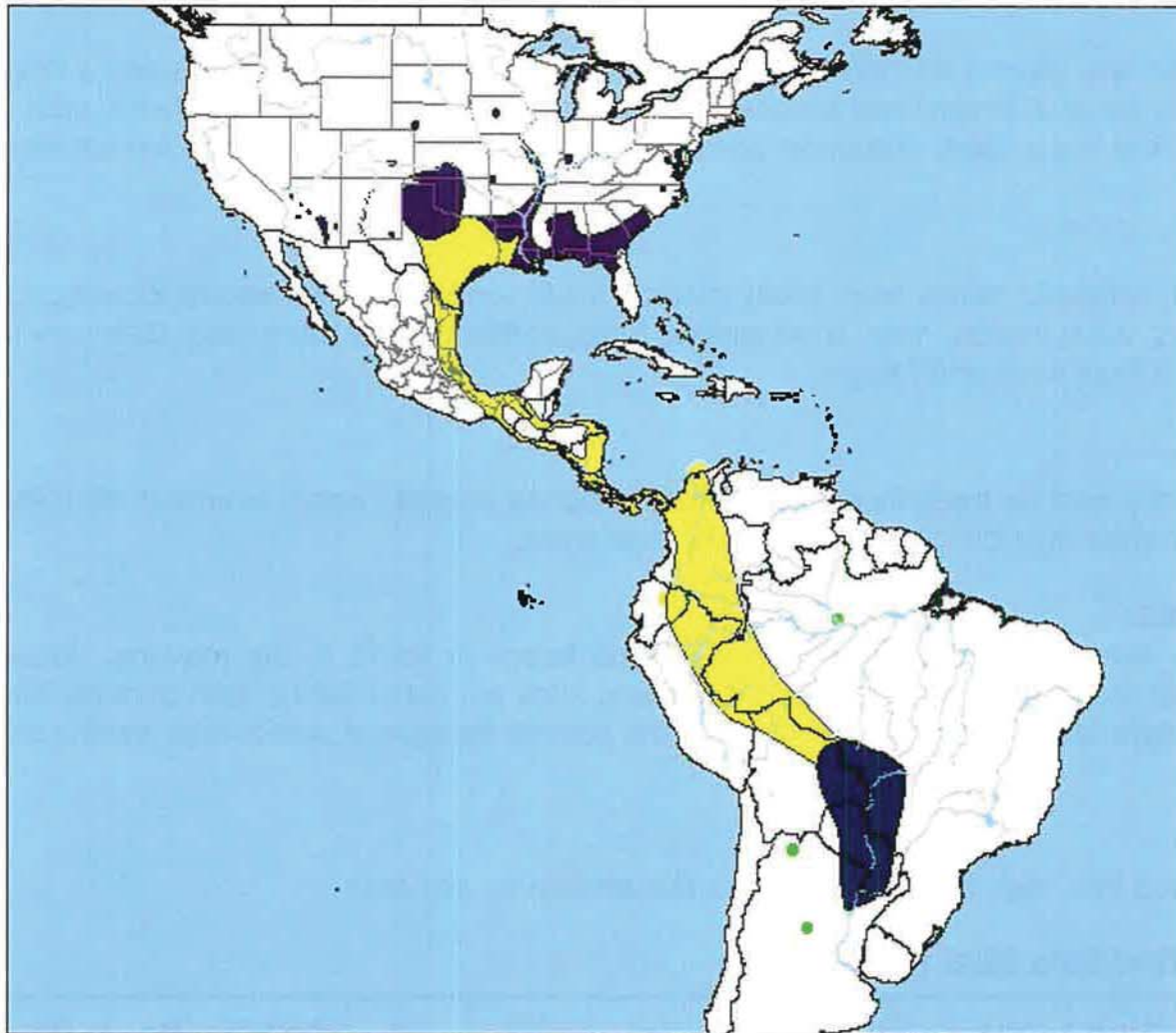
Time of movement: diurnal

### Other names:

Milano Migratorio (Mexico)  
Elanio Colinegro (Costa Rica)  
Gavilán de Mississippi (Guatemala)



## Mississippi Kite *Ictinia mississippiensis*



750 0 750 Kilometers

■ Permanent Resident  
 ■ Breeding Resident  
 ■ Nonbreeding Resident  
 ■ Passage Migrant  
 ■ Uncertain Status

■ Introduced  
 ● Vagrant  
 ▨ Extirpated  
 ▨ Historical Records Only

— National boundary  
 — Subnational boundary  
 — River  
 ■ Water body

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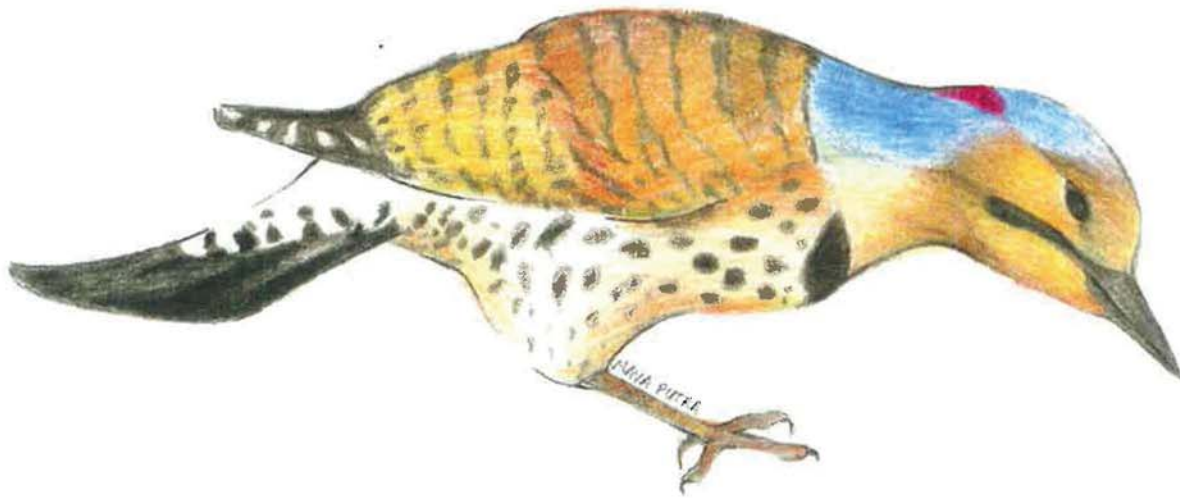
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**Observation Notes:**



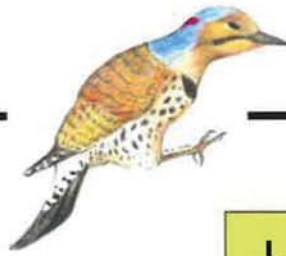
**Northern Flicker**  
**By**  
**Maya Putra**



© Helen Baines



# Northern Flicker



*Colaptes auratus*

L 12.5" WS 20" WT 4.6 oz (130 g)

### Description:

The Northern Flicker is about 12.5 inches long, with a brown back with black barring and black spots. They have a black crescent bib on the breast, and a white rump. The males have a black malar (moustache) stripe on their face, and both males and females have a red crescent behind their head. Linnaeus gave this bird a scientific name in 1758. *Colaptes* is from the Greek *kolaptes*, "chisel", and the Latin *auratus*, "golden".

### Food:

Northern Flickers are a major **diurnal** predator of ants in our woods and yards. They also eat fruit and seeds later in the fall. During migration and winter months they eat a variety of fruit including poison ivy berries and berries from bayberry and hackberry.

### Habitat:

Look for this bird in parks, backyards, open woodlands, farms, and the forest edge.

### Behavior Notes:

The diurnal Northern Flicker has a special tongue that helps them to forage on the ground for ants and beetle larvae. They hop on the ground, and dig in soil and anthills to find prey. Their tongue has fewer barbs than other woodpeckers, but is coated with a sticky substance to catch ants. While flying, the flicker has an undulating "rollercoaster" flight that is produced by bursts of wing flapping, and then no flapping.

### Voice:

The Northern Flicker makes a loud call that sounds like "wik-er, wik-er, wik-er".

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐						◑	●	●

### Migration Notes:

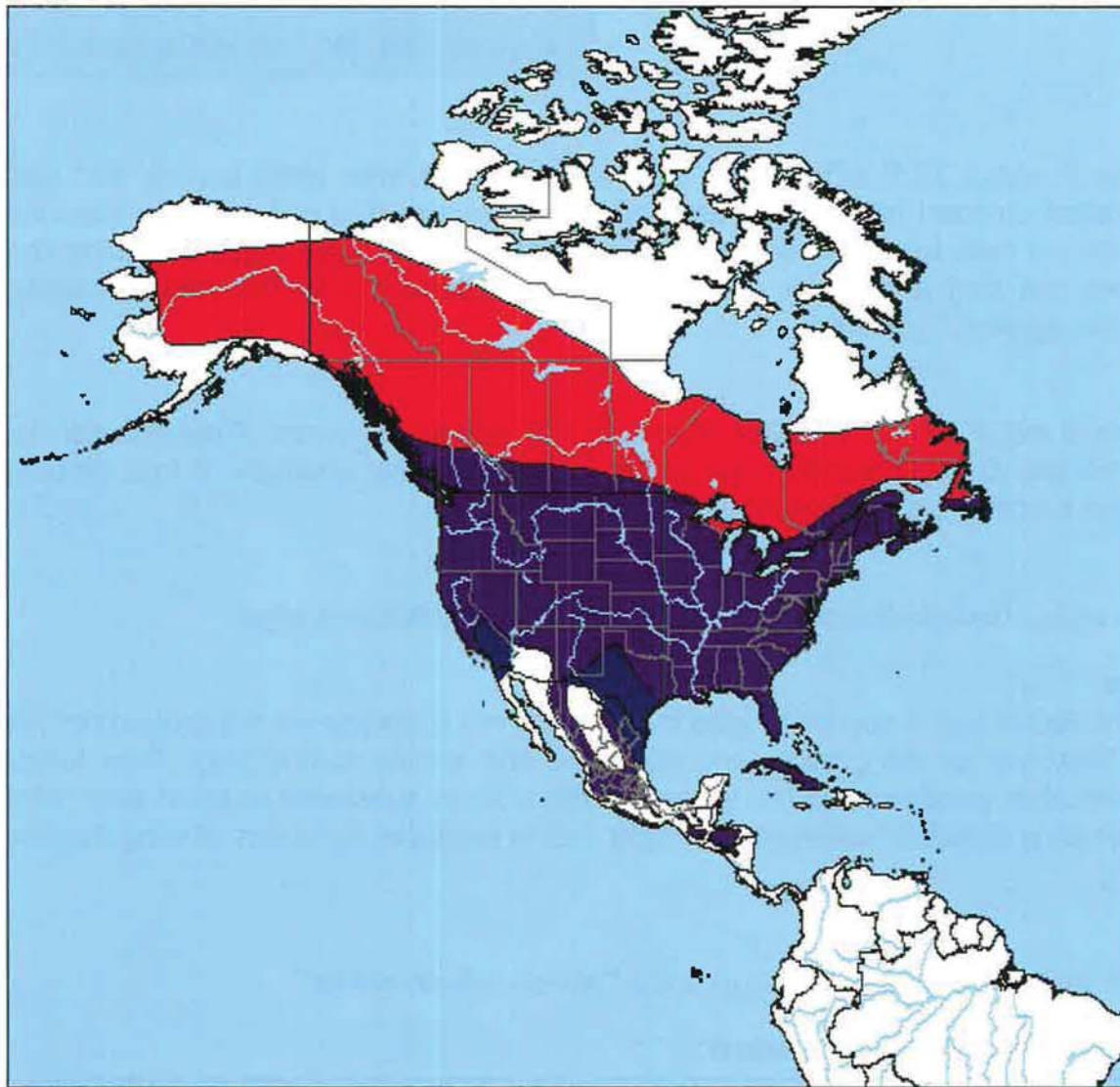
In the northern range of this bird, individuals are strongly migratory. Flickers migrate in loose flocks. Populations are declining, possibly due to competition for nest cavities by European Starlings, and declining habitats with snags. Pesticides also may play a role in their decline.

Time of movement: mainly **nocturnal**, some **diurnal**

**Other names:**  
Carpintero alirrojo (Spanish)  
Pic flamoyant (Quebec, Canada)



## Northern Flicker *Colaptes auratus*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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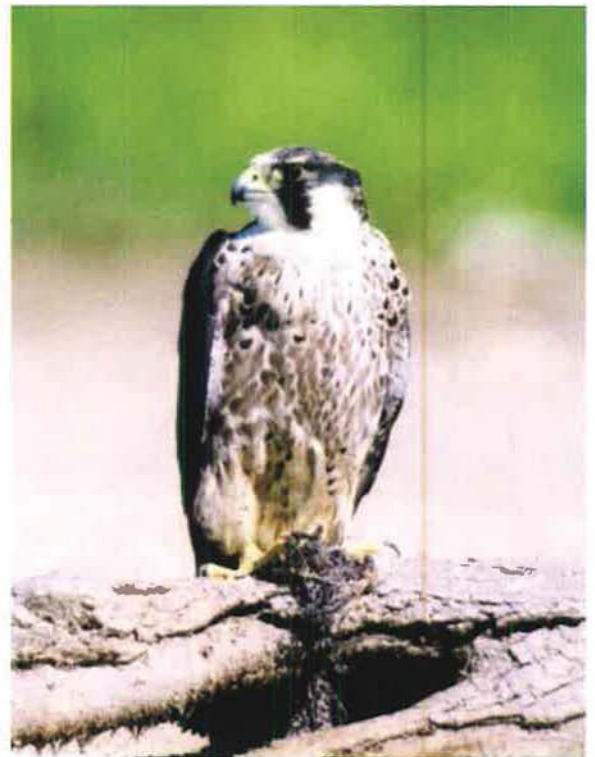




**Observation Notes:**



**Peregrine Falcon**  
**By**  
**James Dong**



Peregrine Falcon photo taken at  
the Houston Audubons' Bolivar  
Flats Shorebird Sanctuary by  
Dr. Bob McFarlane



# Peregrine Falcon



*Falco peregrinus*

L 16" WS 41" WT 1.6 lb (720 g)

## Description:

This large falcon has a bluish-gray back, black hood and moustache stripe, and pale auriculars. Females are larger than the males. Tunstall gave this bird a scientific name in 1771. Threats to this bird include loss of wetland habitats for prey, poachers, and contamination of food chain by pesticides.

## Food:

Formerly known as the "duck hawk", this falcon mainly hunts for medium-sized birds. Most prey is caught in the air. They can dive between 150 -200 mph in pursuit of prey. They will occasionally hunt for bats and small mammals. Peregrine Falcons are diurnal predators.

## Habitat:

Look for this bird on beaches, in open areas, and downtown on tall buildings.

## Behavior Notes:

The Peregrine Falcon is one of the most widespread of birds. They can be found in a variety of habitats across the globe, except Antarctica. Their species name, *peregrinus*, is Latin for "wanderer". During the mid 1990's, the populations of this bird suffered greatly from the use of synthetic organic chemicals, such as DDT. They were removed from the Endangered Species List in 1999 after substantial recovery. Peregrine Falcons normally nest on cliffs, but have now adapted to nesting on window ledges on tall buildings and ledges on bridges in cities.

## Voice:

The Peregrine Falcon makes a rasping alarm call that sounds like "kak-kak-kak-kak".

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●			●						●	●	●

## Migration Notes:

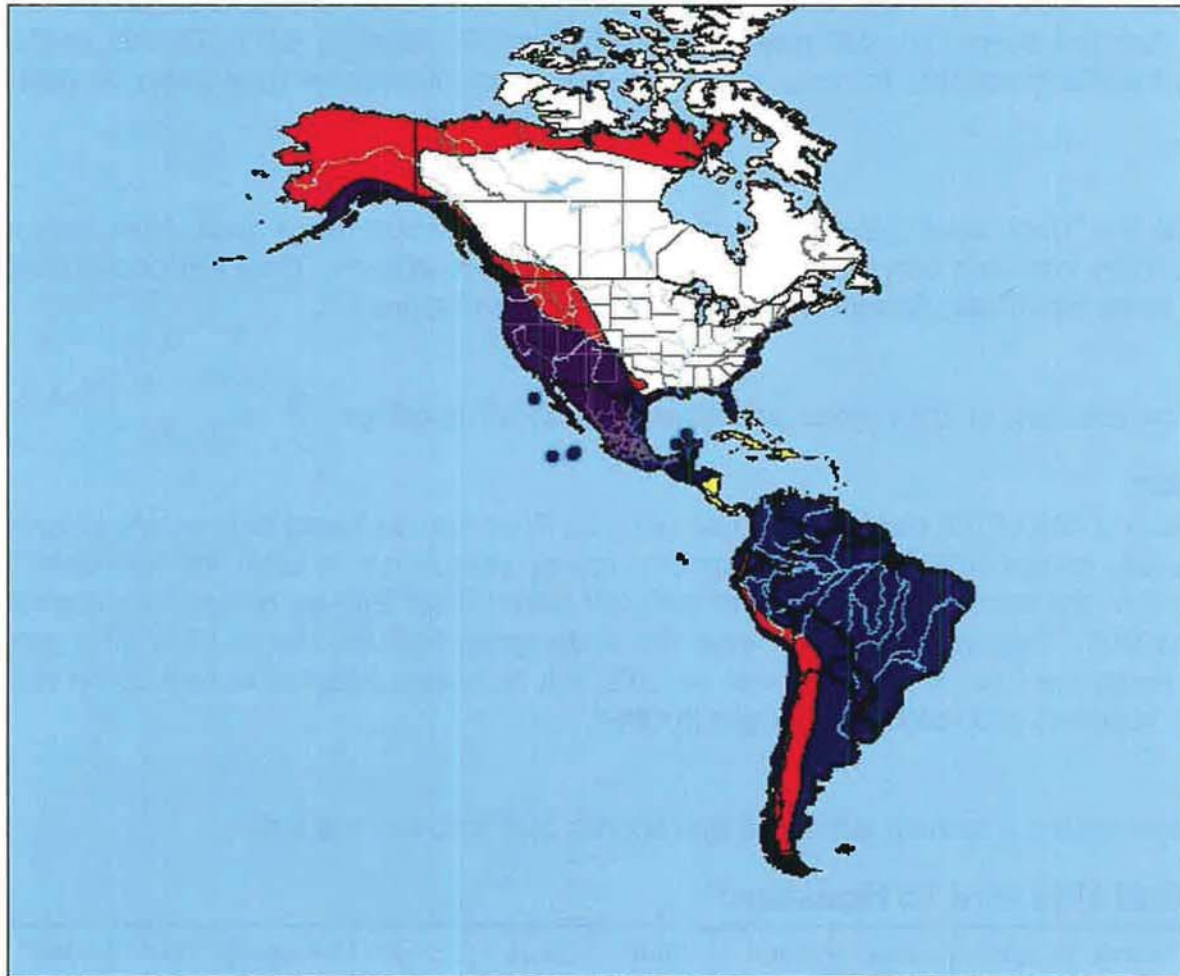
Tundra nesting falcons migrate as far as South America, and may fly as a far as 15,500 miles each year. They are Nearctic and Neotropical migrants. Birds that nest in southern areas are less migratory.

Average flight speed: 25 - 34 mph, up to 69 mph  
 Time of movement: diurnal  
 Average Daily Distance: 120 miles at 21 miles/hour  
 Journey length: 1,250 - 3,750 miles

**Other names:**  
 Halcón Peregrino (Mexico)  
 Faucon Pélerin (Quebec, Canada)  
 Gavilàn, Halcón (Chile)  
 Halcón de Patos (West Indies)



## Peregrine Falcon *Falco peregrinus*



750 0 750 Kilometers



- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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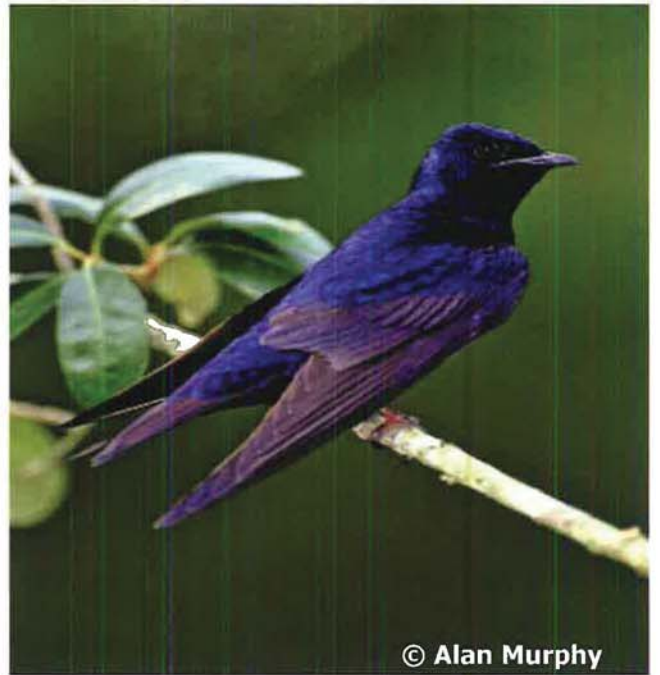


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**Observation Notes:**



**Purple Martin**  
By  
**James Dong**



© Alan Murphy





## Purple Martin

*Progne subis*

L 8" WS 18" WT 2oz (56g)

### Description:

Male martins are glossy black-blue; females and juveniles are gray underneath with pale bellies. Martins have long, pointed wings, and a shallow forked tail. Linnaeus gave this bird a scientific name in 1758. Purple Martins must compete with non-native birds like European Starlings and House Sparrows for nest cavities.

### Food:

Purple Martins eat wide variety of invertebrates. They catch insects while flying such as flies, wasps, beetles, and dragonflies. They will also drop to the ground to eat ants.

### Habitat:

Look for this diurnal bird in parks, backyards, and open areas near water. Purple Martins need open areas to forage for insects.

### Behavior Notes:

Purple Martins nest in colonial martin houses, old woodpecker holes, or natural tree cavities. After the breeding season, they gather in large roosts for several weeks before departing for South America. Large numbers of these birds can perish in spring and summer when exposed to long periods of cold, wet weather, causing a decrease in food supply.

### Voice:

Purple Martins have a bubbling song that sounds like "tchew-wew".

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
	◐	●	●	●	●	●					

### Migration Notes:

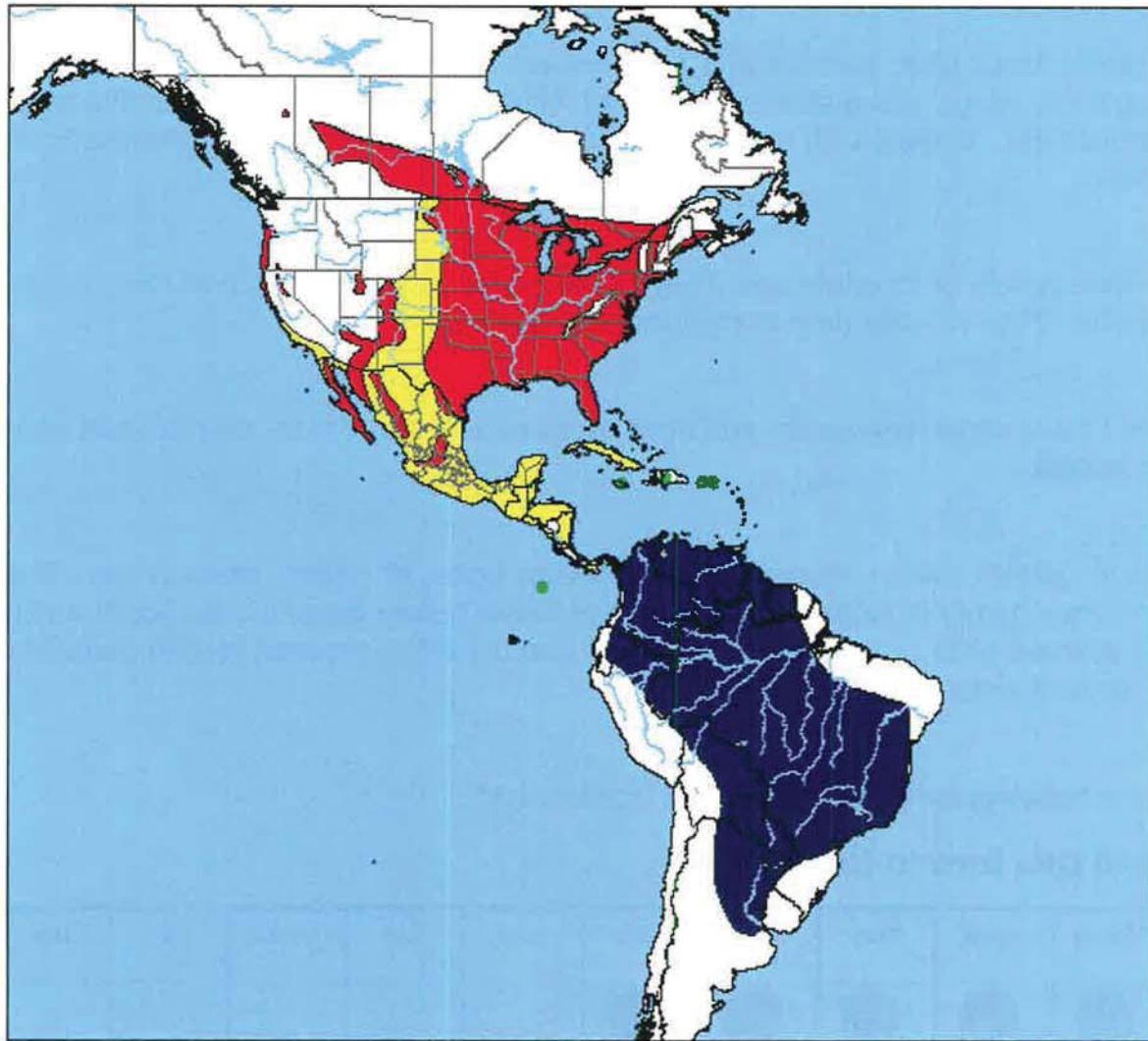
Purple Martins winter in South America and are on of the earliest spring migrants, returning to Houston in mid-February.

Time of movement: **nocturnal**  
Journey length: 600 - 5,900 miles

#### Other names:

Golondrina Grande Negruzca (Mexico)  
Hirondelle Pourprée (Quebec, Canada)  
Martín Norteño (Guatemala)

**Purple Martin**  
*Progne subis*



750 0 750 Kilometers



- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**



**Ruby-crowned Kinglet**  
**By**  
**James Dong**





# Ruby-crowned Kinglet



*Regulus calendula*

L 4.25" WS 7.5" WT 0.23 oz (6.5g)

## Description:

This is one of North America's smallest songbirds. The Ruby-crowned Kinglet is greenish, with white wing bars and a broken white eye-ring. The male has a scarlet crown patch. Linnaeus named this bird in 1766.

## Food:

Ruby-crowned Kinglets are **diurnal** and eat a variety of invertebrates. They forage for spiders and spider eggs and other insects in buds and under bark. In winter they also consume small amounts of fruits and seeds.

## Habitat:

During migration and the non-breeding season, this songbird can be found in a variety of habitats. Look for them in woody thickets and parks with plenty of understory trees. During the breeding season they are found in spruce-fir forests of northern and western United States and Canada.

## Behavior Notes:

Hovering and wing-flicking are distinct behaviors of the Ruby-crowned Kinglet. These birds can be seen in the tree tops foraging for prey under leaves and bark. They move along branches by hopping and flicking their wings. Although this is a tiny bird, they lay a very large clutch of eggs. An entire clutch can contain up to 12 eggs, and weigh as much as the female. Females incubate for 12 days, and young birds fledge about 12 days after hatching.

## Voice:

This is a small bird with a large, loud, and lively voice. Complex songs are heard on the breeding grounds. Calls are a variety of "chirrup" notes and short "chet" notes. The contact call "che-dit" is heard frequently on migration.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐							●	●

## Migration Notes:

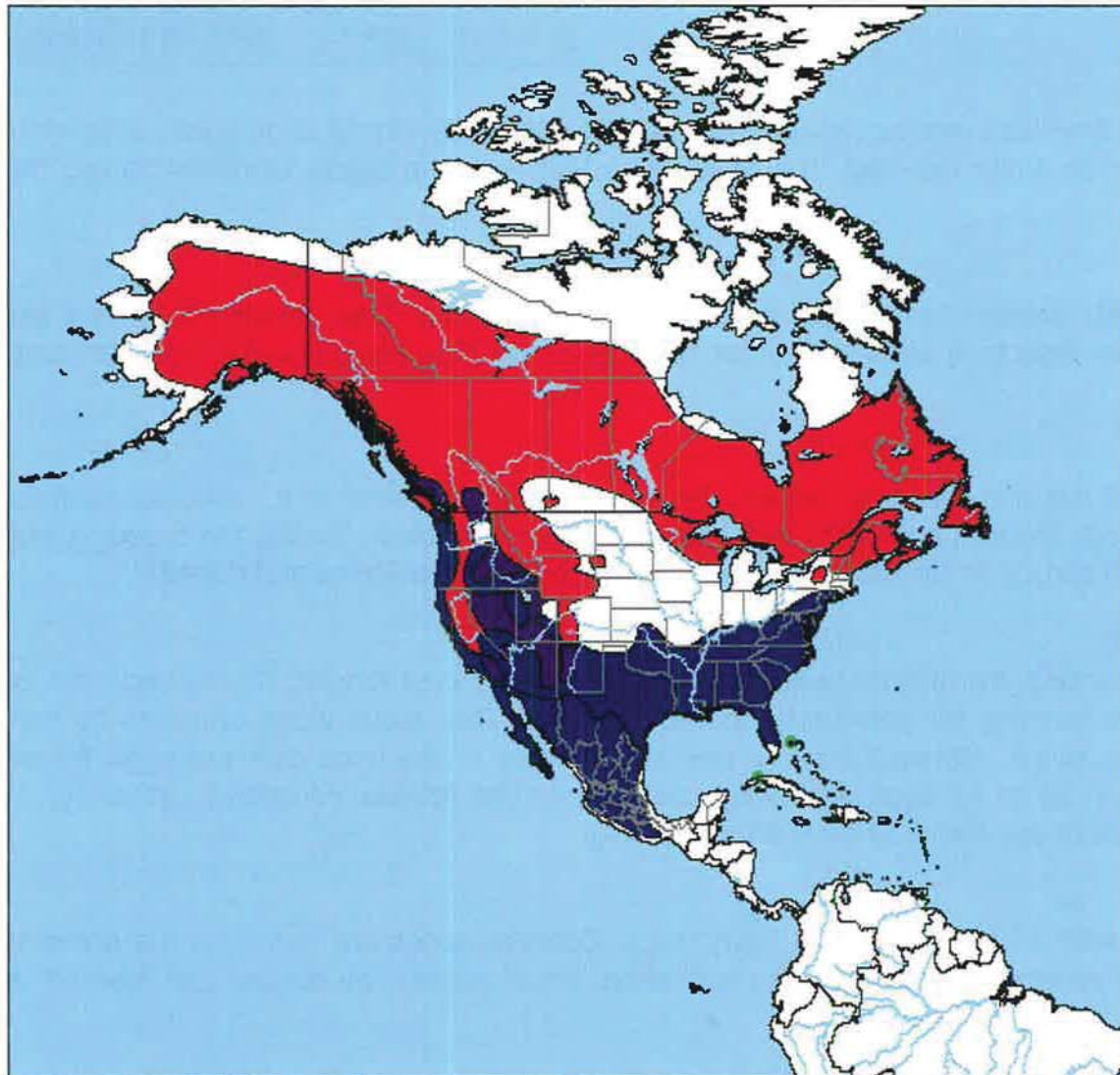
Males are first to migrate in spring. Females are first to migrate in fall.

Time of movement: **nocturnal**  
Journey length: 185 - 5,900 miles

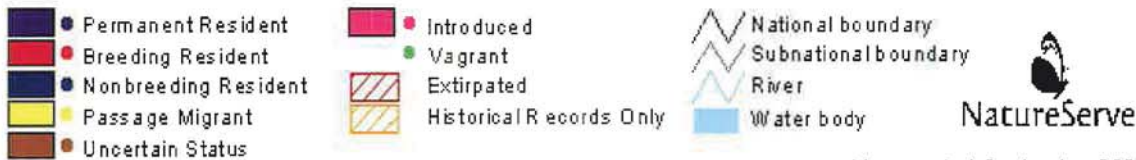
**Other names:**  
Reyezuelo Sencillo (Mexico)  
Roitelet à Couronne Rubis (Quebec, Canada)  
Reyezuelo Monicolorado (Guatemala)



**Ruby-crowned Kinglet**  
*Regulus calendula*



750 0 750 Kilometers



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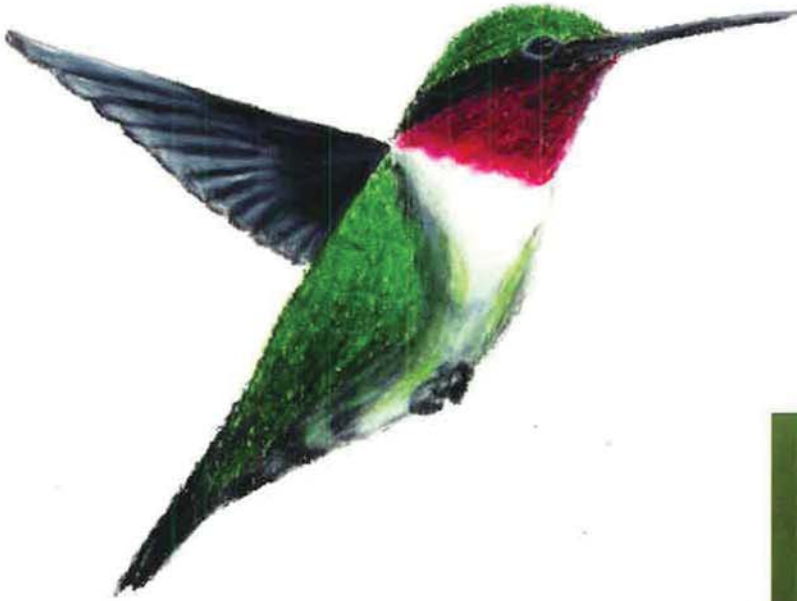
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**Observation Notes:**



**Ruby-throated Hummingbird**  
**By**  
**James Dong**



© Kinjo Yonemoto



## Ruby-throated Hummingbird



*Archilochus colubris*

L 3.75" WS 4.5" WT 0.11 oz (3.2 g)

### Description:

The male Ruby-throated Hummingbird has a brilliant red gorget. Both male and female are metallic green on their backs, and white below, with a black, shallowly forked tail. Look for a small white spot behind the eyes. Linnaeus named this bird in 1758.

### Food:

These **diurnal** birds feed on flower nectar, small insects, spiders, and tree sap. Males arrive early in spring, and often survive on sap and insects from sapsucker holes.

### Habitat:

Look for this bird at flower beds and gardens in parks, arboretums, and backyards.

### Behavior Notes:

This is the only nesting hummingbird east of the Mississippi River, and one of the most widespread of all hummingbirds. While foraging for food, they hover at flowers and sap wells, catch insects in flight, pluck insects from leaves, and spiders from webs.

### Voice:

These birds make a rapid squeaky chipping sound. Adult males produce a faint buzzing sound with their wings while flying.

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	●	◑		◐	●	●	◑		

### Migration Notes:

Winters in Mexico and Central America. These are trans-gulf and circum-gulf migrants. Males migrate first. Females and juveniles migrate later. Males are first to arrive on breeding grounds in spring.

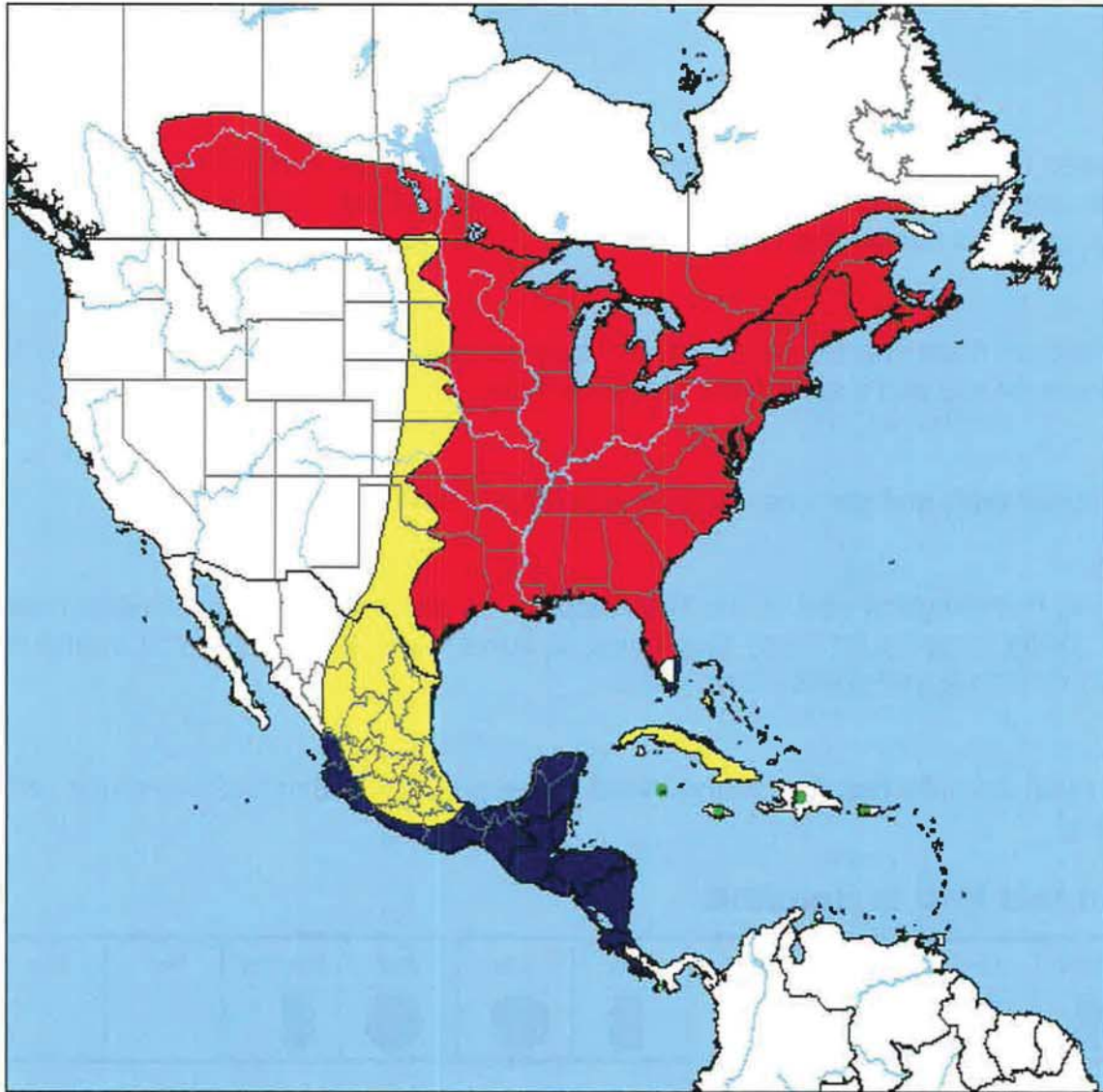
Time of movement: **nocturnal**  
Journey length: 0 -3,500 miles

#### Other names:

Colibrí de Paso (Mexico)  
Colibrí à Gorge Rubis (Quebec, Canada)  
Colibrí garganta de rubí (Costa Rica)



## Ruby-throated Hummingbird *Archilochus colubris*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**

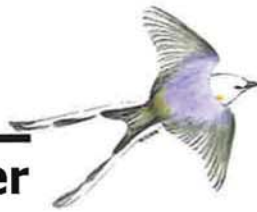


**Scissor-tailed Flycatcher**  
By  
**Maya Putra**





# Scissor-tailed Flycatcher



*Tyrannus forficatus*

L 10 -15" WS 15" WT 1.5oz (43g)

## Description:

The Scissor-tailed Flycatcher is the state bird of Oklahoma. It is often called the Texas bird of paradise. It has a distinct long, forked tail, and pink belly. Males have a longer tail than females or juveniles. Gmelin gave this bird a scientific name in 1789.

## Food:

These birds are **diurnal** and their diet is a variety of invertebrates. They feed primarily on grasshoppers and crickets, beetles and wasps, bugs, caterpillars, and moths. They will also eat mulberries, hackberries, and dewberries.

## Habitat:

Look for this bird on open grasslands with sparse trees, like Honey Mesquite, and other shrubs. They can also be found in towns and agricultural areas.

## Behavior Notes:

The Scissor-tailed Flycatcher is monogamous. The female builds the nest, incubates the eggs, and broods the young. The male helps to feed the young. Sudden, strong storms often cause destruction of nests and young. These flycatchers usually catch prey in the air, or pick prey off vegetation.

## Voice:

Song is a sharp "pup, peroo". Call a low, flat "pik".

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
			●	●				●			

## Migration Notes:

In late August, the Scissor-tailed Flycatcher forms large pre-migratory flocks. These groups can number up to 1000 individual birds. In spring, males arrive on breeding grounds before females.

Time of movement: may be **nocturnal** and **diurnal**

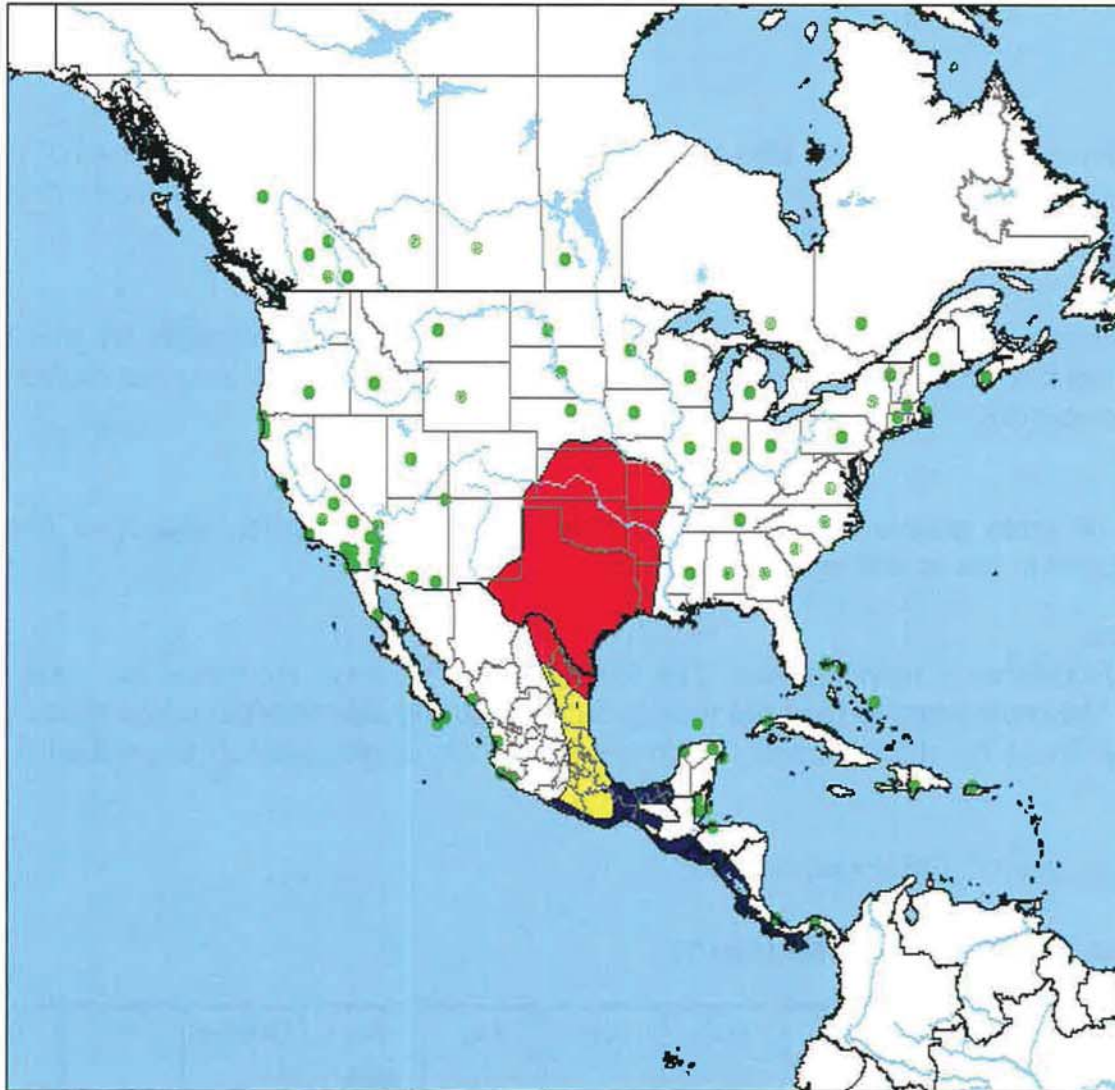
Journey length: 1,250 - 2,500 miles

### Other names:

Tirano, Tijereta Clara (Mexico)  
Moucherolle à Longue Queue (Quebec, Canada)  
Tijerata Rosada, Tijerillo (Costa Rica)  
Mosquero Rosado (Guatemala)



## Scissor-tailed Flycatcher *Tyrannus forficatus*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- ▨ Extirpated
- ▨ Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body

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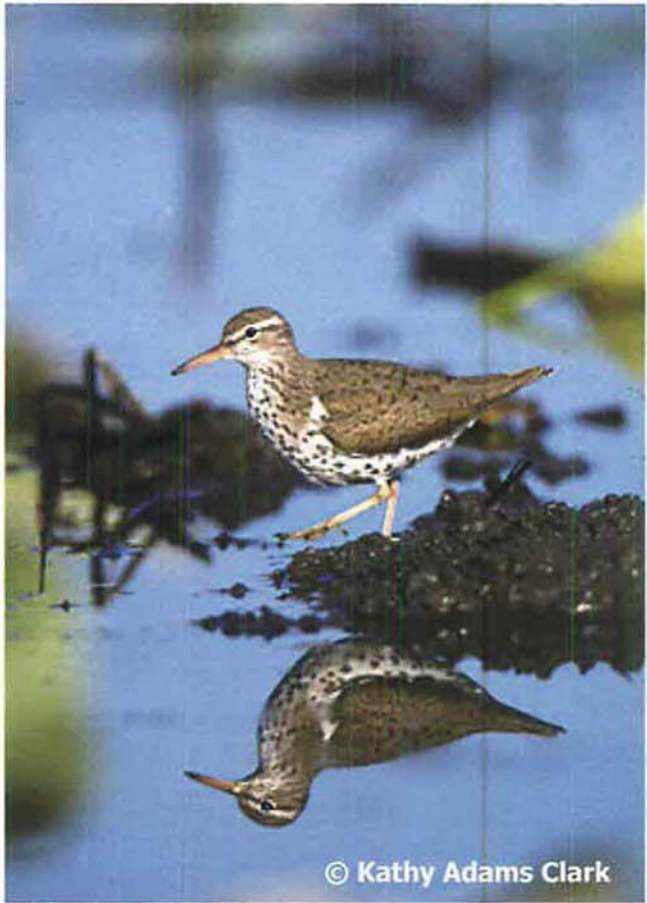


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**Observation Notes:**



**Spotted Sandpiper  
By  
Maya Putra**







## Spotted Sandpiper

*Actitus macularia*

L 7.5" WS 15" WT 1.4oz (40g)

### Description:

The Spotted Sandpiper is a small, short-legged shorebird. They have yellowish or pinkish legs, and a white wing stripe that can be seen in flight. They are short-necked and long-tailed, compared to other sandpipers. During the breeding season they have white throats, with black spots on the breast and belly. During the non-breeding season, there are no spots on the all white throat, breast, and belly. Linnaeus named this bird in 1766.

### Food:

The Spotted Sandpiper feeds on aquatic and terrestrial invertebrates.

### Habitat:

This bird winters wherever water is present, and prefers to stay near the water's edge, and on the steep banks of ponds and creeks. They breed in grassland, sagebrush, forest, lawn, and park habitats.

### Behavior Notes:

Females arrive first on the breeding grounds, and establish and defend the territories. Males have the main role in incubating the eggs and caring for the young. A single female may lay eggs for up to four different males at the same time. Females can also store sperm for up to one month. At 30 minutes old, the Spotted Sandpiper begins its classic teetering or bobbing motion. They also have a unique flight - stiff, wing beats, while flying low over water.

### Voice:

Call is a high pitched whistled "weet".

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	●					●	●	●	●

### Migration Notes:

The Spotted Sandpiper migrates singly in spring, and singly, or in small groups, in fall. Females winter farther north than males. Fall migration begins in early July. Weather plays a strong role in departure timing. Fall migration usually begins when northwest winds and high-pressure fronts arrive.

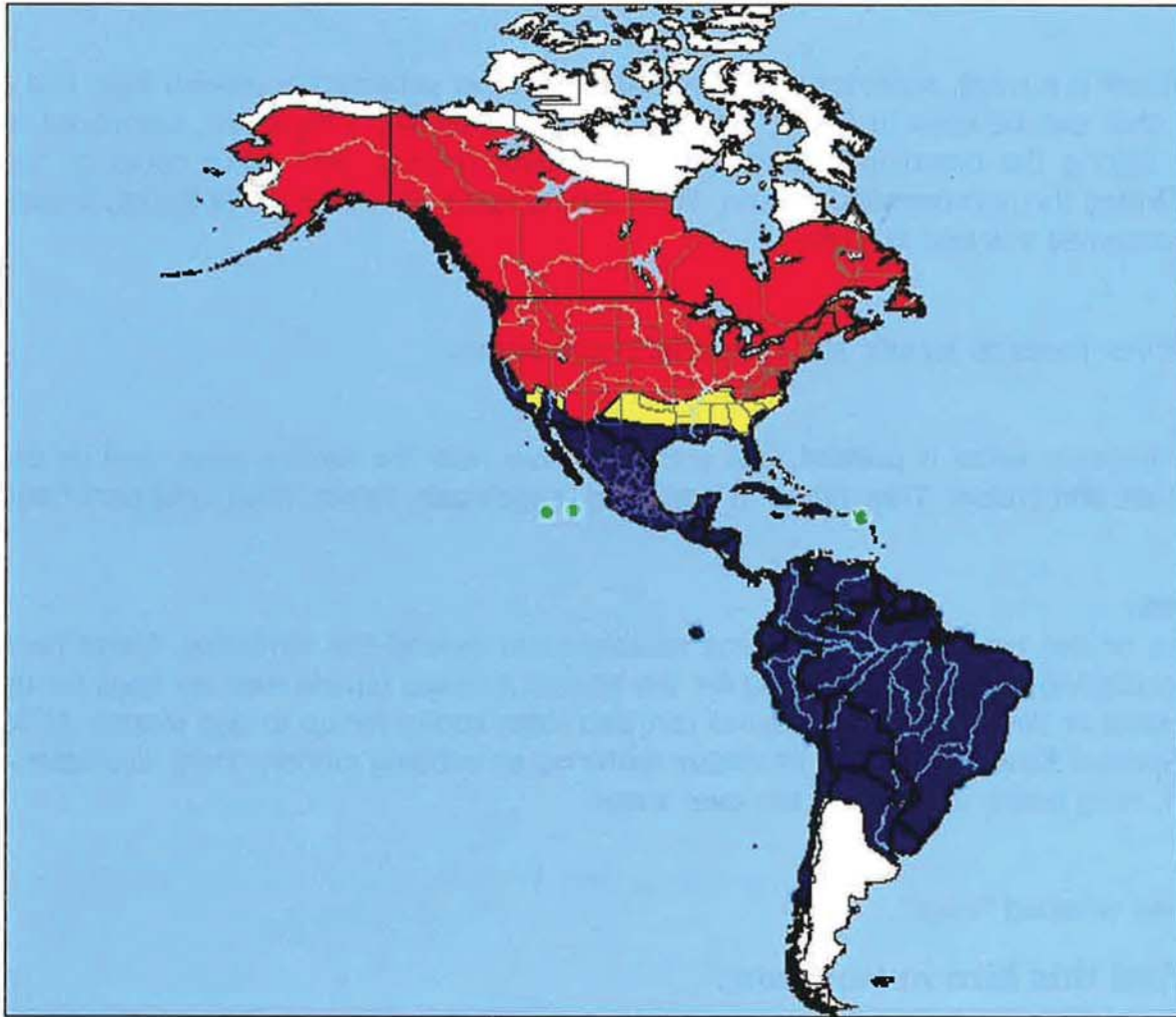
Time of movement: **nocturnal** and **diurnal**

#### Other names:

Playerito Alzacolita (Mexico)  
 Maubèche Branlequeue (Quebec, Canada)  
 Playero Manchado (Chile)  
 Alzacolito (Guatemala)

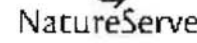


**Spotted Sandpiper**  
*Actitis macularia*



750 0 750 Kilometers

- |                      |                         |                      |
|----------------------|-------------------------|----------------------|
| Permanent Resident   | Introduced              | National boundary    |
| Breeding Resident    | Vagrant                 | Subnational boundary |
| Nonbreeding Resident | Extirpated              | River                |
| Passage Migrant      | Historical Records Only | Water body           |
| Uncertain Status     |                         |                      |



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**Observation Notes:**



**Summer Tanager**  
By  
**James Dong**





# Summer Tanager



*Piranga rubra*

L 7.75" WS 12" WT 1 oz (29 g)

## Description:

The male Summer Tanager is the only completely red bird in North America. The females have olive backs and orange-yellow underparts. This is a medium-sized passerine with a slight crest. Linnaeus gave this bird a scientific name in 1758.

## Food:

The Summer Tanager is a frugivore and an invertivore. They consume large quantities of bees and wasps. They also feed on insect larvae. After catching and eating or harassing adult insects, this bird will tear into nests to eat the grubs. They also eat fruits such as mulberries, blackberries, and poke-weed berries.

## Habitat:

Look for this bird in forested parks of pine and oak, with edges and gaps. During migration, they prefer parks, gardens, and coastal cheniers.

## Behavior Notes:

This tanager is serially monogamous, staying with the same mate during the breeding season, but choosing a different mate the following season. Nests are an open cup built in the mid-story or canopy of the woodland habitat. Young are tended by both parents, and leave the nest 8 to 10 days after hatching.

## Voice:

Call is a hard "pit-i-tuck". Song is musical, and sounds like "peanut-butter". Songs are typically used to attract mates and maintain territories.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		☾	●	☾							

## Migration Notes:

The Summer Tanager is a trans-gulf migrant. In order to survive the journey, they put on large amounts of fat reserves. This is a complete migrant, with all birds leaving the breeding grounds by September and October. They arrive in Columbia in early October, and depart in late April.

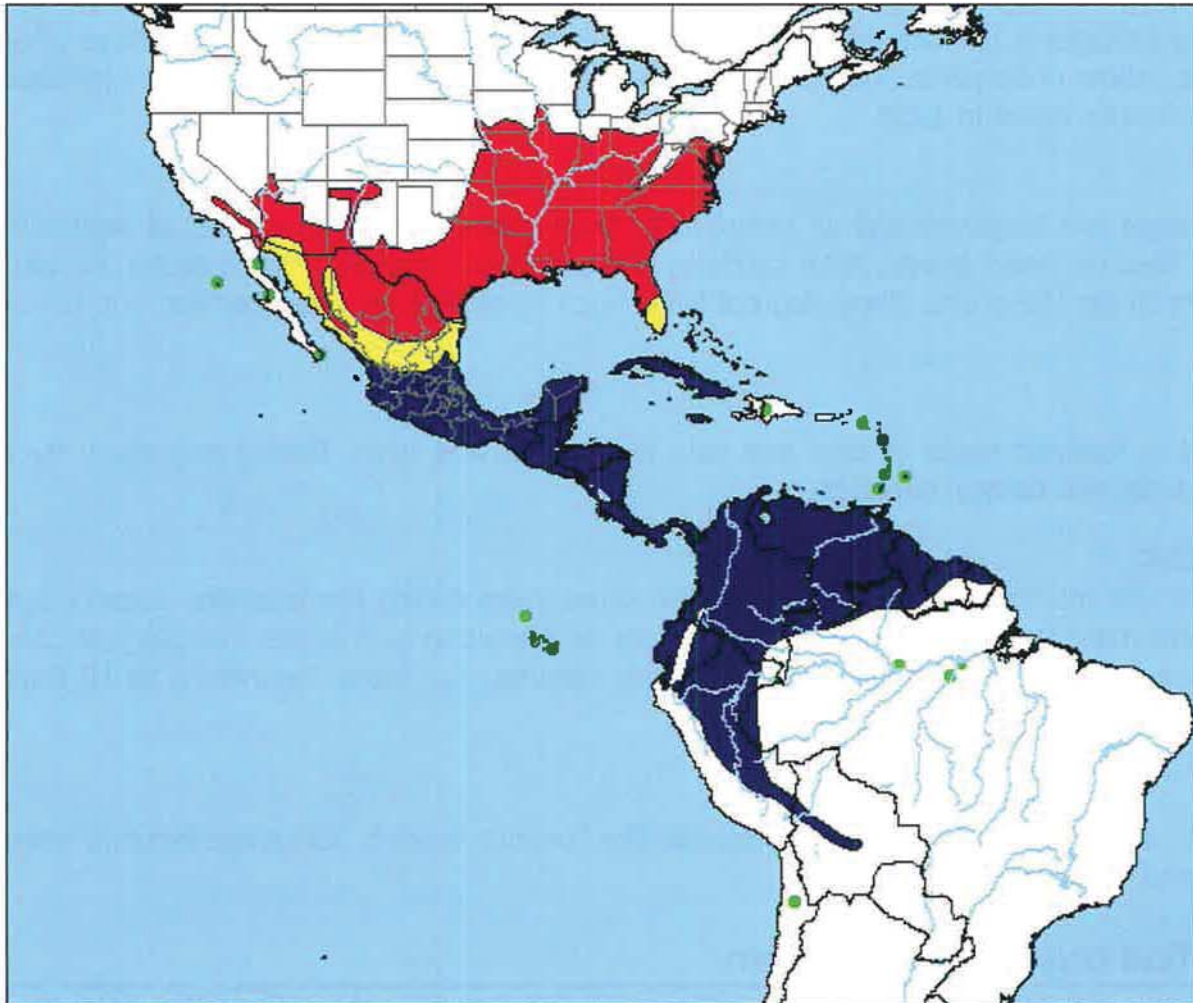
Time of movement: **nocturnal**  
Journey length: 600 - 4,350 miles

### Other names:

Tangara Roja Migratoria (Mexico)  
Tangara Vermillon (Quebec, Canada)  
Tangara Veranera (Costa Rica)  
Cardenal Migratorio (Venezuela)



## Summer Tanager *Piranga rubra*



750 0 750 Kilometers



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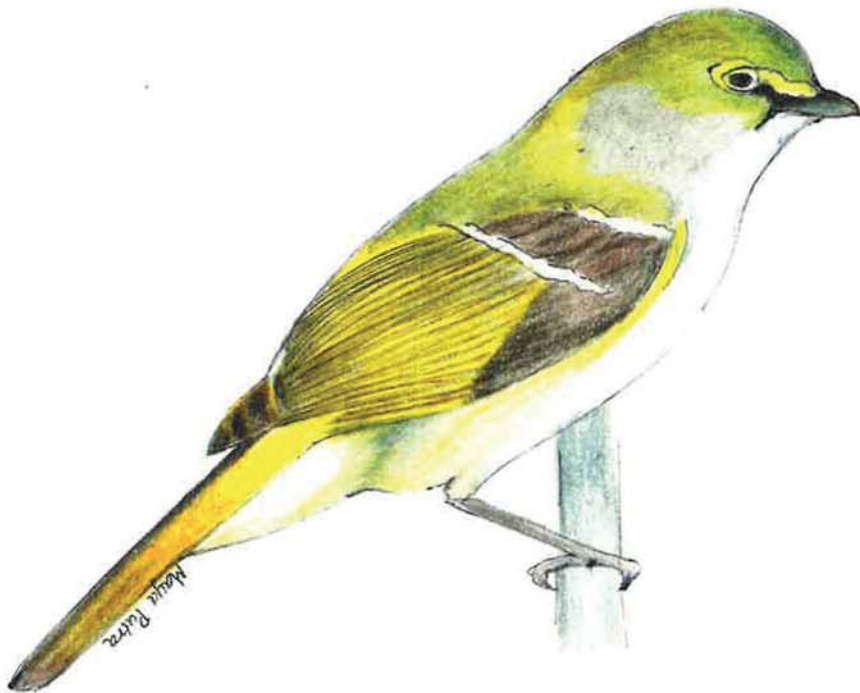
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**Observation Notes:**



**White-eyed Vireo  
By  
Maya Putra**



© Kathy Adams Clark



# White-eyed Vireo



*Vireo griseus*

L 5" WS 7.5" WT 0.4oz (11.5g)

### Description:

The White-eyed Vireo is a small passerine that is usually heard rather than seen. This bird is greenish-gray on the upper-parts, and white below. They have 2 white wing-bars, and yellow "spectacles" around the eyes. Boddaert named this bird in 1783.

### Food:

Major food sources include moths, caterpillars, beetles, butterflies, bees, and wasps, along with spiders and their egg cases. During the non-breeding season, this vireo also relies heavily on fruits.

### Habitat:

Overgrown pastures, farmland, and woody thickets are common habitats to see and hear this small bird.

### Behavior Notes:

The **diurnal** White-eyed Vireo forages with hops or short flights amongst dense foliage. Nests are an open cup found near the ground, and often become parasitized by Brown-headed Cowbirds. Both parents incubate the eggs and brood the young. Both male and female develop brood patches, and feed the young. On wintering grounds, this vireo is an important planter of the tropical Gumbo Limbo tree. These trees need these birds to eat their fruit and disperse their seeds.

### Voice:

There is a high degree of song learning by young birds. They typically match the male's songs. White-eyed Vireos also copy songs from neighboring birds. Song is a rapid and harsh, "tik-a-purrreer-chick" or "Quick, give me a rain check!" with many variations. White-eyed Vireos have the unusual feature of singing during the winter months.

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
		◐	●	●	●	●	●	●	●		

### Migration Notes:

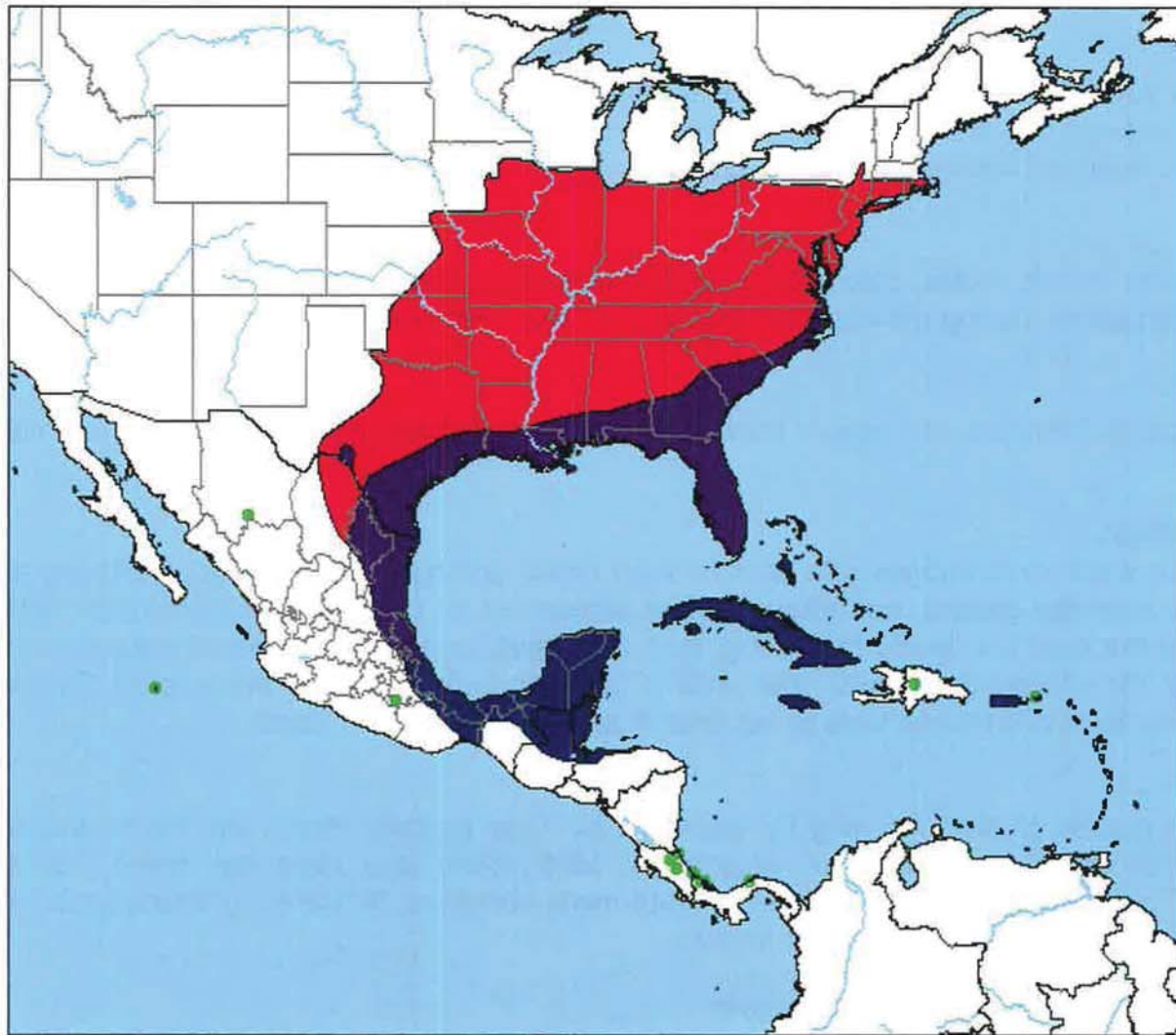
Males sing conspicuously during migration. This bird is more than likely a trans-gulf migrant. Birds arrive on wintering grounds in October and November, and depart in April and March.

Time of movement: **nocturnal**

**Other names:**  
 Vireo Ojiblanco (Mexico)  
 Viréo aux Yeux Blancs (Quebec, Canada)  
 Julian Chibi Ojiblanco (Puerto Rico)



## White-eyed Vireo *Vireo griseus*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body



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**Observation Notes:**



**Yellow-bellied Sapsucker  
by  
Maya Putra**



© Helen Baines



# Yellow-bellied Sapsucker



*Sphyrapicus varius*

L 8.5" WS 16" WT 1.8oz (50g)

## Description:

The Yellow-bellied Sapsucker is a medium-sized woodpecker. Linnaeus gave this bird its scientific name in 1766. They have a vertical white stripe on their side, and blurred black and white barring on their backs. Males have a red throat, and females have white throats. Their forehead and crown are red, with a black border.

## Food:

Phloem sap, fruit, and arthropods make up the diet for this woodpecker. The sapsucker forages for insects by gleaning, probing, and prying up pieces of bark. They will also catch insects in mid-air. Sapsuckers create sap wells that are maintained daily to ensure sap production. Research suggests that sapsucker saliva may contain an anticoagulant that prevents sap from clogging and sealing the holes.

## Habitat:

Look for this diurnal bird in semi-open wooded habitats, forests, orchards, suburbs, and local parks.

## Behavior Notes:

Sapsuckers get their name from the habit of making shallow holes in live trees to harvest sap, cambium, and to trap insects. They possess a brush-like, bristle-tipped tongue. A variety of other animals, including small mammals, hummingbirds, and butterflies use these holes to find sap and insects. Sapsuckers also excavate tree cavities that provide nesting and roost sites for other birds and mammals after the sapsuckers have finished nesting in them. Sapsuckers are documented for using over 250 species of trees and vines.

## Voice:

Call is a nasal "me-ah".

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐						◐	●	●

## Migration Notes:

The Yellow-bellied sapsucker is the only completely migratory woodpecker in eastern North America. Males do not migrate as far as females. Some birds travel as far as Panama.

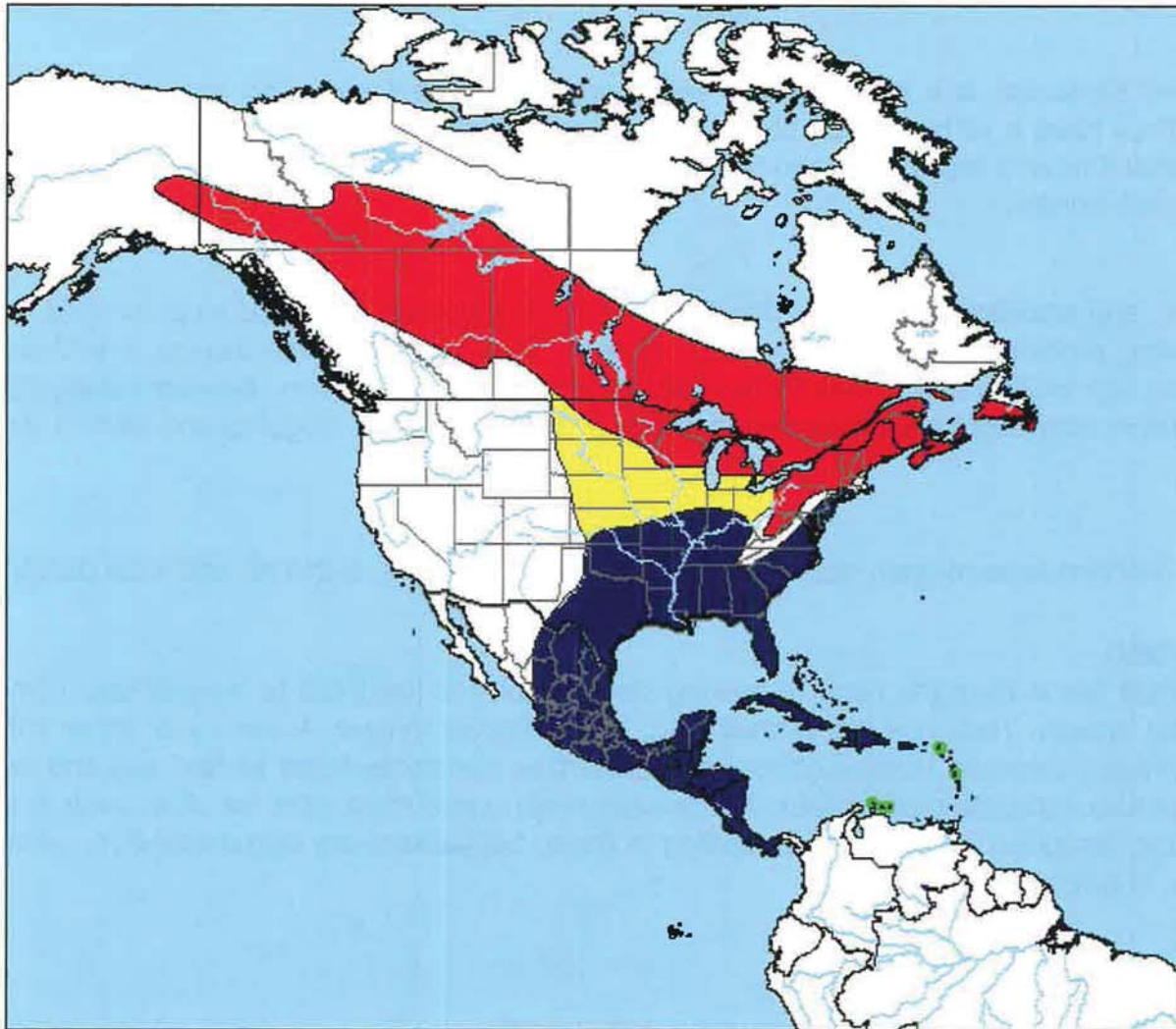
Time of movement: nocturnal

## Other names:

Carpintero Aliblanco Común (Mexico)  
Pic Maculé (Quebec, Canada)  
Carpintero de Paso, Charpentier (West Indies)



## Yellow-bellied Sapsucker *Sphyrapicus varius*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body

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"Data provided by NatureServe in collaboration with Robert Ridgely, James Zook, The Nature Conservancy - Migratory Bird Program, Conservation International - CABS, World Wildlife Fund - US, and Environment Canada - WILDSpace."

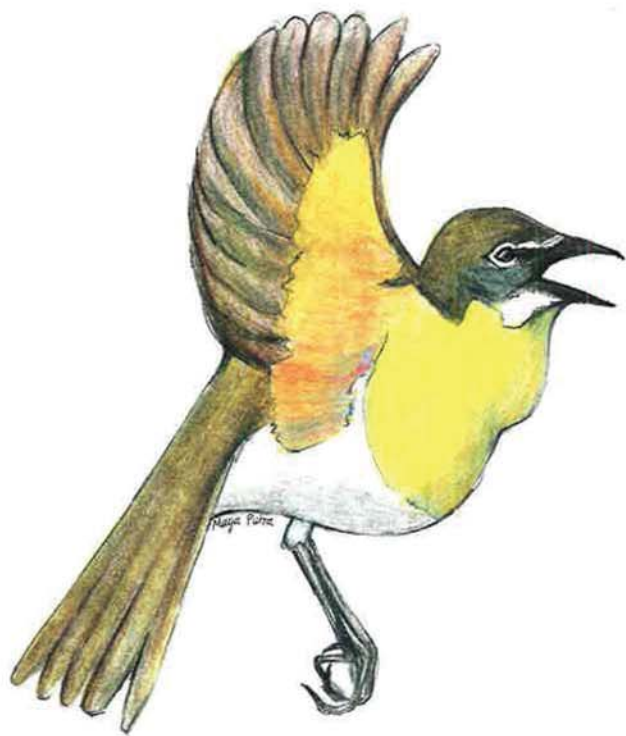
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**Observation Notes:**

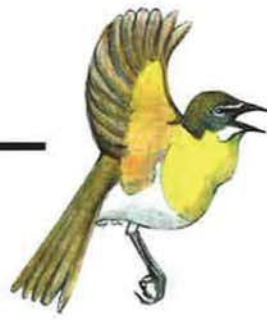


**Yellow-breasted Chat**  
By  
**Maya Putra**





# Yellow-breasted Chat



*Icteria virens*

L 7.5" WS 9.75" WT 0.88oz (25g)

### Description:

The Yellow-breasted Chat is our largest wood warbler. Distinctive white "spectacles" around the eyes, yellow throat and breast, and a long tail help to identify this bird. Chats also have a thick, curved bill. *Icteria* is derived from the Greek word for jaundice or yellowish. *Virens* is Latin for "becoming green". Linnaeus assigned a scientific name to this bird in 1758.

### Food:

Chats are **diurnal** and feed on small insects, spiders, and seasonal fruits. They forage for food by gleaning prey from foliage and catching prey on the ground.

### Habitat:

Look for this bird in dense thickets, overgrown fields, and brushy habitats around town.

### Behavior Notes:

The Yellow-breasted Chat is known for its shy, skulking. They move through dense brush in a solitary manner. Chats are the only warbler that hold food with their feet. They are often heard and not seen. The males are very vocal and sing while flying, or from an exposed perch. Chats will also sing at night. During the breeding season, chat nests are often parasitized by Brown-headed Cowbirds. Breeding season lasts from mid-April through mid-May. Incubation lasts from 11 to 15 days. Both parents care for the young after hatching, and young birds leave the nest 8 to 11 days after hatching.

### Voice:

Male chats sing a variety of songs that sound like a collection of whistles, squawks, and mimicry. During the breeding season, they will sing day or night.

### Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
			●	◐			◑	●	●		

### Migration Notes:

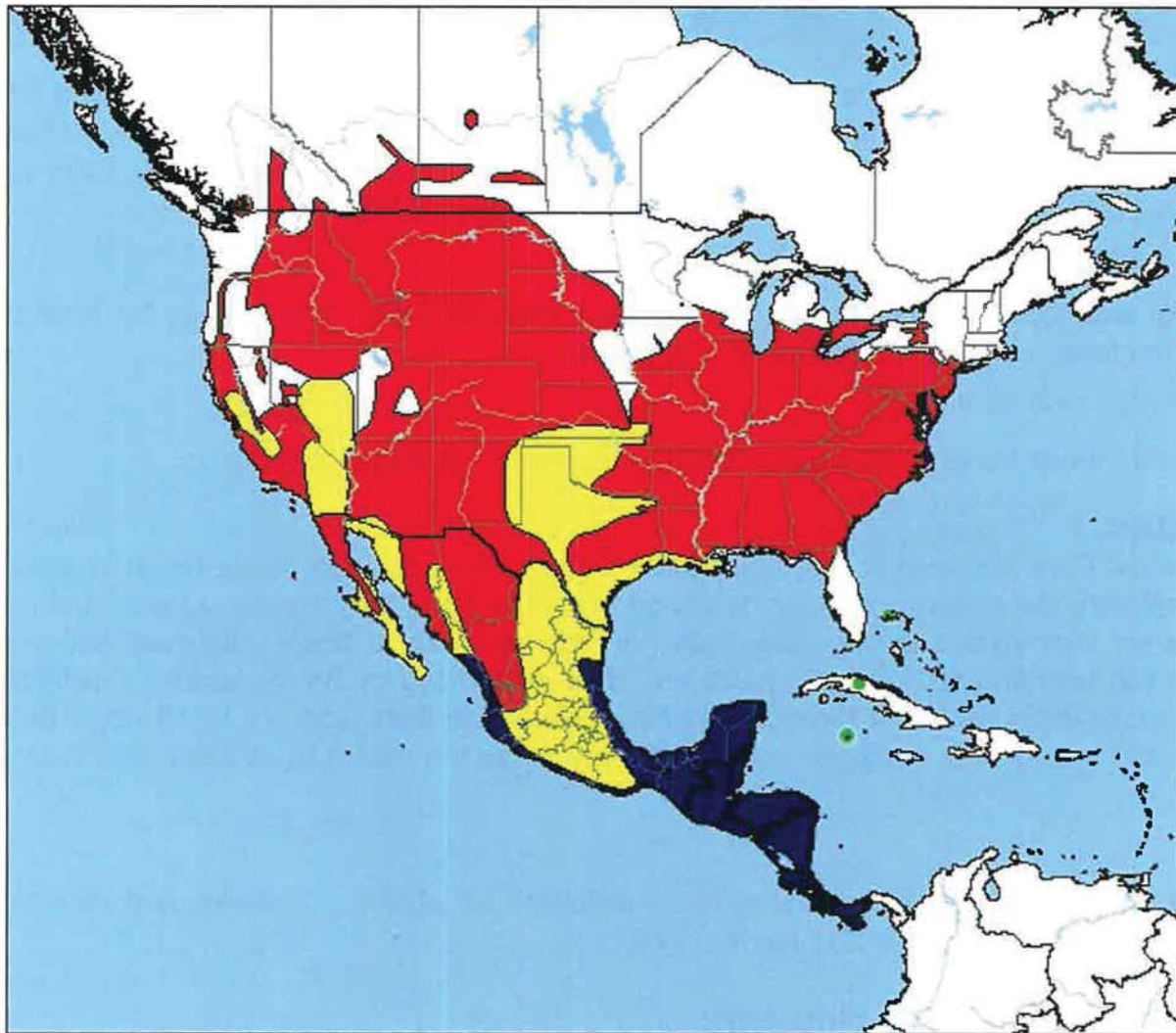
The chat is a trans-gulf and circum-gulf complete migrant. They usually migrate alone or in small flocks. The bulk of the population of chats winter from Mexico, south to Panama.

Time of movement: **nocturnal**

**Other names:**  
 Chipe Piquigrueso (Mexico)  
 Fauvette Polyglotte (Quebec, Canada)  
 Reinita Grande (Costa Rica)



## Yellow-breasted Chat *Icteria virens*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
- River
- Water body

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**Observation Notes:**



**Yellow-rumped Warbler**  
By  
**James Dong**



© Kathy Adams Clark



# Yellow-rumped Warbler



*Dendroica coronata*

L 5.5" WS 9.25" WT 0.43oz (12.3g)

## Description:

Yellow-rumped Warblers are fairly large wood warblers, with a distinctive yellow rump, and white spots near the tips of the outer tail feathers. Also noticeable is the white crescent stripes above and below the eyes, white wing bars, and yellow patches on the sides of the breast and on the crown. During the Texas winter, this warbler is more dull and grayish-brown in color. Linnaeus gave this bird its scientific name in 1766.

## Food:

This **diurnal** bird forages for insects by gleaning them off foliage, catching them in the air, and hovering. They also feed on fruit and nectar. During fall and winter, bayberries and fruit from wax myrtles are a favorite.

## Habitat:

Look for this bird in semi-open wooded habitats, forests, orchards, suburbs, and local parks.

## Behavior Notes:

The Yellow-rumped Warbler has special digestive enzymes that enable it to digest the waxes found in bayberries and wax myrtle fruit. This may allow the bird to remain farther north during the winter than other warblers. They also eat berries from Virginia creeper, poison ivy, honeysuckle, and red cedar. Often found in flocks, this gregarious bird flits from tree top to tree top foraging for caterpillars and other insects.

## Voice:

Song is a slow, musical warble, usually rising or falling in pitch at the end. Call note is a low, flat *chep*.

## Best time to find this bird in Houston:

Jan	Feb	March	April	May	June	July	Aug	Sep	October	Nov	Dec
●	●	●	◐						◑	●	●

## Migration Notes:

Travels and forages in large flocks during migration and winter.

Time of movement: **nocturnal**

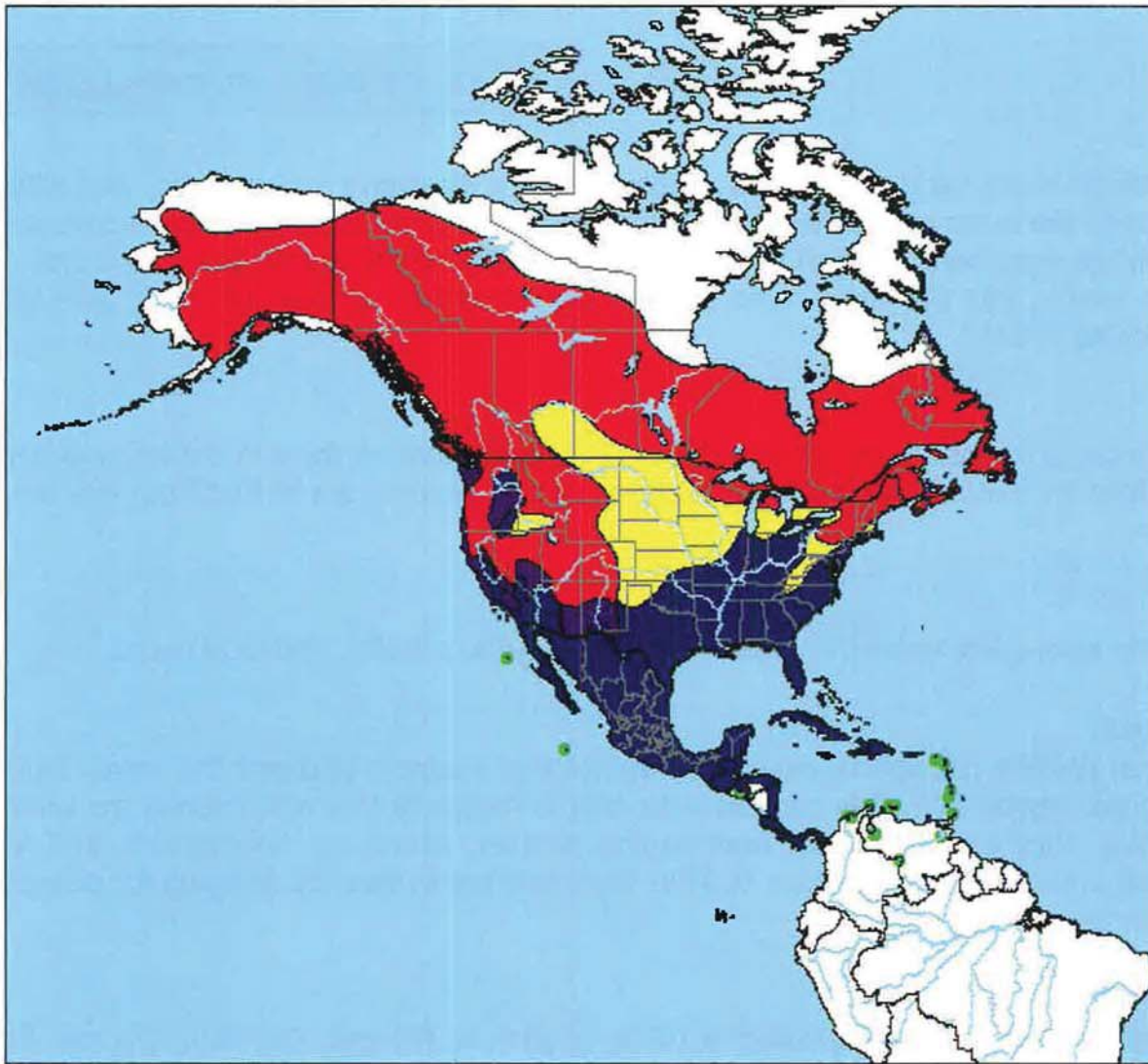
Average daily distance: 195 miles/day (Spring)  
55 miles/day (Fall)

### Other names:

Chipe Grupidorado (Mexico)  
Fauvette à Croupion Jaune (Quebec, Canada)  
Reinita Lomiamarilla (Costa Rica)



## Yellow-rumped Warbler *Dendroica coronata*



750 0 750 Kilometers

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Uncertain Status

- Introduced
- Vagrant
- Extirpated
- Historical Records Only

- National boundary
- Subnational boundary
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- Water body



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## Scientific Names

Taxonomy is the division of biology that is concerned with the classification and naming of organisms based on shared characteristics and natural relationships. The scientific name of an organism is formed by the combination of two terms: the genus name and the species descriptor. The first term (generic name) is always capitalized, while the species name is not; both are written or typeset in italics. The value of using this system of naming derives from its widespread use:

- the same name is used in all languages, avoiding translation problems;
- every species can be unambiguously identified with just two words;
- the system has been adopted internationally in botany (since 1753), zoology (since 1758), and bacteriology (since 1980)

Taxonomic classification of organisms is based upon a hierarchical system beginning with "Kingdom," extending through "Phylum," "Class," "Order," "Family," "Genus," and ending with "Species". The higher the level, the fewer features the organisms have in common. All birds belong to the same kingdom (Animalia), phylum (Chordata), and class (Aves). Classification differences occur in their order, family, genus, and species. The "genus" represents a taxonomic division that generally refers to a group of animals which are similar in structure and descent, but are not able to breed among themselves. The "species" represents a taxonomic division that generally refers to a group of animals which are similar in structure and descent and are able to breed among themselves. Sometimes a species is further divided into subspecies.

**Carolus Linnaeus** - (1707 - 1778) is credited with inventing the idea of organizing species within a hierarchical classification based upon shared characteristics. However, it was the Bauhin brothers, 200 years before Linnaeus who first developed binomial nomenclature. Linnaeus did popularize this naming system within the scientific community. His great contributions to the naming of organisms is evident in the naming of this system as **Linnaean taxonomy**.

- He also originated the practice of using the ♂ (sword and arrow) Mars ♀ and (hand mirror) Venus glyphs as the symbol for male and female.
- He was instrumental in the development of the Celsius temperature scale.
- Linnaeus was born in Sweden and is considered one of the fathers of modern ecology.

Linnaeus' rules have since been formalized and since 1901 have been governed by the International Code of Zoological Nomenclature, which is recognized around the world. The Code takes as its basis the tenth edition of Linnaeus' book *Systema Naturae*, published in 1758.



## What are birds?

**Kingdom - Animalia**

**Phylum - Chordata (having a hollow dorsal nerve cord and flexible skeletal rod)**

**Sub-phylum - Vertebrata (having a backbone)**

**Class - Aves (Birds)**

**Order - iformes**

**Family - idea**

**Subfamily - inae**

**Genus**

**Species**

**Subspecies**

**Falconiformes**

**Falconidae**

**Falconinae**

**Falco (Latin) - refers to sickle-shaped talons or the shape of the wings in flight**

**sparverius (Latin) - "striped" - refers to underparts of wing**

**American Kestrel *Falco sparverius***

Birds are characterized by:

1. Feathers
2. Homoeothermic
3. Laying of eggs
4. Lack of teeth; epidermal covered bony beak
5. Pneumatic bones
6. Adaptations for flight (about 123 flightless)
  - a. lightness
  - b. streamline
  - c. centralization of weight
  - d. efficient metabolism
  - e. visual acuity
  - f. motor development of brain







### Others who named the birds highlighted in the manual -

**Boddaert** - (1730 - 1795) a physician and naturalist who published an identification key to a French publication on natural history. He assigned many scientific names to a variety of specimens.

**Forster** - J. R. (1729 - 1798) was a Polish born naturalist of German descent. He is best known as the naturalist on Captain James Cook's second Pacific voyage. He kept a detailed diary and an extensive collection of specimens and artifacts.

**Gmelin** - (1748 - 1804) was a German naturalist. In 1788 he published the 13th edition of Linnaeus' *Systema Naturae* with many additions and alterations.

**Pallas** - (1741 - 1811) was a German-born Russian zoologist. He wrote *Miscellanea Zoologica* (1766), which included descriptions of several vertebrates new to science which he discovered in a Dutch museum collection. His travels took him to Siberia and southern Russia to collect natural history specimens for the St. Petersburg Academy of Sciences where he taught.

**Tunstall** - (1743 - 1790) - was an English ornithologist and collector. Tunstall was the author of *Ornithologica Britannica* (1771), probably the first British work to use binomial nomenclature.

**Vieillot** - (1748 - 1831) - was a French ornithologist who was one of the first to study changes in plumage, and also one of the first to study live birds, as well as skins. He described a large number of birds for the first time, from the time he spent in the West Indies and North America.

**Wilson** - (1766 - 1813) - was a Scottish-born American poet, ornithologist, naturalist, and illustrator. In 1802 Wilson began traveling to paint and watch birds for his publication on North American birds. Many birds are named after him, and the warbler genus *Wilsonia*. He met John James Audubon in 1810, and probably helped to inspire the young man to pursue the creation of his own book of bird illustrations.

For more information on biologists:

[http://www.iridis.com/tzsb/List\\_of\\_biologists](http://www.iridis.com/tzsb/List_of_biologists)



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- <http://www.natureserve.org>
- <http://www.birds.cornell.edu/programs/AllAboutBirds>

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# The Artists



**James Dong** was a high school sophomore at DeBakey High School for Health Professions when he worked on this project. This project was originally introduced to him by Debbie Rhodes, the Director of Natural Legacy, through the SEAC (Student Environmental Art Council) program. James has been an active member of SEAC since his freshman year, and this has allowed him and other Houston area high school students to study and understand the symbiotic relationship between the local environment and culture. In addition, the program gives students the chance to share their ideas through art, and mentor local area kids about the importance of preservation and conservation. During the process of completing the bird pictures, James gained insight into the differing species and habits of numerous birds in the Texas Gulf Coast region. He hopes that the artwork he has provided can help to teach and inspire others about the beauty of the environment.

The birds were completed using tempera, acrylic, watercolors, and Prismacolor®.



**Maya Putra** was a high school junior at the High School for the Performing and Visual Arts when she worked on this project. Maya was a part of the Student Environmental Art Council program and along with her wonderful illustrations, provided one of the activities in this manual. You can find out more about Maya and James in *A Kid's Gateway to Art and Nature*, the manual referenced in this guide.







# The Photographers

## Helen Baines

For more information: <http://helensbirds.homestead.com>

Helen Baines was born and raised in the north of England, on the eastern edge of the beautiful Lake District National Park. She has always had an interest in the natural world, and began taking photographs at the age of 17, when she went on a school trip to Switzerland. She has a degree in Geology from the University of London, but over the years has developed a passion for birdwatching. In 1987, when her husband's job took them to Southern California, she began keeping a lifelist of all the North American species she was observing. A few years later, in 1992, they moved to the Houston area, and with the discovery of Brazos Bend State Park, birding became a more serious hobby.

Her bird photography really took off in 2001 with the purchase of a digital camera which had an impressive 10x optical zoom feature - she now has 3 digital cameras, the latest being a digital SLR. She began taking bird photographs to aid in the identification of uncertain species, but mainly to use on her website. The photos help to illustrate birding trip resorts both in the USA and abroad, and they are used on pages she has built about her local birds. Helen's backyard has been hosting wintering Rufous Hummingbirds for several years, and a hummingbird bander has trapped and banded 8 Rufous Hummingbirds over the last 2 years, 2 of which returned the following winter. Her subdivision, near Richmond, has nesting Mississippi Kites every summer, and there are Purple Martins which return to nest in her martin house every spring. She also enjoys photographing wild flowers, butterflies, and other wildlife.

## Kathy Adams Clark

For more information: <http://www.kathyadamsclark.com>

Kathy Adams Clark is the owner of KAC productions. She started the company in 1995 after a career in human resources. Her photos have appeared in many places, including *Birder's World*, *Ranger Rick*, *The New York Times*, and *National Geographic Books*. Kathy's provided photo/text packages for *Bird Watcher's Digest*, *Birder's World*, *Texas Parks & Wildlife* and other magazines. She's provided corporate photography for Compaq Computer, South Texas Electrical Project, and The Woodlands Corporation. Her years of college teaching experience are put to good use teaching photo classes and workshops. Kathy also leads tours for Voyagers Photo Tour Network. She speaks frequently at association meetings and nature festivals. In addition, she is a member of the Board of Directors of the North American Nature Photography Association.





## Dr. Robert McFarlane

Dr. Robert McFarlane serves on the Board of Advisors for the Houston Audubon Society, and is our resident ornithologist. He has been a regular contributor to the **Bolivar Bird Count** and is also spearheading the **Houston Bird Survey**. Over the years he has been involved in numerous research projects for Houston Audubon, including surveys of the Katy Prairie and the Trinity River. Among his publications is the book *A Stillness in the Pines: the Ecology of the Red-Cockaded Woodpecker*.

## Alan Murphy

Alan Murphy began his passion for birding and photography as a young boy in England. After moving to America in 1984, Alan continued his birding studies on North American birds. He and his family now live in Houston. Alan's creative talent and love of avian photography is evident in his work. His photos have appeared in numerous publications including *Birders World*, *Wild Bird*, *Bird Watchers Digest*, *North American Birds*, *Texas Birds*, *Texas Parks & Wildlife*, *Texas Highways*, *British Birds*, and many more. Alan's photos are also circulated in many guides, books, CD-ROM's, and post cards. Alan's photos are available for purchase through his web site:

[www.alanmurphyphotography.com](http://www.alanmurphyphotography.com)

## Wayne Nicholas

Wayne Nicholas grew up on the Louisiana Gulf Coast, and has been in Houston for 13 years. He enjoys all nature photography, but prefers to photograph in our coastal marshes and estuaries, as he's always enjoyed the diversity of life to be found there. He took up photography in June, 2001, and focuses mainly on avian subjects. In October, 2002, he won Houston Photochrome's "Nature Photograph of the Year", with a photograph of a Redwing Blackbird taken at Anahuac National Wildlife Refuge. He strives to show each subject in its natural surroundings, using his own perspective. His images have appeared in various publications, including *Texas Sporting Journal*.

His images are for sale at:

[www.nicholasnaturephoto.com](http://www.nicholasnaturephoto.com)





## Mary Anne Weber

Mary Anne Weber is the Education Coordinator of the Houston Audubon Society. Mary Anne travels with six non-releasable birds of prey that assist her in teaching about the birds of Texas and the world. Before migrating to Texas, she was the Founder and Director of Wind Rock Wild Bird Rescue in Montana. She began teaching about birds while working at The Raptor Trust in New Jersey.

Mary Anne developed the Citizens' Guide to Migration and the Migratory Birds of the Bayou City in 2004. She hopes to inspire the many thousands of children that spend time in the city parks of Houston about the wonderful birds in the city to watch and learn about.

To arrange for Mary Anne and her birds to visit your school or organization, visit the Houston Audubon Society website: [www.houstonaudubon.org](http://www.houstonaudubon.org) or call 713.932.1639.



Mary Anne and Spirit at one of the summer bird camps held at the Edith L. Moore Nature Sanctuary each summer. Summer bird camps start with ***Baby Bird Camp*** for the younger kids and progress with ***In and Out of the Nest*** and ***Extreme Bird Camp***.

## Kinjo Yonemoto

Kinjo Yonemoto began taking pictures of birds in 2000 shortly after he began birding. He finds the photography a useful tool in learning about birds, especially bird identification. His poor vision makes it difficult to see field marks while in the field. The main goal of his photography is to document the birds and share this knowledge with others. He shares his photographs with biologists and bird watchers. Kinjo feels we are all "students of mother nature".

Kinjo is the owner of [Computerdojo.com](http://Computerdojo.com).



**Remember that birds can be found almost anywhere. Look for them in obvious and not so obvious places while outside.**







## Activities

The following activities offer a sampling of the many migratory bird projects that you can work on with your students, campers, or with your own children. There are projects for a variety of age groups and links to help you expand your resources.

For a complete listing of education resources about birds and migration:

*A Guide to Bird Education Resources*  
*Migratory Birds of the Americas: An Annotated Bibliography*

A Project of *Partners in Flight*  
Published by: The National Fish and Wildlife Foundation  
1120 Connecticut Avenue, NW, Suite 900,  
Washington, DC 20036  
1997

Copies of this book are available from:  
American Birding Association Sales  
P.O. Box 6599, Colorado Springs, CO 80934  
800.850.2473

Price: \$9.95 plus \$3.75 shipping



What Bird is That?	213
Houston Bird Survey	218
June (Summer) Survey	220
January (Winter) Survey	221
Christmas Bird Count	222
Bird Checklist	224
Citizen Science with Cornell	225
Migrants By Mail	228
You Are What You Eat	231
Frequent Flier Miles	234
Beginning Birdwatching	238
Migrant Bingo	248
Thaumatropes	275
Mindful of Migration	277
Bird Topography	282
Speedy Bird Racers	289
An Eventful Journey	292
The Incredible Journey	301
Just Ducky	313





# What Bird is That?

By Dr. Robert McFarlane

**(P) Permanent Resident**  
**(S) Summer**  
**(W) Winter**

This quick reference guide will help you identify some of the most common birds found in the city of Houston. Look for these birds in parks, backyards, parking lots, and on school campuses.

If it is:

**RED** it's a ..... **Cardinal (P)**



**BLUE** it's a ..... **Blue Jay (P)**



**GRAY** above and lighter below and

very small, with a black cap and bib..... **Carolina Chickadee (P)**



small, with a distinct crest..... **Tufted Titmouse (P)**



small, yellow rump and side patches..... **Yellow-rumped Warbler (W)**



**or** has a long tail with white edges and is  
very small..... **Blue-gray Gnatcatcher (W)**



medium, with white wing patches..... **Northern Mockingbird (P)**





If it is:

**BLACK** and

very large and chunky .....**American Crow (P)**



medium-large, slender, long-tailed.....**Great-tailed Grackle (P)**



medium-small, short-tailed, delta-winged.....**European Starling (P)**



**BROWN** and

small, long slender bill, white eye stripe.....**Carolina Wren (P)**



small, stout, conical bill.....**House Sparrow (P)**



medium, with round spots on its breast.....**Wood Thrush (S)**



medium, with spots, and a rusty tail.....**Hermit Thrush (W)**



medium, with a crest, and black mask.....**Cedar Waxwing (W)**



medium, rusty, with brown streaks on breast.....**Brown Thrasher (W)**







If it is:

**BROWN** and

medium, dark, with orange breast .....**American Robin (P)**



medium, olive, with a bright yellow belly.....**Great Crested Flycatcher (S)**



medium, rusty or gray, with "ear-tufts".....**Eastern Screech Owl (P)**



**or**

looks like a pigeon.....**Mourning Dove (P)**



looks like a smaller pigeon.....**Inca Dove (P)**



**OLIVE GREEN** above and

tiny, plump, white wing bars, pointed bill.....**Ruby-crowned Kinglet (W)**



small, plump, no obvious field marks.....**Orange-crowned Warbler (W)**



small, bright yellow throat and breast.....**Pine Warbler (W)**



small, wings black with white bars, conical bill.....**American Goldfinch (W)**





IF IT HANGS ON A TREE TRUNK, HEAD UP, PROPPED ON ITS TAIL and is **BLACK and WHITE**, and

small, with a white back.....**Downy Woodpecker (P)**



medium, with white wing patch...**Yellow-bellied Sapsucker (W)**



medium, red head and neck.....**Red-headed Woodpecker (P)**



medium, horizontal zebra stripes.....**Red-bellied Woodpecker (P)**



very large, with a red crest.....**Pileated Woodpecker (P)**



## **BROWN**

with black bib, black spots, yellow underwings.....**Northern Flicker (W)**



IF IT'S UP IN A TREE BUT HAS LONG LEGS AND LOOKS LIKE IT SHOULD BE IN THE WATER and is

large, gray, black face, white cheek patch .**Yellow-crowned Night Heron (S)**



medium, bright chestnut neck, dark back and crest....**Green Heron (P)**







## Photo Credits:

Cardinal.....Alan Murphy  
Blue Jay.....Helen Baines  
Carolina Chickadee.....Wayne Nicholas  
Tufted Titmouse.....Alan Murphy  
Yellow-rumped Warbler.....Alan Murphy  
Blue-gray Gnatcatcher.....Mary Anne Weber  
Northern Mockingbird....Kinjo Yonemoto  
American Crow..... Alan Murphy  
Great-tailed Grackle.....Mary Anne Weber  
Carolina Wren.....Alan Murphy  
House Sparrow.....Helen Baines  
Wood Thrush.....Alan Murphy  
Hermit Thrush.....Kathy Adams Clark  
Cedar Waxwing.....Helen Baines  
Brown Thrasher.....Kinjo Yonemoto  
American Robin.....Helen Baines  
Great-crested Flycatcher.....Wayne Nicholas  
Eastern Screech Owl.....Alan Murphy  
Inca Dove.....Kinjo Yonemoto  
Orange-crowned Warbler.....Alan Murphy  
Pine Warbler.....Alan Murphy  
American Goldfinch.....Alan Murphy  
Downy Woodpecker .....Kathy Adams Clark  
Yellow-bellied Sapsucker.....Helen Baines  
Red-headed Woodpecker.....Wayne Nicholas  
Red-bellied Woodpecker.....Kinjo Yonemoto  
Northern Flicker.....Helen Baines  
Yellow-crowned Night Heron.....Wayne Nicholas  
Green Heron.....Wayne Nicholas

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## Houston Bird Survey



The goal of the Houston Bird Survey is to determine the distribution of birds that live in Houston. To accomplish this, the survey will initially focus on the summer, winter and permanent avian residents of the city. While the colorful songbirds migrating to and from the neotropics through our city are fascinating, they are, in essence, tourists, just passing through. They eat a bite, spend the night, wait for good weather, and move on. We will focus on birds that raise their young or spend the winter with us. We are asking for your help in collecting information during June and January of each year.

**WHO** may participate? Anyone who can correctly identify any bird.

**WHAT** do you do? Simply enter information on birds you have observed into an online data form and submit it electronically, or print a copy of the survey form and mail it in.

**WHERE** do you do it? Anywhere that you like in or around Houston. The more different sites that you survey, the more information we will have. Survey your yard, your school, your workplace, a park or green space near you, the route where you exercise or walk your dog. The City of Houston Parks and Recreation Department has an inventory of 515 parcels of park land totaling 20,651 acres within the city. These parcels range from fractions of an acre to 1000+ acres, but only 8 are categorized as reserves or natural areas. An analysis of the birds inhabiting these green spaces, playgrounds, playing fields, and woodlands of varying size may be very informative. We urge you to adopt a park land near you and record its birds.

**WHEN** do you do it? Anytime during the month of **June** for the Summer Bird Survey, or **January** for the Winter Bird Survey.

**HOW** do you do it? Information can be provided in either of two ways, a survey or a list. For a survey bird observation will be your primary activity. It can be as short a time period as 5 or 10 minutes, or as long as you like. Simply record the time that you began and the time you stopped, the date, the locality, and the bird species that you observed. Preparing a list is more casual. Simply keep a list of the birds in your yard, or seen from an office window, or observed during some other activity. Submit a separate list for each separate site.

**RULES:** To ensure reliability of the information, report only birds identified with certainty. **IF IN DOUBT, LEAVE IT OUT.**

**THEN WHAT HAPPENS?** The information that you provide will be assembled into a geographic database, converted into "intelligence", and disseminated back to you in the form of distribution maps, etc. on the Houston Audubon Society website.

Need **HELP?** Try an online field guide for help in identification:

[www.enature.com](http://www.enature.com) or <http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/>

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**A Word About Habitat** - Birds are influenced by the habitats available to them. A simple habitat classification is used in the survey.

**Forest** - large trees with crowns touching, forming an overhead canopy of branches.

**Woodland** - small trees and shrubs, frequently dense, without overhead canopy.

**Parkland** - large trees widely spaced; limbs seldom touch or create a canopy.

**Open** - smaller trees and shrubs, or none; lots of visible sky.

**Commercial** - little or no green space.

These categories may be distinguished by application of the "**squirrel test**." If a tree squirrel could travel a considerable distance within the tree canopy without coming to the ground, it is a forest. If a squirrel must descend to the ground, or resort to utility lines to travel a distance, it is a parkland. If a squirrel occasionally enters the trees but does not live there, it is a woodland. If squirrels are absent, it is open habitat.

**Mail survey forms to :**

**HAS BIRD SURVEY, 440 Wilchester Blvd, Houston TX 77079-7329**

**Forms may be submitted electronically on our web site: [www.houstonaudubon.org](http://www.houstonaudubon.org).**

**Additional forms are also available on our web site.**

A word about the author and compiler of the Survey:

**Dr. Robert McFarlane** serves on the Board of Advisors for the Houston Audubon Society and is our resident ornithologist. He has been a regular contributor to the Bolivar Bird Count and is also spearheading the Houston Bird Survey. Over the years he has been involved in numerous research projects for Houston Audubon, including surveys of the Katy Prairie and the Trinity River. Among his publications is the book *A Stillness in the Pines: the Ecology of the Red-Cockaded Woodpecker*.



## Houston Audubon Society JUNE - SUMMER BIRD SURVEY

**Name:**

**Address:**

**Telephone:**

**City:**

**E-mail:**

**Zip Code:**

This is  **Survey** (observations during a brief time period on a single day)  
 **List** (observations over a period of days)

**Site or List Location:**

Nearest intersection:

**Habitat:**  Forest (large trees, closely spaced)  Woodland (small trees closely spaced)  
 Parkland (large trees far apart)  Open (no or few trees, open sky)  
 Commercial (little or no green space)  
 Optional habitat description (pond, bayou, etc): \_\_\_\_\_

**Date:**

**Survey Time:**

Start:

Stop:

**Species Observed:**

Blackbird, Red-winged  
 Cardinal, Northern  
 Chickadee, Carolina  
 Cowbird, Brown-headed  
 Crow, American  
 Dove, Inca  
 Dove, Mourning  
 Dove, Rock  
 Dove, White-winged  
 Finch, House  
 Grackle, Common  
 Grackle, Great-tailed  
 Wren, Carolina

Jay, Blue  
 Martin, Purple  
 Mockingbird, Northern  
 Robin, American  
 Sparrow, House  
 Starling, European  
 Swift, Chimney  
 Titmouse, Tufted  
 Vulture, Black  
 Vulture, Turkey  
 Woodpecker, Downy  
 Woodpecker, Red-bellied

**Additional Species:**

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## Houston Audubon Society JANUARY - WINTER BIRD SURVEY

**Name:**

**Address:**

**Telephone:**

**City:**

**E-mail:**

**Zip Code:**

This is  **Survey** (observations during a brief time period on a single day)  
 **List** (observations over a period of days)

### Site or List Location:

Nearest intersection:

**Habitat:**  Forest (large trees, closely spaced)  Woodland (small trees closely spaced)  
 Parkland (large trees far apart)  Open (no or few trees, open sky)  
 Commercial (little or no green space)  
 Optional habitat description (pond, bayou, etc): \_\_\_\_\_

**Date:**

**Survey Time:**

Start:

Stop:

### Species Observed:

<input type="checkbox"/> Cardinal, Northern	<input type="checkbox"/> Mockingbird, Northern
<input type="checkbox"/> Chickadee, Carolina	<input type="checkbox"/> Robin, American
<input type="checkbox"/> Cowbird, Brown-headed	<input type="checkbox"/> Sapsucker, Yellow-bellied
<input type="checkbox"/> Crow, American	<input type="checkbox"/> Shrike, Loggerhead
<input type="checkbox"/> Dove, Inca	<input type="checkbox"/> Sparrow, Chipping
<input type="checkbox"/> Dove, Mourning	<input type="checkbox"/> Sparrow, House
<input type="checkbox"/> Dove, Rock	<input type="checkbox"/> Sparrow, White-throated
<input type="checkbox"/> Dove, White-winged	<input type="checkbox"/> Starling, European
<input type="checkbox"/> Finch, House	<input type="checkbox"/> Tufted Titmouse
<input type="checkbox"/> Goldfinch, American	<input type="checkbox"/> Warbler, Yellow-rumped
<input type="checkbox"/> Grackle, Common	<input type="checkbox"/> Waxwing, Cedar
<input type="checkbox"/> Grackle, Great-tailed	<input type="checkbox"/> Woodpecker, Downy
<input type="checkbox"/> Jay, Blue	<input type="checkbox"/> Woodpecker, Red-bellied
<input type="checkbox"/> Kinglet, Ruby-crowned	<input type="checkbox"/> Wren, Carolina

### Additional Species:

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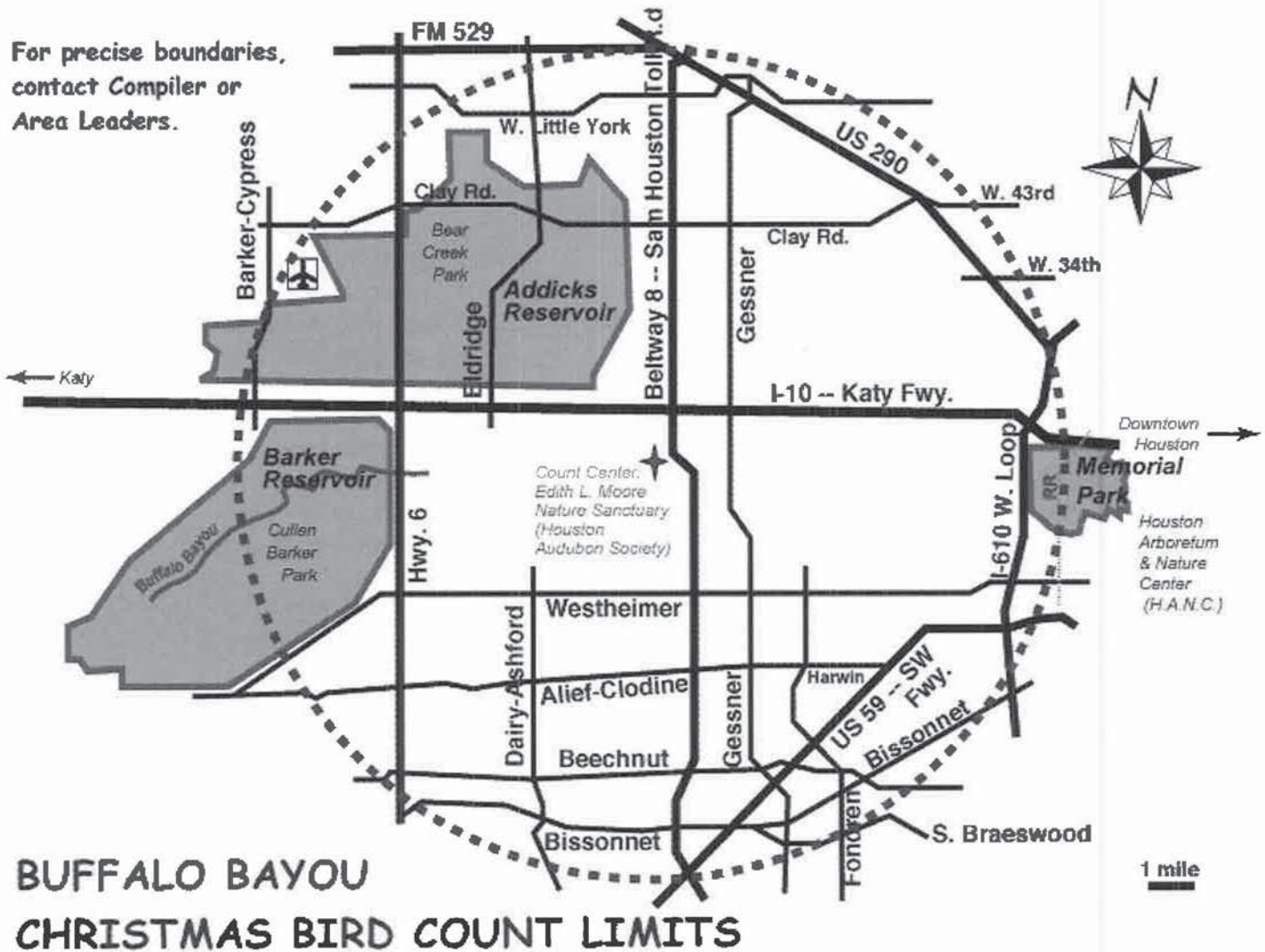
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## Christmas Bird Counts

Last year (2004) marked the 105th Christmas Bird Count (CBC). Citizens across three continents participated in this annual event. The Buffalo Bayou CBC began in 1978. It was established to document the birds on the west side of Houston, Texas, a part of the city containing good habitat yet also subject to fairly rapid residential and commercial development. Because so much of this CBC area is residential, Feeder Watchers (those who stay at home and observe their feeder, yard, and/or neighborhood) are extremely important to the count and greatly increase the efficiency of the count by observing species that otherwise would not be seen, such as hummingbirds. The entire history of Buffalo Bayou CBC results can be found on the National Audubon Society's CBC web site <http://www.audubon.org/bird/CBC>.







## **Christmas Bird Counts**

mid-December - early January

There are more than 90 CBCs scheduled throughout Texas - and more than 20 in the Houston area. For a full list of all Texas counts, along with contact information, please visit the Texas Ornithological Society website at **[www.texasbirds.org](http://www.texasbirds.org)**.

To participate in the Buffalo Bayou CBC visit the Houston Arboretum & Nature Center (HANC) website at **[www.houstonnaturecenter.org/cbc/txbfintro.htm](http://www.houstonnaturecenter.org/cbc/txbfintro.htm)**. If you want to join in and do not sign up for a particular area, meet at the HANC at 6am.

**Started in 1900, the CBC involves more than 50,000 citizen-scientists on three continents. Participants are organized into groups (field parties) that cover a specific area on a specific route. Inexperienced birders are paired with seasoned birders. This is a great opportunity to practice bird identification, learn from the experts, have fun, and provide important data about bird populations.**

### **Checklist**

On the following page is a checklist of birds that can be found in Houston. Make copies to post in your classroom, home, community center, or office. Be sure to record all the birds that you see at a particular location. You can use one checklist per year or season. Ask your students, campers, or family members to compare how the list changes throughout the year, as birds come and go. Remember that identifying birds takes practice. By participating in bird counts you can practice your skills and learn tips and tricks from the experts.



Great Blue Heron	Hairy Woodpecker	Golden-winged Warbler	Blue Grosbeak
Little Blue Heron	Northern Flicker	Tennessee Warbler	Indigo Bunting
Green Heron	Pileated Woodpecker	Orange-crowned Warbler	Painted Bunting
Black-crowned Night Heron	Olive-sided Flycatcher	Nashville Warbler	Dickcissel
Yellow-crowned Night Heron	Eastern Wood Pewee	Northern Parula	Red-winged Blackbird
White-fronted Goose	Yellow-bellied Flycatcher	Yellow Warbler	Common Grackle
Snow Goose	Acadian Flycatcher	Chestnut-sided Warbler	Great-tailed Grackle
Ross's Goose	Alder Flycatcher	Magnolia Warbler	Brown-headed Cowbird
Wood Duck	Willow Flycatcher	Black-throated Blue Warbler	Orchard Oriole
Turkey Vulture	Least Flycatcher	Yellow-rumped Warbler	Baltimore Oriole
Black Vulture	Eastern Phoebe	Black-throated Green Warbler	House Finch
Swallow-tailed Kite	Great Crested Flycatcher	Blackburnian Warbler	Pine Siskin
White-tailed Kite	Eastern Kingbird	Yellow-throated Warbler	American Goldfinch
Mississippi Kite	Loggerhead Shrike	Pine Warbler	House Sparrow
Sharp-shinned Hawk	White-eyed Vireo	Prairie Warbler	
Cooper's Hawk	Blue-headed Vireo	Bay-breasted Warbler	
Red-shouldered Hawk	Yellow-throated Vireo	Blackpoll Warbler	
Broad-winged Hawk	Warbling Vireo	Cerulean Warbler	Additional Species:
Swainson's Hawk	Philadelphia Vireo	Black-and-white Warbler	
Red-tailed Hawk	Red-eyed Vireo	American Redstart	
American Kestrel	Blue Jay	Prothonotary Warbler	
Merlin	American Crow	Worm-eating Warbler	
Killdeer	Purple Martin	Swainson's Warbler	
Spotted Sandpiper	Carolina Chickadee	Ovenbird	
Ring-billed Gull	Tufted Titmouse	Northern Waterthrush	
Rock Dove	Red-breasted Nuthatch	Louisiana Waterthrush	
White-winged Dove	Brown Creeper	Kentucky Warbler	
Mourning Dove	Carolina Wren	Mourning Warbler	
Inca Dove	House Wren	Common Yellowthroat	
Eurasian Collared Dove	Winter Wren	Hooded Warbler	
Yellow-billed Cuckoo	Golden-crowned Kinglet	Wilson's Warbler	
Black-billed Cuckoo	Ruby-crowned Kinglet	Canada Warbler	
Eastern Screech Owl	Blue-gray Gnatcatcher	Yellow-breasted Chat	
Great Horned Owl	Veery	Summer Tanager	
Common Nighthawk	Gray-cheeked Thrush	Scarlet Tanager	
Chuck-will's-widow	Swainson's Thrush	Chipping Sparrow	
Chimney Swift	Hermit Thrush	Fox Sparrow	
Ruby-throated Hummingbird	Wood Thrush	Song Sparrow	
Black-chinned Hummingbird	American Robin	Lincoln's Sparrow	
Rufous Hummingbird	Gray Catbird	Swamp Sparrow	
Belted Kingfisher	Northern Mockingbird	White-throated Sparrow	
Red-headed Woodpecker	Brown Thrasher	White-crowned Sparrow	
Red-bellied Woodpecker	European Starling	Dark-eyed Junco	
Yellow-bellied Sapsucker	Cedar Waxwing	Northern Cardinal	
Downy Woodpecker	Blue-winged Warbler	Rose-breasted Grosbeak	





## CITIZEN SCIENCE [www.birds.cornell.edu/LabPrograms/CitSci/](http://www.birds.cornell.edu/LabPrograms/CitSci/)

From backyards and city streets to remote forests, anyone who counts birds can contribute to the Lab's research. Data from the projects described below are used to monitor bird populations and outline conservation efforts. It's easy and fun--join us!

[Fall/Winter Projects »](#)

[Spring/Summer Projects »](#)

[Year-Round Projects »](#)

### What is citizen science?

It is a partnership between the public and professional scientists. People across the continent are gathering data to better understand and conserve birds.

### Who can participate?

EVERYONE is invited to participate! No matter your location, age, or experience, we have a project for you.

### How do I participate?

Each project has easy-to-follow instructions describing how to count the birds and record additional information. Once you have submitted your data to the Lab, you have succeeded as a citizen scientist and contributed valuable data to bird conservation and population monitoring efforts.

The Lab projects are listed below by time of year: [Fall/Winter](#), [Spring/Summer](#), [Year-Round](#).

## FALL/WINTER PROJECTS

### Project FeederWatch



Join more than 16,000 other citizen scientists who periodically count the birds that visit their bird feeders from November to April. Your counts will help scientists track the distribution and abundance of birds in winter. Anyone can participate in Project FeederWatch.

### Great Backyard Bird Count



A four-day winter survey of birds. Anyone can submit observations and see results in real time over the Internet.

### Classroom FeederWatch



Students learn inquiry by observing and recording bird counts and interacting with university scientists. Data are part of a continent wide effort to learn more about bird population dynamics.



[www.birds.cornell.edu/LabPrograms/CitSci/](http://www.birds.cornell.edu/LabPrograms/CitSci/)

## CITIZEN SCIENCE

# YEAR-ROUND PROJECTS

## House Finch Disease Survey



Will House Finch eye disease cause an epidemic in the West as it has elsewhere? We need help from citizen scientists in all regions to find out more about how the disease is affecting House Finches across the continent.

## Urban Bird Studies



It's a mystery how birds survive in urban landscapes. Join hundreds of city residents and help scientists learn more about urban birds.

## eBird



A continentwide, year-round survey of North American birds: Any bird, Anywhere, Anytime. State-of-the-art Web technology provides simple and flexible, yet powerful, ability to track birds and share information with scientists, teachers, amateur naturalists, and other birders.

## PigeonWatch



Did you know that pigeons come in different colors? Join PigeonWatch and help scientists solve the mystery, "Why are there so many colors of pigeons?"

# SPRING/SUMMER PROJECTS

## The Birdhouse Network



Join and help scientists study and conserve North American cavity-nesting birds. All you need is a nest box (birdhouse) and a small amount of time each week during spring and summer to monitor the birds nesting in your boxes.





## CITIZEN SCIENCE

# SPRING/SUMMER PROJECTS (continued)



### Birds in Forested Landscapes

Help scientists examine the effects of habitat change (e.g. forest fragmentation) on North American birds. Participants choose study sites in forests of various sizes, then survey for target species by broadcasting recordings of the species' vocalizations.



### House Finch Nest Survey

Find nests of House Finches and help scientists discover how breeding affects House Finch eye disease.



### Golden-winged Warbler Atlas Project

Help determine the population status and habitat and area requirements of Golden-winged and Blue-winged warblers and their hybrids. Volunteer birders and professional biologists observe and record the warblers at known and potential breeding sites.

## ADDITIONAL RESOURCES

### All About Birds

Everything you ever wanted to know about birds!

<http://www.birds.cornell.edu/programs/AllAboutBirds>

### Educator's Guide to Bird Study

The Lab's citizen-science projects work well in elementary and middle-school classrooms. They promote scientific inquiry through children's natural fascination with birds.

### BirdSource

Developed and managed by the Cornell Lab of Ornithology and Audubon, BirdSource provides the technology that powers the Lab's citizen-science projects and implements interactive online projects.



## Migrants By Mail

by Mary Anne Weber

Many educators are familiar with the *Flat Stanley Project*. This fun and educational project is based on a 1964 children's book. In 1995 Dale Hubert, a 3rd grade teacher in London, Ontario decided to turn the story into a school project. Schools around the world now participate in *Flat Stanley Projects*.

Based on this wonderful example, *Migrants By Mail* allows students to explore the globe, practice communication skills, discover geography and appreciate the incredible journeys that birds and other animals travel each year.

- Have your students create their own "flat" migrants using the birds found in this manual. Students should make their migrant on heavy stock paper and make sure that the migrant will fit in the envelope that will be used.
- Ask your students to write their own letter describing why they are participating in this project.
- Record the date and address that the original migrant is sent from.
- Record each return with the date it was received and the address.
- Students can now map the destinations, calculate mileage and time spent getting to each location.
- Compare these results to routes taken by real birds and the length of time it takes them. On the reference pages in the "bird" section you will find the average flight speed for many birds.



Black-and-white Warbler

For information about  
*Flat Stanley Project*  
<http://flatstanley.enoreo.on.ca/>





## Migrants By Mail - Letter Instructions

**FROM:**

**To:**



Dear "friend"

This is my Black-and-white Warbler. This bird is a neotropical Migrant. Each fall this bird travels past my home in Houston and across the Gulf of Mexico to the Yucatan peninsula. I am studying bird migration with my class (family etc...). We are mapping the route that each of our Migrant Mail Birds take and how long it takes them. This activity is also helping us to learn about geography.

Could you email me the date when you received this card?

My class email is:

Please send this migrant on to another friend with the same instructions.

Thanks for all your help with our project.





## Migrants By Mail - Keeping Track

### Student Name

Departure Date

Departure Address



Return 1 Date

Return 1 Address

Return 2 Date

Return 2 Address

Return 3 Date

Return 3 Address

**Total Distance (miles) Traveled:**

**Total Length of Time (days):**





## You Are What You Eat

By Maya Putra

**Grade Level** - 3rd -5th grade

**Subject Areas** - Science and Art

**Setting** - outdoors

### Objectives

- To learn how certain animals' eating habits determine their physical appearance
- To learn how colored water can affect a flower's physical appearance
- To demonstrate how colored water can affect a flower's physical appearance
- To paint or draw animals whose physical appearance is based on their diet

### Method

Students learn how certain animals' eating habits determine their physical appearance by demonstrating the effects that colored water has on a white flower.

### Materials

- Pictures of animals whose eating habits determine their physical appearance (e.g. roseate spoonbills, flamingos)
- A white carnation/rose
- Glass of water
- Food coloring
- Paint (a minimum of red, blue, and yellow)
- Paper (amount depending on number of students)
- Paintbrushes (amount depending on number of students)



*Roseate Spoonbill*  
By John James Audubon

### ***A Kid's Gateway to Art and Nature***

This manual was created by the Student Environmental Art Council and Natural Legacy. Local high school students created the activities for the guide and the artwork. They also participated in outdoor environmental activities around south-east Texas.

Natural Legacy is a community-based organization focused on building the awareness and knowledge of youth in the areas of land stewardship, nature education and creative use of space.



## Background

Nature presents us with a kaleidoscope of colors. From the green grass of a lawn to a forest's ruddy autumn hues, we are surrounded by a palette of natural colors. Most living things obtain their colors from natural pigments. The most common and most important natural pigments are the "carotenoids." Carotenoids are mostly found in plants to enable photosynthesis, but they are also found in bacteria, yeast, and mold. Carotenoids are responsible for many of the red, orange, and yellow hues of plant leaves, as well as the colors of some insects, fish, and crustaceans. Crustaceans constitute the Roseate Spoonbill's and Flamingo's principal diet, contributing to the pink color of its plumage.

Roseate Spoonbills can be observed in marshes around the Houston area.

## Procedure

1. Tell students how certain birds' eating habits determine their physical appearances. Explain how the color of their plumage is affected by the food they eat. Take into account the Roseate Spoonbill or any species of bird with similar characteristics and show them pictures of these birds.
2. Gather the materials needed: a glass of water, food coloring, and a white flower
3. Squeeze 2 - 3 drops of food coloring into the glass of water, then stir.
4. Submerge the white flower into the now colored glass of water.
5. Leave the flower in the glass of water for 20 - 30 minutes.
6. Have the students gather around and observe what happens to the white flower.
7. Explain the relationship between the flower coloration exercise and the way in which bird plumage gets its coloration.
8. Using paint, paintbrushes, and paper, have the students paint a picture of an animal of their choice whose coloration is affected by its eating habits.

## Evaluation

1. What happened to the white carnation/rose?
2. How does this activity relate to the plumage colors of certain birds?
3. What would happen if the now colored carnation/rose were to be submerged into clear water?
4. Discuss which types of food give colors to the plumage. What would happen if those birds were to stop eating those foods?

## Extensions

1. Have the students research other animals (not only birds) whose coloration is affected by their eating habits.
2. Have students do a black and white version of their paintings using black and white paint or pens and pencils.
3. Have students write a poem about the birds described in the activity.







**For more information on Natural Legacy and the  
Student Environmental Art Council**

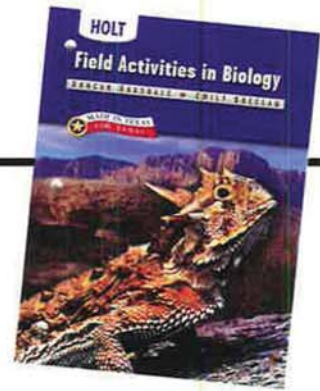
**Natural Legacy  
Harris County After-School Initiative  
Lisa Caruthers  
6300 Irvington  
Houston, TX 77022**

**713.696.1336  
lcaruthers@hcde-texas.org**

**Student Environmental Art Council  
The Artist Boat  
Directors: Karla Klay and Tina Proctor  
4919 Austin Place  
Galveston, TX 77551**

**1.409.770.0722  
kklay@houston.rr.com**

The Artist Boat offers Eco-Art and Eco-Tour Adventures to students, visitors, and community members in Harris, Galveston, and Chambers Counties. These art and environmental educational experiences provide participants with a sense of place, an introduction to the restoration and conservation projects in the Lower Galveston Bay Watershed, a visual outreach tool in educating friends and family about the Upper Texas Gulf Coast's history and beauty, and a unique experience founded in the traditions of naturalists, scientists, and artists. Eco-Art and Eco-Tour adventures are kayaking and canoeing tours that combine art and science.



## Frequent Flier Miles

By Mary Anne Weber  
Field Activities in Biology  
Copyright © Holt, Rhinehart and Winston

Every spring, a flock of endangered whooping cranes leaves the Aransas National Wildlife Refuge in Aransas, Texas, and begins its journey to Canada's Wood Buffalo National Park. The cranes are likely to encounter numerous hazards during their 2,500 mile, 2-3 week journey. And they are on a tight schedule. Once the birds arrive in Canada, they must quickly build a nest, lay eggs, incubate the eggs, and then raise their young. The baby cranes have little time to build up endurance for the return trip to Texas before the cold Canadian winter begins.

The whooping crane is one of many birds that migrate each year. Some birds make relatively short trips of a few hundred miles. Others travel thousands of miles. The Arctic Tern is the champion migrator. This bird travels up to 25,000 miles each year. Migration journeys are incredibly athletic feats. For example, an average-sized bird must remain in flight for about 18 hours to cover the 600-mile stretch over the Gulf of Mexico.

### Background Understanding Migration

Why do migrants migrate? What kinds of adaptations do birds need to survive long-distance travel? Does their behavior change during the journey or when they arrive in a new habitat? Are migratory birds more in need of environmental protection than other birds are? In this activity, you will follow a specific bird into the fascinating world of migration to learn the answers to these and other questions. You will share what you learn by creating a model that shows your bird's migratory path and many of its unique characteristics and habits.

### Materials

- computer with Internet access
- thick poster board or cardboard
- atlas or globe
- modeling clay
- map pins, straight pins, or toothpicks
- string or yarn
- paints
- scissors
- glue
- miscellaneous items to illustrate characteristics and habits of bird



chosen





## Frequent Flier Miles

By Mary Anne Weber

Field Activities in Biology

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### Procedure

#### Part A: RESEARCH

1. Use library or Internet resources to research migratory birds. Choose one species and do detailed research on that bird. You may wish to choose a bird that migrates through your region.
2. Find out and list the following facts about your bird:
  - basic natural history
  - classification
  - physical characteristics
  - feeding habits
  - habitat
  - reproduction habits
  - population status
  - conservation issues
  - where your species breeds
  - where your species lives during the winter
  - the route your species takes when it migrates
  - the timing of your bird's migration
  - the typical length of a daily trip
  - the bird's flight speed
  - how much energy the bird uses each day to maintain its flight speed



#### Part B: MODELING

3. Create a model of your bird's migratory route. To do this, on the poster board or cardboard, outline the western hemisphere or other broad geographical region that includes your bird's migratory route.
4. **CAUTION: Wear an apron when working with clay, paint, and other craft materials. Exercise extreme caution when using scissors and pins or toothpicks.** Spread the modeling clay across the board to fill in the entire land area. Make your model as three-dimensional as possible by adding geographic features. Features should include mountain ranges, islands, rivers, and other markers.
5. Carefully mark the migratory route of your bird using pins or toothpicks and string or yarn.



## Frequent Flier Miles

By Mary Anne Weber  
Field Activities in Biology  
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6. Enhance your model with details to describe characteristics of the bird and its route. For instance, if you are showing the migratory route of a whooping crane, and you know that these birds often visit rice fields during their migration, you could glue rice onto the map at an appropriate point. Also include a photo or other representation of the bird.

### Sample Migration Data

Here's a sample scenario that one student used to create a model for the whooping crane. The scenario shows some of the bird's habits as well as brief descriptions of the areas it travels through. Use this example as a guide when designing your model.

- One morning in mid-April, distinctive "whooping" calls are heard as a whooping crane family of three takes off from the Aransas National Wildlife Refuge.
- The cranes reach an altitude of about 2,000 feet and establish a regular pace of about 30 miles per hour as they travel over southern Texas.
- Spending the night on a farm in Oklahoma, the birds feed on grains left behind by a farmer who wants to help the rare birds.
- Taking off from a roosting site near Wichita, Kansas, the birds must navigate around a new cell phone tower. Two excited bird watchers spot the whooping cranes. They identify the rare birds by their large size, snowy white color, and distinctive red markings on the head.
- In rural Nebraska, a hunter illegally takes aim at the endangered birds. The birds barely escape.
- The family joins a large flock of sandhill cranes at a wetland in east central South Dakota
- For several days, high winds and rain keep the birds grounded near a riverbed in Saskatchewan, Canada.
- They made it! The family reaches their breeding grounds in the Wood Buffalo National Park in the Northwest Territories, Canada.







## Frequent Flier Miles

By Mary Anne Weber

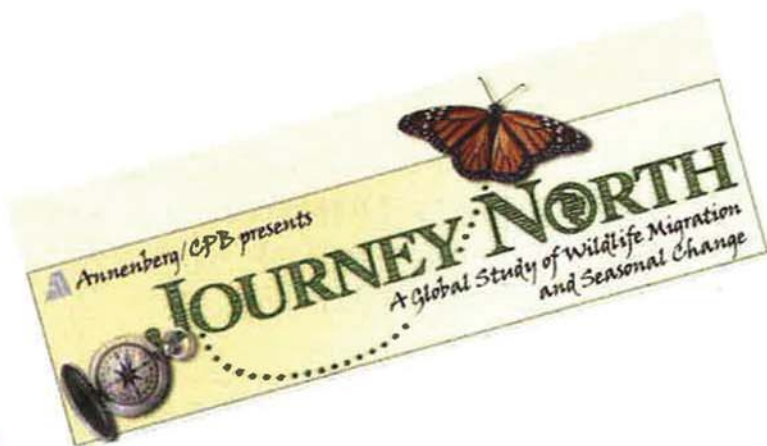
Field Activities in Biology

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### Part C: EXTENSION

Now that you've learned so much about migratory birds, get involved in a bird conservation (protection) program! One way to get involved is to join an online research program such as Journey North. This interactive program enables students to enter real data about migration observations and receive up-to-the-minute migration data from around the country. You could also take part in International Migratory Bird Day (IMBD). IMBD is held every year on the second Saturday in May. IMBD helps celebrate and build awareness about your migratory bird conservation.

<http://www.learner.org/jnorth/>



**To order the Field  
Activities in Biology Manual**

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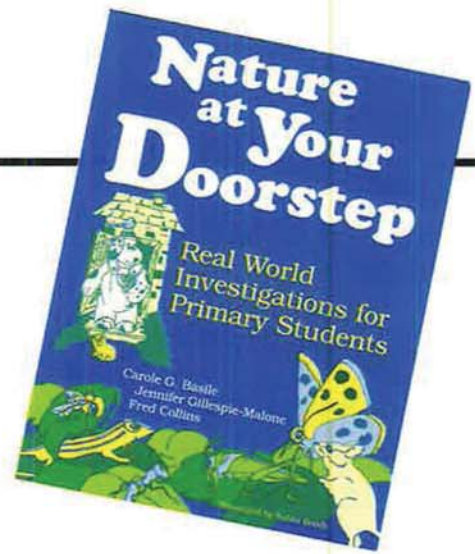
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International Migratory Bird Day celebrates the incredible journeys of migratory birds between their breeding grounds in North America and their wintering grounds in Mexico, Central, and South America. The event, which takes place on the second Saturday in May each year, encourages bird conservation and increases awareness of birds through hikes, bird watching, information about birds and migration, public events, and a variety of other education programs.

Join us in the celebration!

### International Migratory Bird Day

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## NATURE AT YOUR DOORSTEP

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### Beginning Birdwatching

#### *What's Happening*

Birds are the only animals in the world with *feathers*. They can be big or small, with many colors on their feathers, or only one. Some run very fast, some can swim, and most can fly. Scientists who study birds are *ornithologists*. They learn about the colors of different birds, where to look for birds, and the different ways they act.

#### *Schoolyard challenge*

Your challenge is to become an ornithologist. You will keep track of birds that you see. Ask yourself some questions about birds, such as: What is the main color of different birds? Where do birds spend their time? What do birds do?

#### **EXTRA! Word Play**

Here are some bird riddles. Can you figure out which bird name answers the riddle? What bird is a sad letter? What must you do before you digest your food? What is another way of saying "crazy"? What bird's name is a country? What are thieves doing?



#### **Word Play Answers**

Each of the riddles represent a different bird. Examples: What is a sad letter? Blue Jay. What must come before digestion? Swallow. What is crazy? Loon or Cuckoo. What is a country? Turkey. What are thieves doing? Robin. See if your students can make up some of their own with the use of field guides or other books about birds.





## **Schoolyard Challenge**

Read Schoolyard Challenge with your students. Write the questions on the board or on separate chart paper for later use. Add other questions the students have about birds. Explain that the questions in Schoolyard Challenge are the questions you will begin answering today, and that you will answer the others on another day. Keep the list of questions posted in the classroom so you can add any that come up later and check off those that you investigate. Don't worry if you cannot answer the questions the students ask - research them together.

## **INVESTIGATING**

In this activity, we suggest starting with Investigation 1 and then moving to either Investigation 2 or 3. The first one is concerned with finding and identifying birds by location. The second focuses on color, and the third on behavior. All data sheets ask students to check the appropriate box based on what they see. Start by having the students fill in their variables and hypotheses.

Birds are often more than one color. As you find birds, allow each student to choose which color they think is the primary one. Blue would probably be the primary color for blue jays, but some students might choose black or white. Encourage the students to approach a bird slowly to get a good look at its colors. They also have the option of reporting that they "can't tell" what color a bird is. This may happen if a student sees only a silhouette, or if the bird is too far away to identify.

After collecting data, have the students write their conclusions. Then compare their conclusions with their hypotheses and ask: Were their conclusions the same or different from their hypotheses? Why?

## **MAKING COMPARISONS**

A number of comparisons can be made. Use this worksheet to compare the birds found in the front of the school to the birds found in the back of the school, birds found on bird feeders and birds found in trees, or birds found at different times of the year.

## **CONNECTING MATHEMATICS**

### **Creating a Representation**

For this unit, students can create their own horizontal bar graphs representing the data they have collected about the location of the birds they saw or what the birds were doing. Depending on the age and experience of the group, you can use the sheet provided or create class-sized graphs. Have students shade in the boxes that correspond to the number of birds they saw in a particular location. Students can create their own graphs to show different locations, colors, or behaviors.



### **Analyzing the Data**

Follow-up questions provided in Analyze Your Data allow students to think about the data they collected by reviewing their representation. Older students can write their own answers, or you can use these questions for discussion purposes.

### **Solving a Problem**

Have students try this problem: "Little Island has a population of 100 birds. The population doubles every five years. What will the population be in 30 years?" Calculators will be helpful. (In 30 years there will be 6,400 birds; in 60 years there will be 409,600 birds, and in 100 years there will be 104,857,600 birds.)

## **CREATING YOUR OWN INVESTIGATION**

This is an opportunity for students to take home a new data sheet to create their own scientific study about birds, and collect information from their home environment.



## **EXTENDING**

- Go back to the suggested activities, children's literature, or Word Play, and try those you skipped, or try them again with a new twist.
- Reuse an Investigation sheet at different locations, at different times of the day or year, or while on a field trip.
- Review the questions students had during the unit and make sure they are all answered.
- Have the students assemble a notebook containing all their investigations, so they can see their progress as scientists. This will provide a good assessment for both you and the students, as well as something that will make everyone feel proud.





# BIRDS 1

## INVESTIGATION

Investigator \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Weather \_\_\_\_\_

Study area \_\_\_\_\_

**QUESTION:** Where will I find most birds today?

**HYPOTHESIS:** I **think** that I will find most birds \_\_\_\_\_

**DATA:** Fill in one box for each bird you see.

In the air:



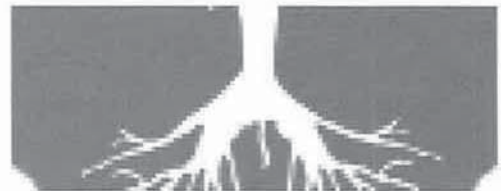
High in the trees:



Low in the bushes:



On the ground:



**CONCLUSION:** I found \_\_\_\_\_



# BIRDS 2

## INVESTIGATION

Investigator \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Weather \_\_\_\_\_

Study area \_\_\_\_\_

**QUESTION:** What color will most birds be today?

**HYPOTHESIS:** I **think** that most birds will be \_\_\_\_\_

**DATA:** Fill in one box for each bird you see.

<b>RED</b>											
<b>ORANGE</b>											
<b>YELLOW</b>											
<b>GREEN</b>											
<b>BLUE</b>											
<b>PURPLE</b>											
<b>BROWN</b>											
<b>BLACK</b>											
<b>WHITE</b>											
<b>GRAY</b>											
<b>CAN'T TELL</b>											

**CONCLUSION:** I found \_\_\_\_\_

\_\_\_\_\_







# BIRDS

## MAKE A COMPARISON

My comparison is between \_\_\_\_\_  
\_\_\_\_\_

**What is the same?** (Write a sentence or draw a picture)

**What is different?** (Write a sentence or draw a picture)





# BIRDS

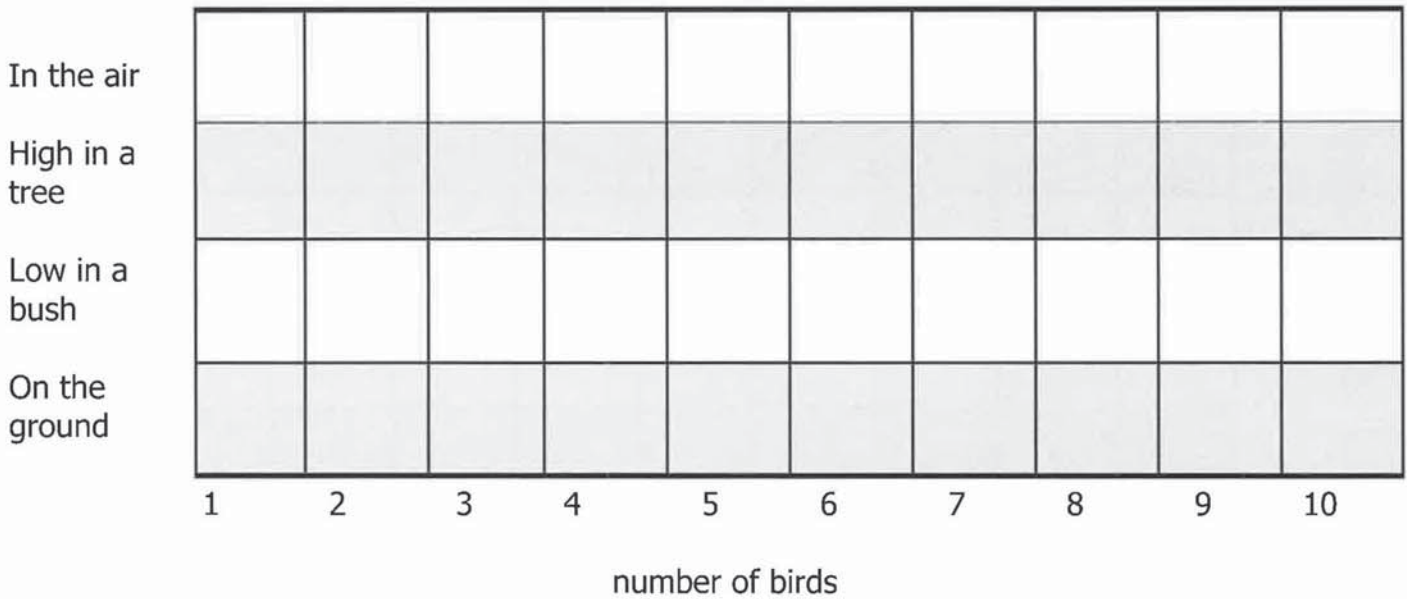
## MATH CONNECTION

Can you create a horizontal bar graph for your data?

Where were the birds?

**TITLE:** \_\_\_\_\_

locations



**Analyze your data:**

Where did you see the most birds? \_\_\_\_\_

Why do you think you saw the most birds there? \_\_\_\_\_

Where did you see the least birds? \_\_\_\_\_

Why do you think you saw the least birds there? \_\_\_\_\_



# BIRDS

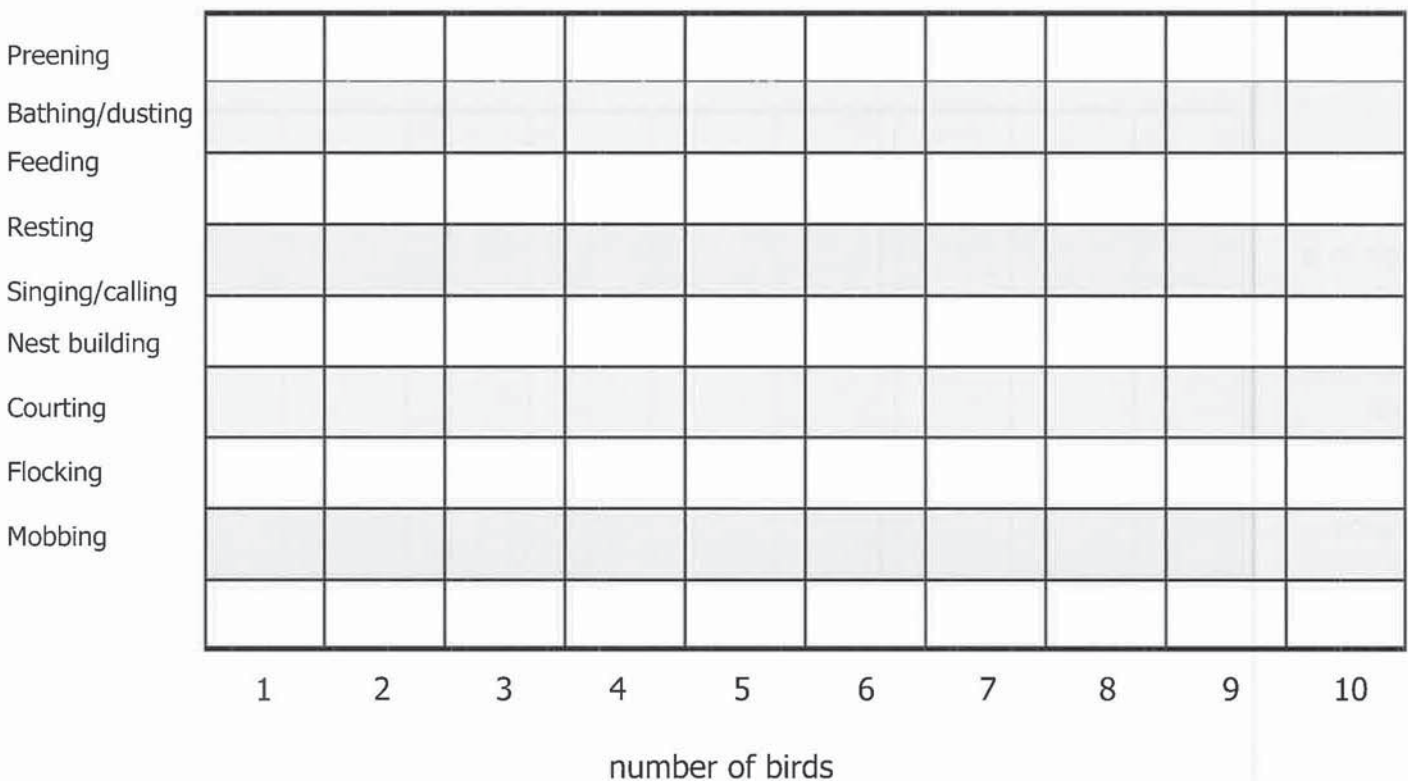
## MATH CONNECTION

Can you create a horizontal bar graph for your data?

What were the birds doing?

**TITLE:** \_\_\_\_\_

behavior



**Analyze your data:**

What were most birds doing? \_\_\_\_\_

Why do you think they were doing that? \_\_\_\_\_





# BIRDS

## CREATE YOUR OWN

(Title) \_\_\_\_\_  
**INVESTIGATION**

Investigator \_\_\_\_\_  
Date \_\_\_\_\_  
Time \_\_\_\_\_  
Weather \_\_\_\_\_  
Study area \_\_\_\_\_

**QUESTION:** (What question do you have?) \_\_\_\_\_

**HYPOTHESIS:** (What is your hypothesis?) \_\_\_\_\_

**DATA:** (How will you keep track of your data?) Create your own data table:

**CONCLUSION:** I found \_\_\_\_\_  
\_\_\_\_\_



---

## Migrant Bingo

By Mary Anne Weber

Artwork by Maya Putra and James Dong

### Directions

Just like a typical bingo game, this activity uses the following game boards and any kind of token you have on hand. There are seven different game boards for the participants to use. The game and questions deal with the 26 birds featured in this manual. The questions are just examples of what you can ask during the game. Have students make up their own after they have studied the birds.

### Questions and Answers

- This is what you call someone who studies birds. (**Ornithologist**)
- This bird is the state bird of Oklahoma. (**Scissor-tailed Flycatcher**)
- This tiny insectivore may be small, but it is a "royal" bird. (**Ruby-crowned Kinglet**)
- Like a real fisherman, this bird knows just what bait will get the fish to bite. (**Green Heron**)
- Many birds migrate north before they build this. (**Nest**)
- What tool do birdwatchers use to help them see birds that are far away? (**Binoculars**)
- When birds collide into these obstacles, many of them won't survive their migration. (**Towers**)
- This fast flyer used to be called the "duck hawk". (**Peregrine Falcon**)
- This bird uses a special tongue to prey on ants in our parks and yards. (**Northern Flicker**)
- If Maid Marion was a bird, she may like the looks of this small warbler. (**Hooded Warbler**)
- Some birds spend most of their lives going from one end of this to the other. (**Earth**)
- This high flying highway passes through Texas. (**Central Flyway**)
- Building these will help many "cavity" nesting birds. (**Birdhouse**)
- This famous explorer lived over 200 years ago and spent most of his life painting birds. (**Audubon**)
- This bird is shy so watch for them on the ground looking under leaves for insects. (**Hermit Thrush**)
- This bird is not a "bird of prey", but flying insects should get out of the way when this bird flies. (**Common Nighthawk**)





## Migrant Bingo

By Mary Anne Weber

Artwork by Maya Putra and James Dong

- Luckily for this bird, we don't have to use our fireplaces to keep warm until they have gone south. (**Chimney Swift**)
- Locating this sweet treat is easy in the summer but these tiny birds must head south before winter. (**Flower Nectar**)
- All birds have them, take care of them, and lose them at least once a year. (**Feathers**)
- This small insectivore is named for the coloration on its side. (**Chestnut-sided Warbler**)
- Researchers use these to track how far birds travel and how long birds live. (**Bird Bands**)
- Birds are such good navigators that in the past they were used to deliver this. (**Mail**)
- In the past, people thought birds hibernated in the winter, but now we know that they migrate. (**People waving goodbye**)
- These cavity nesting birds like to nest in groups and travel in large flocks. (**Purple Martin**)
- Weighing less than .2 oz, this is one of our tiniest travelers. (**Ruby-throated Hummingbird**)
- Like a child's toy, this bird is an aerial acrobat while hunting insects and migrating south. (**Mississippi Kite**)
- This "skulker" is shy and solitary, but likes to do a lot of talking. (**Yellow-breasted Chat**)
- This bird has special enzymes to help it digest waxes found in certain fruits. It is named for the color found on its rump. (**Yellow-rumped Warbler**)
- This bird is an expert excavator for a sweet, sticky tree substance. (**Yellow-bellied Sapsucker**)
- This frugivorous bird is highly nomadic as it searches for berries in winter. (**Cedar Waxwing**)
- Small insects should be wary of this "bug catching" bird. (**Blue-gray Gnatcatcher**)
- Looking like a miniature avian zebra, this bird spends most of its time searching under leaves for insects. (**Black-and-white Warbler**)



## Migrant Bingo

By Mary Anne Weber

Artwork by Maya Putra and James Dong

- Many people in Central and South America believe this bird is a symbol of Christmas. (**American Redstart**)
- This bird may be small, but it is a fast flying bird of prey with keen eyesight. (**American Kestrel**)
- This bird may not look like a precious mineral when it arrives in Texas, but it is still a welcome migrant. (**American Goldfinch**)
- This bird is not afraid to take on a bee or wasp nest. (**Summer Tanager**)
- The "glasses" this bird wears don't help it to catch insects, but help us to identify it. (**White-eyed Vireo**)
- This small shorebird makes a huge migration. (**Least Sandpiper**)
- You can find this bird "bobbing" along the edges of ponds and creeks. (**Spotted Sandpiper**)
- The female of this bird can lay so many eggs that the weight of the eggs equals her own weight. (**Ruby-crowned Kinglet**)
- Strong, sudden storms on the open prairie can destroy many nests built by these birds. (**Scissor-tailed Flycatcher**)
- This bird is an excellent songster, singing its own songs and copying songs from other birds. (**Yellow-breasted Chat**)
- This bird doesn't eat the snack that some say it "sings" for. (**American Goldfinch**)
- This insect and fruit eating bird is the only completely red bird in North America. (**Summer Tanager**)
- Look for this bird hunting gulls and shorebirds on the beach in winter. (**Peregrine Falcon**)



Now it is time for your students to make up their own questions. Have them study the birds featured in the manual. Students should look at the game boards as they develop their own questions.



<p><b>This is what you call someone who studies birds.</b></p>	<p><b>This bird is the state bird of Oklahoma.</b></p>	<p><b>This insectivore may be small, but it is a "royal" bird.</b></p>
<p><b>Like a real fisherman, this bird knows just what bait will get the fish to bite.</b></p>	<p><b>Many birds migrate north before they build this.</b></p>	<p><b>What tool do bird watchers use to help them see birds that are far away?</b></p>
<p><b>When birds collide into these obstacles, many of them won't survive their migration.</b></p>	<p><b>This fast flyer used to be called the "duck hawk".</b></p>	<p><b>This bird uses its special tongue and saliva to prey on ants in our parks and yards.</b></p>





**If Maid Marion was a bird, she may like the looks of this small warbler.**

**Some birds spend most of their lives going from one end of this to the other.**

**This high flying highway passes through Texas.**

**Building these will help many "cavity" nesting birds.**

**This famous explorer lived over 200 years ago, and spent most of his life painting birds.**

**This bird is shy, so watch for them on the ground looking under leaves for insects.**

**This bird is not a "bird of prey", but flying insects should get out of the way when this bird flies.**

**Luckily for these birds we don't have to use our fireplaces to keep warm until they have migrated south.**

**Locating this sweet treat is easy in the summer, but tiny birds must head south before it withers in winter.**





<p><b>All birds have them, take care of them, and lose them at least once a year.</b></p>	<p><b>This small insectivore is named for the coloration on its sides.</b></p>	<p><b>Researchers use these to track how far birds travel and how long birds live.</b></p>
<p><b>Birds are such good navigators that in the past they were used to deliver this.</b></p>	<p><b>In the past, people thought birds hibernated in the winter, but now we know that they migrate.</b></p>	<p><b>These cavity nesting birds like to nest in groups and travel in large flocks.</b></p>
<p><b>Weighing less than .2oz, this is one of our tiniest travelers.</b></p>	<p><b>Like a child's toy, this bird is an aerial acrobat while hunting insects and migrating south.</b></p>	<p><b>This "skulker" is shy and solitary, but likes to do a lot of talking.</b></p>





<p><b>This bird has special enzymes to help it digest waxes found in certain fruits. It is named for the color found on its rump.</b></p>	<p><b>This bird is an expert excavator for a sweet, sticky tree substance.</b></p>	<p><b>This frugivorous bird is highly nomadic as it searches for berries in winter.</b></p>
<p><b>Small insects should be wary of this quick "bug catching" bird.</b></p>	<p><b>Looking like a miniature avian zebra, this birds spends most of its time searching under leaves for insects.</b></p>	<p><b>Many people in Central and South America believe this bird is a symbol of Christmas.</b></p>
<p><b>This bird may be small, but it is a fast flying bird of prey with keen eyesight.</b></p>	<p><b>This bird may not look like a precious mineral when it arrives in Texas, but it is still a welcome migrant.</b></p>	<p><b>This bird is not afraid to take on a bee or wasp nest.</b></p>





<p><b>The “glasses” this bird wears don’t help it to catch insects, but helps us to identify it.</b></p>	<p><b>This small shorebird makes a huge migration.</b></p>	<p><b>You can find this bird “bobbing” along the edges of ponds and creeks.</b></p>
<p><b>The female of this bird can lay so many eggs that the weight of the eggs equals her own weight.</b></p>	<p><b>Strong, sudden storms on the open prairie can destroy many nests built by these birds.</b></p>	<p><b>This bird is an excellent songster, singing its own songs and copying songs from other birds.</b></p>
<p><b>This bird doesn’t eat the snack that some say it “sings” for.</b></p>	<p><b>This insect and fruit eating bird is the only completely red bird in North America.</b></p>	<p><b>Look for this bird hunting gulls and shorebirds on the beach in winter.</b></p>







ORNITHOLOGIST









ORNITHOLOGIST















ORNITHOLOGIST



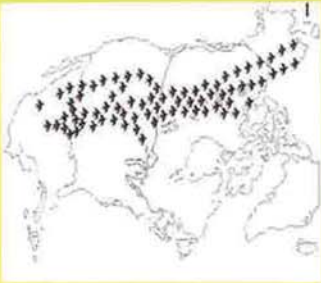






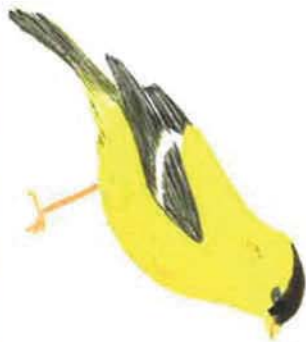


















## Thaumatrope

from *School-to-School A Science Festival!*

presented by  
Christine Hawthorne  
Carol Singletary  
Rita Williams  
Dunbar Middle School, Dickinson, TX

**Background:** A thaumatrope is a device made of a card with a different design on each side of it. When the card is spun, the two designs appear to be one. This demonstrates the persistence of vision. The human eye works like a camera. The shutter in a camera adjusts to regulate the amount of light. The pupil in the eye does this. The lens focuses the light to form a picture. The eye's retina is like film that records the image. It is composed of millions of cells that are light sensitive. It also contains cells that change light into impulses that are sent to the brain.

**Purpose:** The purpose of this activity is to show that the retina in the eye is capable of retaining an image even after the source of the picture has been removed.

**Materials:** Pattern  
Scissors  
Glue or tape  
Hole punch  
Crayons or markers  
Tagboard pieces  
Rubber bands

### Procedure:

1. Cut out the pattern pieces.
2. Color the designs.
3. Use the front piece of the pattern to cut out a square of tagboard the same size.
4. Tape or glue the pieces of the pattern onto the tagboard. Put the back side on **upside-down** from the front piece.
5. Punch a hole in each end of the thaumatrope.
6. Fit a rubber band through each hole. Wrap the rubber band inside itself. Pull tight.
7. Wind the rubber bands as tightly as possible.
8. Pull the rubber bands and let them unwind.
9. Watch what happens

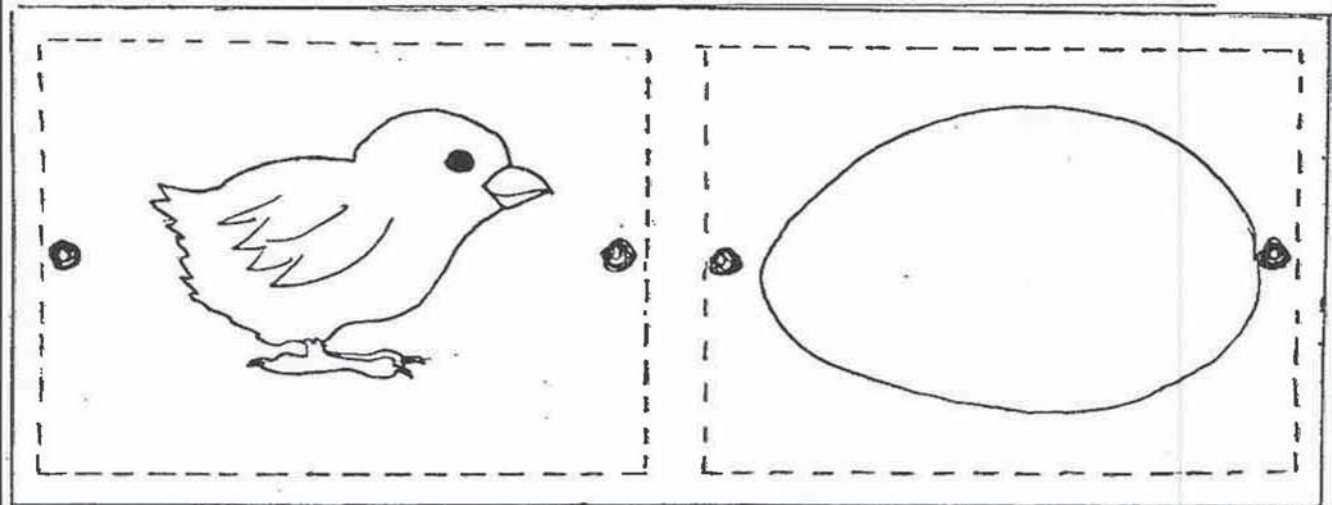
**Why It Works:** As the picture spins, the retina in the eye will retain the image of one picture even after it has passed. The pictures spin fast, and the thaumatrope appears as one picture.

# Thaumatrope

from *School-to-School A Science Festival!*

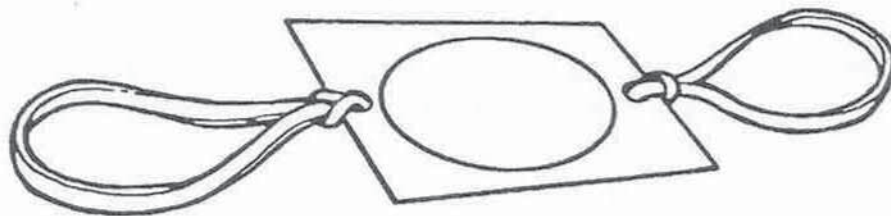


## Thaumatrope Pattern



Front

Back







## Mindful of Migration

From *Shorebirds - Migratory Super Heroes!*

### U.S. Fish and Wildlife Service

National Conservation Training Center

Shorebird Sister Schools Coordinator

Route 1 Box 166, MS -18

Shepherdstown, WV 25443

<http://sssp.fws.gov>

If you are visiting a National Wildlife Refuge that is a migration stopover site during spring, you will probably see thousands of shorebirds. But if you are visiting the refuge in the summertime, you might only see a handful. Where have all the shorebirds gone? Many birds have both summer and winter homes. Each year they make the same round-trip flight, or migration, from one home to the other. Why would they make this long and dangerous trip every year? Most North American birds migrate south for the winter to follow warmer weather and abundant food supplies, and return north to nest when spring has sprung.

Chincoteague National Wildlife Refuge in Virginia is located on the Atlantic flyway, a common route for migrating birds. More than 320 species of birds use the refuge as a stopover to rest and eat during their long journeys.

Refuge biologists keep track of the bird species using the refuge. This information is used to follow trends or patterns in bird populations and to change the refuge's management practices if necessary.

### Activity Instructions:

Study the shorebird surveys below. Based on the survey information, graph when those birds are at the refuge, and answer the questions.

### Questions:

- If Dunlins are at the Chincoteague National Wildlife Refuge in fall through spring, where do they go in the summer?
- Do you think Piping Plovers breed at the refuge, or simply stop to rest during their migration?
- Do you think Least Sandpipers breed at Chincoteague, or simply stop to rest during their migration?



## Mindful of Migration

From *Shorebirds - Migratory Super Heroes!*

**U.S. Fish and Wildlife Service**

National Conservation Training Center

Shorebird Sister Schools Coordinator

Route 1 Box 166, MS -18

Shepherdstown, WV 25443

<http://sssp.fws.gov>

### Chincoteague National Wildlife Refuge - Shorebird Survey

	January	Feb.	March	April	May	June	July	August	Sept.	October	Nov.	Dec.
Dunlin	357	848	526	806	6,663	4	0	0	0	99	2,356	427
Least Sand-piper	0	2	0	58	1,253	0	595	61	70	0	5	0
Piping Plover	0	0	30	60	66	90	90	80	30	0	0	0



Least Sandpiper  
By  
Maya Putra





## Mindful of Migration

From *Shorebirds - Migratory Super Heroes!*

**U.S. Fish and Wildlife Service**

National Conservation Training Center

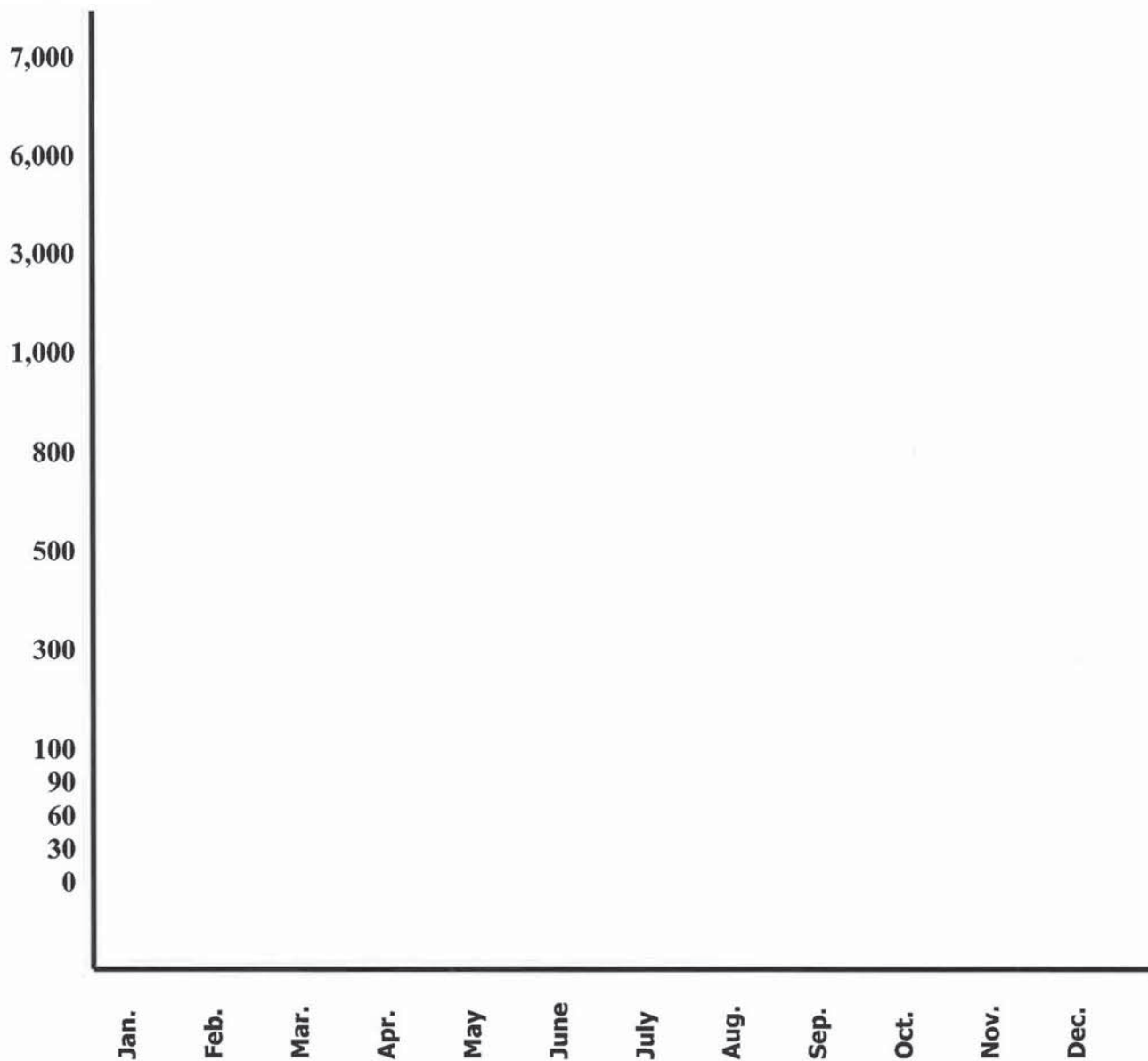
Shorebird Sister Schools Coordinator

Route 1 Box 166, MS -18

Shepherdstown, WV 25443

<http://sssp.fws.gov>

### Number of birds



Months of the Year



## Even Super Heroes Need Our Help

From *Shorebirds - Migratory Super Heroes!*

**U.S. Fish and Wildlife Service**

National Conservation Training Center

Shorebird Sister Schools Coordinator

Route 1 Box 166, MS -18

Shepherdstown, WV 25443

<http://sssp.fws.gov>

### Western Hemisphere Shorebird Reserve Network (WHSRN)



**START**

**FINISH**



Native Plants



Can you think of something that the countries of Argentina, Suriname, Brazil, the United States, and Canada all have in common? They all provide habitat for shorebirds!

Since shorebirds travel through many different countries it is very hard to protect them. People throughout the Americas must work together to preserve the wetlands needed by shorebirds during migration.

As the sandpiper migrates north, show it all the special things people are doing across the Americas to help conserve shorebirds and their habitats.





## Which Way to the Nesting Grounds?

From *Shorebirds - Migratory Super Heroes!*

**U.S. Fish and Wildlife Service**

National Conservation Training Center

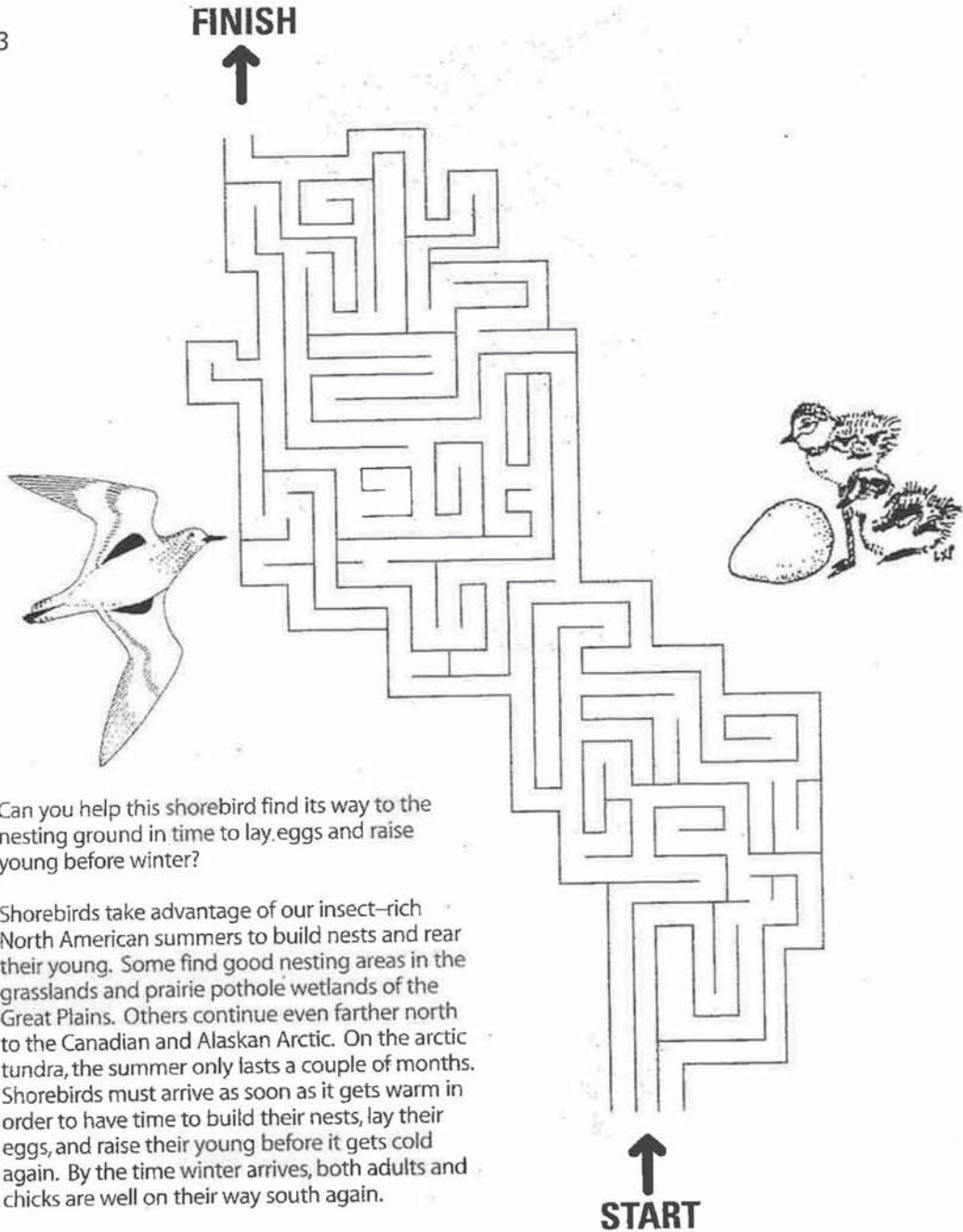
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Route 1 Box 166,

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## Bird Topography

When you venture outside to identify birds, it is helpful to be familiar with some basic terms that describe the outside of a bird, and a few clues to look for in the field. Bird topography is a map to the outside characteristics of a bird that can be seen and documented. The following three pages show some simple terms that are used to describe various parts of a bird's body. You can find more detailed descriptions of bird topography in most field guides.

### 5 CLUES

**Silhouette and Size**  
**Plumage and Coloration**  
**Behavior**  
**Habitat**  
**Voice**

### Activity

Hold a relay race for your students or family. Draw two or more large silhouettes of a bird on poster paper. Write the topography terms on small pieces of tissue paper. Form two or more teams of players. Teams line up behind a rope. Each player is given a straw that has been cut in half. Lay the pieces of tissue paper out on the ground in front of the teams. You may want to write each term on several pieces of paper. Designate one person as the "clue giver" for each team.

At "GO", the "clue giver" quickly reads a description of a particular part of a bird without using the topography term. The first person in each team must run forward, find the appropriate term, and pick it up by sucking the paper up with the straw. They must then run to the diagram, and tape the term on the bird at the appropriate spot. They must then run back, and tag the next person in line. Play continues until one team has completed labeling their bird.

### Resources

<http://www.kidwings.com/bodyparts/topography/index.htm>

<http://birding.com>

[http://birds.cornell.edu/schoolyard/all\\_about\\_birds/bird\\_id/bird\\_topography.html](http://birds.cornell.edu/schoolyard/all_about_birds/bird_id/bird_topography.html)

<http://www.enature.com>

<http://www.nuthatch.birdnature.com/identification.html>





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## 5 CLUES

### Silhouette and Size

Using this manual and field guides, show your students a variety of birds. Be sure that you point out the size of each bird. Once everyone is familiar with general bird sizes, they will be able to use this clue while birding outside. Remind them when they see a bird to ask themselves, "Is it small like a warbler?, medium in size like a Blue Jay? or large like an American Crow?"

In addition to size, have your students look for the shape and length of the bill, presence of a crest, and position and length of the tail. When you only get a quick glimpse at a bird, these clues will help to narrow down the possibilities of what kind of bird it actually was.

### Plumage and Coloration

Field marks are the distinguishing plumage clues that identify different species. Have your students look for wing bars, eye rings, breast spots, and coloration. Some groups of birds are divided into smaller groups by the presence or absence of a field mark. For example, warblers are divided by those that have wing bars and those that don't. Sparrows can be divided by those that have streaks on the breast and those that don't.

### Behavior

The way a bird flies, forages for food, and reacts to the environment are great clues to watch for. Woodpeckers have an undulating or "roller coaster" motion flight. Wrens hold their tails cocked upwards. Buteo hawks soar, and falcons fly with strong wingbeats. A Great Blue Heron will move slowly while hunting. A Snowy Egret forages actively for prey in shallow water. Watching for behavior is another clue that will lead to a positive identification.

### Habitat

This is a simple, but important clue to remember. When trying to identify birds, look around and record what type of habitat you are in. That will eliminate a large number of birds that may look similar, but will be found in different habitats.

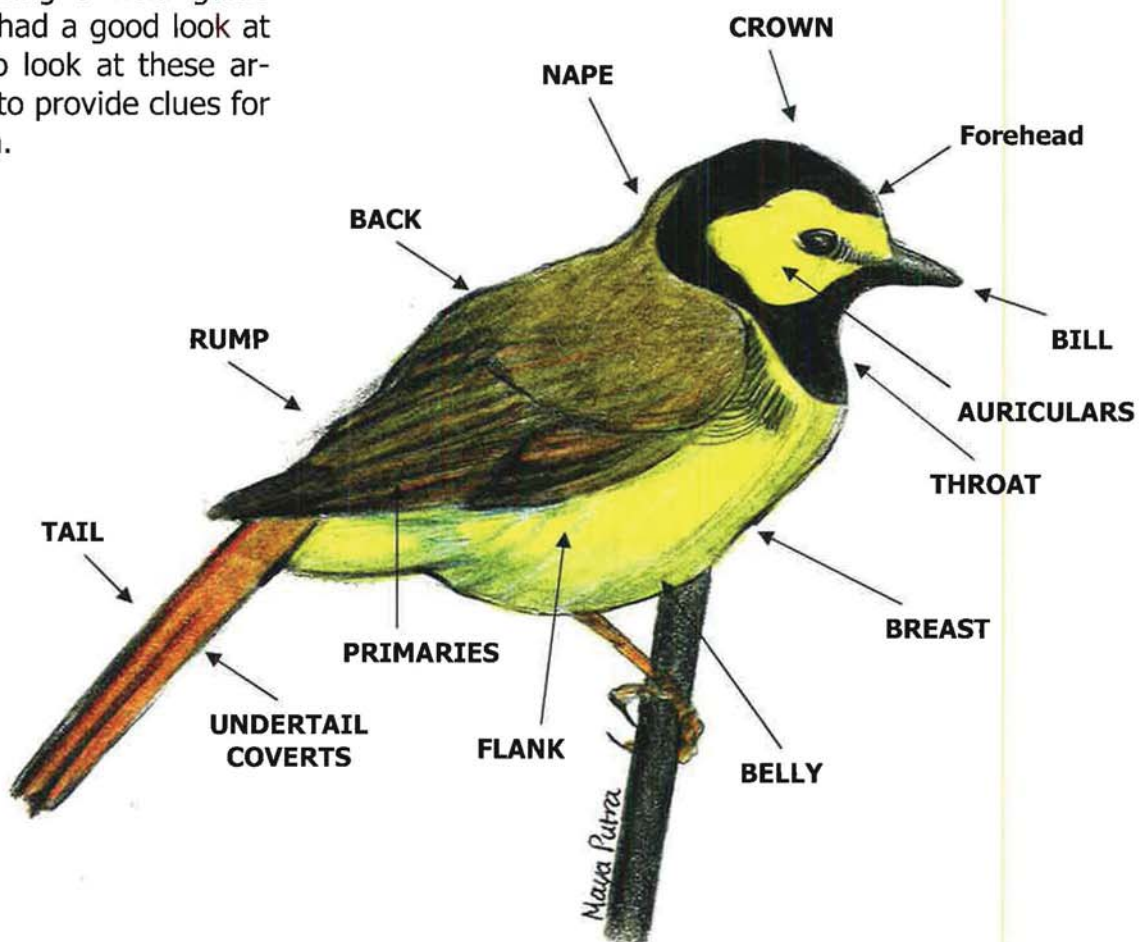
### Voice

Birds use songs and calls to communicate. Many have easy to remember and distinctive sounds. Many birders can identify a bird just by hearing its call or song. Practice listening to sounds on tapes and CDs before heading out. Bird ID websites will also have recordings to listen to. Make a point to listen while outside, and find the bird that is calling or singing. Watch the bird and make your own notes about how it sounded.



## Songbird Identification

Learn what field marks to look for when you first see a bird. Don't worry about using a field guide until you have had a good look at the bird. Try to look at these areas of the bird to provide clues for its identification.



Hooded Warbler  
By  
Maya Putra

Have students sketch one of the 26 birds in the manual, and identify all the field marks to watch for when looking for this bird.

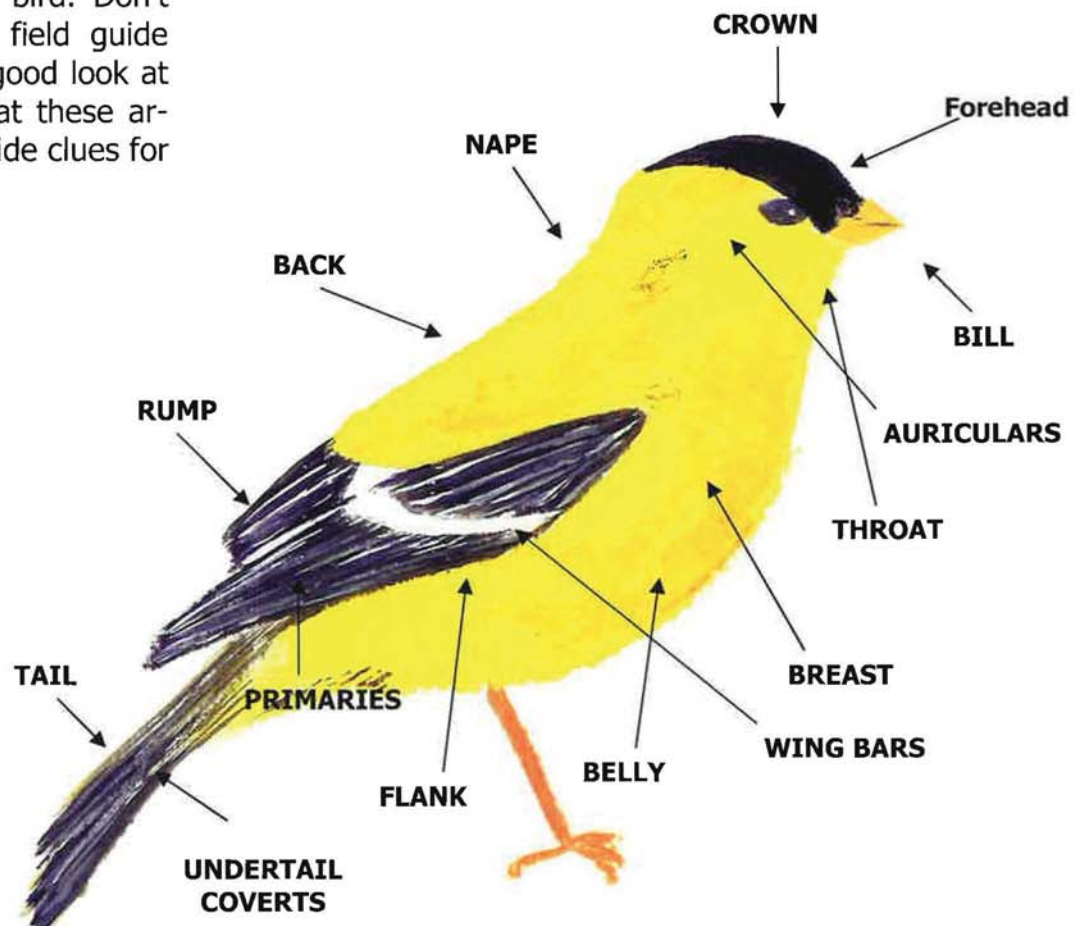
**virtual bird topography for kids:**  
<http://www.kidwings.com/bodyparts/topography/index.htm>





## Songbird Identification

Learn what field marks to look for when you first see a bird. Don't worry about using a field guide until you have had a good look at the bird. Try to look at these areas of the bird to provide clues for its identification.



American Goldfinch  
By  
James Dong

Have students sketch one of the 26 birds in the manual, and identify all the field marks to watch for when looking for this bird.

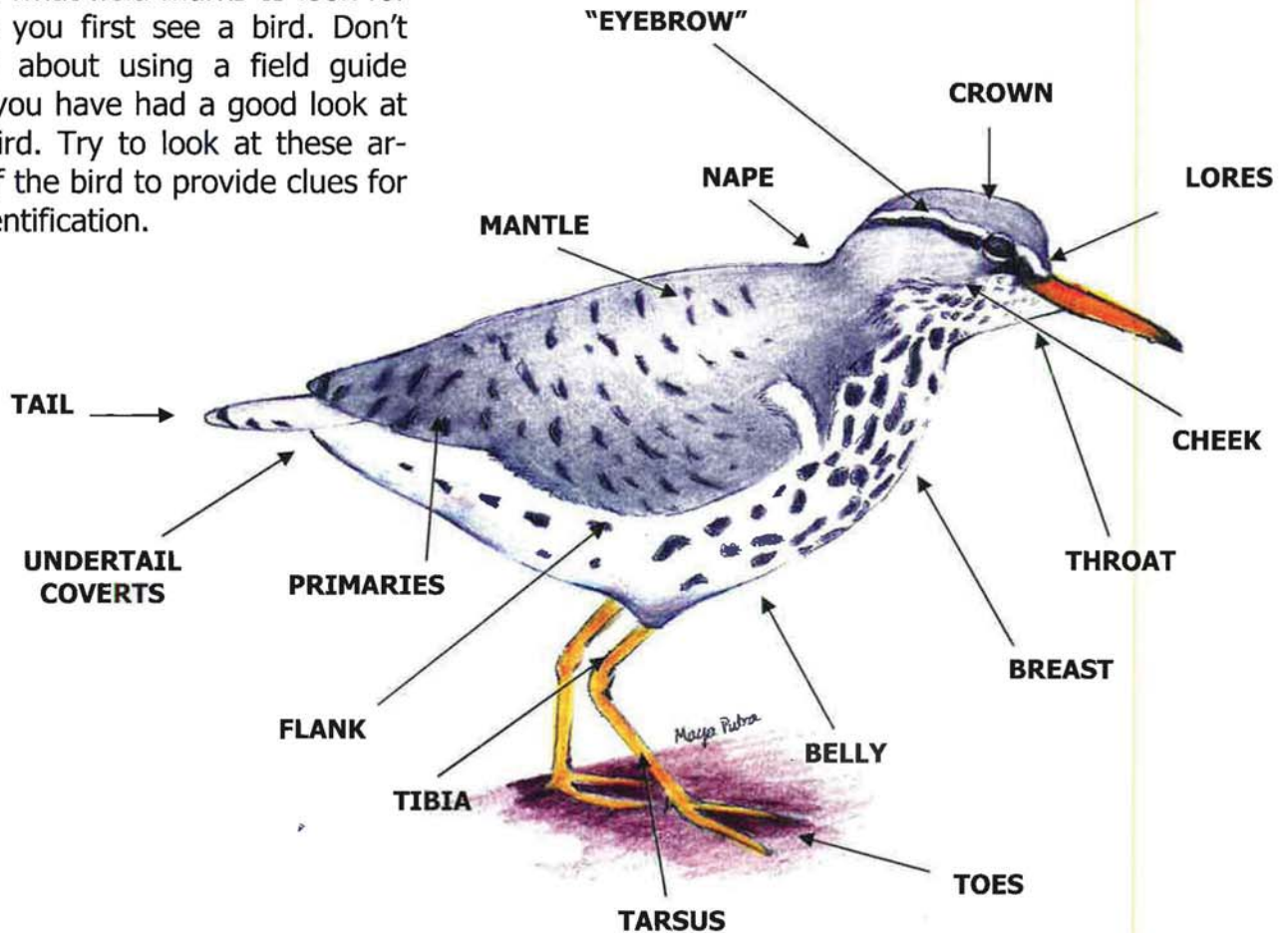
**virtual bird topography for kids:**

<http://www.kidwings.com/bodyparts/topography/index.htm>



## Shorebird Identification

Learn what field marks to look for when you first see a bird. Don't worry about using a field guide until you have had a good look at the bird. Try to look at these areas of the bird to provide clues for its identification.



Spotted Sandpiper  
By  
Maya Putra

Have students sketch one of the 26 birds in the manual, and identify all the field marks to watch for when looking for this bird.

**virtual bird topography for kids:**

<http://www.kidwings.com/bodyparts/topography/index.htm>



## Bird Identification, Observation and Sketching



Use this page to record your observation of a particular bird at your school or in a park. Use a field guide to help you with identification of the bird. Be sure to write down the colors of each part of the bird.

**DATE:**  
**LOCATION:**  
**TIME:**  
**WEATHER:**

**HABITAT:**

**SKETCH:**

**Sound:**  
**SPECIES:**

---

## **Bird Identification, Observation and Sketching**



Use this page to record your observation of a particular bird at your school or in a park. Use a field guide to help you with identification of the bird. Be sure to write down the colors of each part of the bird.

**DATE:**  
**LOCATION:**  
**TIME:**  
**WEATHER:**  
  
**HABITAT:**  
  
**SKETCH:**

**Sound:**  
**SPECIES:**





## Speedy Bird Racers

By Kathy Ross

<http://www.realfamiliesrealfun.com/>

Ready, set, fly! You'll soon see flocks of birds flying back home from the southern states - another mark of spring's arrival. Let your kids participate in the spring migration by making colorful birds to race on a string. Place some gummy candy worms in a bowl at the end of the line to reward the winning bird of each race. It's a great group activity and party game.

### Directions:

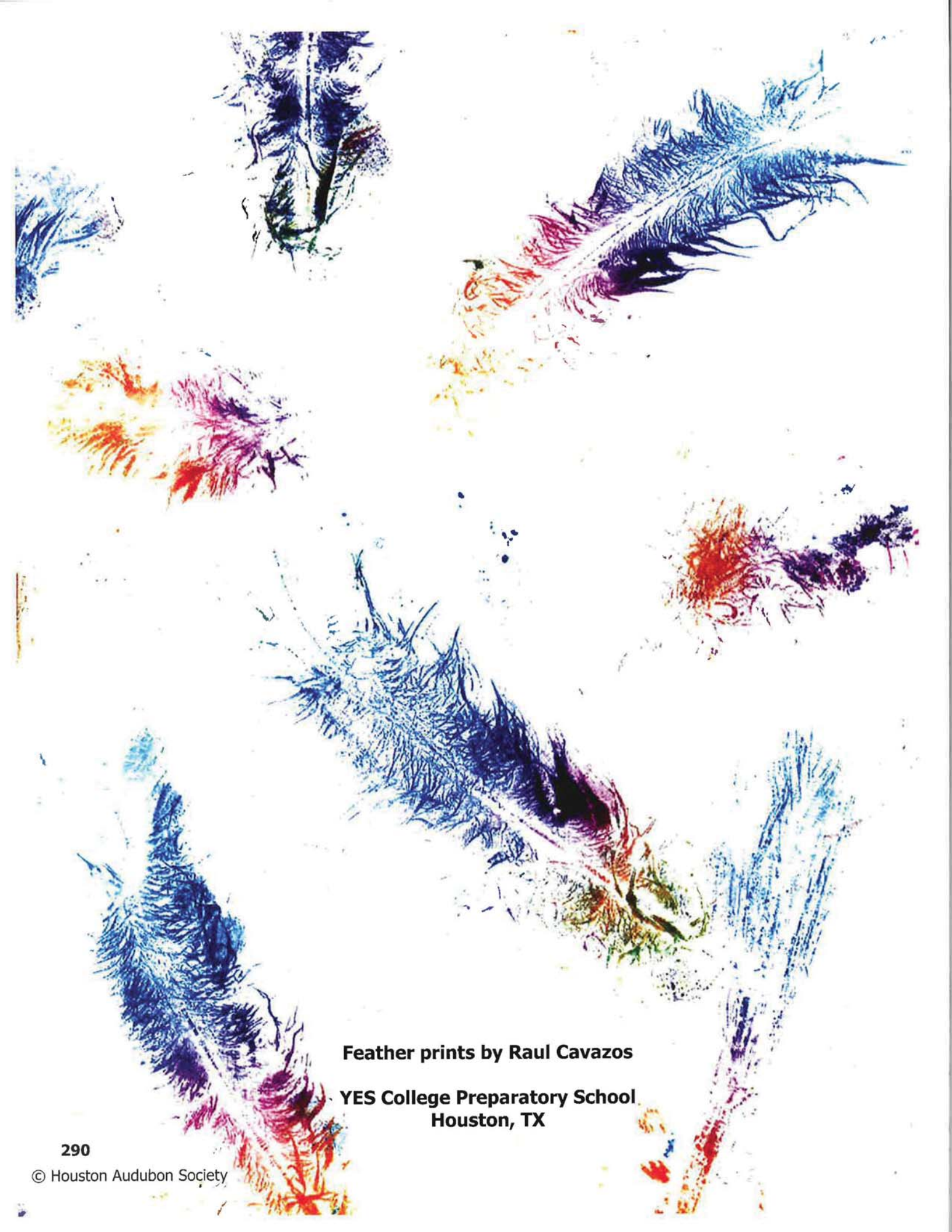
For each bird, you'll need a paper cup for the body. The cup's bottom will be the face of the bird. Glue on an orange beak and two wiggle eyes. Add craft feathers to the cup's sides for the wings. Glue some feathers to the cup's back for the tail. Glue the ends of the tail feathers inside the opening of the cup, and curved downward, so they won't interfere with the bird's flight. Cut a 1 1/2 inch piece from a plastic straw. Use packing tape to attach the straw to the center back of the bird.

To fly the birds, cut smooth white string as long as you want the race to last. Tie one end of the string to the bottom of a chair leg or outdoor fence railing. Thread the other end through the front of the straw to the back of the bird and attach a washer. Instruct each player to hold the washer and the bird as high as possible. When the signal is given, players should release the birds and wiggle the strings to propel the birds to the other end.

You may need to have several practice runs before an "official" race.

The winning "early" bird gets to dine on the worms first.





**Feather prints by Raul Cavazos**

**YES College Preparatory School  
Houston, TX**





## Migratory Bird **Survivor** Challenge

**OUTFLY**  
**OUTMIGRATE**  
**OUTEAT**

The next two activities will lead your students, campers, family members, etc... on an imaginary migration. Beware! There are dangers ahead. Each activity is available in its original format, along with more environmental education resources from the following:

### **An Eventful Journey** (adapted with permission from *Bridges to the Natural World*)

New Jersey Audubon Society Department of Education  
Center for Research and Education  
600 Route 47  
Cape May Court House, NJ 08210  
Phone: 609.861.0700  
Website: [www.njaudubon.org](http://www.njaudubon.org)



### **The Incredible Journey**

Ecosystem Matters  
Activity and Resource Guide for Environmental Educators  
United States Department of Agriculture  
Forest Service  
Rocky Mountain Region  
Project Manager: Pattyanne Corsentino  
Printed January 1995



## An Eventful Journey (adapted with permission)

Grade Levels: 3 - 6

Length of Activity: 40 minutes

### Process Skills

*Inferring, predicting, interpreting  
data, formulating hypotheses,  
communicating*

New Jersey Audubon Society  
Department of Education

Bridges to the Natural World

[www.njaudubon.org](http://www.njaudubon.org)

Bird migration refers to the regular seasonal movement of certain species of birds. Nearly all North American birds migrate between their breeding areas and their wintering areas. Each species has its own special requirements for food and time for breeding; hence, they migrate at different times. A major stimulus for bird migration is the seasonal change in the amount of daylight. In spring, lengthening days trigger hormonal changes in birds that prompt northward migration. In autumn, decreasing daylight effects similar changes that prompt southward migration. The benefits of migrating include increased availability of food and of nesting territories, as well as escape from extremes of climate.

During migration, birds encounter many obstacles. They need to rest and feed during their flight north and south. Severe weather, lack of food, destruction of prime habitat through alteration or pollutants, and human harassment are all problems which may result in diminished numbers. As a result of these obstacles, it is estimated that many species have a 50% mortality rate during migration, and in young birds it may be as high as 80%.

Ornithologists study migration in several ways. One way is simple observation: count the number of birds that fly through a specific area during a specific time period. Houston Audubon Society conducts regular bird counts at Bolivar Flats Shorebird Sanctuary, and helps sponsor the Christmas Bird Counts and Houston Bird Survey. Ornithologists also study migration by banding birds. Bird banding involves catching birds alive, and placing small, individually numbered aluminum bands on their legs. When banded birds are recaptured or found dead elsewhere, scientists gain facts about where they go, how long they live, and the physiological changes caused by their migration.

Scientists use the information they collect from counting and banding birds to detect upward and downward trends in bird populations. A declining trend will sometimes warn that there may be a problem in the environment.

Texas is along the Central Flyway, and has some of the most important habitats for migrating birds. This activity was originally printed by the New Jersey Audubon Society in the *Bridges to the Natural World* curriculum. New Jersey is in the heart of the Atlantic Flyway. New Jersey has critical habitats for birds that are migrating. It is very important that birds find safe habitats all along their migration route.





### Basic Concepts

- Migration is a regular seasonal movement.
- Texas is in the Central Flyway; birds that migrate through the state use its habitats for resting and feeding areas
- Birds encounter obstacles created by natural phenomena and human behaviors.
- People have the ability to minimize some of these obstacles by preserving critical habitats, conserving open space, and planning new development that is compatible with our natural resources.

### Materials

- 24 migration statements
- ten risk statements
- 34 3x5 index cards
- three blank, sticky labels
- magic marker
- glue or stapler
- 24 clip-on clothespins

### PREPLANNING

1. Prepare a set of journey cards. Copy the sample migration statements. Cut and attach each to an index card.
2. Clip one clothespin to each card to prevent the cards from blowing away. These cards will be used to form a simulated migration path.
3. Prepare a set of risk cards. Copy samples. Cut and attach to index cards. Mark the back of each card with "RISK." Clip cards together with a clothespin.
4. Find an appropriate location for the game (indoors or outdoors). You will need approximately 100 feet of clear pathway for the students to follow with separate starting and ending points. The pathway does not have to be linear.
5. Mark each sticker with an "X". Place them at the end of the pathway. (There are three mortality cards. The students who come to the finish line with these cards get a label stuck to their forehead and are asked not to divulge what happened to them.)
6. Wait until the game is about to begin before placing the cards on the pathway.



### MOTIVATIONAL ACTIVITY

- Engage the students in a discussion about plans for a journey. You are going on a trip to Minnesota. What are some things that would help you get there? (fair weather, car in good condition, fuel, airplane, money for fares, food, suitcases, place to sleep along the way)
- What are some things that would upset your plans along the way? (flat tire, breakdown, accident, no places to eat or sleep on the way, lost or stolen money, plane crash)



## PROCEDURE

1. Explain to the students that they are going to pretend to be migrating birds.
2. Create a migration path with the journey cards by placing each card face down at four-foot intervals along the pathway.
3. Risk cards should be set in a pile off to the side of the pathway.
4. The ideal number for this game is 12. When the class size is larger, students can travel in twos or threes and "fly" as a single unit with their group to each space.
5. Divide the class into three groups. As you designate a student or group to be an early, middle, or late migrant, show them a picture of the bird. Visit [www.enature.com](http://www.enature.com) for samples.
6. Beginning with the first group of migrants, assign each student/ unit a number from one to four.
7. Start the game by sending the first group (early migrants) onto the pathway: first student/unit to card #1, second to card #2, etc.
8. Instruct the students to pick up the card, read it, replace it face down, and do what the card tells them to do. Anytime someone else is using the card they are sent to, they are to go to the risk pile and follow the instructions on the card that is picked. If a number along the migration path is missing or out of sequence, go to the next card in the path.
9. As the travel cards are vacated by the early migrants, middle migrants enter the pathway. Then repeat the procedure with late migrants.
10. When most have reached the finish, assemble for discussion. (Note: Some students may get caught in a holding pattern. This is not unusual, as many young birds do not breed until their second year.)







## Putting It All Together

? Let's talk about your journey. What obstacles did you encounter as birds? [Describe specific events] Which of those obstacles were created by people? (powerlines, plastic fishing line, pollution, lighthouses, glass buildings) Which were natural phenomena? (hawks, cold snaps, difficult winds, storms) [Interprets data.]

? What things helped you complete your migration? Which of these were created by people? (bird feeders, wildlife refuges) Which were natural phenomena? (good winds, plenty of food) [Analyzes and classifies data.]

? Why didn't all of you finish at the same time? (Birds migrate at different times, birds were held back by obstacles, and they were advanced by helps.) [Draws inferences from unstated facts.]

? What do you think happened to the "birds" with the "Xs" on their foreheads? (They died.) [Draws conclusions.]

? What kinds of habitats would birds use as they migrate through Texas? (marshes, fields, coastal areas, lakes, ponds, streams, rivers, swamps, beaches, woodlands) [Applies knowledge to practical situation.]

? What should people consider when altering a natural habitat by building and development? (Current use of the area by wildlife and migrating birds, what impact the development would have, and whether development would displace animals permanently.) [Identifies criteria and draws conclusions.]

### Take Another Step

- Plant shrubs, trees, or vines that will produce wild food (seeds, berries, flowers, etc.) around the edge of your schoolyard or lawn. These will attract migrating birds.
- Evaluate your community. List the things that would help birds migrate and those which would interfere with migration.
- Erect and monitor a feeding station on the school grounds. Keep a daily log and make seasonal comparisons of the birds that come to feed. Note: A feeding station can be as simple as scattered seed on the ground near a tree or bush.
- Research the birds you have seen at the feeding station. Categorize them into winter visitors and year-round residents. Why are some birds able to survive the winter without migrating? (Winters are milder, birds change their diet, or have a varied diet.)
- Make a list of winter birds other than those seen at your feeding station. Where do they come from?



## For More Information

Dunne, Peter J., Richard Kane, and Paul Kerlinger. *New Jersey at the Crossroads of Migration*. (text and video)

Brian Vernachio, Don Freiday and Dale A. Rosselet. *Wild Journeys: Migration in New Jersey*. NJ Audubon Society, 2003.

National Geographic Society. *Bird Migration in the Americas*. (map)

Opus and Massachusetts Audubon Society. *Audubon Alliance Bird Identifier*. (chart)

Peterson, Roger Tory. *Eastern Birds*

Sutton, Patricia. *Backyard Habitat for Birds: A Guide for Landowners and Communities in New Jersey*.

### Timing of Selected Spring Migrants

Shackelford, C. E., E. R. Rozenburg, W. C. Hunter and M. W. Lockwood. 2002. Migration and the Migratory Birds of Texas: Who They Are and Where They Are Going. Texas Parks and Wildlife PWD BK W70000-511 (7/02). Booklet, 34pp.

These are selected examples and is in no way an inclusive list; involves most of Texas

#### **Early Migrants** (March to April)

American Golden-Plover  
Chimney Swift  
Purple Martin  
Barn Swallow  
Yellow-throated Warbler  
Black-and-white Warbler

#### **Middle Migrants** (mid April to early May)

Hudsonian Godwit  
Buff-breasted Sandpiper  
Yellow-billed Cuckoo  
Golden-winged Warbler  
Cerulean Warbler

#### **Late Migrants** (late April to late May)

Olive-sided Flycatcher  
Eastern Wood-Pewee  
Magnolia Warbler  
Blackburnian Warbler





## Migration Cards

Copy and mount on 3x5 index cards.

<p><b>1. Watch Out!!! Power lines ahead in Houston, Texas. Don't hit them! Crawl ahead four spaces on your hands and knees.</b></p>	<p><b>2. Many berries and insects are available in this overgrown field in Mexico. Smack your lips four times, and move ahead six spaces.</b></p>
<p><b>3. You land in a polluted marsh and become sick from the food you eat. Sit down, hold your stomach for a count of 30, groan ten times, then move ahead one space.</b></p>	<p><b>4. Watch out for the Sharp-shinned hawk! It wants to eat you. Freeze, count to 40, then move ahead three spaces.</b></p>
<p><b>5. You escape being caught by a cat in Liberty, Tx., but slightly sprain your wing in the escape. Get it back in shape. Slowly swing your left arm around ten times, and move ahead one space.</b></p>	<p><b>6. Scientists at Texas A &amp; M catch you for research. After putting a numbered metal band on your leg, you are set free. Move ahead three spaces.</b></p>
<p><b>7. You got tangled in a plastic fishing line near Galveston. You can't eat and are weak from hunger. A kind person takes you to a bird rehab center where the line is cut and removed. Hop on one foot in a circle, count to 40, then move ahead four spaces.</b></p>	<p><b>8. You find a bird feeder in a fifth-grader's backyard in High Island. Spend a few days enjoying the free food. Chew 20 times, and move ahead two spaces.</b></p>



## Migration Cards

Copy and mount on 3x5 index cards.

<p><b>9. It's raining, it's pouring, and you don't want to fly in this rainstorm. Count to 50 while you wait for the storm to stop, then move ahead four spaces.</b></p>	<p><b>10. You can't find the spot you came to last year, because a new shopping mall has been built on the site. Walk around in three wide circles, searching for a place to rest and feed. Because you are still hungry, you have only enough energy to move ahead three spaces.</b></p>
<p><b>11. While traveling at night, you become confused by the lights from a communication tower. You are tired from flying in circles, and can't continue. Sit down, count to 40, and move ahead three spaces.</b></p>	<p><b>12. You arrive at a wildlife refuge where there is plenty of food, water, and shelter. Rub your stomach 15 times, and move ahead four spaces.</b></p>
<p><b>13. Good winds allow you to fly a long distance in one day. Move ahead four spaces.</b></p>	<p><b>14. It's hard to find caterpillars to eat, because the forest was sprayed with an insecticide. Open and close your eyes 25 times while you look for food, and move ahead one space.</b></p>
<p><b>15. Strong winds from the wrong direction keep you from migrating. Go back three spaces.</b></p>	<p><b>16. You become covered with oil from a spill. Although rescued, you do not recover. The game is over for you! You died! DON'T TELL ANYONE! Take this card with you. Go to the finish, and place a sticker on your forehead. Sit down and wait for the others.</b></p>





## Migration Cards

Copy and mount on 3x5 index cards.

<p><b>17. You just flew into a tall glass building in Chicago. Sit down, hold your head, count to 35, and move ahead two spaces.</b></p>	<p><b>18. A good wind helps you fly. Move ahead four spaces.</b></p>
<p><b>19. You have been shot with a BB gun. The game is over for you! DON'T TELL ANYONE. Take this card with you. Go to the finish, and place a sticker on your forehead. Sit down and wait for the others to finish.</b></p>	<p><b>20. After flying for several days, you land in a wildlife refuge. Spend time feeding on berries in a thicket. Pretend to pick 20 berries from a bush, then move ahead one space.</b></p>
<p><b>21. Oops! An unexpected freeze kills off all the insects that you usually eat. Go back two spaces as you try to find more food.</b></p>	<p><b>22. A hurricane blows you into the ocean. You rest on the water, but get eaten by a gull. The game is over for you. You're dead! DON'T TELL ANYONE. Take this card with you. Go to the finish, and place a sticker on your forehead. Sit down and wait for the others to finish.</b></p>
<p><b>23. Strong winds along the coast blow you off course. Go back six spaces.</b></p>	<p><b>24. Spend five days resting and feeding on mudflats. Count to 40. Because you are so strong, you can fly to the finish!</b></p>



## Risk Cards

Copy and mount on 3x5 index cards.

<b>Go to card #9</b>	<b>Go to card #23</b>
<b>Go to card #18</b>	<b>Go to card #3</b>
<b>Go to card #24</b>	<b>Go to card #6</b>
<b>Go to card #5</b>	<b>Go to card #15</b>
<b>Go to card #10</b>	<b>Go to card #17</b>





# The Incredible Journey

*Ecosystem Matters*  
*USDA Forest Service*

**Level:** Grades 4-8

**Subjects:** Environmental Education, Science, Geography, Physical Education, Social Studies, History, Math.

**Process:** Through an active simulation game, students learn characteristics of migratory shorebirds and the importance of wetlands to them.

**Objectives:** The student will:

1. List five characteristics of a shorebird
2. Locate the three main shorebird flyways in the United States.
3. Name four hazards shorebirds encounter along their annual migrations.
4. Explain why these birds migrate from the far north to the far south of the Western Hemisphere.
5. Explain what "fat load" is, and why it is important to migrating shorebirds.

**Timeframe:** 1 hour to 1 hour 30 minutes

**Skills:** Comparing similarities and differences, counting, developing psychomotor skills, developing vocabulary, listening, kinesthetic learning, role playing, understanding cause and effect.

**Materials:** Playing field or gymnasium, cones, string, rope or hula hoops to mark breeding grounds, wintering grounds, and staging areas, "Northern Cards," "Southern Cards," and "Staging Area" cards.

**Vocabulary:** Aquatic habitat, aquatic insects, body mass, clutch, fat load, fledgling, flyway, foraging, invertebrates, juvenile, migration, migratory route, nesting, pesticide, pothole, predator, probing, shorebird, species, survivorship, territory, wetlands, (amphipods, critical habitat).



Spotted Sandpiper  
by  
Maya Putra



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**The Incredible Journey**  
*Ecosystem Matters*  
USDA Forest Service

**Overview:** There are approximately 49 different species of shorebirds throughout North America. Shorebirds all have two common characteristics: longer legs and longer beaks than other bird species. Their body shapes, sizes, habitat uses, and foraging behaviors (how they collect food) are quite varied. Shorebirds feed along the edges of ponds, lakes, wetlands, coastal beaches, and any other places that they can find food in the mud and shallow waters. Many different sizes and shapes of beaks help them specialize in ways of eating. Some, like the Semipalmated Sandpiper, have thin beaks for probing in the mud; others, such as the Lesser Golden Plover, have shorter, thicker beaks for gleaning invertebrates from the surface of mud and water. Still others have beaks for snatching flying insects. The Wilson's Phalarope is a unique shorebird, because it swims in deeper water, kicking up food with its feet.

Shorebirds have certain needs that can only be met in very specific habitats. They must live by shallow water and muddy shores in order to find their food. They eat mostly freshwater worms (bloodworms=fly larvae), shoreflies, danceflies, crane flies, amphipods, and snails.

Most shorebirds spend their summers in the northern areas of the United States, and in Canada and Alaska. They migrate to southern United States, Central America, and South America to spend their winters in a warmer climate. Countries south of the equator have the opposite seasons to ours. When we are having winter, countries south of the equator are having summer.

The White-rumped Sandpiper is one shorebird that has an especially incredible migration. Each year it migrates from the Arctic Circle to the southernmost tip of South America, and back to the Arctic Circle. This small (around 20 grams in weight) bird travels 20,000 miles every year.

Not all shorebirds migrate such long distances. Some, like the American Avocet, have short migrations as they breed in the northern part of the United States, and winter in the southern part of the United States.

In North America three primary flyways are heavily used migration routes, connecting the shorebirds' breeding grounds in the north to their wintering grounds in the south. One of these flyways follows the Pacific coast from Alaska to the southern part of South America. A second flyway follows the Atlantic coast from northwestern Canada to the very southern tip of South America. The third flyway stretches from north central Canada down through the center of the United States into northern South America. This is the route we will focus on in this activity.

Shorebirds must prepare themselves physically for their strenuous migrations. Before leaving their wintering grounds in the south, they must put on a fat load, which is mainly stored lipids (fats), but includes protein and water. Shorebirds feed almost constantly for two weeks, often doubling their weight for the migration to the north.





### **Overview (continued):**

Some shorebirds fly non-stop to their destination, but others make several stops along the way to replace their body fat. These stop-over areas along the migratory route are called "staging" areas. They are usually lowlands flooded from the spring snow melt, and are very rich in newly hatched insects. Many shorebirds increase their body masses up to 100 percent at these staging areas!

One of the most critical *wetland* staging areas is the Prairie Pothole region. Located in the northern Great Plains of the United States and southern Canada, it spreads across hundreds of miles, forming many small wetlands. Tens of thousands of shorebirds use this area as a feeding and resting place along their migration route to or from the northern breeding grounds and the southern wintering grounds.

Weather can be a factor in the shorebird's departure from the wintering grounds. Poor weather may keep them from leaving, delaying the journey until cold weather offers no threats.

Shorebirds usually fly in large flocks and migrate at night. If a bird is left behind, it usually waits for another flock to join. But while it is alone, it has less time to feed, because it has to be more watchful of predators.

Once the migration north begins, there is no time to waste. Semipalmated Sandpiper males for instance, usually migrate to the breeding grounds several days before the females to establish territory for nesting. The males normally reestablish the same territory they claimed the previous year. When the females arrive and pair with mates, nest building begins. Four to six days after pairing, egg laying begins. Incubation of the eggs is about 20 days. After hatching, the juvenile shorebirds (young birds that have not yet reached sexual maturity) must eat constantly to become strong enough and put on enough fat to leave for the wintering grounds. Juvenile shorebirds often do not start their southern migration until three to four weeks after the adults have left.

Shorebirds travel over several different countries during their migration. That makes it difficult to protect them. Shorebirds must contend with a number of problems.

During migration, Peregrine Falcons and Merlins often attack shorebirds in flight. There can be the impact of oil spills and agricultural pesticides along the migration route as well, both contaminating shorebirds' food supplies. Agricultural pesticides are widely used throughout North America. DDT, a highly poisonous pesticide, was banned in the United States in 1972, but continues to be produced in the United States and sold to Central American and South American countries for agricultural use. Shorebirds have died as a result of the application of DDT to agricultural fields.





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**Overview (continued):**

Migratory staging areas and southern wintering grounds are being impacted by increased human development. Many wetlands have been drained for agricultural or building purposes. The Prairie Pothole region has lost about 50% of its wetlands, with some areas having lost 90%. The loss of wetlands has caused declines in shorebird populations of 60 - 80% in some species. The remaining birds must then compete for less food with more birds. If birds using the potholes as a staging area cannot get enough food to replenish their fat load, they will have to make many more stops. They may not reach their breeding grounds in time to mate and hatch their young before returning south for the winter.

Human recreation and hunting also affect nesting areas, and some nests are deserted or destroyed. In the late 1800's many shorebirds were hunted in great numbers by market hunters in Canada and the United States. These two countries signed the Migratory Bird Convention in 1916, agreeing to protect migratory birds. Some hunting still exists in northern South America.

Efforts are being made to protect shorebirds. The Western Hemisphere Shorebird Reserve Network identifies important shorebird sites and helps protect them. There is an increased awareness of the importance of wetlands and the need to preserve them. These efforts will insure the shorebird populations a more secure future.

**Field Trip -Houston Audubon's Bolivar Flats Shorebird Sanctuary  
Bolivar Peninsula, Port Bolivar, Texas**

Plan a field trip with your students or family to the Bolivar Flats Shorebird Sanctuary. This nature sanctuary has been designated as a site of hemispheric importance by the Western Hemisphere Shorebird Reserve Network due to its special importance to 25 species of shorebirds. This habitat is a combination of salt marsh, mud flats, and beach. Hundreds of thousands of shorebirds use this area for nesting and as a stopover during migration each year.

**Fun on the Flats** is a family event that the Houston Audubon Society hosts each June. Come and learn about the birds and other living creatures that depend on this sanctuary for survival.

To get directions and learn more about Bolivar Flats Shorebird Sanctuary visit [www.houstonaudubon.org](http://www.houstonaudubon.org).







## **PROCEDURE:**

### *PRE-ACTIVITY*

1. Read "Overview" thoroughly. It is essential to your understanding of this activity. Read through the game cards as well to be aware of situations presented to students!
2. Using a playing field or a gymnasium, identify one end as the northern breeding grounds and the other as the southern wintering grounds.
3. Place a rope or other line across each end of the playing field to mark the wintering grounds and the breeding grounds. Then place three circles spaced out between these grounds. (See diagram.) The circles represent the staging areas.
4. Disperse the "staging area" cards evenly among the three "staging" circles. Spread the "Northern Cards" in the breeding grounds area and the "Southern Cards" in the wintering grounds area.
5. Talk briefly about migration, staging areas, breeding grounds, and wintering grounds. Explain that students will be playing the parts of migrating shorebirds.

### *ACTIVITY:*

1. Each player must pick up one card at the wintering ground, each staging area, and the breeding ground. They must follow directions written on the cards and return the cards to the pile before they continue their migration. For example, a card from the breeding grounds may instruct its holder to take a person that has been labeled "dead" by another card and return them into the game as a young bird. Any player that picks up a card indicating death of the bird must drop out of the game and stand along the sidelines until an opportunity (eggs hatching in the North) arises to rejoin the game.
2. Select one or two players to represent the Peregrine Falcon and/or the Merlin as predators in flight. Their job is to tag students as they move among the staging areas. They must escort each tagged victim to the edge of the playing field before tagging another migrating student.
3. As the players run to the other side of the playing field, they must stop at each of the staging areas to refuel (unless otherwise instructed). They collect one card at each staging area and follow directions.
4. Players must make four complete migrations (that is from south to north and back to south). Each migration (in one direction) will begin upon the teacher's signal.



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*Ecosystem Matters*  
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**AFTER THE GAME:**

1. Plot the survival rate of each migration.
2. Locate the three main flyways on a map of North and South America. For purposes of this game, players are to imagine they have migrated on the Central Flyway.
3. Ask players to share some of the unexpected situations described on their cards. Discuss how these things affect the migrating shorebirds.
4. Ask players to recall some causes of the birds' deaths. Have them categorize the causes as "Natural" and "Human Caused." They may need to define the criteria for each of these categories before listing the causes. Write the lists on the chalkboard.
5. Discuss the list of "Human Caused" and evaluate the pros and cons of each of these situations. How do they affect other animals and people? (i.e. DDT, outlawed in the United States for over twenty years, is very poisonous and is passed on from one animal to another poisoning each. Yet it saves crops from infestation of insects.)

**ASSESSMENT:**

1. Have students locate the three main flyways on a map of North America and South America. Ask:
  - **What are some of the weather changes shorebirds experience during their migration?**
  - **What are some of the more predominant wetlands, lakes, or coastal shores they pass during their migration?**

Students draw their own maps and plot possible staging areas on it.

2. Have students draw or design the perfect shorebird from junk, and be ready to explain the adaptations they have added to their birds.







## EXTENSIONS:

1. Working in small groups, students research to learn more about specific shorebirds in their local area. Have students report on it and trace its migration route.
2. Visit a wetland area near your community, and list the different birds you find.
3. Invite your local State Wildlife officer to speak to the class about what impacts wildlife in your community and how students can help to lessen the negative impacts.
4. Have students research the formation and history of the Prairie Pothole Region.
5. Have students create a role play/debate between a person in support of draining wetlands for agricultural or urban building purposes and a person in support of saving wetlands for migrating shorebirds. Allow students time to prepare their arguments.

## RESOURCES:

*Conservation Biology*, Susan K. Skagen and Fritz L. Knopf, "Toward Conservation of Midcontinental Shorebird Migrations," 7(3) (September 1993): 533-541

*Shorebirds: an identification guide to waders of the world*, P.J. Marchant Hayman and T. Prater, Houghton Mifflin Co., 1986

*Shorebird Education Project Newspaper*, Julie Sibbing

*Shorebird Management Manual*, Douglas L. Helmers, Western Hemisphere Shorebird Reserve Network.

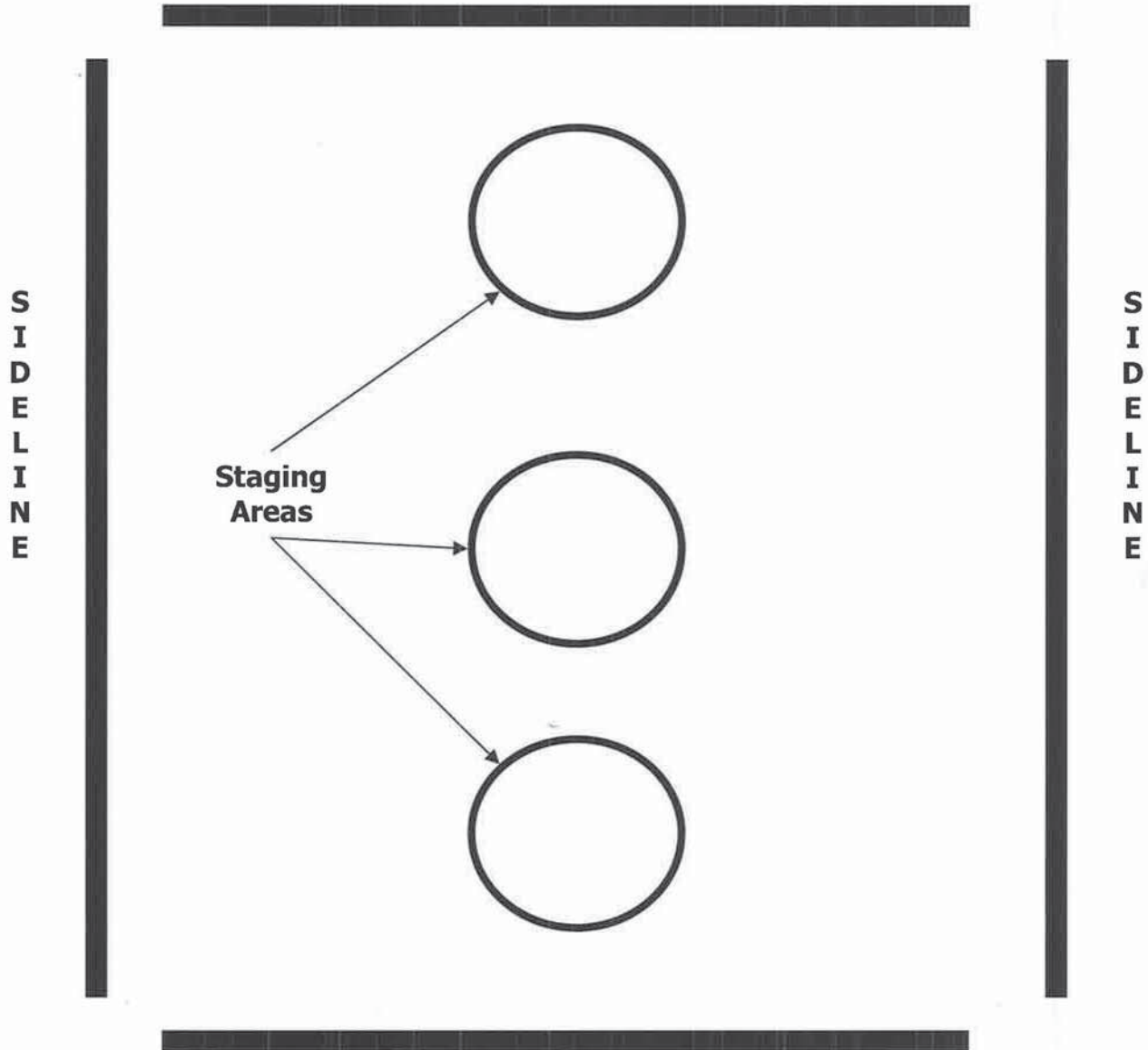
"Semipalmated Sandpipers," *The Birds of North America* 6, (1993): 1 - 20, Cheri L. Gratto-Trevor.

"Protecting Prairie Potholes Saves Shorebirds," Shorebird Education Project.





## Northern Breeding Grounds



Use tape, chalk, or cones  
to mark off areas.





## The Incredible Journey Game Cards

**The Incredible Journey**  
*Ecosystem Matters*  
USDA Forest Service

Copy and cut out the following:  
10 - Northern Cards  
10 - Southern Cards  
14 - Staging Cards

<p style="text-align: center;"><b>Northern Card</b></p> <p>Bad news! Unusually bad weather has limited your feeding time. You are too weak to make it to the first staging area. You die and must go to the sideline.</p>	<p style="text-align: center;"><b>Northern Card</b></p> <p>Yea! Good weather and only a few predators have made it a great nesting season. Pick two people from the sidelines to migrate with you.</p>
<p style="text-align: center;"><b>Northern Card</b></p> <p>Hurrah! It's been a warm, wet summer. You have had an abundance of shore flies and dance flies to feed on. Your nesting is successful. Take one person from the sidelines with you. Begin migration.</p>	<p style="text-align: center;"><b>Northern Card</b></p> <p>Great! You have successfully hatched and fledged one of your young. Pick one person to migrate with you.</p>
<p style="text-align: center;"><b>Northern Card</b></p> <p>Bummer! A large fox population this year has increased fatalities. You are eaten. Go to the sideline.</p>	<p style="text-align: center;"><b>Northern Card</b></p> <p>Yum! There is an abundance of amphipods and snails this year. You have doubled your body weight easily. You have had a successful nest, take two people to migrate with you. Begin migrating!</p>
<p style="text-align: center;"><b>Northern Card</b></p> <p>You are young and are not able to put on a sufficient fat load before migration begins. You are not as strong. Skip to the first staging area.</p>	<p style="text-align: center;"><b>Northern Card</b></p> <p>Yikes! It's been a good year for weasels and a bad year for eggs. You have no young that survived. Food was abundant. Begin migration.</p>



## The Incredible Journey Game Cards

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<p><b>Northern Card</b></p> <p>Lost wetlands on the way to your breeding grounds made you late on arrival time and weak. You do not have time to reproduce. Crane flies and blood worms are abundant, you double your weight. Begin migration.</p>	<p><b>Northern Card</b></p> <p>Continued severe weather in the Arctic tundra caused you to not lay eggs. You have difficulty finding a sufficient supply of invertebrate prey (animals you eat). You struggle to keep up with the flock. Hop on one foot to the first staging area.</p>
<p><b>Southern Card</b></p> <p>How disappointing! You have had a rough nine months at your wintering grounds. Part of the wetlands you have always returned to have been drained, causing more birds to compete for less food. You are weak, hop on one foot to the first staging area.</p>	<p><b>Southern Card</b></p> <p>Yipee! It's been a good winter! A new wetland reserve area has been added to your wintering grounds. There was plenty of food. Fly to your first staging area.</p>
<p><b>Southern Card</b></p> <p>Too bad! Agriculture is spreading on your wintering grounds, and as a result so is DDT. You are poisoned by this lethal pesticide, and die. Go to the sideline.</p>	<p><b>Southern Card</b></p> <p>Oh no! More wetlands have been drained and turned up into agricultural areas. You are unable to find enough food, and eventually die. Go to the sideline.</p>
<p><b>Southern Card</b></p> <p>Worms! Oodles of freshwater worms! It's been a great winter with lots of food. You are easily able to increase your body weight from 20 grams to 40 grams for the long migration to the Arctic tundra. Migrate to the first staging area.</p>	<p><b>Southern Card</b></p> <p>Good news! Educating people about the need to preserve wetlands has paid off. You have more wetlands and abundant food. You begin your next migration in good health.</p>
<p><b>Southern Card</b></p> <p>Moo! The cattle industry is booming in South America. Your winter habitat is severely overgrazed, making it difficult to eat enough to put on an adequate fat load for migration. You must skip to your first staging area.</p>	<p><b>Southern Card</b></p> <p>Bang! Hunting of shorebirds is still legal in South America. You are shot by a hungry hunter. Go to the sideline.</p>



# The Incredible Journey Game Cards



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<p style="text-align: center;"><b>Southern Card</b></p> <p>Starvin' Arvin! Overcrowding due to loss of wetlands has increased competition for what little food there is. You do not have an adequate fat load, and your migration is difficult. You may skip to your first staging area.</p>	<p style="text-align: center;"><b>Southern Card</b></p> <p>Yuck! You are feeding on aquatic insects that have been contaminated with DDT in the runoff from agricultural lands surrounding your wetland habitat. You become sick and die. Go to the sideline.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>What!? Your usual staging ground is swarming with people! A new recreation center has been opened at your staging area. Being around so many people makes feeding difficult. You do not store enough energy. Walk to your next staging area.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Hooray! The Western Hemisphere Shorebird Reserve Network has done a great deal to preserve important shorebird sites along your migration route. You find a surplus of food, and quickly refuel for your continued migration.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>Brrr! Bad weather makes for a slow migration! Side step to your next staging area.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Bad stuff! You find that this staging area has been contaminated with pesticides from surrounding agricultural lands. You become ill and die. Go to the sideline.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>Wheeee! You've got a full stomach and a tail wind pushing you on to your next staging area. A predator can't even catch you! Arrive at your next staging area quickly and safely.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Yikes! Your usual staging area has been drained for farming. You must scrounge to find enough food for the next leg of your journey. Hop on one foot to the next staging area.</p>

## The Incredible Journey Game Cards



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<p style="text-align: center;"><b>Staging Card</b></p> <p>Gobble, gobble! You have had warm weather and abundant food at this staging area. You have easily increased your weight by 100%! Begin your migration again.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Bye, bye! You did not find enough food to replenish your fat load, and the flock you were traveling with has left without you. You must wait one turn to continue on with another flock.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>This is unnerving! You are on the perimeter (outer edge) of the flock, and must constantly be on the look for predators. You do not eat enough to put on an adequate fat load. Hop to the next staging area.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Goopy! You find one of your coastal staging areas to be covered with the results of an oil spill. You become covered with the thick goo and are unable to eat, fly, or maintain any body heat. You die. Go to the sideline.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>Ugh! You have run into a head wind (wind blowing against you), and you are burning up a lot of energy. Take two steps forward and one step back, as you make your way along your migration.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>Whoopee! Education about wetlands has gained public support for the restoration of wetland areas. You have an abundance of snails and freshwater worms to feed on! You begin your migration in good health.</p>
<p style="text-align: center;"><b>Staging Card</b></p> <p>Zap! New radio towers have been built across your migration route. You are zapped and die. Go to the sideline.</p>	<p style="text-align: center;"><b>Staging Card</b></p> <p>You find yourself feeding in the safety of the flock. Craneflies, danceflies, and shoreflies are abundant. You double your weight easily. Move on to the next staging area.</p>





## Just Ducky

Participants play ring toss to learn about the routes that waterfowl take between summer and winter homes.



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*An Educator's Guide to Celebrating Birds*  
CEE  
Council for Environmental Education  
5555 Morningside Drive  
Suite 212  
Houston, TX 77005

### Need to Know

Do you take the same route to and from school each day? If you do, then you understand a little bit about what many ducks, geese, and swans do each spring and fall as they migrate.

As a group, ducks, geese, and swans are known as **waterfowl**. In North America, most waterfowl species migrate between summer grounds in the north where they nest and raise their young, and winter grounds in the south. The main reason scientists believe that birds migrate is so they may continue to find food year round. Another reason for migration is to find safe and suitable habitat with enough space for breeding, nesting, and raising young.

In past decades, many researchers believed waterfowl migrating through North America traveled along four well-defined **corridors** or "**flyways**." Although scientists now recognize that the migration patterns of waterfowl are actually much more complex than previously believed, the corridor model is still used for annual estimations of population sizes and setting hunting limits for waterfowl. The concept of corridors allows provinces, states, and countries to coordinate conservation and management activities for the birds they share.

In this activity, you will set up a ring toss game to help participants learn about these corridors and some of the wildlife refuges that provide habitat for migrating birds. Participants also learn about some of the waterfowl species that stop at National Wildlife Refuges along their migration route.

### NEED TO GET

- 12 plastic, 2-liter soda bottles filled with water, sand, or soda (with tight lids)
- 6 rings, heavy enough to toss and wide enough to fit over the soda bottles
- An enlarged version of the Migration Map showing North America and the corridors. (Ideas for making your map: Outline it with masking tape on the floor; draw it on large sheets of paper; trace it with chalk.)
- Twelve labels for the soda bottles, large enough to wrap around the bottle
- Tape
- A copy of the Traveling Waterfowl Cards, cut into four individual cards



## Getting Ready

Participants attempt to complete a successful "migration" by tossing rings over the soda bottles in their chosen corridor on the Migration Map.

1. In large print, write the name of each of the 12 wildlife refuges mentioned on the Traveling Waterfowl Cards on labels.
2. Tape each wildlife refuge label onto a soda bottle.
3. Plan to create an enlarged Migration Map (based on the ones on page 32). If you use two-liter-size soda bottles, make sure your Migration Map is about 8 to 10 feet long and almost as wide (or adjust the size of your map depending on the space available for your station, the size of the rings and soda bottle you are using, and the skill level of participants.)
4. Draw an enlarged version of the map on a large roll of paper. Label each of the corridors: the Atlantic, Mississippi, Central, and Pacific.
5. Place the soda bottles on your enlarged Migration Map, following the original map as a guide. (Position the bottles far enough apart to allow the rings to slide down.)
6. Draw a line at the bottom of your Migration Map, where participants can stand as they attempt to toss the rings over the bottles.



## Taking Flight!

1. As participants gather, ask them if they know what the lines on the map mean. Explain what a flyway is. Tell participants that scientists identified the four flyways by studying the routes that waterfowl took to get between their summer and winter habitats. Because of that, many National Wildlife Refuges were established in these migratory corridors to help ensure that migratory birds would have protected places along the way.
2. Explain that each of the soda bottles represents one of the many National Wildlife Refuges that provides resting and feeding places for waterfowl as they migrate. In this ring toss game, each participant is a bird that is migrating along one of the corridors. In order to complete a successful "migration," the participant needs to stop at each of the three refuges in that corridor by tossing a ring on the neck of the appropriate bottle.
3. One person plays at a time. Have the player step up to the line and pick up the six rings. Select one of the four Traveling Waterfowl cards and read it aloud.





4. After reading the card, the player attempts to toss the rings on the neck of each of the three bottles in the selected flyway, going from south to north. Each player gets to toss six rings per turn.
5. Give each player a title based on his or her performance. Here are some ideas for making a poster with titles for players:
  - Master Migrator: Tossed rings over every bottle in order
  - Fledgling: Tossed rings over some, but not all, of the bottles in the corridor
  - Lost in the Sky: Tossed a ring over a bottle in a different flyway
  - Staying South: Missed all the bottles
6. Some players will successfully complete their migrations. You may want to challenge them to reverse their migration. This time, they will stop at the refuges going from north to south, attempting to toss the rings over the bottles in reverse order. If these players miss any of the bottles on their return journey, point out that they will be "Staying in the Snow" this winter!

## QUIZ YOUR GUESTS

1. What do you think waterfowl need as part of their migratory journeys? (Answers include: food, water, safe places to rest, safe places to breed, and shelter from extreme weather.)
2. If you were going to set up some new National Wildlife Refuges to help migrating waterfowl, what would you need to know to help you select areas to protect? (Answers include: where different types of waterfowl usually stop on their migratory journeys (particularly those species that need the most help), where are the greatest concentrations of waterfowl found throughout the year, what kinds of habitat attract different species, and what types of habitat are in need of more support as a protected area.)

### Field Trip - Katy Prairie

Learn about the Katy Prairie and the fight to protect this very important area for migrating waterfowl. Plan a trip to the Katy Prairie.

[www.katyprairie.org](http://www.katyprairie.org)



### AMERICAN BLACK DUCK

You are an American Black Duck using the **ATLANTIC CORRIDOR**.

You look kind of like a female mallard, mottled all over, but darker. Your favorite place for lunch is a shallow pond where you can find underwater plants, insects, and maybe even an amphibian or two to snack on.

Your winter home is along the Atlantic coast of the United States. Now you're on your way to your breeding grounds in the northeast U.S. and central and eastern Canada. On the way, you might stop at refuges such as:

- Cape Romain National Wildlife Refuge, South Carolina
- Block Island National Wildlife Refuge, Rhode Island
- Capemay National Wildlife Refuge, New Jersey



### LESSER SNOW GOOSE

You are a Lesser Snow Goose using the **MISSISSIPPI CORRIDOR**.

being called "Lesser" shouldn't give you an inferiority complex—It's just because you are smaller than your close relative, the "Greater" Snow Goose. You might be all white except for your striking black wingtips, or have just your head and neck white with the rest of your body a bluish-gray color.

Your winter home is along the Gulf coast of Texas, Louisiana, and Mexico, and sometimes in the fields and pastures of Louisiana, Texas, Mississippi, and Arkansas. On your way to your Arctic breeding grounds in far northern Canada, you might stop at refuges such as:

- Bald Knob National Wildlife Refuge, Arkansas
- Squaw Creek National Wildlife Refuge, Missouri
- Cypress Creek National Wildlife Refuge, Illinois



### NORTHERN SHOVELER

You are a Northern Shoveler using the **CENTRAL CORRIDOR**.

You have a bill like no other duck! Large and shaped like a spoon, some people think it looks like a shovel. Since you use your bill for filter feeding, "shoveler" is a good name for you.

Your winter home is along the Gulf coast of Mississippi, Texas, Louisiana, and Mexico, or in the highlands of north and central Mexico. You are on your way to your breeding grounds in the prairies of the north-central United States and south-central Canada. On your trip, you might stop at refuges such as:

- Fish Springs National Wildlife Refuge, Utah
- Seedsdakee National Wildlife Refuge, Wyoming
- Charlie M. Russell Wildlife Refuge, Montana



### NORTHERN PINTAIL

You are a Northern Pintail using the **PACIFIC CORRIDOR**.

In the spring, you are one of the first ducks to head north. In the fall, you are among the first to fly south. You are such a long, slender duck that your nickname is "Greyhound of the Air."

Your winter home is in central California or along the west coast of Mexico. You are flying north to your breeding grounds in Alaska, the Canadian Arctic, western Greenland, or the western and central United States. Along the way, you might stop at refuges such as:

- San Luis National Wildlife Refuge, California
- Tule Lake National Wildlife Refuge, Oregon
- Togiak National Wildlife Refuge, Alaska



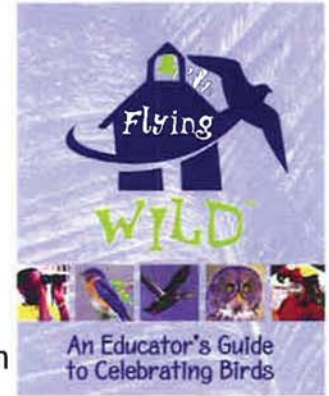




## Just Ducky

### What Did You Learn?

1. What are the four main corridors used to manage migratory waterfowl in North America?
2. How are National Wildlife Refuges important to migratory waterfowl species?
3. If you were going to set up some new National Wildlife Refuges to help migrating waterfowl, what would you want to know as you selected areas to protect?



### Wanted: Your Feedback (send to CEE)

1. How well do you think the activity helped players understand what a corridor is?
2. What seems to be the main lessons that participants learned?
3. What would you do differently if you were to do this activity again?

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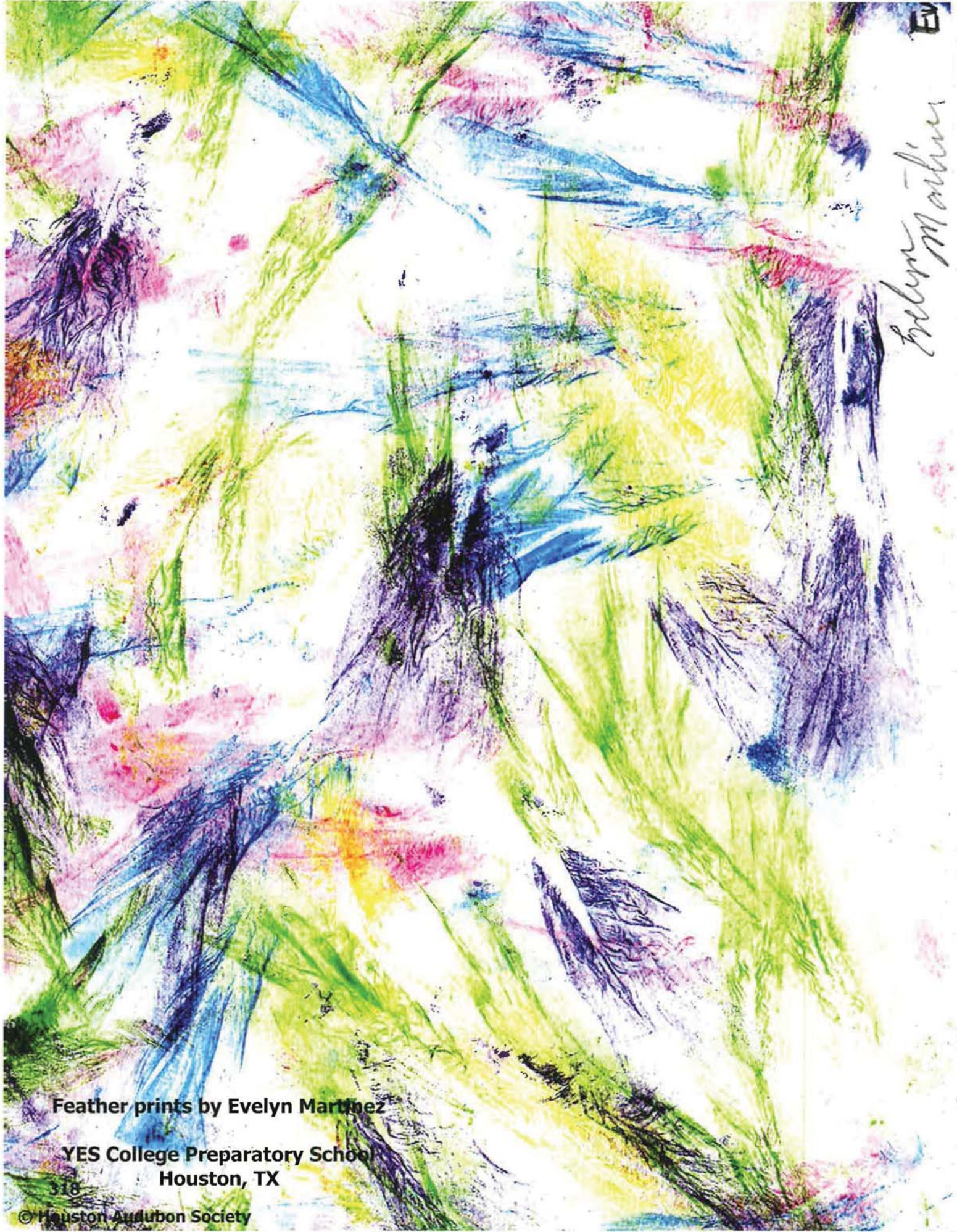
### Question for Reflection

How does knowing a bird species' migration route help in protecting that species?



E

*Evelyn Martinez*



Feather prints by Evelyn Martinez

YES College Preparatory School  
Houston, TX

318

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# got habitat?



**Houston Audubon Society**  
Houston, Texas  
[www.houstonaudubon.org](http://www.houstonaudubon.org)

**Get outside,  
Watch Birds,  
Get Involved**

"The wild goose comes north with the voice of freedom and adventure. He is more than a big, far-ranging bird, he is the epitome of wanderlust, limitless horizons, and distant travel. He is the yearning and the dream, the search and the wonder, the unfettered foot and the wind's-will wing.

**Hal Borland** (1900-1978)  
American Journalist and Writer



## **Birding Ethics: Good Rules for all Bird Watchers**

### *An Introduction to Birdwatching*

©Texas Parks and Wildlife  
4200 Smith School Road  
Austin, TX 78744

The American Birding Association and National Audubon Society recommend the following guidelines:

1. Take care not to disturb either the birds or their habitat. Walk softly on the land.
2. Stay on established pathways and keep motor vehicles on established roads and parking areas.
3. Avoid harassment; don't disturb birds that are nesting or their nesting areas. Do not handle eggs or young or tarry too long at a working nest.
4. Don't over-use playback tapes of screech owl recordings to call birds in. Don't use these if endangered or threatened birds may be present.
5. Don't trespass on private property. Respect landowners' rights to privacy. Always ask permission first.
6. If looking to find endangered species, follow all USFWS refuge and State management area rules and regulations
7. Avoid "tree-whacking" to arouse cavity dwellers. Undue disturbance may cause the bird to abandon its nest and young, or even kill young inadvertently, in an attempt to escape.
8. Divide larger groups of people into smaller, more manageable numbers. Small groups cause less disturbance. When possible, car pool.
9. Leave no litter or trash. Pack your garbage out of wilderness areas. Ingested items can kill.
10. Support local and national bird conservation organizations.
11. Support the Texas Parks and Wildlife Nongame and Threatened and Endangered Species fund.  
All moneys donated go towards management of nongame birds, wildlife, and their habitat.
12. Support the National Audubon Society, Houston Audubon Society, and Texas Nature Conservancy  
These organizations work tirelessly to preserve, purchase, and restore avian habitats.

Keep in mind we are all sharing this planet with these beautiful avian creatures. It is important to remember that the more habitat we irreversibly modify and destroy, the fewer birds there will be for us and our children to enjoy. We are temporary stewards of this land. We must safeguard it, and hopefully, pass it on in better condition than we found it. Great-grandchildren unborn may wish to continue the study of ornithology or the science of birds. Let's do our best to pass our natural heritage rich in bird species on to them!





## **A Glimpse At How They Get Here** **by Darrell Vollert**

Bird migration, particularly trans-gulf migration across the Gulf of Mexico, is one of the great miracles in nature. Millions of neotropical migrant birds migrate through Texas each fall and spring. These are bird species which winter in Latin America and nest in temperate zone of North America. Included in this group of birds are shorebirds, raptors, cuckoos, nightjars, flycatchers, vireos, swallows, thrushes, wood warblers, grosbeaks, buntings, and orioles. They are among the most colorful birds which nest in the United States. A number of these migrant birds circum-vent the Gulf of Mexico during their southbound and northbound flight, while many others make the much more treacherous journey across the gulf. In order to make this nonstop flight north across the gulf, neotropical migrants gorge on protein-rich fruit and insects almost 24/7 to build their fat reserves. At dusk on days in the spring when weather conditions are favorable (clear skies) neotropical migrants strike out singularly or in small, loose flocks over the Gulf of Mexico heading north to the Gulf States. Many depart from the tip of the Yucatan Peninsula, while others take flight north from Central America and even northern South America. Migrants prefer to make this flight across at night when the temperature is cooler and the humidity is higher allowing moisture to flow through their lungs. They navigate across the gulf using the North Star and the earth's magnetic field. If conditions remain favorable throughout the flight across the Gulf of Mexico small migrants such as warblers will arrive at the coastline around 2pm the following day. Larger migrants like thrushes will arrive around 11am to noon. Shorebirds and raptors prefer to migrate during the daylight hours over land rather than over open water.

When winds are strong out of the south and southeast, migrants will bypass the coastline and land as far as one hundred miles inland. A strong late season cold front associated with rain over the gulf is a neotropical migrant's worst nightmare. It is one thing to fly into the face of a strong head wind. It's another thing to fly with rain pelting their bodies. A bird's instinct is to come out of the sky when it is raining, but what is a bird to do when they are flying over open water? They will dip down and fly just above the surface of the water. Some will be overtaken by waves. Others will run out of energy and perish in the gulf. After a strong spring cold front millions of tiny birds will wash ashore. Many of these dead birds have completely metastasized their flight muscles. It is a form of self-cannibalization. The keel of the breast bone is protruding through the skin. Only the most physically fit survive the flight across during these weather conditions. It is nature's way of weeding out the genetically and physically weak. A weather event such as this produces what is known as a fall out. Exhausted birds literally fall out of the sky when they reach land during these weather conditions. Coastal oak-hackberry mottes and cheniers and mulberry trees are a neotropical migrant's saving grace. They provide shelter and foraging habitat for tired migrants. A single bush along the coast line can look like a living Christmas tree during a fall out. Colorful wood warblers, tanagers, and orioles adorn trees and shrubs like Christmas ornaments during fallouts. Not only do these tired birds





have to survive the elements, but also lurking raptors. Critical habitat for migrant shorebirds and land birds can be found at national wildlife refuges, state parks, Houston Audubon sanctuaries, and Texas Ornithological Society sanctuaries along the coastline.

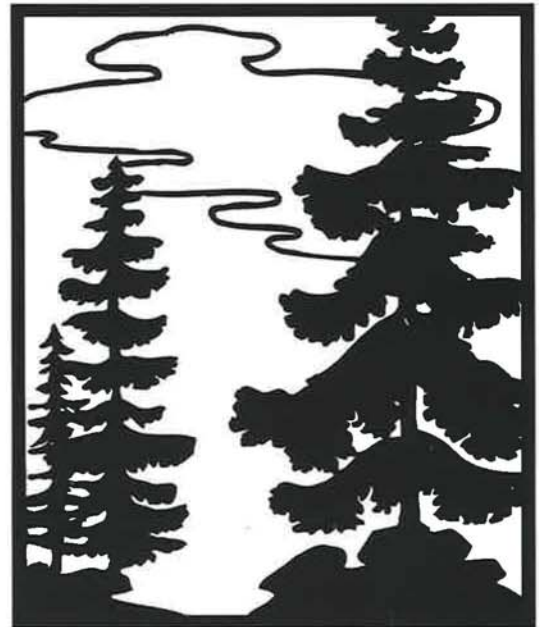
Once neotropical migrant landbirds have replenished their fat reserves sufficiently they strike out from the coastline for points farther north. Flying over land, migrants will also use familiar landmarks for navigation along with the previously mentioned North Star and magnetic field tools. During spring migration neotropical migrants are on a tight time budget to reach their nesting grounds and set up a territory to defend. They will reach their nesting grounds in a matter of days once they reach the coastline.

Spring migration begins in early March and continues into early June. The bulk of the neotropical migrants migrate through Texas the last two weeks of April and the first week of May. One might ask why they would risk their lives to make such a treacherous flight across the Gulf of Mexico. Why not stay year-round in the tropics? The answer lies in the billions of insects which emerge in the spring in the temperate zone from their winter slumber. Migrants take advantage of a literal buffet of insects to sustain themselves through the nesting season. Extended daylight hours in the United States and Canada during the spring and summer months allow neotropical migrants to feed hungry young for longer periods of time during the day. Shorebirds nesting on the Arctic Tundra can feed young in almost twenty-four hours of daylight. Plus, there are relatively fewer native bird species in the temperate zone to compete with for food during the nesting season.

Fall migration is more prolonged. There is not that immediacy to reach a destination. Fall migration begins in early July with the arrival of shorebirds along the coastline. At times a representation of almost every shorebird species can be found at Houston Audubon Society's Bolivar Flats in late summer. Fall migrants continue to trickle through until mid November. Migrants will join their tropical cousins until it is time to begin the risky migration northward again, to sustain the species existence.

**Darrell Vollert**  
**Chappell Hill, Texas**  
**Native Texan**





**Houston is the fourth largest city in the United States and is also home and habitat to an amazing array of birds. Birds traveling along the Central Flyway and straying from the other major flyways, end up in a vibrant city, mixed with urban and green spaces.**

**At the time of this compilation, Houston Parks and Recreation Department (HPARD) is managing over 20,000 acres of land. This includes 314 parks with more than 79 miles of trails for nature watching, jogging, hiking, and biking. Birds migrating along the Central Flyway meet up with these green spaces as rest stops on an arduous journey. Without these refuges for food, shelter, and water, many more bird species would be in jeopardy of declining populations.**

**This manual highlights just some of our great city parks. Almost every city park has the potential to host migratory birds. By providing native plantings and natural habitat, the birds will find a safe haven they can return to each year.**

**For a complete listing of Houston City Parks,  
visit the HPARD website at:**

**<http://www.houstonparks.org>**



Houston Audubon members birding in Sunnyside Park. Birds spotted on this October day included: American Pipits, Yellow-bellied Sapsucker, Carolina Wren, Carolina Chickadee, Northern Cardinal, Mourning Dove, Killdeer, Blue Jays, and many more.



## The “Green” Reality of City Parks

Ask just about any six-year old in the City of Houston, “Why do they like to go to the park?”, they are going to tell you that they love to play outside. There is a wonderful sense of freedom that comes from a good romp around a park with your kids. The fresh air and sunshine have health benefits that are both physical and mental for all of us. But with increasing concerns in Houston about air pollution, traffic, population increases, crime, and the safety of unwatched children, how do our city parks keep themselves green and healthy?

In a recent publication by the Trust for Public Land, the benefits of urban open space, certainly seem to outweigh the continued paving of our green spaces. The article sites that more than 200 million Americans and 5 billion people worldwide, now live in metropolitan areas. These areas and the connection between the cities and nature have impacts on the global environment.

The revitalization of urban green space, more natural stewardship practices, and education of the next generation of citizens about the natural world will in turn benefit local communities and neighborhoods for the long term. Benefits of urban green space, as explained by the Trust for Public Land include the following:

- Control and mitigation of air and water pollution
- Reduction of fossil fuel consumption
- Reduction of urban sprawl
- Reduction of crime
- Fostering of cohesive communities
- Attracting and retaining of businesses
- Stabilizing property values

**The Trust for Public Land**  
**[www.tpl.org](http://www.tpl.org)**

Ask any elementary student why we need trees and they will tell “So that we can breathe”. Somehow we need to recapture what we learned and loved about the environment as youngsters and start desiring that in our neighborhoods and communities. Recent floods have taught us all a lesson about how nature, naturally protects itself. When we put our own human blueprint on the landscape, there are consequences. We all know that our city parks improve our quality of life and now we need to let our voices be heard, as development progresses at what seems an uncompromising speed. Houston has a wealth of green space that needs proper stewardship. The Houston Parks and Recreation Department needs to hear support from the citizens, about planting natives and improving habitats for birds and other native wildlife. We need to let our city government know that we use the parks and we want the parks to stay green for the future generation of Houstonians.





# Houston Parks

## Key to symbols



Trails - may be paved or primitive



Parking Lot



HPARD Community Center



Playground



Picnic area



Water feature - bayou, creek, or pond



Trails are handicapped accessible

### Urban Conservation Treaty for Migratory Birds

City of Houston Parks that were directly involved:

Clinton  
Robinson Sr.  
Perez Selena  
Finnigan  
Almeda  
Sunnyside  
Linkwood  
Cloverland  
Robinson Jr.  
Emancipation  
Mason  
Dezavala  
Hartman  
Crestmont  
Swiney  
Garden Villas



## South Side Parks (south of I-10)

**Blackhawk Park** : 9401 Fuqua 77075 Key Map: 575V



*Notes: 76 acres of woods, primitive trails, seasonal ponds  
Watch for American Pipits in fields*

**Charlton Park** : 8200 Park Place 77017 Key Map: 535P



*Notes: 8.7 acres along Sims Bayou, mature  
Post Oak trees, rolling hills  
Good spot for owl prowling*

**Cloverland Park** : 3801 Hickok 77047 Key Map: 573L



*Notes: 12 acres in neighborhood with woods nearby  
Great place to start plantings to attract birds*

**Meadowcreek Village** : 5333 Berry Creek 77017 Key Map: 536S



*Notes: 10 acres in neighborhood, mix of trees and open areas  
Great place to start gardens to attract hummingbirds and other  
birds*

**Sagemont Park** : 11507 Hughes 77089 Key Map: 576Y



*Notes: 8 acres along Sam Houston Tollway, small open area and woods  
Watch for birds of prey in open fields*

**Scottcrest Park** : 10700 Rosehaven 77051 Key Map: 573F



*Notes: 19 acres along tributary to Sims Bayou,  
paved trail around open area  
This park has lots of potential with plantings for  
birds and wildlife*

**Sunnyside Park** : 3502 Bellfort 77051 Key Map: 533X



*Notes: 206 acres, paved trail around open sports  
fields, thickets along perimeter provide great bird habitat  
Watch for American Pipits, Shrikes, Yellow-bellied Sapsuckers,  
Yellow-rumped Warblers and others*





## South Side Parks (south of I-10)

**Buffalo Bayou Park** : 18 - 3600 Allen Parkway and Memorial Drive 77002 Key Map:492M



*Notes: 124 acres along Buffalo Bayou, hike and bike trails, dog park, boat launch, opportunities to bird by foot and canoe*  
[www.buffalobayou.org](http://www.buffalobayou.org)

**Sam Houston Park** : 1000 Bagby 77002 Key Map: 493L



*Notes: 20 acres*  
*The first city park in Houston, acquired in 1899*  
*Trails, walkways and gardens attract many birds*

**Bendwood Park** : 12700 Kimberly 77024 Key Map: 489D



*Notes: 14 acres*  
*Mature Live oaks, sweetgums and pines*  
*Great potential for birding and habitat improvement*

**Cullinan Park at Oyster Creek** : Highway 6 S 77478 Key Map: 567H



*Notes: 750 acre nature preserve*  
*Extensive woods and a large lake (White Lake) with an observation tower, pier and boardwalk*  
*Excellent location to view ducks in winter, anhingas, herons and other waterfowl in all seasons*  
*Nina J. Cullinan wrote in her will, "It is my last wish that this land be a place of beauty and peacefulness in the city," and today that is exactly what this park is.* [http://hpbinc.org/oyster\\_creek.htm](http://hpbinc.org/oyster_creek.htm)



## North Side Parks (north of I-10)

**Moody Park** : 3725 Fulton 77009 Key Map: 453Y



*Notes: 35 acres along White Oak Bayou, trails, mature trees and newly planted natives, thickets*

*Watch for Common nighthawks and bats*



**Shadylane Park** : 10100 Shady Lane 77093 Key Map: 414W



*Notes: 12 acres of tree groves with weedy fields and woods  
This park has great potential for birds and bird watching*

**Tidwell Park** : 9720 Spaulding 77016 Key Map: 454D



*Notes: 85 acres with woods on the north side  
Great place to incorporate birding trails*

**Herman Brown Park** : 400 Mercury 77013 Key Map: 496A



*Notes: 717 acres of woods and open fields  
Great place for birding and wildlife watching*

**Keith Weiss** : 12300 Aldine-Westfield 77093 Key Map: 413M



*Notes: 500 acres of woods and open fields  
Great place for birding and wildlife watching*

**Nob Hill Park** : 10300 Timber Oak 77043 Key Map: 449V (leased to Pct 3)



*Notes: 13 acres of mature trees, open areas and new native plantings  
Walk the trail and enjoy the woodpeckers and other resident birds  
and watch for Mississippi Kites in August*

**Little Thicket Park** : 1831 West 23rd St 77008 Key Map: 452T



*Notes: 10 acres along White Oak Bayou  
Great place for birding and wildlife watching*



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## Parks of special interest to birds and birdwatchers



Houston Parks and Recreation Department

"To play a vital role in building a sustainable community and enhancing the quality of life in Houston through parks, programs and partnerships."

### **Cullen Park** - 19008 Saums and 18203 Groeschke Key Map 447S

This park is one of the largest U.S. municipal parks at over 10,500 acres. It is also home to one of only 19 velodromes in the United States. Hike and bike trails offer wonderful birding opportunities. This park is a great place for a family picnic and bird watching trip. Watch for migratory birds and permanent residents along the wooded edges of trails and keep your eyes looking upwards, for birds of prey soaring above open areas.

### **E. R. and Ann Taylor Park** - 1900 Reed Road near Almeda

Dedicated in 2003, this 27 acre is important both historically and environmentally. The park is the former site of the Taylor homestead and sits on one of the oldest oil fields in the state, known as Pierce Junction. E. R. Taylor was a confederate soldier and Ann was his father's slave. The park honors their history and preserves a special place in Houston. HPARD will be spending nearly \$600,000 on improvements, which will include extensive nature trails, habitat improvements, wildlife viewing areas, an observation tower, pond restoration, and a pavilion.

### **Little Thicket Park** - 1831 West 23rd St. Key Map 452T

This is a 10 acre gem of a park in the Heights. Parking is not always available on the neighboring streets but a venture into the park will reward anyone who can get past the parking situation. The park is on White Oak Bayou and has wonderful winding trails, native plantings to attract migrants and an observation deck for wildlife watching. The Bayou Preservation Association has recently worked on restoring native vegetation and water sources for migrant and resident birds.

### **Hogg Bird Sanctuary** - 100 Westcott Key Map 492L

Sixteen wooded acres along Buffalo Bayou and adjacent to the former home of Ima Hogg, give birds a needed haven in the city. Plans are in the works to develop natural trails to allow for birding and wildlife watching. When visiting Bayou Bend and Ima Hogg's gardens, be sure to stop, look, and listen for the birds in the wooded acres around the homesite.

### **Timbergrove Park (West 11 Street Park)** - 2600 West 11th St. Key Map 492B

HPARD leases this 20 acre park from HISD. Meander down the simple trails through this natural woodland and you will discover the magic of this park. Old Loblolly pines provide woodpeckers a place to find food and shelter and the growing vines and understory shrubs provide food and shelter for hummingbirds, cardinals, warblers and lots of other wildlife. Neighbors to this park have worked hard to preserve this place and are battling to keep it green as this manual goes to print. Referred to as a pocket of wilderness in Houston, it is worth visiting, and worth saving.



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## Parks of special interest to birds and birdwatchers



Houston Parks and Recreation Department  
"To play a vital role in building a sustainable community and enhancing the quality of life in Houston through parks, programs and partnerships."

### **Memorial Park** - 6501 Memorial Drive Key Map 492K

A simple letter written to pay tribute to the World War I soldiers who had lived and trained at Camp Logan was to be the beginning of the battle for Memorial Park. Appearing in the Houston Chronicle in 1923, this letter and subsequent responses, soon established a desire for a city park to commemorate a part of Houston history. Purchased from Ima Hogg and her two brothers, Will and Mike, at cost, the 1500 acres would soon be known as Memorial Park. The rich history of the park and the battle for its preservation is beautifully documented by Sarah Emmott (1913 - 1992). Her book, *Memorial Park - A Priceless Legacy*, allows the reader to step back in time and discover a fascinating piece of Houston history. The character names are easy to recognize, as we see them memorialized as city and street names in present day Houston. The book can be found in libraries and collections around the city and in the Sarah Emmott Memorial Library at the Houston Audubon's Edith L. Moore Nature Sanctuary. Knowing the history allows visitors to truly appreciate this special piece of green space. While many go to the park to run, jog, walk, golf, play tennis, and get involved in other recreational activities, it is also a great place to bird and wildlife watch. Great Horned Owls, Red-shouldered Hawks, and a host of other resident birds, play host to the myriad of migrants that pass through each year. Keep a watchful eye and an open ear when visiting.

### **Keith Weiss Park** - 12300 Aldine-Westfield Key Map 413M

This 500 acre park offers a variety of recreational areas but also has ample woods for birding and wildlife watching. The woods and thickets offer exceptional habitat for a variety of birds, year-round.

### **Herman Brown Park** - 400 Mercury Key Map 496A

Tucked in along Greens Bayou and Hunting Bayou, this 717 acre park is a big attraction for migratory birds. Woodlands and open areas provide shelter and abundant food supplies for all types of wildlife. This Northeast side park is just waiting for you to discover the abundance of natural habitats and the opportunities to see a variety of birds and other creatures. Watch for American Bitterns in the marshy areas, Red-shouldered Hawks soaring above open fields, Northern Bobwhites in the brushy areas and migrants like the American Goldfinch in winter and Chimney Swifts in summer.

### **Willow Waterhole Greenway Project and Park** - near S. Post Oak and US 90

This impressive project is a cooperative partnership between Harris County Flood Control District, Houston Parks and Recreation and Texas Parks and Wildlife. This project is designed to reduce flood damage in neighboring communities and provide recreational and aesthetic amenities to the area. Four large stormwater detention basins or storage "lakes" will help to prevent future flooding but also attract wildlife and wildlife watchers. The project will bring 280 acres of green space to the community and provide trails for walking and biking, playgrounds, and picnic areas.





## Hermann Park

6001 Fannin  
Houston, TX 77030



© Wayne Nicholas

Hermann Park has been a vibrant green space in the city of Houston for over 90 years. It was presented to the City of Houston by George Hermann in 1914. Over the years, the Houston Zoo, Miller Outdoor Theatre, the Houston Museum of Natural Science, and the first desegregated public golf course in the United States have all added to the Park's importance as a recreational destination. It is also an important destination for thousands of migratory birds each year. Wayne Nicholas, one of the featured photographers in this manual, has spent many hours birding and photographing the wildlife that abounds in the park. Below is a listing of the birds he has spotted over the last year and a half. He photographed this Red-tailed hawk in January of 2005. Bring a field guide and a checklist when you visit and see how many more birds you can add to the list.

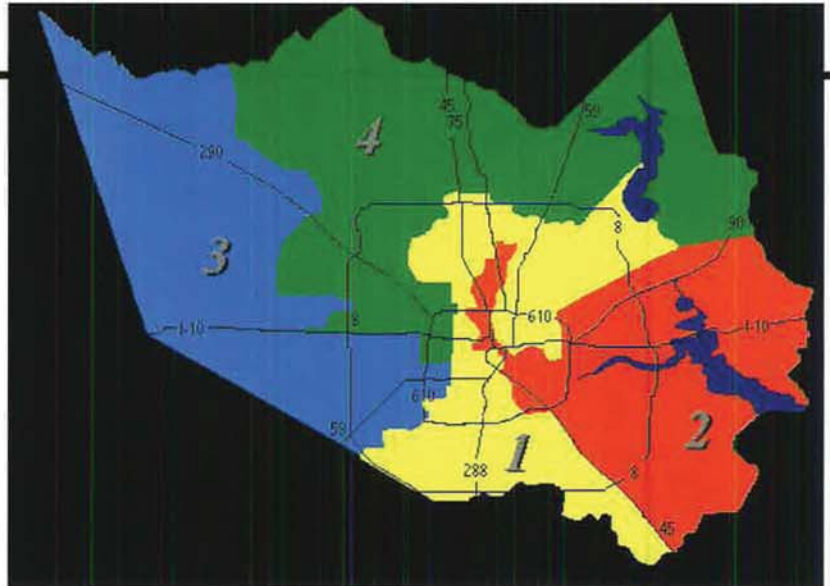
Hermann Park Conservancy is dedicated to the conservation and protection of Hermann Park. To learn how you can get involved, visit their website at: [www.hermannpark.org](http://www.hermannpark.org).

Red-bellied Woodpecker  
Red-headed Woodpecker  
Downy Woodpecker  
Yellow-bellied Sapsucker  
Northern Mockingbird  
Blue Jay  
Northern Cardinal  
Yellow-rumped Warbler (w)  
Pine Warbler (w)  
Black-and-white Warbler (w)  
White-eyed Vireo (w)  
Blue-headed Vireo (w)  
Ruby-throated Hummingbird

European Starling  
House Sparrow  
Carolina Wren  
Brown Creeper  
American Coot  
Pied-billed Grebe  
Ring-necked Duck  
Lesser Scaup (w)  
Redhead Duck (w)  
Mallard  
Wood Duck  
Black-bellied Whistling Duck  
Double-crested Cormorant

Neotropic Cormorant  
Green Heron  
Great Egret  
Ring-billed Gull  
White-winged Dove  
Mourning Dove  
Inca Dove  
Sharp-shinned Hawk  
Cooper's Hawk  
Red-tailed Hawk  
Osprey  
Peregrine Falcon  
American Kestrel  
Harris's Hawk

# Harris County Park System



Select rules and regulations:

## RULES AND REGULATIONS FOR COUNTY PARKS IN HARRIS COUNTY, TEXAS

### Section 1. **Authority.**

These rules and regulations are adopted by the Commissioners Court of Harris County, Texas, acting in its capacity as the governing body of Harris County, Texas. These rules and regulations are authorized by Chapter 320 of the Texas Local Government Code, as amended, for all public parks, owned, operated, or maintained by Harris County.

### Section 2. **Administration.**

The Commissioners Court hereby designates the Park Superintendent, along with the Harris County Sheriff, the Harris County Constables, and their respective deputies to enforce these rules and regulations.

### Section 3. **Area Covered.**

Except as expressly exempted in these rules and regulations, they shall apply to all county parks located within Harris County, Texas.

### Section 7. **Wildlife.**

- (a) No person shall willfully harm, harass, trap, confine, catch, or possess any wildlife within a park.
- (b) Fishing in accordance with State of Texas laws and regulations shall be permitted within all parks, except as specifically prohibited.

### Section 8. **Plant Life.**

No person shall willfully destroy or remove any tree, shrub, vine, wildflower, grass, fern, moss, leaves, cones, or dead or downed wood within a park.





## Precinct 1 Parks Harris County, Texas

[http://www.co.harris.tx.us/comm\\_lee/parks.htm](http://www.co.harris.tx.us/comm_lee/parks.htm)

### El Franco Lee

9400 Hall Road  
Houston, TX 77089

- 1.5 mile nature trail bordering reservoir next to Clear Creek

### Alexander Deussen Park

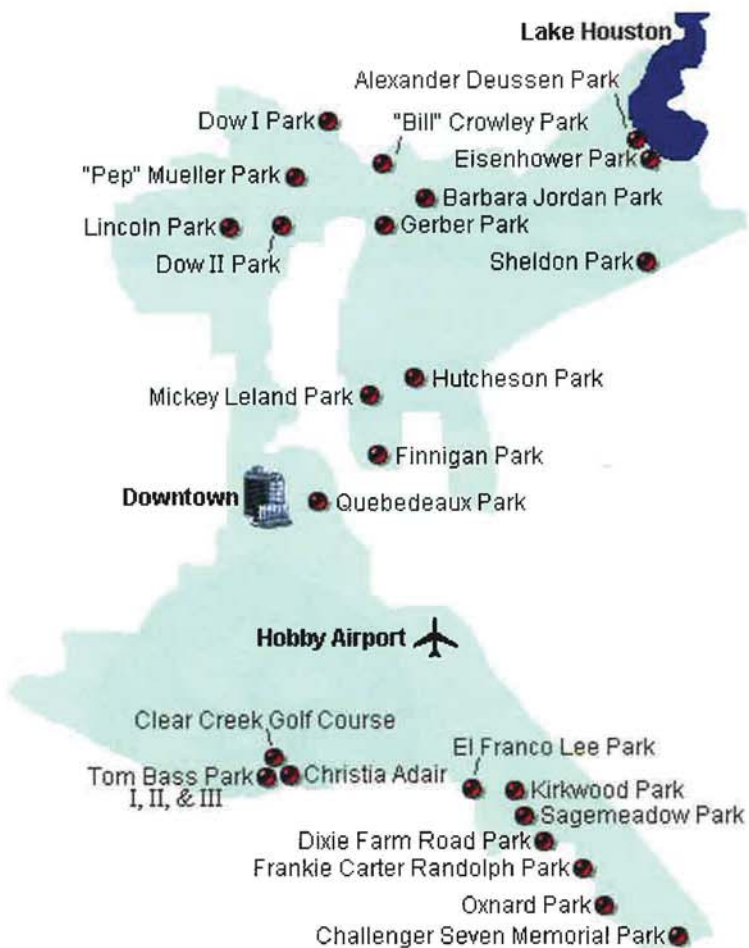
12303 Sonnier St.  
Houston, TX 77044

- watch for Eastern Bluebirds and other summer visitors
- look for resident deer, bison, peacocks and geese

### Eisenhower Park

13400 Aqueduct Road  
Houston, TX 77044

- east Texas piney woods habitat is great for all types of wildlife
- black vulture roost near the Big Eddy of the San Jacinto River
- watch for cormorants, pelicans, and eagles near the Lake Houston spillway



### Challenger Seven Memorial Park

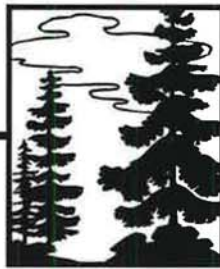
2301 W. Nasa Blvd.  
Webster, TX 77598

- coastal prairie and riparian habitats are excellent places to spot water birds including ibis and Roseate spoonbills
- watch for deer, coyote, and bobcat

### Tom Bass Regional Parks One and Three

3452 Fellows Road, Houston, TX 77047 and 15108 Cullen Blvd., Houston, TX 77047

- watch for raptors hunting above the open prairie



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## Precinct 2 Parks Harris County, Texas

[http://www.co.harris.tx.us/comm\\_garcia/Parks/parksdept.htm](http://www.co.harris.tx.us/comm_garcia/Parks/parksdept.htm)

The 35 parks in Precinct Two cover 4,000 acres, which include 14 miles of walking trails.

In 1992, Precinct Two started a wildflower program that is aesthetically pleasing and cost effective (lower maintenance). Today, the 67 wildflower areas remain an important part of the Parks Department, and can be seen throughout Precinct Two.

**Armand Bayou Nature Center** leases 2500 acres from Harris County located at 8500 Bay Area Boulevard in Pasadena. This park encompasses three ecosystems: grasslands, hardwoods, and wetlands. For more information go to page , in this manual.

Other parks that offer trails for walking and wildlife watching:

**Cedar Bayou Park - Hadden Road, Baytown**

**Edna Mae Washington - 7613 Wade Road**

**Halls Bayou Jogging Trail - Littleyork @ Halls Bayou**

**Highlands - 604 Highlands Woods**

**James Bute - 512 McKee**

**Meadowbrook Park - 17410 River Road, Channelview**

**Moncrief Park (off the pier) - 16800 Bear Bayou at Park St., Channelview**

**Northshore - 14422 Wallisville**

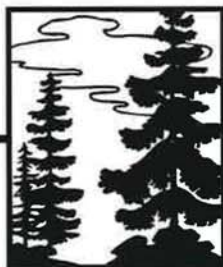
**Riley Chambers - 808 1/2 Magnolia**

**River Terrace Park - 16550 Market Street, Channelview**

**White Oak Bayou Hike & Bike Trail - Taylor to Houston Avenue**

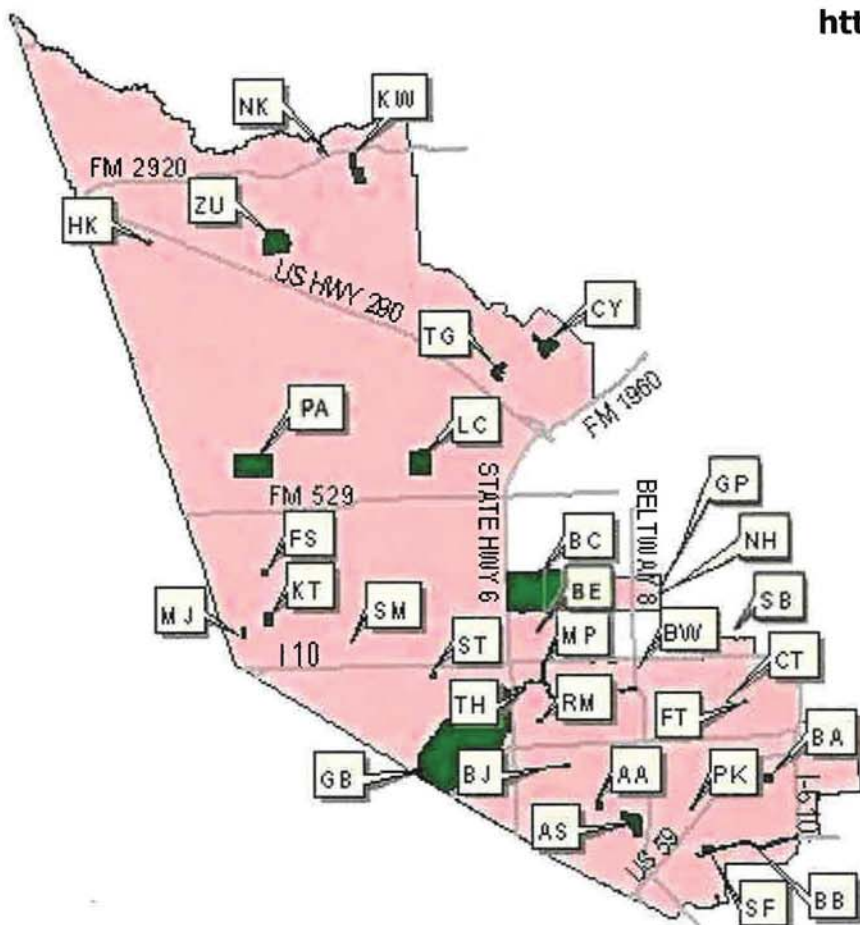






## Precinct 3 Parks Harris County, Texas

<http://www.pct3.hctx.net/parks.htm>



Precinct 3 Parks of Special Interest to wildlife watchers.

(Information provided by Fred Collins)

### **Terry Hershey Park, Hike & Bike Trail**

Located along Buffalo Bayou between Highway 6 and Beltway 8.

- Open area with parkland woodlands along Buffalo Bayou
- Watch for Black Vultures, warblers and flycatchers

### **George Bush Park**

Located along Buffalo Bayou between Highway 6 and Beltway 8.

- A remnant prairie
- Deer, small mammals
- Watch for owls, Barn Swallows, and Eastern Meadowlarks
- Waders most of the year

- Shorebirds in spring
- Christmas Bird Count

### **Bear Creek Park**

This park is a favorite among local birders. Located along Buffalo Bayou between Highway 6 and Beltway 8.

- High intensity use
- Good woodland birding
- Picnic areas
- Equestrian trail
- Christmas Bird Count



## Precinct 3 Parks Harris County, Texas

### **Mary Jo Peckham Park For All Children**

Located at 5597 Gardenia Street in Katy

- Indoor pool
- Fitness Center
- Miniature Golf
- Fishing Lake
- Hiking path
- Woodland birds and water birds

### **Katy Park & Four Seasons Park**

Located at 24927 Morton Ranch Rd & 4702 Katy-Hockley Cutoff Road

- Open areas, primarily devoted to ball fields
- Special birds to watch for - Killdeer, doves, raptors and blackbirds

### **Paul Rushing Park**

Located at 9114 Katy-Hockley Road

- Softball fields and playground equipment
- Large mowed areas are good for spring shorebirds
- Waterfowl and eagles in winter
- Waders and raptors at all seasons
- Future home of Chain of Lakes
- Cypress Creek Christmas Bird Count

### **Zube Park**

Located at 17400 Roberts Road

- A prairie remnant
- Home of Houston Area Live Steamers
- Soccer fields, playground equipment
- Hiking path
- Wildlife to watch for - open woodland species, waders and raptors

### **Brays Bayou Hike & Bike Trail**

Located along Brays Bayou between the Southern Pacific Railroad and Gessner

- Open area with parkland woodlands along Brays Bayou
- Birds, butterflies





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## Precinct 3 Parks Harris County, Texas

### **Arthur Storey Park**

A favorite among bird watchers. Located at 7400 W. Sam Houston Parkway South (Beltway 8 between Bellaire and Beechnut)

- Playground
- Hike and Bike Trail
- Picnic Facilities
- Wildlife to watch for - herons, egrets, water birds, and shorebirds

### **Kleb Woods Nature Preserve**

Located at 20605 F.M. 2920

- Nature Trail through pine woodlands
- Picnic facilities
- Group pavilion
- Group camping
- Future home of Nature Center and Heritage Farm
- Birds to watch for - Brown-headed Nuthatch, Pine Warbler and Greater Roadrunner

### **New Kentucky Park**

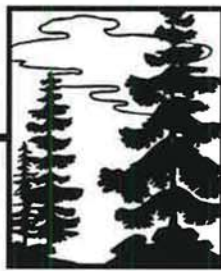
Located at 21710 F. M. 2920

- Group Pavilion
- Picnic Tables
- Historical Marker
- Birds to watch for - Brown-headed Nuthatch, Pine Warbler and winter finches

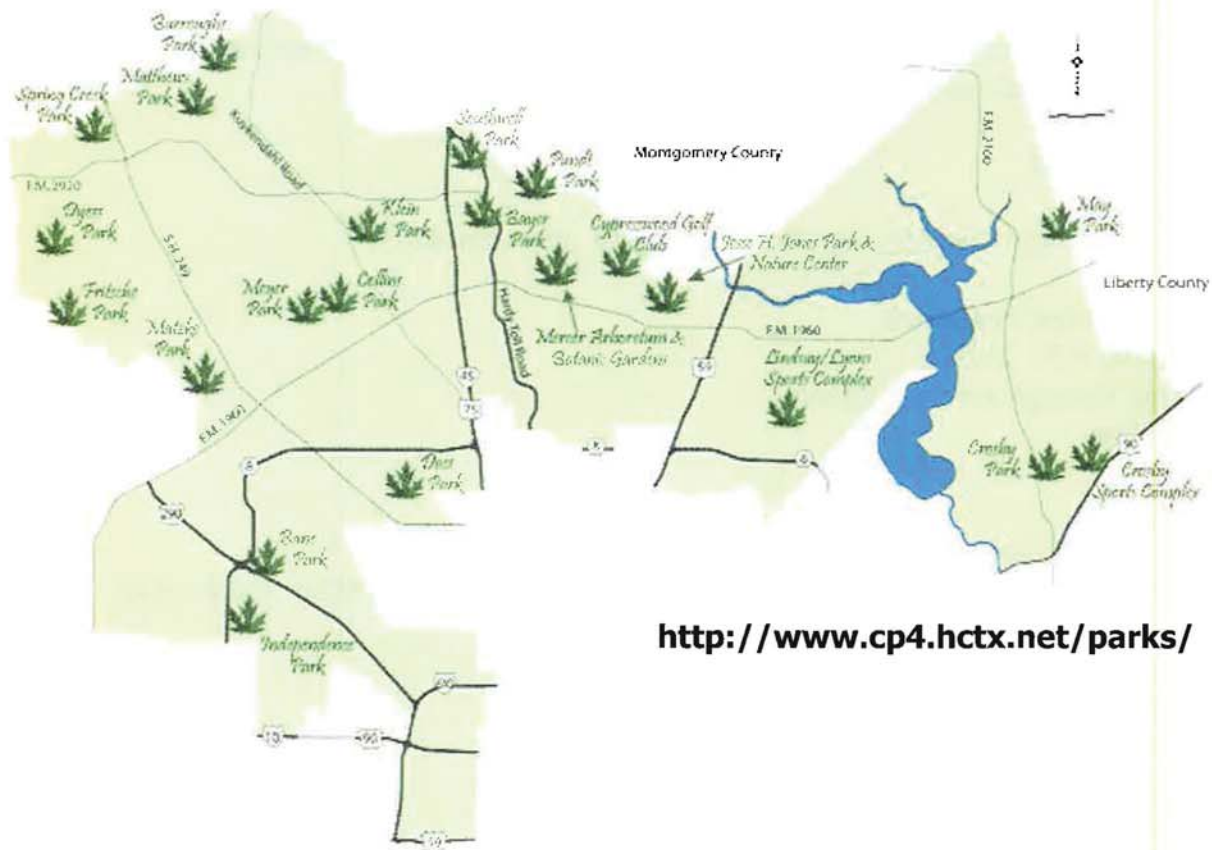
### **Telge Park**

Located at 12400 Pleasant Grove Dr. at Telge Road

- Playground
- Historical Marker
- "Renegade" nature trail along Cypress Creek
- Watch for woodland species and migrants



## Precinct 4 Parks Harris County, Texas



<http://www.cp4.hctx.net/parks/>

**Jesse Jones Park & Nature Center (see page 353 in this manual)**

**Mercer Arboretum & Botanic Gardens (see page 356 in this manual)**

### **Spring Creek Park**

Located at 15012 Brown Road in Tomball

- 114 acres
- Sports facilities
- Camping facilities
- Fishing in Spring Creek
- Nature Trail





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## Precinct 4 Parks Harris County, Texas

### **Meyer Park**

Located at 7700 Cypresswood Drive in Spring

- 286 acres
- Nature Trails
- Duck pond
- Three-acre fishing lake

### **Doss Park**

Located at 2500 Frick Road in Houston

- 33 acres
- Sports facilities
- Walking trails
- Community Center

### **Crosby Park**

Located at 419 Hare Road in Crosby

- 46 acres
- Sports facilities
- .726 - mile trail
- Community Center

### **Collins Park**

Located at 6727 Cypresswood Drive in Spring

- 55 acres
- Sports facilities
- Nature trails
- Picnic areas

### **Burroughs Park**

Located at 9738 Hufsmith Road in Tomball

- 320 acres
- Sports facilities
- Seven-acre fishing lake
- More than 8 miles of nature trails

### **Pundt Park**

Located south of Lexington Woods in Spring, Texas is currently being developed for birding, wildlife watching, hiking and picnicking. Phase Two will feature the trail system and two naturally beautiful ponds.

For more information: 281.353.4196



## Precinct 4 Parks Harris County, Texas



### Spring Creek Greenway Project

This impressive plan will connect Precinct 4's existing parkland along the south side of Spring Creek with the remaining undeveloped land to create a 10 - mile, 1700 - to 2000 - acre linear park with a canoe launch, nature trails, parking lots, rest areas, and picnic grounds.

Plans include a water trail - a marked interpretive trail along a contiguous stretch of creek - with historical and ecological information that will benefit canoeists, kayakers, nature lovers, and the general public.

The 10 - mile trail will connect Pundt Park to Highway 59.

Spring Creek feeds into the San Jacinto River and affects the Lake Houston watershed, a major drinking water supply for Houston and Harris County residents. This project will have a direct impact on the water quality of the Lake Houston watershed.





## Armand Bayou Nature Center

**Address:** 8500 Bay Area Blvd. Pasadena, TX

**Phone:** 281.474.2551

**Website:** <http://www.abnc.org>

**Hours:** 9 a.m. to 5 p.m. Tuesday through Saturday  
12 noon to 5 p.m. Sundays  
Closed Mondays



Armand Bayou Nature Center provides environmental education, and preserves the important and vanishing ecosystems with which it has been entrusted. Armand Bayou Nature Center is 2,500 acres of diverse ecosystems located near NASA, situated in the Bay Area in Pasadena.

Come explore the hardwood forests, walk the restored prairies of native grasses, and discover the wetlands. Wildlife abounds with bison, wild deer, rabbits, raccoons, and resident and migratory birds, to mention just a few. Visit the turn of the century farm house to learn about rural life in the early 1900s.

A full calendar of events and programs are available on the website. Watch for information on dates and times of *Early Morning Birding* and *Owl Prowls*.



## Baytown Nature Center

**Website:** <http://www.baytown.org/BNC/index.html>

Take a quiet stroll through the 400 acres of this nature preserve with uplands, oak motts, and wetlands. Enjoy numerous varieties of butterflies, dragonflies, wildflowers, mammals, aquatic organisms, and over 315 species of birds thriving in this unique area. The City of Baytown is the steward of the Baytown Nature Center, and places the highest priority on habitat protection.

For bird sightings, tours or information, contact Howard and Merle Hunt at [hcube@ev1.net](mailto:hcube@ev1.net) or call 281.420.3448.



## Bolivar Flats Shorebird Sanctuary

**Website:** <http://www.houstonaudubon.org>

At first glance, you might not see the special qualities of Bolivar Flats, a unique area combining salt marsh, mud flats, and beach, each habitat quite different from the other. Every year hundreds of thousands of birds discover that Bolivar Flats is a special place. Here they find a resting place and nesting habitat where a smorgasbord of invertebrates and fish is spread. Decomposing plant material derived from the salt marsh and delivered by the coastal currents feeds millions of small worms, shrimp, and clams which live in the mud flats. Thousands of birds, small fish, and crabs hunt the shallows for these invertebrates and small fish that venture into deeper water.

Bolivar Flats has been recognized by the Western Hemisphere Shorebird Reserve Network as an important resting and feeding location for migrating shorebirds from throughout the Western Hemisphere.

People are encouraged to walk along the beach and enjoy watching the birds and other wildlife that is protected here. Observe wildlife from a distance at which they feel comfortable. Walking in the vegetated dunes and marshes is discouraged. These areas contain hidden nests and snakes that may be venomous. The vehicular barrier was erected to protect nesting and roosting birds, most of which live on the ground. Regulations prohibit fires in the sanctuary.

Monthly surveys are held on the third Saturday of every month. Volunteers meet at 8 a.m. at the Bolivar side of the ferry landing parking lot. Teams are given areas to survey until 11 a.m.. This is a great opportunity to be with experienced birders and learn about the bird life on the peninsula. Results are posted on the Houston Audubon Society website. Contact information and additional information about the surveys are available online.

This is a special place that needs protection. Bring your family, your class, your friends, and participate in the conservation efforts to protect Bolivar.

**Directions:** From Houston take I-45 South to Galveston. In town, I-45 turns into Broadway. Follow Broadway to Seawall Boulevard. Turn left on Seawall. Turn left on Ferry Road to the terminal. You will exit the ferry on Hwy. 87. Follow this for 3.7 miles to Retillon Road. Turn right and drive to the beach. Turn right on the beach, and drive on the beach to the vehicular barricade, and park your car. **ENJOY!**





## Brazos Bend State Park



**Address:** 21901 FM 762 Needville, TX 77461

**Phone:** 979.553.5101 or 1.800.792.1112

**Website:** <http://www.tpwd.state.tx.us/park/brazos/>

**Gate Hours:** Friday - Sunday 7 a.m. - 10 p.m. Year Round

Not far from downtown Houston lies Brazos Bend State Park, a scenic haven for birdwatchers and wildlife observers. For stargazers, the George Observatory is located within the park. More than 270 species of birds have been sighted within the park, and the prehistoric-looking American alligator is the park's most noteworthy resident. Hiking and biking trails meander through the park's varied terrains, and several lakes offer excellent fishing.

Friday morning bird hikes are scheduled each month. Bird with a park naturalist along a one-mile route. Call 979.553.5101 for a schedule, or visit the website.

Brazos Bend State Park is approximately a one-hour drive from downtown Houston. Take Highway 59 South to the Crabb River Road exit. You may also take State Highway 288 south to FM 1462 to FM 762 south. From the south, follow State Highway 288 North to the FM 1462 exit, or take State Highway 36 to FM 1462 East. All routes are marked with brown signs to guide you.

The Park is open 7 days a week year-round, except when closed for emergencies or scheduled closures. Check the calendar of events on the website for closure schedules.

- Brazos Bend State Park is about 28 miles southwest of Houston, and covers roughly 5000 acres of Brazos River floodplains and upland coastal prairies.
- This was the area of Texas' first Anglo colonization. It was purchased by the state in 1976, and was opened to the public in 1984.



## The Children's Museum of Houston's EcoStation

**Address:** 1500 Binz, Houston, TX 77004

**Phone:** 713.522.1138 ext.254

**E-mail:** Cathy Gauthier, [cgauthier@cmhouston.org](mailto:cgauthier@cmhouston.org)

**Website:** <http://www.cmhouston.org>

The Children's Museum of Houston provides bilingual family learning programs and educational services to a broad cross-section of families, including those who visit the Museum and/or access the services of area schools, childcare centers, community centers, public libraries, and social service agencies.

The museum serves more children than any other children's museum in the U.S., on a per square foot basis.

The museum houses 14 multidisciplinary and bilingual exhibits, a 166-seat auditorium, and the Parent Resource Library, which offers a diverse array of materials on parenting and early childhood education.

The EcoStation is a one-of-a-kind hands-on, outdoor, environmental exhibit which focuses on ecosystems and environmental issues through a native plant garden, puppet stage, woodland area bayou table, pond, and a research pavilion. Each area is full of exciting hands-on activities such as insect collecting, tree rubbings, water quality testing, bird identification, decomposition observation, soil-type exploration, and make-and-take activities like nature journals, home environmental awareness inventory logs, bird feeders, and more. In addition, the exhibit hosts live performing arts such as puppet shows, story times, skits, and sing-alongs supporting environmental stewardship themes.

The Children's Museum of Houston celebrates International Migratory Bird Day each May with special week long events for all ages. Watch their website for more information.







## Council for Environmental Education

**Address:** 5555 Morningside Drive, Suite 212 Houston TX 77005

**Phone:** 713.520.1936

**E-mail:** [info@c-e-e.org](mailto:info@c-e-e.org)

**Website:** <http://www.c-e-e.org>

**Mission:** To provide environmental education programs and services that promote stewardship of the environment, and further the capacity of learners to make informed decisions.

For 34 years, the Council for Environmental Education (CEE) has been a nationally recognized leader in environmental education, providing programs and services that promote responsible stewardship of natural resources. To accomplish its mission, CEE supports programs and partnerships for environmental education. A hallmark of CEE's co-sponsored programs is a commitment to balanced, non-biased environmental education. CEE's programs are among the most long-lived and successful environmental education efforts in the nation.

CEE is a founding co-sponsor of Project WILD, Project Learning Tree, and Project WET. Responding to a national need to reach more underserved students, CEE developed the WET in the City program, a K-12 water education initiative that brings water education to urban educators through community-based networks.

**Flying WILD**, a new initiative developed by CEE, will facilitate efforts to bring migratory bird conservation education to schools. The manual will provide background information and resources relating to bird education and conservation, as well as a step-by-step guide for establishing a school bird festival. *Flying WILD: An Educator's Guide to Celebrating Birds* introduces middle-school students to bird conservation through school festivals and hands-on classroom activities. Flying WILD supports educators by providing interdisciplinary, standards-based opportunities to engage students in real-world learning. Flying WILD also meets other needs.

- Birds benefit when people learn about bird conservation, and take action to protect birds and preserve their habitat.
- Classroom teachers gain access to an environmental education program that focuses on birds, meets national science standards, and emphasizes cross-disciplinary approaches to learning.
- Students gain opportunities to learn and lead.





## The Great Texas Coastal Birding Trail



Website: <http://www.tpwd.state.tx.us/birdingtrails/contact.phtml>.

The Great Texas Coastal Birding Trail was developed to help birders and beginning birders find the great avian resources along the Texas coast, and to ensure that the Texas coastal birding experience is rich and varied.

For more information:  
[http://www.fermatainc.com/ttt\\_trail.html](http://www.fermatainc.com/ttt_trail.html).

The hugely successful Great Texas Coastal Birding Trail winds through 43 Texas counties, encompassing the entire Texas coastal region. Completed in April 2000, the Trail features 308 distinct wildlife-viewing sites. Enhancements such as board walks, parking pullouts, kiosks, observation platforms, and landscaping to attract native wildlife have been constructed at a number of sites. The Coastal Birding Trail was a recent winner in the prestigious British Airways Tourism for Tomorrow Awards, recognizing environmental and social responsibility in the tourism industry worldwide.

Each section of the Trail (upper, central, and lower coast) has a map showing 12 - 16 separate loops. The color-coded loops encompass an array of associated sites and birds, and provide easy access to related information. Each site on the Trail is marked with a unique sign and site number designed to coincide with the site description on the map. The Trail maps have information about the birds and habitats likely to be found at each site, the best season to visit, and food and lodging available in the vicinity.

These maps are available at many locations, including the Edith L. Moore Nature Sanctuary at 440 Wilchester Blvd, Houston, TX 77079 713.932.1639 [www.houstonaudubon.org](http://www.houstonaudubon.org)





## Gulf Coast Bird Observatory



**Address:** 103 West Highway 332, Lake Jackson TX 77566

**Phone:** 979.480.0999

**E-mail:** [criley@gcbo.org](mailto:criley@gcbo.org)

**Website:** <http://www.gcbo.org>

**Mission:** The study and conservation of birds and their habitat in and around the Gulf of Mexico

**Purpose:** To be a catalyst for bird conservation through individual and community partnerships and the sharing of expertise and knowledge.

Almost 300 species of migratory birds depend on coastal habitat as they travel between the U.S. and Latin America twice a year. Many of these species, such as warblers, tanagers, and orioles, are enjoyed for the beauty and color they add to backyards and parks throughout our nation, but protection of coastal habitat needed during migration is vital to their survival.

Recognizing the importance of the Gulf region, the GCBO has teamed with well over 40 conservation partners who are working together across political boundaries to ensure the protection of critical coastal habitats and avian resources in and around the Gulf of Mexico. GCBO partners protect habitat in five states of the United States, and five states of Mexico, as well as one location in Western Cuba.

In addition to the Land Protection program, GCBO is involved in a variety of citizen science research projects. These projects involve volunteers located throughout the Gulf region who gather data in the field, and submit that to the GCBO for analysis.

These research projects include:

**Migration Monitoring**

**Smith Point Hawk Watch**

**Project Prairie Birds**

**Columbia Bottomlands Forest Bird Study**

**Smith Point Hawk Watch is located on the Candy Abshier Wildlife Management Area**

**<http://www.tpwd.state.tx.us/wma/wmarea/abshier.htm>**

**Be sure to take part in the annual Xtreme Hummingbird Xtravaganza each fall at the GCBO headquarters in Lake Jackson.**

**To watch the spectacular fall hawk migration, visit the tower at the Smith Point Hawk Watch between August 15 and November 15.**



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## High Island Bird Sanctuaries

**Website: <http://www.houstonaudubon.org>**

The woods of High Island, Texas, have undoubtedly been an important stopping place for migratory birds for thousands of years. However, they have only been attracting birdwatchers since the 1940's, when birders from nearby Beaumont began to haunt the woods every spring.

Recognizing the value of High Island's habitat, the Houston Audubon Society bought what was to become the core of the High Island sanctuary system, the four-acre Louis B. Smith Sanctuary (also known as Boy Scout Woods) in 1980. An additional 11 acres surrounding this small core was leased from Amoco Production Company. In 1991 the opportunity arose to purchase a 40% undivided interest in the Smith Oaks Sanctuary nearby.

Many species of neotropical migrants use the woods of High Island as a stopover point on their journey north each spring and south each fall. Each spring, millions of birds that winter in Central and South America are driven north by the urge to establish breeding territories and select mates. They first push to the Yucatan Peninsula and the adjacent Mexican coast. Beginning in early March, migrants reach the tip of the peninsula and if the weather conditions are favorable, just after sunset, migrants leave Mexico and head north across the Gulf of Mexico. The trip across the Gulf is 600 miles, and with good weather takes about 18 hours. Arriving on the Texas coast at midday, some of these birds will stop and rest in High Island; but most will fly inland until nightfall. Birders come to the woods to watch an amazing array of species that will be heading north to breed. When cold fronts push down from the north and stall the migrants, a phenomenon called a "fallout" can occur. Thousands of extremely tired migrants are forced to seek shelter and food as soon as they reach the coast. At these times, good-quality habitat along the coast is vitally important to the survival of tens of thousands of birds.

To arrange a visit to one of the sanctuaries located in High Island, please visit the Houston Audubon Society website:

**[www.houstonaudubon.org](http://www.houstonaudubon.org)**

During the spring migration, volunteers host the entrances to Boy Scout Woods and provide information, a birding retail shop and collect the entry fees. The fees help to continue the conservation of this critically important habitat.

**Call for a brochure: 713.932.1639**





## Houston Arboretum & Nature Center



**Address:** 4501 Woodway Drive, Houston, TX 77024

**Phone:** 713.681.8433

**E-mail:** arbor@houstonarboretum.org

**Website:** <http://www.houstonarboretum.org>

**Mission:** To provide education about the natural environment to Houstonians of all ages, while acting as an urban wildlife sanctuary for native plants and animals.

The Houston Arboretum, one of the first nature education facilities for children in the state of Texas, provides services to nearly 220,000 visitors annually. The Arboretum also provides nature education for more than 10,000 children annually.

The Houston Arboretum & Nature Center is a 155-acre non-profit urban nature sanctuary located on the western edge of Memorial Park. It is managed by the Houston Arboretum Board of Trustees and staff under an agreement with the City of Houston Parks and Recreation Department.

Visitors can enjoy over 5 miles of nature trails, including forests, pond, and prairie habitats. Discovery Room hours are Tuesday-Sunday, 10:00 a.m. to 4:00 p.m. Nature Shop hours are 10:00 a.m. to 4:00 p.m. daily. The grounds are open daily 8:30 a.m. - 6:00 p.m.

The land on which the Arboretum sits was officially annexed by the City of Houston in December of 1927, and set aside as a memorial to the young men who died in World War I. The idea of carving out a piece of land from Memorial Park to serve as an arboretum began with Robert A. Vines. In 1951, the City Council set aside 265 acres as an arboretum and botanic garden.

The Houston Arboretum & Nature Center (HANC) has developed programs that reflect the changing needs of the Houston community. Since 1995, the HANC annually serves over 13,000 children from public and private schools and other children's programs. Adult education classes and other programs, some of them free of charge, serve thousands more. Over 250,000 visitors are recorded annually. Thousands of Houstonians spend quality time relaxing at the arboretum on weekends, walking the five miles of wooded trails, enjoying the Discovery Room or Nature Shop, taking a guided tour, or using the reference library for independent study and research.

A Wildlife Garden to demonstrate plantings appropriate to attract hummingbirds, butterflies, and other wildlife to an urban backyard, and the Carol Tatkon Sensory Garden featuring native plants attractive to the senses are the major landscaping features. The Alice Brown Trail introduces the casual visitor to forest, pond, and open spaces using printed descriptions and audio recordings. It meets National Center on Accessibility guidelines for persons with limited mobility and limited sight.





## Houston Audubon Society & Edith L. Moore Nature Sanctuary



**Address:** 440 Wilchester Blvd., Houston, TX 77079

**Phone:** 713.932.1639

**E-mail:** Mary Anne Weber, maweber@houstonaudubon.org

**Website:** <http://www.houstonaudubon.org>

**Mission:** To promote the conservation and appreciation of birds and wildlife habitat.

Houston Audubon is one of the largest and most active chapters of the National Audubon Society. We are a non-profit organization, supported by member dues and donations from individuals, foundations, corporations. All contributions and local membership dues remain in our 13-county area and support our local activities.

Houston Audubon provides lots of opportunities to help birds and get involved.

### Houston Audubon

- protects and manages over 3,000 acres of critically important habitat for birds.
- provides educational programs for children and adults at the Edith L. Moore Nature Sanctuary, and at local schools and libraries
- sponsors the North American Rare Bird Alert
- provides membership meetings, field trips and seminars to members and the general public
- has a coastal component called the Galveston Audubon Group

The **Edith L. Moore Nature Sanctuary** in west Houston is a great place to start learning about birds. This 18-acre haven for birds is open to the public every day from 7am till 7pm. You can visit the log cabin, natural history library, and enjoy bird watching and wildlife watching on the trails. The Audubon Docent Guild provides numerous opportunities for volunteering with their children's programs. Summer day camps, pre-school nature story hour, nature tours, bird walks, school field trips, and owl prowls are just some of the happenings at this bird sanctuary. The sanctuary is near Beltway 8 and I-10, off of Memorial. For directions and a calendar of events, visit the website, at [www.houstonaudubon.org](http://www.houstonaudubon.org) or call us at 713.932.1639.



Houston Audubon Society



... keeping our eyes on the birds.



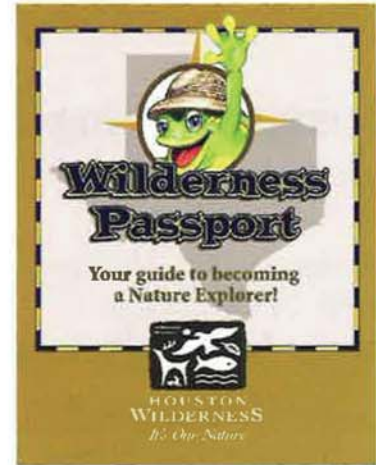


## Houston Wilderness

**Address:** P.O. Box 66413 Houston, TX 77266-6413

**Phone:** 713.524.7330

**Website:** <http://www.houstonwilderness.org>



**Mission:** Houston Wilderness is a broad-based alliance of business, environmental, and government interests that act in concert to protect, preserve and promote the unique biodiversity of the region's precious remaining ecological capital - from bottomland hardwoods and prairie grasslands to pine forests and wetlands - while recognizing the importance of the region's natural assets to its cultural history, economic vitality, and future well-being.

The Houston Wilderness website provides a calendar of events happening around Houston, including birdwatching field trips and hikes that you can participate in.

Houston Wilderness has also created an imaginative *Wilderness Passport*, which encourages families to explore nature in a 24-county region. The Passport is a guide to use when visiting all the natural treasures in our area.

Each child or family will want to own a Passport. Every page describes possibilities for different field trips - there are 8 in all - and at each location, the child will receive a special sticker for a page in the Passport. After only 3 sites are visited, the child is eligible for a "cool" reward.





## Houston Zoological Gardens

**Address:** 1513 N. MacGregor Houston, TX 77030

**Phone:** 713.525.3300

**Website:** <http://www.houstonzoo.org>

**Mission:** The Houston Zoo provides a fun, unique, and inspirational experience fostering appreciation, knowledge, and care for the natural world.

### Guiding Principles:

- Be a zoo for all
- Practice exemplary animal care
- Deliver an outstanding guest experience
- Create a workplace that instills empowerment, respect, and teamwork
- Provide superior education and learning opportunities
- Promote conservation awareness and action
- Apply best business practices and sound financial management
- Inspire broad community support



Located on 55 acres in Hermann Park just minutes from downtown Houston, Houston Zoological Gardens has more than 3,500 animals representing over 700 species. Education programs at the zoo are designed to nurture the wonder of the diversity and interdependence of life.

School group programs are available on topics including: conservation, ecology, wildlife, species studies, endangered species, renewable resources, environmental sensitivity, environmental impact, and urban studies.

The Houston Zoological Gardens is an excellent place for individual nature study, wildlife observation, picnicking, and photography. Native Texas birds are attracted to the natural areas at the zoo, and there is always a great variety to watch for. The ponds and lakes on zoo grounds and in the surrounding park provide habitat for a number of different species throughout the year.

Bring your binoculars and field guide when visiting. You can also provide much needed bird survey information while you are enjoying the exhibits. Bring your Houston Bird Survey sheets when you visit the zoo in June and January.





## Jesse H. Jones Park & Nature Center

**Address:** 20634 Kenswick Drive, Humble TX 77338

**Phone:** 281.446.8588

**Website:** <http://www.cp4.hctx.net/jones/>

**Nature Center Hours:** 8am - 4:30pm Year-round

**Park Hours:** December to January 8am - 5pm  
November and February 8am - 6pm  
March to October 8am - 7pm



Opened to the public in 1982, this 275 acre nature park is named after the late Jesse H. Jones, whose Houston Endowment, Inc. contributed to the initial funding for the project. Jones Park preserves the "Native American" and Texas settler lifestyles commonly found along the banks of Cypress and Spring Creeks during the late 1700's and early 1800's .

Natural beauty and history are combined in this unique setting located along the banks of Spring Creek. Jones Park is a window into a vast floodplain forest habitat in southeast Texas. Explore diverse ecosystems, including ancient cypress bogs, natural white sand beaches, and wildflower meadows. Jones Park staff and volunteers offer a variety of guided tours and free educational programs, ranging from the lifestyles and customs of local early settlers to the environmental benefits of this natural setting.

Park bird list and trail maps are available in the nature center. A variety of stuffed birds can also be viewed in the nature center. Year round birding programs are offered for birders of any experience level, including regularly scheduled bird walks, identifying classes for you and old alike. Over 160 species have been recorded in the park, including Swainson's Warblers and Prothonotary Warblers.

### **Breakfast With the Birds** - Monthly

Guided bird walks and continental breakfast. Open to anyone 12 and older. Admission is free but limited to 20 people. Call 281.446.8588 at least 10 days in advance.

Check website for upcoming dates.



## Katy Prairie Conservancy

**Address:** 3015 Richmond Ave, Suite 230, Houston TX 77098

**Phone:** 713.523.6135

**Website:** <http://www.katyprairie.org>

**Mission:** To protect a sustainable portion of the Katy Prairie for the benefit of its wildlife and all Texans forever.

*West of Houston, a magnificent tallgrass prairie once ruled the countryside, from the fertile bottomlands of the Brazos River to the noble East Texas forests. The Katy Prairie was a rich quilt of natural wonders and resources - woven with shallow wetlands sustaining huge flocks of birds, cypress-lined bayous bursting with fish, and fields of native grasses and wildflowers touched by gentle Gulf breezes. Today, the Katy Prairie is a resource in danger of disappearing from Texas altogether. Less than half of this once grand prairie remains. And, as the prairie goes, so too goes a rich Texas legacy of wildlife habitat, flood protection, rice farming, cattle ranching, outdoor recreation, indigenous plants, and native animals.*

A Katy Prairie studies curriculum is currently under development. This program will include activities in prairie ecology, stream and watershed studies, and rice agriculture studies.

Student groups will be able to visit the educational site on the prairie. Teachers and group leaders will be provided with pre- and post- field trip activities.

For more information, contact Shelley Pollock at the Katy Prairie Conservancy.







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## **KEEP - Kids' Environmental Education Project**

**Address:** P.O. Box 440490, Houston TX 77244

**Phone:** 281.759.8343

**E-mail:** Duncan Ragsdale, Founder and Director duncanrags@ev1.net

### **Initiatives:**

#### **KEEP Learning**

The primary goal of the KEEP LEARNING initiatives is to connect students to the environment around them, with the hope of building interest and commitment. This is accomplished through after school and day-camp projects that focus on academics, creativity, athletics, service, and ownership.

Projects partner teachers and students with parents and local environmental educators. Teachers and parents receive formal environmental education curriculum training from local educators and from groups such as Texas Parks and Wildlife Department. Trained parents become Parent Scholars, and receive stipends from KEEP for assisting teachers during day camp and after school programs. Current programs include the Houston based, Kids on the Bayou.

#### **KEEP Serving**

KEEP SERVING is an extension of KEEP LEARNING. Once students, teachers, and parents have explored and learned about habitats in their community, this branch of the organization provides the tools and skills they need to take on projects like habitat restoration, neighborhood gardens, stream development, and recycling.

#### **KEEP Seeding**

KEEP SEEDING is designed to introduce students to the unique Texas prairie grasses and wildflowers. Students will learn the basics of harvesting and collecting native seeds. Through this project, students will get a hands-on learning experience, guided by teachers, to investigate not only the unique characteristics of the prairie's plant and animal life, but also to examine the properties of soil and study its ability to support life, and explore the historical causes which attracted settlement.

#### **KEEP Traveling**

KEEP TRAVELING will bring educational travel and ecotourism to a new level. Through this project, students and their families will have opportunities to explore our environment and history through birding, hiking, and camping trips, and trips to habitats from mountains to seashores.

#### **KEEP The Land Trust**

We are training a leadership group of students through our city-wide Leadership Convocations to take responsibility for entire tracts of land through KEEP THE LAND TRUST.





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## Mercer Arboretum & Botanic Gardens

**Address:** 22306 Aldine Westfield Road Humble, TX 77338

**Phone:** 281.443.8731

**E-mail:** <http://www.cp4.hctx.net/mercero/general.htm>

**Hours:** Winter Hours Daily 8 a.m. - 5 p.m.

Summer Hours Monday - Saturday 8 a.m. - 7 p.m.

Sunday 10 a.m. - 7 p.m.

**Mission:** In pursuit of an enhanced quality of life through a greater appreciation of the essential value and beauty of the plant world, Mercer Arboretum & Botanic Gardens seeks to establish and maintain a versatile botanical facility for Houston and the greater Gulf Coast region, serving the general public, the horticulture industry, and the scientific community.

Mercer Arboretum & Botanic Gardens is a Harris County Precinct 4 facility. It is named after Thelma and Charles Mercer who purchased the 14.5 acres in the late 1940s. They chose this property for the many special trees that are still a part of the Mercer landscape. Thelma was an avid horticulturist, and they both wanted to share their small private garden with the community and preserve their special oasis. Harris County purchased the property in 1974, and volunteers from the community played an early role in the care and further development of the gardens. Harris County purchased additional acres in the 80s and 90s. Today, Mercer has over 250 acres of East Texas piney woods showcasing the region's largest collection of native and cultivated plants.

Mercer Arboretum and Botanic Gardens is a nationally renowned flower garden nestled in a 250-acre nature preserve. It is located along Cypress Creek. Watch for birds and butterflies as you explore 27 different gardens and trails. The website describes each opportunity for discovery. Enjoy the brick and stone trails, walk in the forest, or relax by the ponds and bogs.

**Directions:** Near Bush Intercontinental Airport, Mercer is 22 miles north of downtown Houston. From I-45 or the Hardy Toll Road, exit FM 1960 and turn east. At Aldine Westfield Road, turn left. At the second traffic light (1 1/4 miles), 22306 Aldine Westfield Road, turn right for the Visitor Center and Gardens or left for the Arboretum, picnic area, and playground.





## Nature Discovery Center

**Address:** P.O. Box 777, Bellaire, TX 77402

**Phone:** 713.667.6550

**E-mail:** [mail@naturediscoverycenter.org](mailto:mail@naturediscoverycenter.org)

**Website:** <http://www.naturediscoverycenter.org>

### LUNCH WITH THE BIRDS

Spring and Fall are wonderful times of the year to go bird watching at Russ Pitman Park. Join other bird enthusiasts on Tuesdays for guided bird walks through the park. Discover the migratory birds that are finding rest in Bellaire and your own backyard. Call or visit the website for start dates.

**Mission:** To develop in children and adults a life-long curiosity, understanding, and respect for nature.

The Nature Discovery Center's interactive hands-on approach to learning is designed to nurture the inquiring mind, awaken children's natural curiosity and sense of wonder, and spark interest in the study of nature and science.

### Goals:

- Encourage parents to explore nature with their children.
- Help children discover the beauty and the wonder of the natural world and its importance to our daily lives.
- Provide quality opportunities for children to learn about nature in an urban setting.
- Help teachers develop the skills they need to guide students in real-world investigations of nature and science.

The Hana & Arthur Ginzberg Nature Discovery Center is a warm and friendly place where children and families share the joy of discovery. It is housed in the old Henshaw home, nestled in Russ Pittman Park, a four-acre rural retreat in the midst of the city of Bellaire, Texas. The Center's Discovery Rooms, open free of charge, are full of intriguing exhibits and hands-on activities that invite children and adults to explore and have fun learning.

The Nature Discovery Center is located in Russ Pitman Park at 7112 Newcastle, Bellaire, Texas, just inside the West 610 Loop, between Bellaire Blvd and Evergreen.

### From West 610 heading south:

Take the Bellaire Boulevard exit. Turn left onto Bellaire Boulevard and go two stop lights to Newcastle. Turn right onto Newcastle, go approximately 0.4 miles, then turn right into the parking lot just before the Nature Discovery Center mailbox, "7112".

### From West 610 heading north:

Take the Evergreen exit. Turn right onto Evergreen and go to the stop light at Newcastle. Turn left onto Newcastle, go approximately 500 feet, then turn left into the parking lot just after the Nature Discovery Center mailbox, "7112".

### Hours of Operation

Tuesday – Sunday 12:00 noon - 5:30 p.m. Closed Monday



## Outdoor Nature Club - Ornithology Group

**Website:** <http://www.ornithologygroup.org/>

**Mission:** The Ornithology Group (OG) of the Outdoor Nature Club is a club of individuals interested in birds, birding, and birdwatching. Some members focus on bird identification and listing, some enjoy studying bird behavior and habitat, and some just enjoy watching birds. The OG is organized to accommodate all of these diverse birding interests. Members also benefit from the synergism of getting together to share knowledge and interests during the club's activities.

**OG activities make learning about birds fun! All are welcome at meetings and field trips.**

The Ornithology Group meets the first Monday, August through May (except the second Monday in September and January). Learning Corner begins at 6:30pm; meeting begins at 7:00pm.

Location: Bayland Community Center (713.541.9951)  
Bayland Park  
6400 Bissonnet (just west of Hillcroft)

- Regular monthly meetings feature a wide variety of local and nationally recognized speakers. Guests and new members are always welcome, and the atmosphere is relaxed and friendly. Monthly meetings also feature an informal discussion session called the Learning Corner, to enhance member and visitor birding skills.
- The Spoonbill is the group's monthly newsletter and announces group activities, business and articles of birding interest. The Spoonbill also includes The Clearing House, a monthly record of bird sightings along the Upper Texas Coast. Non-member subscriptions to the Spoonbill are \$13.00 per year.
- Membership is \$20.00 per year and includes a subscription to the OG's newsletter The Spoonbill and to the Outdoor Nature Club's newsletter Nature Notes. Membership also entitles you to check out books and tapes from the extensive OG library.

## Rice University Campus - A Great Place to Study and Bird

As of November 2004, 132 species of birds have been recorded on the Rice University Campus. For a complete list and map of places on campus to bird, visit the following website.

<http://www.ruf.rice.edu/~ctlee/ricebirds.htm>

Thanks to Tim Perkins, Nick Block and Cin-Ty Lee for keeping the records and making them available.





## Sheldon Lake State Park and Environmental Learning Center

**Address:** 15315 Beaumont Highway (Business 90) Park Road 138 Houston TX 77049

**Phone:** 281.456.2800

**Website:** <http://www.tpwd.state.tx.us/park/sheldon/>



**Mission:** To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing, and outdoor recreation opportunities for the use and enjoyment of present and future generations.

Sheldon Lake State Park & Environmental Learning Center is a 2,800 acre outdoor education and recreational facility located in northeast Harris County. The park is split into two units: Sheldon Lake is accessible from Garrett and Pineland/Fauna roads, and the Environmental Learning Center is accessible from Beaumont Highway. The reservoir levees encompass 1,200 acres, of which 800 are permanently inundated, and 400 acres are marsh and swampland. Sheldon Reservoir, located on Carpenter's Bayou, a tributary of Buffalo Bayou, was constructed in 1942 by the federal government to provide water for war industries along the Houston Ship Channel. Texas Parks and Wildlife acquired the reservoir in 1952, and designated it as the Sheldon Wildlife Management Area; it was opened in 1955. **Sheldon Lake was designated a state park in 1984.**

Formerly in the "country", Sheldon Lake has survived a tremendous influx of urbanization over the past 45 years as Houston has grown. Sheldon Lake is now a green and blue "oasis" for wildlife and people on the edge of Texas' largest city.

The **Sheldon Lake Environmental Education Center** (SLEEC) is a 40-acre site, formerly the Sheldon Fish Hatchery. SLEEC provides programs and tours on nature and ecology, composting/recycling, fishing for children, native plant gardening, hunter education, and canoeing. SLEEC has more than 20 ponds and wooded trails for nature observation. Classrooms provide space for educational activities. There is no entrance fee. Group programming fees are \$1 - \$3 per person.

**Hours: 8:00 - 5:00 Wed. - Sun.; Tues. by appointment**

### **Texas Parks and Wildlife - Philosophy**

We seek to balance outdoor recreation with conservation as we achieve greater self-sufficiency. On one hand, we must manage and protect our natural and cultural resources. At the same time, we must generate increased revenue by adding value through more and better public services. We affirm that a culturally diverse well-trained staff will best achieve this balance. And we must never forget, not in the haste of business, nor in the pride of science, that the outdoors should above all be a source of joy! Providing outdoor experiences, whereby young minds form values, will be our greatest contribution to the future.



## Texas Ornithological Society

**Address:** 6338 N New Braunfels Avenue, San Antonio TX 78209

**Website:** <http://www.texasbirds.org>

**Mission:** Dedicated to the study, conservation, and enjoyment of the birds of Texas

**Purpose:** The purpose of the Texas Ornithological Society is to promote the discovery and dissemination of knowledge of birds, and to encourage specifically the observation, study, and conservation of birds in Texas; to encourage the formation of local birding groups; and to stimulate cooperation among professional and amateur ornithologists (birders).

### SEMI-ANNUAL MEETINGS

TOS members meet every Spring and Fall/Winter at various locations throughout the state. Evening programs are presented to increase knowledge on a wide range of ornithological and birding topics.

### BIRDING FIELD TRIPS

Exciting field trips are organized at every TOS meeting and at various times throughout the year. These trips are led by some of the most knowledgeable birders in Texas.

### SANCTUARIES

TOS owns Sabine Woods, a 30-acre tract of land near Sabine Pass in Jefferson County, and the Edna Crawford Bird Sanctuary, a two-acre tract at High Island in Galveston County. Another property, known as Magic Ridge, contains over 70 acres of coastal beaches and prairie in Calhoun County. These three properties provide habitat for many species, resident, as well as migratory.

### PUBLICATIONS

Members of the Texas Ornithological Society receive two excellent publications. *TEXAS BIRDS*, published twice annually, is written by Texas birders about Texas birds. This full-color publication features stunning photography as well as interesting and informative articles geared toward both novice and experienced birders.

The *BULLETIN OF THE TEXAS ORNITHOLOGICAL SOCIETY* is a journal which publishes research reports and short communications in the field of ornithology.

Membership: Active \$20, Family \$30, Student \$14, Life \$300





# Texas Bird Festivals

Fly in to some of these great festivals around the state. Many are held annually. Field trips, expert speakers, hands-on opportunities, programs for children and many other attractions await at each of these events.

The state of Texas abounds with great birding festivals and opportunities to bird with experienced naturalists. The following links will provide up to date information on happenings around Texas.

<http://www.tpwd.state.tx.us/news/tpwcal/>  
<http://www.tpwd.state.tx.us/nature/birding/festivals/>  
<http://www.texasexplorer.net/birdingevents.htm>  
<http://www.birds-n-garden.com>  
<http://www.houstonaudubon.org>

## 2004-2005 Events

- **September 11, 2004** - Xtreme Hummingbird Xtravaganza  
Gulf Coast Bird Observatory  
Lake Jackson, TX  
979-480-0999  
[www.gcbo.org](http://www.gcbo.org)
- **September 16-19, 2004** - Hummer/Bird Celebration  
Rockport, TX  
[www.rockport-fulton.org](http://www.rockport-fulton.org)
- **September 23-26, 2004** - A Celebration of Flight  
Hazel Brazemore Park  
Corpus Christi  
[www.ccbirding.com/thw/](http://www.ccbirding.com/thw/)



## 2004-2005 Events continued

- **August 15 - November 15, 2004** - Smith Point Hawk Watch  
Smith Point, TX  
[www.gcbo.org](http://www.gcbo.org)
- **October 2-3, 2004** - Texas Parks & Wildlife Expo  
Austin  
800-792-1112  
[www.tpwd.state.tx.us/expo/](http://www.tpwd.state.tx.us/expo/)
- **October, 2004** - Balmorhea Birdfest  
432-375-2325  
[birdingbalmorhea@hotmail.com](mailto:birdingbalmorhea@hotmail.com)
- **November 10-14, 2004** - 10th Annual Rio Grande Valley  
Birding Festival  
Harlingen  
800-531-7346  
[www.harlingen.com](http://www.harlingen.com)
- **November, 2004** - South Texas Wildlife and Birding Festival  
Kingsville  
800-333-5032  
[www.kingsvilletexas.com](http://www.kingsvilletexas.com)
- **February 12-13, 2005** - Eagle Fest  
Rains County, Eagle Capital of Texas  
Emory, TX  
800-561-1182  
[www.eaglefest.org](http://www.eaglefest.org)





## 2005 Events continued

- **Spring 2005** - Nature Celebration  
Sea Center Texas  
Lake Jackson  
979-292-0100
- **February 25-27, 2005** - Celebration of Whooping Cranes  
& Other Birds  
Port Aransas on Mustang Island  
800-45COAST  
[www.portaransas.org/cranes.asp](http://www.portaransas.org/cranes.asp)
- **March 31 - April 3, 2005** - Texas Tropics Nature Festival  
McAllen, TX  
877-MCALLEN  
[www.mcallencvb.com](http://www.mcallencvb.com)
- **Spring, 2005** - Bird Habitat Weekend  
Barton Warnock Environmental Education Center  
Lajitas  
432-424-3327
- **April 8-9, 2005** - Attwater's Prairie Chicken Festival  
Attwater Prairie Chicken NWR  
979-234-3021
- **April 8-10, 2005** - 12th Annual Migration Celebration  
Lake Jackson  
Brazosport Convention and Visitors Council  
888-477-2505
- **April 16-24, 2005** - 9th Annual Great Texas Birding Classic  
[www.tpwd.state.tx.us/gtbc/](http://www.tpwd.state.tx.us/gtbc/)



## 2005 Events continued

- **Spring 2005** - Nature Quest  
Concan  
800-210-0380  
[www.thcrr.com](http://www.thcrr.com)
- **April 23, 2005** - 12th Annual Bluebird Festival  
Wills Point, TX  
903-873-3111  
[www.flash.net/~junction/festival.htm](http://www.flash.net/~junction/festival.htm)
- **April 22-24, 2005** - Birding in the Big Thicket  
Kountze, TX  
866-456-8689  
[www.kountzecoc.org/birding\\_thicket.htm](http://www.kountzecoc.org/birding_thicket.htm)
- **Spring, 2005** - FeatherFest  
Galveston, TX  
[www.galvestonfeatherfest.com](http://www.galvestonfeatherfest.com)
- **April 29 - May 1, 2005** - 5th Annual Texas Songbird Festival  
Lago Vista, TX  
888-328-LAGO  
[www.lagovista.org](http://www.lagovista.org)
- **April 29 - 30, 2005** - 2nd Annual BirdFest  
Chappell Hill, TX  
[www.chappellhillbirdfest.com](http://www.chappellhillbirdfest.com)
- **May 12 -15, 2005** - 6th Annual Dragonfly Days  
Valley Nature Center  
Weslaco, TX  
956-969-2475



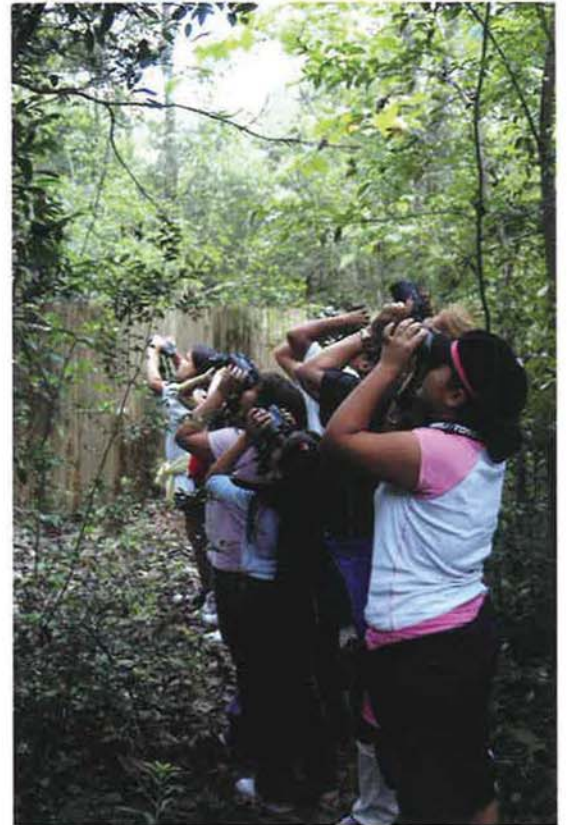
# Migration Resources

For a more comprehensive directory of local organizations and birding opportunities contact the following:

**Jesse H. Jones Park and Nature Center**  
20634 Kenswick Drive, Humble TX 77338  
281-446-8588

**AND**

**Citizens' Environmental Coalition**  
3015 Richmond, Suite 270  
Houston, TX 77098  
[www.cechouston.org](http://www.cechouston.org) 713.524.4232



"The field has eyes, the wood has ears; I will look, be silent, and listen."

**Hieronymus Bosch** (1450-1516)  
Flemish Artist

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## Resources



## A Click Away

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<http://birding.about.com/library/weekly/aa032898.htm>

<http://birding.about.com/library/weekly/aa011599.htm>

<http://www.birds.cornell.edu/programs/AllAboutBirds/>

<http://birds.fws.gov/education.htm> (U.S. Fish & Wildlife Service website on Birds)

<http://www.learner.org/jnorth/> (Journey North)

<http://www.ci.chi.il.us/Environment/BirdMigration/> (City of Chicago website on migration)

<http://shorebirds.pwnet.org/migration/forteachers.htm>

<http://www.ornithology.com/teacher.html>

<http://www.birdday.org/> (International Migratory Bird Day)

<http://66.241.214.202/index.cfm> (Shorebird Sister Schools Program)

<http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/>

<http://www.partnersinflight.org/default.htm>

<http://www.partnersinflight.org/birdbib/>

<http://www.tpwd.state.tx.us/nature/birding/migrant/>

<http://www.texbirds.org>

<http://www.OutdoorNatureClub.org>

<http://www.texasbirds.org>

<http://home.houston.rr.com/radarbiota/> (radar observations of migration)

<http://urbanbirdscapes.blogspot.com>

<http://www.virtualbirder.com>

[http://www.audubon.org/bird/at\\_home/alternatives.html](http://www.audubon.org/bird/at_home/alternatives.html)

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## Resources - A Bookworm Away

- Able, Kenneth. 1999. *Gatherings of Angels: Migrating Birds and Their Ecology*. Cornell University Press, New York
- Berthold, Peter. 1993. *Bird Migration: A General Survey*. Oxford University Press, Oxford
- Bird, David Michael. 2004. *The Bird Almanac*. Firefly Books (U.S.) Inc., New York
- De Graaf, Richard M., John H. Rappole. 1995. *Neotropical Migratory Birds: Natural History, Distribution, and Population Change*. Cornell University Press, New York
- Elphick, Jonathan, general editor. 1995. *The Atlas of Bird Migration*. Marshall Editions Developments Limited, Random House, Inc., New York
- Faaborg, John. 2002. *Saving Migrant Birds*. University of Texas Press, Austin, TX
- Kerlinger, Paul. 1995. *How Birds Migrate*. Stackpole Books, Mechanicsburg, Pennsylvania
- Richardson, Don, Ed Rozenburg and David Sarkozi. 1998. *A Birder's Checklist of the Upper Texas Coast*. Houston Outdoor Nature Club, Ornithology Group
- Rupp, Rebecca. 1995. *Everything You Never Learned About Birds*. RR Donnelley & Sons Company. Storey Books, Vermont
- Sibley, David Allen. 2000. *National Audubon Society The Sibley Guide to Birds*. 1st ed. Chanticleer Press, Inc., New York
- Sibley, David Allen. 2002. *Sibley's Birding Basics*. Alfred A. Knopf, publisher. Random House, Inc., New York
- Tveten, John L.. 1993. *The Birds of Texas*. Shearer Publishing, Fredricksburg, Texas
- Vanner, Michael. 2003. *The Encyclopedia of North American Birds*. Parragon Publishing
- Wells, Diana. 2002. *100 Birds and How They Got Their Names*. Algonquin Books of Chapel Hill, Chapel Hill, North Carolina



**GREAT BOOKS FOR KIDS**  
[www.naturallycurious.com](http://www.naturallycurious.com)

Learn about the many ideas that scientists have to explain the mystery of migration. This book is designed for children in primary grades.

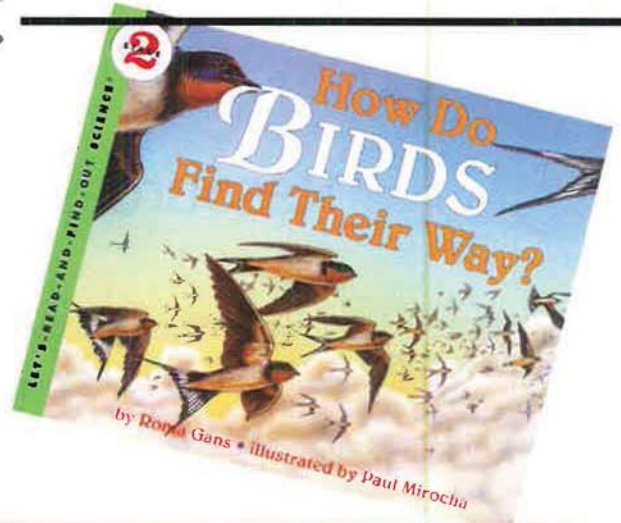
**How Do Birds Find Their Way?**

**By Roma Gans**

**Illustrated by Paul Mirocha**

**Harper Collins Publishers**

**©1996**



Follow a Peregrine Falcon on her journey from Alaska to Argentina. Amazing facts and beautiful illustrations of habitats help the reader to feel a part of the global trek.

**The Peregrine's Journey: A Story of Migration**

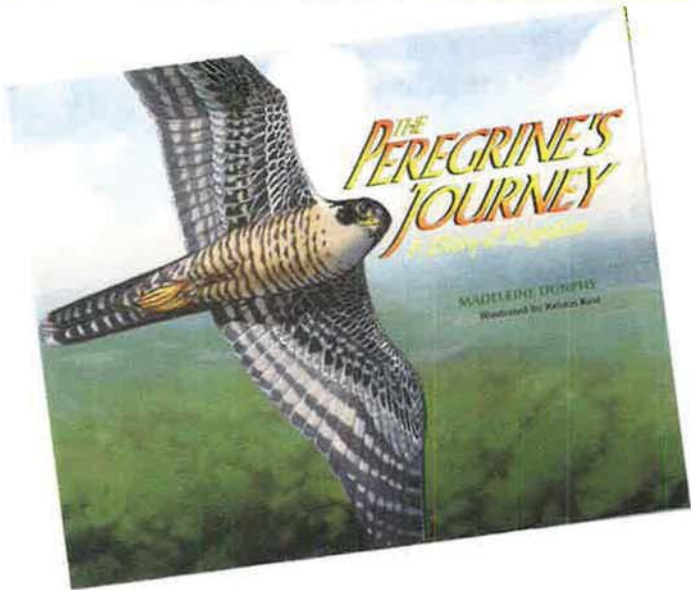
**By Madeleine Dunphy**

**Illustrations by Kristin Kest**

**The Millbrook Press, Inc**

**©2000**

**[www.millbrookpress.com](http://www.millbrookpress.com)**



Explore the world of bird migration and enjoy wonderful illustrations, maps, and explanations of this amazing event.

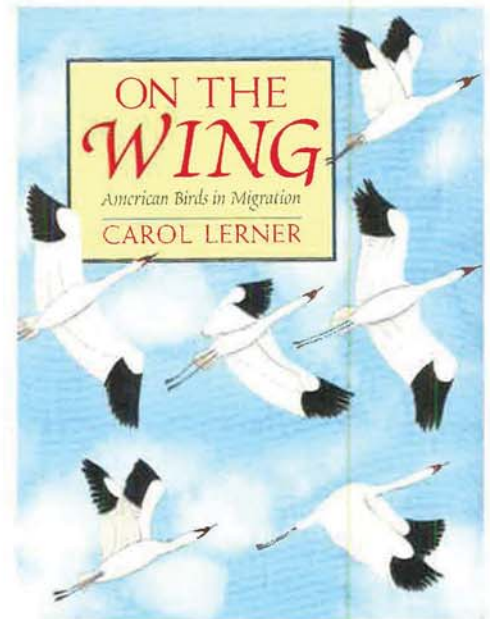
**On the Wing: American Birds in Migration**

**By Carol Lerner**

**Harper Collins Publisher**

**©2001 by Carol Lerner**

**[www.harperchildrens.com](http://www.harperchildrens.com)**



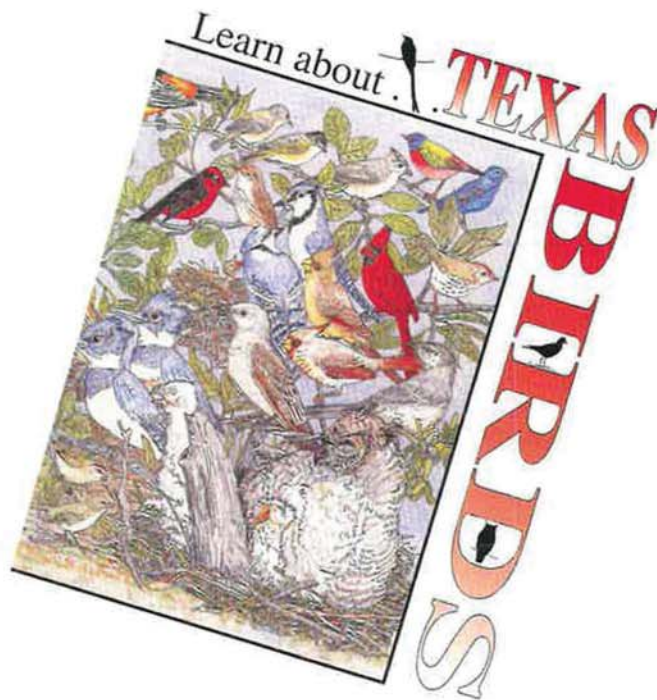
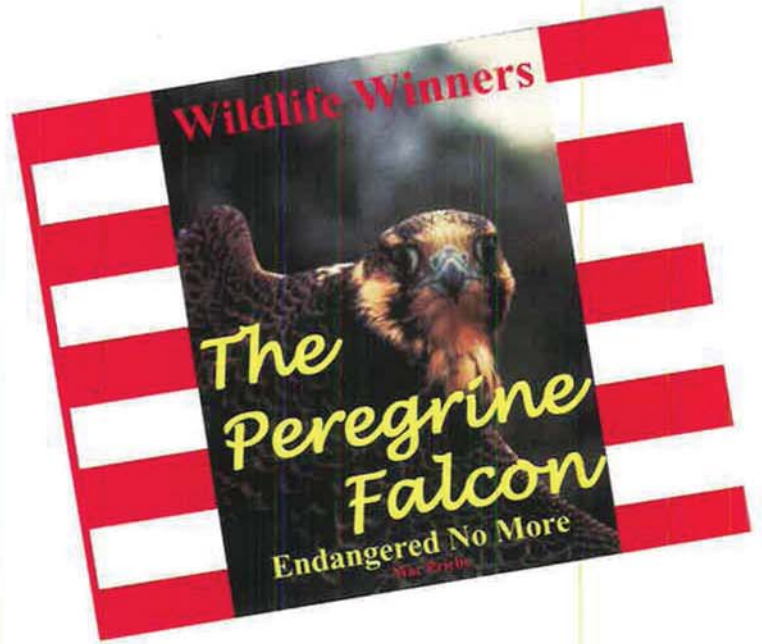






This book tells the story of the Peregrine Falcon. Learn about how this bird makes its living, how it almost became extinct, and how many different groups of people helped it to recover.

**Wildlife Winners - The Peregrine Falcon - Endangered No More**  
By Mac Priebe  
Illustrated by Jennifer Priebe  
Mindfull Publishing  
Norwalk, Connecticut  
©2000



This is a learning and activity book that will help the young and young at heart discover some of the great birds that spend time in Texas. This book comes loaded with pages to color, great facts you may not have known about these birds, and lots of activities.

**Learn about...Texas Birds**  
text by Mark W. Lockwood  
Texas Parks and Wildlife Press  
©1997  
4200 Smith School Road  
Austin, Texas 78744





## What to do when you find an injured or baby bird

What do you do when you find a baby bird on the ground or an injured bird?

The answer is not as simple as putting the bird in a box and feeding it. Many people make the mistake that birds can drink milk. They cannot, and it is a very bad idea to try and force feed food or water to any baby or injured animal. Another misconception is that the parent birds will reject their nestling after you have touched it. The majority of birds do not have a well developed sense of smell and will therefore, not reject, their own young. Yet another common mistake occurs when people pick up fully feathered young birds that don't yet fly. They think they must be injured or sick. In fact, many species of birds leave the nest before they can actually fly. It may take another 48 hours for them to gain the skills and strength to fly, but the parents are still there protecting and feeding their young.

So how do you know when to help and when not to help?

Here are some guidelines:

- For immediate help and answers, have the phone number of your nearest wildlife rehabber nearby

**Lone Star Wildlife Rescue 281.356.9393**

**Texas Wildlife Rehabilitation Coalition 713.468.8972**

**Wildlife Rehabilitation and Education 713.643.WILD**

- If you are not in Houston, you can find the entire listing of licensed rehabilitators, on the Texas Parks and Wildlife website, at the following link:

**<http://www.tpwd.state.tx.us/nature/research/rehab/>**

- If you cannot talk to a rehabber immediately, here are some ways you can help without doing more harm than good

1. If the young bird has no feathers and has obviously fallen out of a nearby nest, return the bird to its nest as quickly as possible. Move away from the nest and make sure there are no cats and dogs in the area that might scare the parents away.

2. If the young bird is feathered and hopping on the ground, move all cats, dogs and children away and observe the fledgling for about an hour. The parents are more than likely nearby. If the parents do not return, carefully pick up the bird and put it in a cardboard box with a towel at the bottom. Cover loosely and put in a safe place, away from pets, children, and extreme temperatures.



3. Do not offer the bird food or water. Call your nearest rehabber immediately. Do not "pet" the bird or expose the bird to loud noises. Avoid continuous peeking at the bird, they can become very stressed. A stressed bird will often appear very calm and will let you handle them. You may think they are being very nice and that they like you, but they are actually in a state of shock that could be deadly.

4. Larger birds that are injured can be dangerous. You should always observe the bird to make sure it is truly in need of help before you offer any. Wild birds will not know that you are trying to help them and they will try to protect themselves. Sharp beaks and claws can be a painful reminder that this is a wild animal you are trying to rescue. If you are convinced that the bird is in need of help, secure a cardboard box that is big enough for the bird to be comfortable and a towel. For birds such as hawks and owls, you should wear gloves to protect yourself from their talons (sharp claws). Use the towel to scoop the bird into the box and call your nearest rehabber immediately. Remember to avoid trying to force feed food or water.

- **It is very important to remember that all species of native birds are protected by federal and state laws.**
  - **It is illegal to keep them or try to help them if you are not licensed and trained.**
  - **It is very important to turn them over to a licensed rehabilitator as soon as possible.**
  - **Beyond the legalities, these animals require special care and diets in order to be returned into the wild where they belong.**

## **For more information**

**<http://www.theraptortrust.org>**

**<http://www.tc.umn.edu/~devo0028/advice4.htm>**

**[www.rande.org](http://www.rande.org)**





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## A final note - A view from the north

### *Migration into Fall*

by Mary Anne Weber, written in August of 1994 from Three Forks, Montana (elevation - 4810 feet)

As the sun sets behind the Tobacco Root Mountains there is a welcome chill in the air. After the long, hot summer, signs of autumn are bringing sighs of relief from many. Soon, the leaves will be decorating the landscape with deep golds and reds and we will be waking to glistening frost on lawns and windshields. Many of us will be heading back into the classroom, while for others the routine remains the same. However, in the natural world around us, dramatic changes are happening on every scale.

Hibernation is just around the corner for many creatures and others are busy storing food for the winter ahead. However, one of the most fascinating events of the autumn season is migration. Specifically, the migration of birds. This seasonal movement has long caught the imagination and interest of earth bound beings such as ourselves. To many it is the heralding of the new season. The skies are filled with the V formation of migrating geese and our backyards are alive with chickadees and grosbeaks returning to the feeders.

Migration allows birds to exploit food supplies that are available for only limited periods of time and to avoid the physiological stresses of unfavorable climates. In spring, lengthening days trigger hormonal changes in birds that prompt migration, and likewise, shortening daylight in the fall.

Migration takes on many forms. Species move from breeding areas to wintering areas. The diversity of the distance traveled and the direction of travel can be astounding. For many birds it is simply moving from the high elevation forests into the valleys, like the Clark's Nutcracker. For others like the Swainson's Hawk, it is a journey of thousands of miles to the grasslands of Argentina. As they head south, birds such as the Rough-legged Hawk fly from their breeding grounds at the Arctic Circle to take their place here in Montana.

Most of us are familiar with latitudinal and elevational migrations as described above. There are however other forms of migration that include longitudinal, austral, and seasonal movements. Prairie Falcons are an example of longitudinal migration. After nesting in the foothills of the Rockies they migrate south and east to the Midwest. In areas, like Kansas, they will find an abundance of prey such as waterfowl in late spring and fall. Migration in the southern hemisphere is often called austral migration. Cinnamon Teal in these areas fly from southern nesting areas to northern wintering areas. In North America they fly north to south. The austral winter runs from June through August. Sooty Shearwaters also fly north after breeding. They fly along the Atlantic coast until they reach northern areas such as Newfoundland. From here they head east across the Atlantic to Europe. By following this incredible route they are able to take advantage of the abundance of fish and invertebrates in the Atlantic Ocean at different times. They fly south again to breed.





Seasonal migration occurs primarily in the tropics. Some tropical migrants move into a particular area when the rainy season starts. The rainy season produces an abundance of insects in the tropics just like warm weather does in temperate areas. In Africa, the Grasshopper Buzzards are triggered to migrate when the rainy season begins. They move to northern areas to breed and exploit the abundance of insects and then head south during the dry season.

Birds use a variety of cues to find their way from nesting grounds to wintering areas and back again. There are five primary sources the birds acquire directional information: 1) topographic features, 2) stars, 3) sun, 4) the earth's magnetic field, and 5) odors. Research has shown that birds use a variety of these cues so they are able to continue under most conditions.

There are unfortunately, many obstacles on a migration route. Severe weather, lack of food, destruction of habitat through alteration or pollutants, and human harassment are just some of the many problems encountered. As a result of these, it is estimated that many species have a 50% mortality rate and in young birds it may be as high as 80%.

Whatever the reason and whatever the navigational technique used, the movement of birds in and out of an area each year is a welcome sign of warming or cooling temperatures and the changing of seasons.

There are many stories in folklore about migrating birds and a favorite of many concerns the migration of cranes. It was once suggested that small birds would often hitch rides on the backs of cranes and other large birds. Not only did the birds get a free ride, but it was believed that the bigger birds also benefited, for they could listen to merry chatter of their guests the entire journey and this helped to pass the time.

The Sandhill Cranes are unmistakable as they fly south in large flocks. Their voice ring out across the land. The Eskimos of northwestern Alaska tell the following story of migrating cranes.

*One cold autumn day long ago, the cranes began to prepare to fly south. As they gathered in a huge flock, they saw a beautiful young girl. They coveted her loveliness and finally decided to take her with them. Surrounding her, they lifted her on their widespread wings and carried her away. When she began to cry for help, they all flew close together, drowning her small voice with their mighty cries. So today, when the cranes fly close together, sounding their loud trumpet calls, it is time for all Eskimo children to come inside and stay close to their family.*

**Autumn is certainly a season of changes and one that abounds in opportunities for learning and building bridges to the natural world. So as the cranes croak high in the sky, perhaps we can take some time to appreciate this spectacular event. Let us wish our migrants a safe journey, save a place for them in the coming spring, and teach others to do the same.**

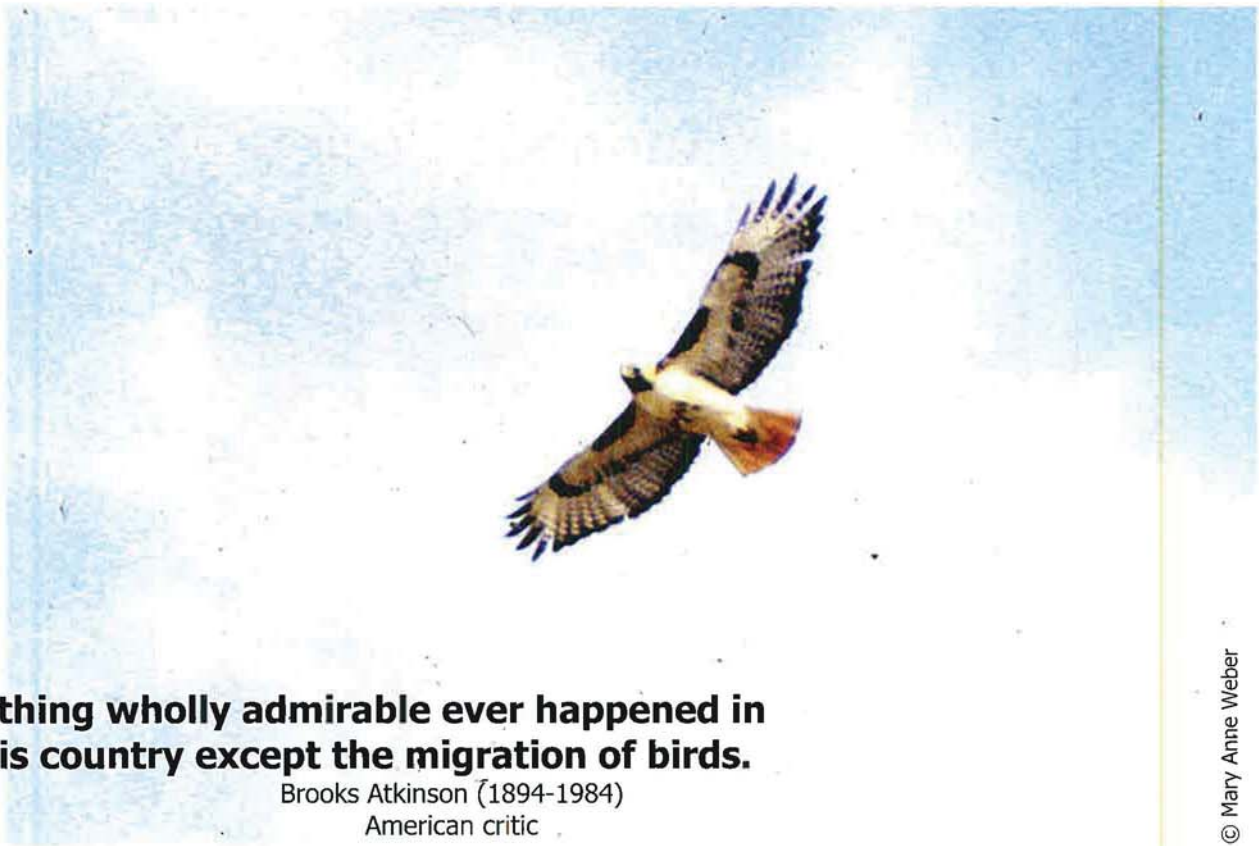


# Houston Audubon Society



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... keeping our eyes on the birds.



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**Nothing wholly admirable ever happened in  
this country except the migration of birds.**

Brooks Atkinson (1894-1984)  
American critic

**To be a bird is to be alive more intensively than  
any other creature...(Birds) live in a world that  
is always the present, mostly full of joy.**

N.J. Berrill, B. 1903  
Canadian writer

Well, I guess that you probably know by now - I was one who wanted to fly.

I wanted to ride on that arrow of fire right up into heaven.

And I wanted to go for every man, every child, every mother of children,

I wanted to carry the dreams of all people right up to the stars.

And I prayed that I'd find an answer there or maybe I would find a song,

giving a voice to all of the hearts that cannot be heard.

And for all of the ones who live in fear and all of those who stand apart,

my being there would bring us a little step closer together.

They were flying for me, they were flying for everyone.

They were trying to see a brighter day for each and every one.

They gave us their light, they gave us their spirit and all they could be,

they were flying for me, they were flying for me.

And I wanted to wish on the Milky Way and dance upon a falling star.

I wanted to give myself and free myself and join myself with it all.

Given the chance to dream, it can be done, the promise of tomorrow is real.

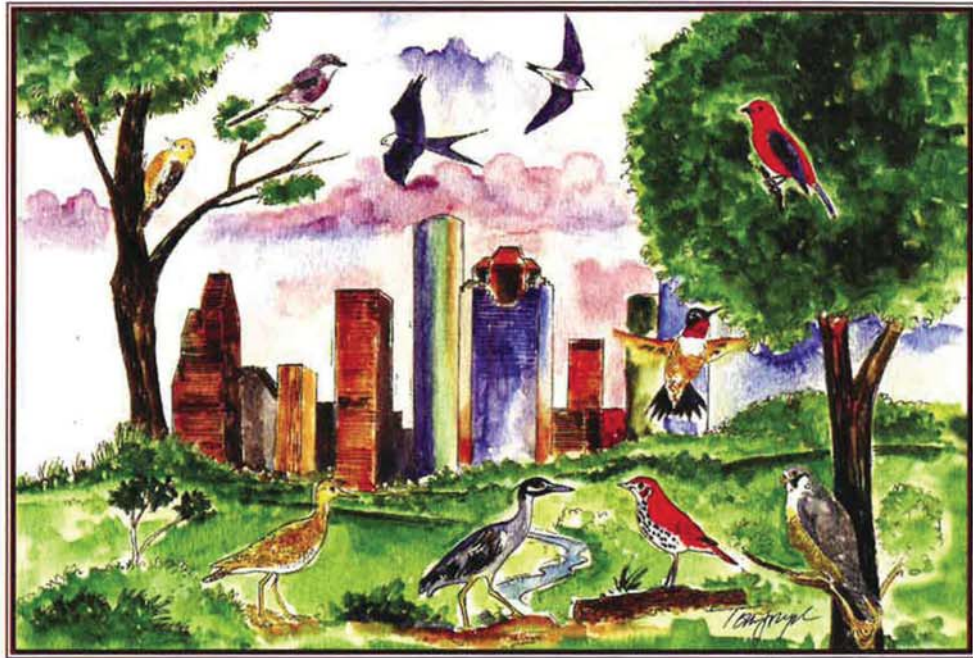
Children of spaceship Earth, the future belongs to us all.











Houston Urban Conservation Treaty  
for Migratory Birds

**Citizens' Guide to Migration  
and the  
Migratory Birds of the Bayou City**



**Houston Audubon Society**  
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