
TEXAS PARKS AND WILDLIFE

Migration and The Migratory Birds of Texas:

*Who They Are And
Where They Are Going*

FOURTH EDITION



By Clifford E. Shackelford, Edward R. Rozenburg,
W. Chuck Hunter and Mark W. Lockwood

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This booklet is intended to be used by the general public as an introduction to bird
migration in Texas. Common names follow the 7th edition of the AOU Check-list.
Added modifiers in parentheses represent distinct subspecies. All lists are in
phylogenetic order.

INTRODUCTION

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 629 species of birds documented in Texas, 53% 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 farther south (i.e., Central and South America). Their migratory habits are part of their lives and heritage.



(see page 22 for world map)

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SECTION 1

Questions and Answers on Migration

What is migration?

Migration is the cyclic or periodic travel of an animal as it returns eventually to its original place of departure. Migration is often annual and is closely linked with the cyclic pattern of the seasons. It is most evident among birds, which have a highly efficient means for traveling swiftly over long distances. The migration of most birds is a yearly cycle.

Do all birds migrate?

Not all birds migrate. The more severe the climate of an area, the greater percentage of nesting birds migrate. Two-thirds of bird species found in the United States migrate, some only short distances to more southern states. Those that do migrate have adaptations not seen in their non-migratory relatives. Migratory birds can build fat stores as an energy source for long flights. Migratory birds usually have longer, more pointed wings and weigh less than related non-migratory birds.

Why do birds migrate?

There are a number of explanations for migration: (1) Birds migrate to areas where food is more abundant, (2) there is less competition for nesting space, (3) the climate is milder, or (4) the daylight hours are longer. These enhance the chances of survival of a bird and its brood. Most birds require a rich, abundant supply of food at frequent intervals because of their high metabolic rate. Adequate food is not available throughout the year in most regions. North American birds must endure the hazards of winter or migrate to more friendly climates. In winter they migrate to the warmer, southern regions of the United States, Caribbean, Mexico, Central America and South America where food is abundant. In the spring, these birds fly north to habitats where spring and summer provide more food production and less competition for food and nesting sites than in their winter habitat. Summertime at northern latitudes also means more daylight hours to seek food for themselves and their nestlings.

Where do migrating birds go?

Many nesting birds in Canada and the northern United States fly south to the tier of states along the Gulf of Mexico where the winter climate is more favorable and food is abundant. More than 330 species of birds that nest in the United States and Canada migrate to the West Indies or Central and South America. The principal wintering area for Neotropical Migrants extends through Mexico and Central America to Panama; it has the highest density of winter bird residents in the world.

Do birds follow established migratory routes?

The migratory flights of many migrating birds follow specific routes, sometimes quite well-defined, over long distances. The shape of the continent determines the main routes of migration. These routes run north to south and include the Atlantic oceanic route, the Atlantic Flyway, the Mississippi Flyway, the Central Flyway, the Pacific Flyway, and the Pacific oceanic route (see Section 2). Geographic factors, ecological conditions and meteorological conditions determine such routes. The majority of migrants travels along broad airways within these flyways changing their flight direction in response to the direction and force of the wind. Some routes cross oceans or huge bodies of water. Some small songbirds migrate 500-600 miles across the Gulf of Mexico.

How far do migrating birds travel?

Migration usually involves latitudinal or altitudinal travel. The distance may be a few miles or thousands of miles. In mountainous areas, birds, mammals and others move just a few miles from upper zones where they breed to the foothills or plains during seasons when the weather is severe and unfavorable. Clark's Nutcracker, for example, of the Rocky Mountains nests in the summer high in the mountains then winters in the lower forests.

The Ruby-throated Hummingbird nests from the southern United States up into Canada and winters as far south as Panama. Some of these little birds fly nonstop across the Gulf of Mexico (up to 600 miles). Many flycatchers fly similar routes. Some birds, such as robins or grackles, winter in large flocks in the Gulf States. The seasonal flights of American wood warblers are spectacular. Some winter in the Gulf States and the West Indies; others fly as far south as Guyana, Brazil and Peru. Tanagers and Bobolinks migrate through the eastern United States, past Cuba to southern Brazil, Bolivia, and Argentina. This area in South America is also the wintering ground for the American Golden-Plover. It leaves its nesting ground on the arctic tundra of Alaska and Canada, assembles in Labrador and southeastern Canada, then flies nonstop over the Atlantic Ocean, about 2400 miles, to Brazil. They return in the spring over Central and South America, and the Gulf of Mexico, then follow the Mississippi Valley north. The migratory champion is the Arctic Tern. It breeds in the northern most regions of Asia, Europe, and North America, then winters in the extreme southern Pacific and Atlantic Oceans at the edge of the Antarctic ice pack 11,000 miles away.

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How fast do migrating birds fly?

The speed of flight depends largely on the species and the type of terrain covered. Birds fly faster when migrating than otherwise. Birds seem to fly faster in spring migration than in the fall. Migrants fly faster over water than over land. The American Golden-Plover may fly over 2400 miles south over the Atlantic Ocean at nearly 60 mph. Common Loons are among the fastest flyers at nearly 70 mph. Woodcocks on the other hand, fly at just over 10 miles per hour. Birds migrating over land may make stops for food and rest.

How high do migrating birds fly?

Most migrants fly at low altitudes, usually below 7400 feet. Small birds migrating at night fly between 800-1600 feet. In the daytime they fly much lower, often below 200 feet. Some fly much higher, the record is held by the Bar-headed Goose: 29,500 feet above sea level, over the Himalayas in India.



What birds migrate during the day?

Swift, strong fliers and hunters are often daytime, or diurnal migrants. These include pelicans, herons, birds of prey, hummingbirds, swifts, swallows and finches. Some of these birds can feed on the wing.

What birds migrate at night?

Nighttime or nocturnal migrants usually are birds that live in thick vegetation and rarely venture out of it. They include waterbirds, cuckoos, flycatchers, thrushes, warblers, orioles and buntings. Nighttime movement gives them protection from their diurnal predators. They feed and rest by day to build up energy stores for their long-distance flights at night.

Do birds usually migrate in groups?

Most birds are gregarious during migration, even those that are usually solitary at other times such as insectivores and birds of prey. Birds, such as shorebirds and waterfowl, with similar habits often migrate together. Migrating flocks will often show remarkable cohesion. Traveling in large groups provides safety for individual birds by confusing predators and making it difficult to pick out a specific victim. A characteristic migratory formation is the 'V' of geese, ducks, pelicans, and cranes with the point turned in the direction of flight.

How well can birds navigate?

Migrants often return to breed in the same locality where they were hatched. This journey may cover thousands of miles over many types of terrain and through extremes of weather. Birds show an amazing ability to orient themselves and home in on their destination. Migrating birds have many potential cues for orientation and navigation between summer and winter habitats. They do not depend on any single navigational cue.

What do birds use for orientation and navigation?

It has been demonstrated that birds use various guiding factors. These include topographic landmarks (mountains, valleys, rivers, coastlines), ecological factors (vegetation zones), and climatic changes (air masses differing in temperature and humidity). Birds have also demonstrated a compass sense. They are able to fly in a particular constant direction regardless of their starting point with respect to their destination. Birds have shown that they can relate a release point to their home area, determine which direction to take (orientation), then maintain that direction of flight (navigation). We presume this to be, in part, due to sensitivity to the intensity and direction of the earth's magnetic field. Experiments have shown that the orientation of birds is also based on celestial bearings. They can use the sun as a point of orientation during the day and the stars at night. Birds can compensate for the movement of the sun throughout the day with an internal clock mechanism that seems to give them the ability to gauge the angle of the sun above the horizon.

How do birds navigate at night?

Migrant birds that travel at night use the stars to determine their bearings. In clear weather, captive migrants head immediately in the proper direction using only the stars. They can orient themselves correctly to the arrangement of night skies projected on the dome of a planetarium. Birds apparently can determine their longitude and latitude by the position of the stars. Evidence also indicates that the glare of the moon can interfere with this orientation.

Do birds use landmarks to navigate?

Many birds, especially diurnal migrants, can recognize the topography beneath them and can navigate using familiar landmarks. Some birds follow coastlines to avoid flying over large bodies of water. At times, many follow river valleys. River valleys are like highways offering direction and shelter and food when the birds land to rest. Some birds, such as hawks, that migrate by day concentrate along mountain ranges where they ride updrafts along the mountains.

What initiates migration?

The same factors stimulate migration and reproduction. Before migration, metabolic changes occur. The thyroid gland controls these changes. Food consumption increases and fat accumulates under the skin tissues. This will provide the energy for long flights. The Ruby-throated Hummingbird stores enough fat to fly 26 hours non-stop at 25 miles an hour. This is enough to span the Gulf of Mexico. Variations in metabolism and related phenomena are controlled by another endocrine gland, the pituitary, located in the lower part of the brain. It sends out instructions by way of hormones.



What external factors prepare birds to migrate?

The pituitary is influenced by environmental factors such as day length and the intensity of the sun. The pituitary responds to increasing day length in springtime by accelerating the development of the gonads and all other metabolic processes, including the development of the thyroid, to prepare the bird for migration.

What external factors affect time of migration?

If pituitary functions and variations in day length were the only factors, migration would occur regularly every year. Such a lack of flexibility could be catastrophic for migrants because of variations in biological and meteorological conditions. Environmental factors such as weather, arrival of spring, flowering, foliation, insect hatching and availability of food vary from year to year. The pituitary prepares the bird for migration. The proper ecological conditions are necessary to trigger it. Birds can be exhausted and emaciated by the time they reach stopping areas. They gorge themselves to replenish their fat reserves before preparing for the next leg of the flight.

Does the temperature affect migration?

Weather and temperature are very important—the first cold front of the fall usually brings with it flocks of migrating geese. Many birds follow a temperature gradient as they return to nest in the spring. Birds vary in sensitivity toward temperature and other environmental conditions. Woodcocks and snipe rely on surrounding weather conditions to initiate their spring and fall migrations. The patterns of their flight depend on temperature and barometric pressure. Other birds such as swifts, swallows and orioles are less weather dependent and the dates of their departure and arrival occur with regularity each year (i.e., the swallows at Capistrano).

How does the weather affect migration?

Weather is one of the chief external influences on migration. Cool air masses moving south in the fall can trigger migratory flight. Cool air brings high pressure, low or falling temperatures and winds moving in the direction of flight and clear skies. If the cool air meets warmer air, clouds, precipitation and fog may result. Fog, especially, causes birds to descend to the ground and cease migration. Sudden changes in the weather can be disastrous for birds. In the spring, a warm, moist mass of air (low pressure with higher or rising temperatures) moving north over the Gulf of Mexico can start a wave of migrating birds to move northward from the American Tropics or southern United States. A southward moving cold front meeting such a warm air mass can result in heavy rains and high winds. This can stop migration immediately or within 24 hours. These spring “fallouts” or “groundings” of migrants may occur when the migrating birds literally fall into sheltered areas seeking food and refuge. This can be disastrous if the migrants are forced down into the ocean drowning thousands of birds. Resumption of southerly winds and rising temperatures starts migration northward again.

How did migration originate?

The roots of the migratory habits of modern birds are believed to date back millions of years, and were tempered by environmental changes caused by the Ice Ages of the Quaternary period over the last 2,500,000 years. Migration, as is known among modern birds, probably developed gradually by stages. As the environment changed, some animals changed their habitat slightly, hardly leaving their home region. The movements of others were more erratic, moving toward more favorable places. These first stages of migration were stabilized by natural selection. As winters grew more severe, much of a given bird population probably perished rather than attempting to flee any unfavorable conditions. A fraction of this population probably sought more favorable conditions elsewhere. Natural selection favored the ‘migrants’ and migratory tendencies were retained.

Why do birds fly to specific locations in the spring and fall?

In some cases, the original habitats were in present-day southern wintering areas. The birds developed a tendency to leave in spring to breed in territories to the north that were less crowded. Fall brought seasonal changes in weather and declining food supply in these newly settled regions. This forced the birds to migrate back to their former range for the winter. North American birds that originated in the tropics include hummingbirds, tyrant flycatchers, tanagers, wood warblers, orioles, and swifts. In recent

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geological times these birds gradually spread northward as glacial ice receded and the continent became warmer. Other birds, such as plovers, ducks and geese, originally lived in what are now their northern breeding areas. Gradual climatic changes forced them to spend winters far to the south. Migrations appear to be the consequences of invasions or emigrations during which animals settle in new regions during part of the annual cycle, then return to the original region to complete the cycle. Migration patterns are not fixed. As climates change, migration routes change as well, causing birds to lengthen or shorten the routes, or to abandon them altogether.

Are there any ecological implications with migration?

There are many ecological implications of migration. The sequence of migratory movement is closely integrated with the annual cycle of ecosystems that are characterized by productivity fluctuations. The food resources of some regions could not be adequately exploited without bird populations moving. Migratory behavior occurs in species located at specific trophic levels where maximum fluctuation in food production occurs in both breeding and wintering regions. Many migrant birds avoid primary equatorial forests where productivity is usually constant throughout the year and food surpluses do not occur. They do, however, congregate in savannas where productivity varies with the seasons.

How is migration coordinated with the seasons?

A coordinated sequence is apparent in the case of birds migrating from the northern Arctic regions to tropical winter regions; both life zones show broad fluctuations in productivity. In the Arctic, vegetation and animal production are very high during the summer. Ducks and shorebirds nest there in great numbers, exploiting the food resources. As winter comes, days shorten and food becomes scarce. The waterbirds migrate to southern climates where the rainy season has caused food production to increase to optimal levels. In winter, ducks and shorebirds concentrate in the most favorable areas and remain until spring when productivity there is lowest. By then, conditions at the breeding areas are again favorable for the birds. The life cycle of these birds is closely attuned with the productivity cycles in their breeding and winter habitats. The size of populations is controlled by the capacity of both habitats to sustain them.

How do human activities affect migratory birds?

The winter habitat of the “Lesser” Snow Goose is in the southeastern quarter of Texas. Combinations of mild weather, ample winter food supply and protection on numerous wildlife refuges in its wintering range, as well as the

bird's natural wariness, have led to a tripling of the snow goose population in the last decade. The summer nesting range around Hudson's Bay in Canada is being destroyed by overpopulation of geese. This may lead to a collapse of the habitat's ability to support the goose population. This can lead to a major die off and nesting failure of the geese and any associated wildlife in this area of Canada.

Forest clearing for agriculture and petroleum exploration in Mexico and Central America has decreased the winter habitat of many migrant birds. The great fires of 1998 in Mexico will have, as yet, unknown effects on migrant birds. The fires have likely decreased forest habitat even further though. Migrants that returned that fall encountered decimated habitat and likely experienced a stressful winter resulting in fewer migrants returning the next spring. No one knows for sure. On the other hand, the fires created open areas that are the varied, transitional vegetation zones that many migrants prefer as habitat.

What are some human caused hazards for migrants?

Flying at night or in fog, many birds collide with tall structures. Lighthouses and skyscrapers are notorious killers of migrants. Reflective windows can be deadly. Birds see reflections of sky or trees and fly into them. Electronic towers for radio, television, cellular phones, etc. and their supporting cables kill thousands of migrating birds during migration.

Habitat loss and degradation is a much greater problem. Habitat needed for food and shelter in winter is disappearing in Latin America. Clearing of forestland and plowing of grassland for crops destroys the diverse habitat that is necessary for many species of birds to survive. In the United States and Canada there is often not enough habitat for some species to raise their young. Where there is appropriate habitat, it may be too close to human disturbances or be too small an area. The populations of many North American bird species have decreased severely over the last 100 years.

A serious man-caused hazard to migratory birds is pet cats. Free-roaming cats take a high toll on migratory birds. Scientific studies show that each year cats may kill hundreds of millions of migratory songbirds. Cats are serious threats to fledglings, birds roosting at night and birds on nests. An indoor cat is the best kind of cat.

Human introduction of exotic birds has proved detrimental to native songbirds. The European Starling, for example, is a cavity-nesting species that attacks and replaces native cavity-nesting birds which don't seem to be able to defend themselves from these aggressive invaders.

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Do most migrants return after the winter?

Many birds perish during migration and the winter season. It is believed that less than half the birds that leave the nesting grounds in fall migration will return the following spring. Migration over water is one of the most hazardous times for birds, especially small songbirds. Millions of migrating birds perish at sea. These are often young birds or birds that are blown off-shore or forced down by bad weather.

Wildlife experts study waterfowl populations intensively to set hunting seasons and limits. They have a good idea of how many waterfowl head south each fall, about 100 million. About 40 million return; hunters kill about 20 million and about 40 million fall victim to predation, accidents, environmental factors and disease.



How does migration benefit birds and the environment?

Migration has considerable ecological significance. It enables fast-moving animals to exploit fluctuating resources and to settle in areas where they could not live if incapable of rapid travel. On the other hand, peaks of food production would be unexploited without the periodic presence of migratory populations.

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 of 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 the populations. Laws established to protect nongame 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 birdwatching and other forms of nature related activities become more popular. Ecotourism, including birdwatching, camping, hiking, nature study and photography have become part of a multi-billion dollar industry. Throughout the United States, more people are engaged 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.

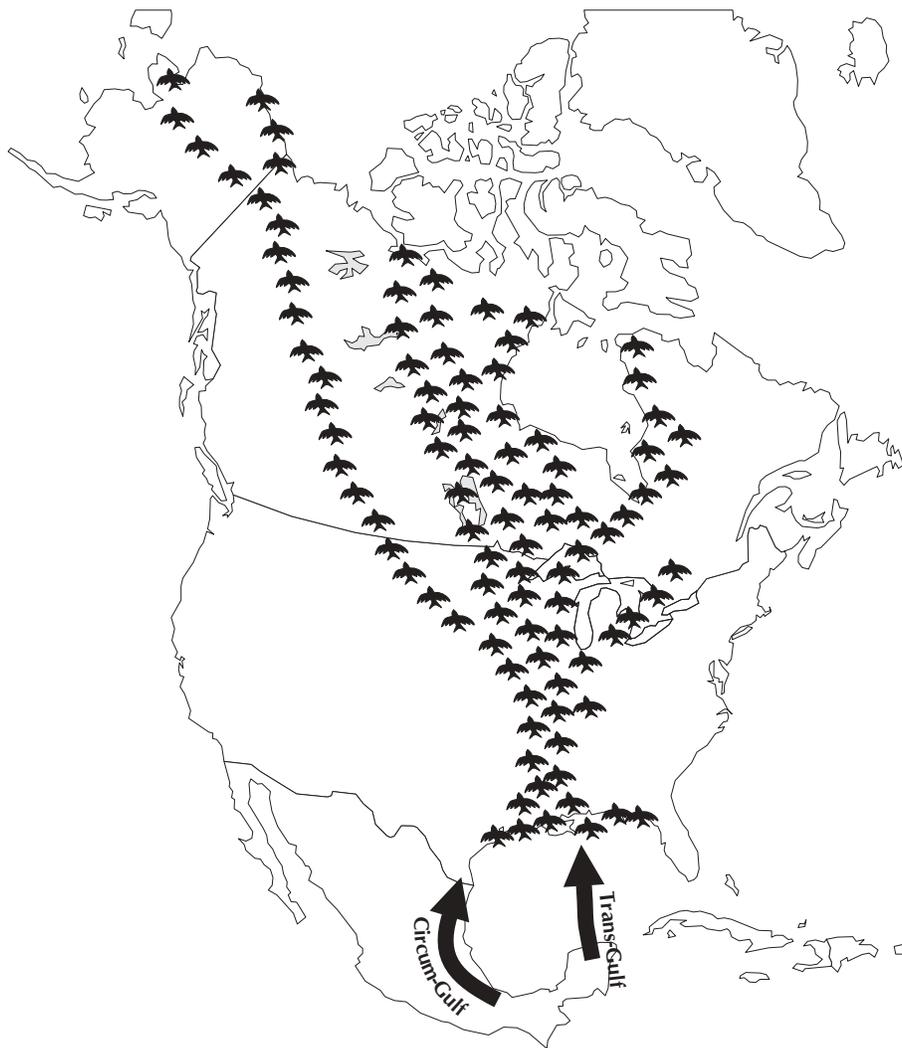
SECTION 2

The Migratory Flyways of North America

Central Flyway



Mississippi Flyway



Atlantic Flyway



Pacific Flyway



SECTION 3

Timing of Selected Spring Migrants

These are selected examples and is in no way an inclusive list; involves most of Texas

<u>SPECIES</u>	<u>APPROX. MIGRATION TIMING</u>
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Early-season Examples

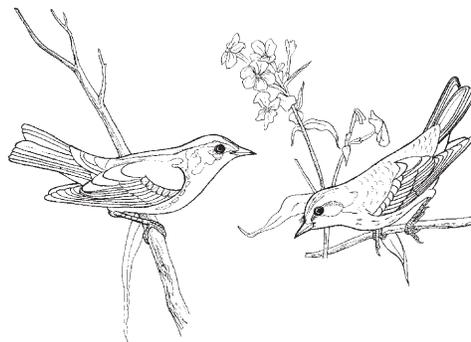
American Golden-Plover	early March to late April
Chimney Swift	late March to late April
Ruby-throated Hummingbird	late March to mid May
Purple Martin	mid February to early March
Barn Swallow	early March to early April
Northern Parula	early March to mid April
Black-throated Green Warbler	late March to early May
Yellow-throated Warbler	early March to mid April
Black-and-white Warbler	early March to late April

Mid-season Examples

Hudsonian Godwit	mid April to the beginning of May
Buff-breasted Sandpiper	mid April to the beginning of May
Yellow-billed Cuckoo	mid April to mid May
Golden-winged Warbler	mid April to the beginning of May
Cerulean Warbler	mid April to the beginning of May

Late-season Examples

Olive-sided Flycatcher	early to late May
Eastern Wood-Pewee	late April to mid May
“Traill’s” Flycatcher (Alder/Willow)	early to late May
Magnolia Warbler	late April to mid May
Blackburnian Warbler	late April to mid May
Bay-breasted Warbler	late April to mid May



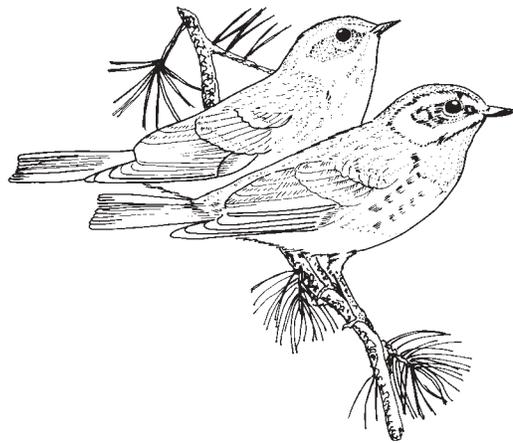
Further Reading on Bird Migration

This is in no way considered an inclusive list

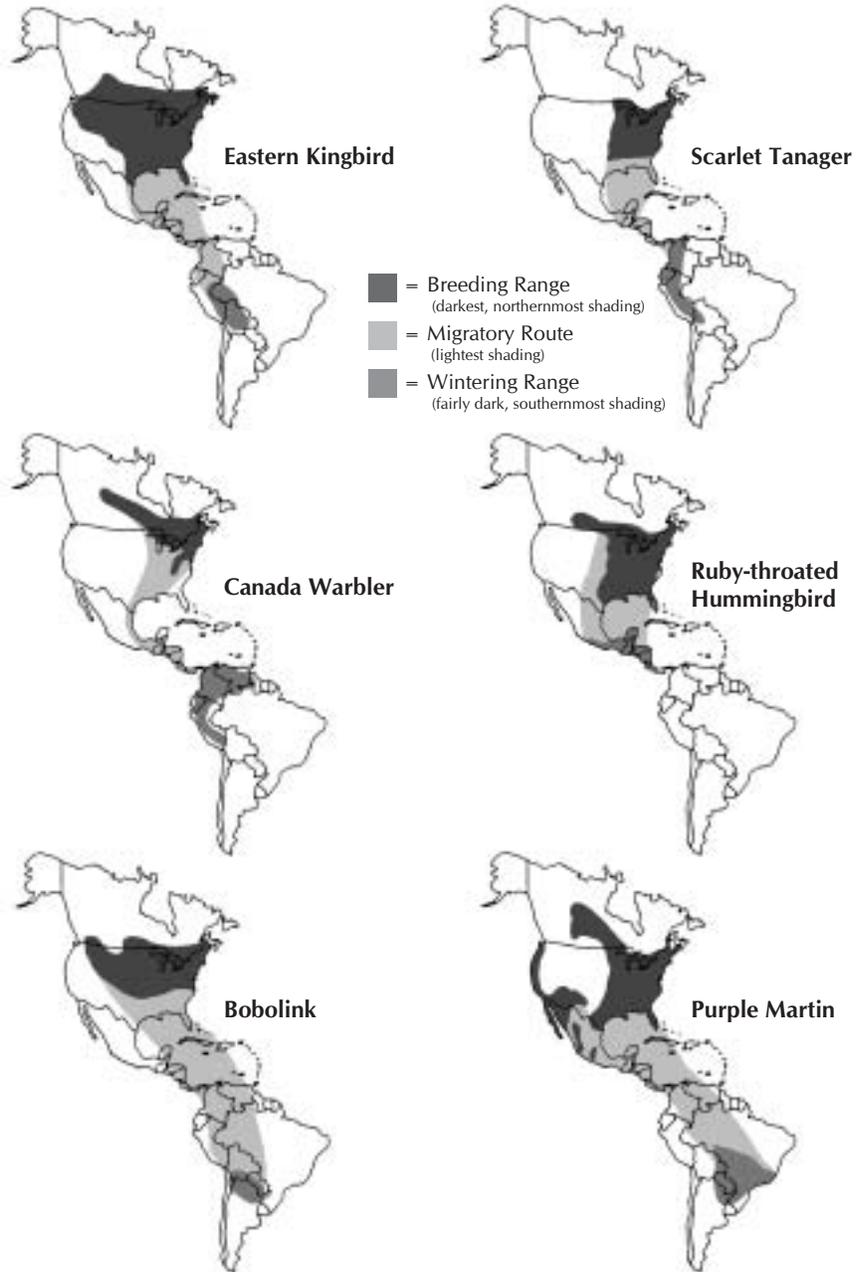
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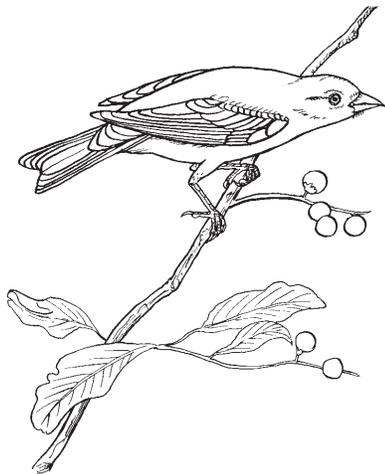
Migratory Routes of Selected Species: Many birds spend a lot of their lives “on the road.”



Grouping North American Birds by Migratory Status

Partners in Flight originally was formed to emphasize conservation of species not otherwise covered by existing conservation initiatives. Nearctic-Neotropical migratory landbirds were not included in previously existing initiatives covering waterfowl (North American Waterfowl Management Plan), shorebirds (Western Hemispheric Shorebird Reserve Network), colonial waterbirds (Colonial Waterbird Group), or for that matter numerous initiatives that focused on tropical biodiversity. However, the momentum generated under the Partners in Flight banner interestingly has led not to competing with other bird conservation initiatives, but instead to a spreading desire to link many of these initiatives together so as to pool limited resources towards shared goals and objectives (e.g., Mississippi Alluvial Plain and Prairie Pothole Migratory Bird initiatives; Mueller, et al. *in press*).

While Partners in Flight still concentrates on Nearctic-Neotropical migratory landbird conservation, planning and implementation of specific actions requires taking into account the status and potential effects of these actions on all landbirds, in both temperate and tropical areas. Although many Neotropical migrants require attention throughout the Western Hemisphere, significant concern also exists for some temperate migrants (those species remaining primarily north of the tropics) and resident species that co-occur with Neotropical migrants in both breeding and wintering habitats (Hunter 1995). In fact, Neotropical migrants provide the common link by which cooperation in conservation should occur across States and Nations, without taking anything away from conservation of highly endangered and narrowly distributed resident species, especially in the tropics.



Despite these advances in bird conservation thinking, there continues to be dissatisfaction about how to best categorize groups of migratory birds (i.e., which species are Neotropical migrants; Finch and Martin 1991). As DeGraaf and Rappole (1995), Greenberg and Reaser (1995), and other investigators correctly point out, many species of shorebirds, waterfowl, and wading birds also migrate to and from temperate breeding areas through tropical zones. These and other investigators also correctly point out that there are many tropical species migrating solely within the tropics and other species referred to as Austral migrants that breed in temperate South American habitats while wintering north into tropical zones (e.g., Chesser 1994, Nosedal 1994).

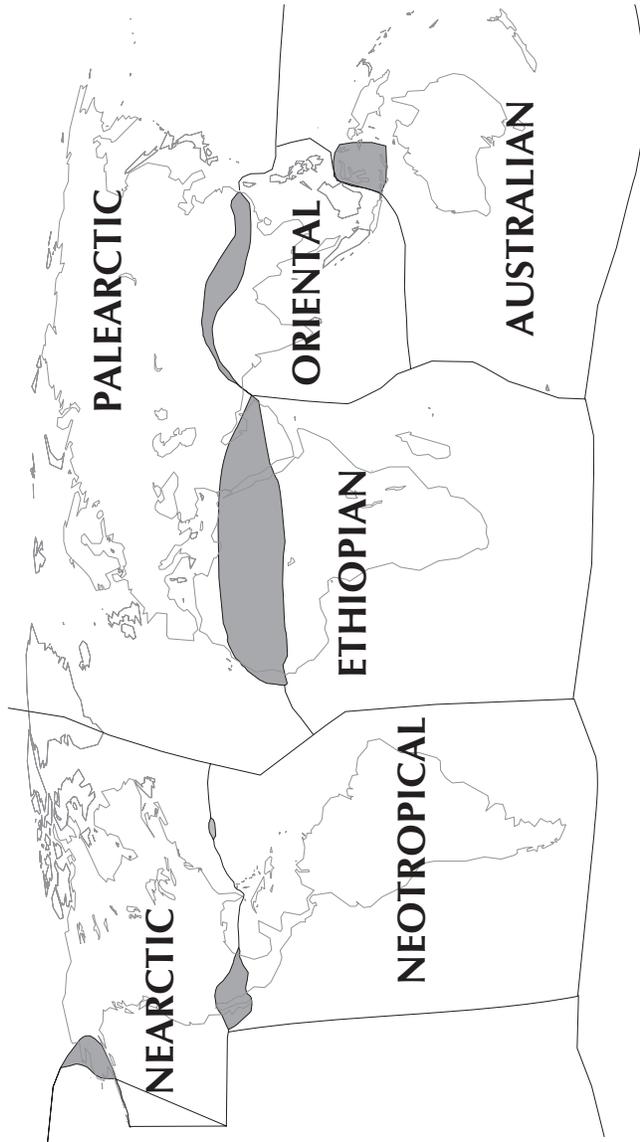
Understanding migration patterns and the underlying causes of why and where birds migrate are of course topics for serious debate, as is the expansion of what species should be included in lists of Neotropical migrants. As important as these topics are for academic debate, they add little to furthering bird conservation by themselves, especially in communicating what is important for local landowners and land managers to understand who control at least in part the fate of many vulnerable species. Obviously, species requiring conservation attention have been understood for many years to include Neotropical migrant (including species breeding in Nearctic, Neotropical, and Austral zones of the Western Hemisphere), temperate migrant, and resident (both temperate and tropical) landbirds and waterbirds (e.g., Terborgh 1989).

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The Migratory Birds of Texas

ZOOGEOGRAPHIC REGIONS OF THE WORLD (not including Antarctica)



Pantropical = Southern latitudes excluding Australia and Antarctica;
tropical regions of Neotropical + Ethiopian + Oriental

Holarctic = Northern latitudes; Nearctic + Palearctic

Shaded Areas are regions of overlap

I. NEARCTIC-NEOTROPICAL MIGRANTS

1. Breeding: Temperate; Wintering: Middle America

a. Landbirds

Band-tailed Pigeon
 Flammulated Owl
 Lesser Nighthawk
 Whip-poor-will
 Ruby-throated Hummingbird
 Black-chinned Hummingbird
 Calliope Hummingbird
 Broad-tailed Hummingbird
 Rufous Hummingbird
 (Allen's Hummingbird)
 Yellow-bellied Flycatcher
 Willow Flycatcher
 Least Flycatcher
 Hammond's Flycatcher
 Dusky Flycatcher
 Cordilleran Flycatcher
 Ash-throated Flycatcher
 Cassin's Kingbird
 Western Kingbird
 Scissor-tailed Flycatcher
 Violet-green Swallow
 Northern Rough-winged Swallow
 Cave Swallow
 House Wren
 Wood Thrush
 Bell's Vireo
 Black-capped Vireo *
 Blue-headed Vireo
 Cassin's Vireo
 Plumbeous Vireo
 Warbling Vireo
 Blue-winged Warbler

Orange-crowned Warbler
 Nashville Warbler
 Virginia's Warbler
 Colima Warbler
 Lucy's Warbler
 Chestnut-sided Warbler
 Black-throated Gray Warbler
 Townsend's Warbler
 Hermit Warbler
 Golden-cheeked Warbler *
 Kentucky Warbler
 MacGillivray's Warbler
 Wilson's Warbler
 (Red-faced Warbler)
 Yellow-breasted Chat
 Western Tanager
 Black-headed Grosbeak
 Blue Grosbeak
 Lazuli Bunting
 "Texas" Painted Bunting
 Chipping Sparrow
 Lincoln's Sparrow
 Hooded Oriole
 Bullock's Oriole
 Scott's Oriole

b. Waterbirds

Anhinga
 White-faced Ibis
 Wood Stork
 Blue-winged Teal
 Cinnamon Teal
 Common Moorhen

2. Breeding: Temperate; Wintering: Middle America and West Indies

a. Landbirds

Cave Swallow
 Blue-gray Gnatcatcher
 Gray Catbird
 White-eyed Vireo
 Northern Parula
 Magnolia Warbler
 Black-throated Green Warbler
 Yellow-throated Warbler

Palm Warbler
 Worm-eating Warbler
 Swainson's Warbler
 Ovenbird
 Hooded Warbler
 Indigo Bunting
 "Western" Grasshopper Sparrow

SECTION 7

2. Breeding: Temperate; Wintering: Middle America and West Indies *(continued)*

b. Waterbirds

Least Bittern
Green Heron

White Ibis
Forster's Tern

3. Breeding Landbirds: Temperate; Wintering: Middle America and South America

Broad-winged Hawk
Olive-sided Flycatcher
Acadian Flycatcher
Great Crested Flycatcher
Barn Swallow
Swainson's Thrush
Philadelphia Vireo
Golden-winged Warbler

Tennessee Warbler
Yellow Warbler
Bay-breasted Warbler
Mourning Warbler
Summer Tanager
Rose-breasted Grosbeak
Dickcissel
Orchard Oriole

4. Breeding: Temperate and/or Tropical; Wintering: South Florida and/or West Indies

(Short-tailed Hawk)
(Mangrove Cuckoo)
(Gray Kingbird)
Cape May Warbler

Black-throated Blue Warbler
Prairie Warbler
"Eastern" Painted Bunting
(Shiny Cowbird)

5. Breeding: Temperate and/or Tropical; Wintering: South America

a. Landbirds

Swallow-tailed Kite
Mississippi Kite
Swainson's Hawk
Black-billed Cuckoo
Yellow-billed Cuckoo
Common Nighthawk
Chimney Swift
Western Wood-Pewee
Eastern Wood-Pewee
Alder Flycatcher
(Sulphur-bellied Flycatcher)
Eastern Kingbird
Purple Martin
Bank Swallow

Cliff Swallow
Veery
Gray-cheeked Thrush
Red-eyed Vireo
(Yellow-green Vireo)
(Black-whiskered Vireo)
Blackburnian Warbler
Blackpoll Warbler
Cerulean Warbler
(Connecticut Warbler)
Canada Warbler
Scarlet Tanager
Bobolink

5. Breeding: Temperate and/or Tropical; Wintering: South America

b. Waterbirds

American Golden-Plover
Solitary Sandpiper
Upland Sandpiper
Eskimo Curlew *
Hudsonian Godwit
Red Knot
White-rumped Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Stilt Sandpiper
Buff-breasted Sandpiper

Wilson's Phalarope
Red-necked Phalarope
(Red Phalarope)
Pomarine Jaeger
Parasitic Jaeger
(Long-tailed Jaeger)
Franklin's Gull
Sabine's Gull
(Arctic Tern)
"Interior" Least Tern *
Black Tern

6. Breeding: Temperate; Wintering: Middle and South America and West Indies

a. Landbirds

Osprey
Merlin
"Arctic" Peregrine Falcon *
Chuck-will's-widow
Yellow-throated Vireo
Black-and-white Warbler
American Redstart
Prothonotary Warbler
Northern Waterthrush
Louisiana Waterthrush
Common Yellowthroat
Baltimore Oriole

Roseate Spoonbill
Wood Stork
Purple Gallinule
Black-bellied Plover
Wilson's Plover
Semipalmated Plover
Black-necked Stilt
Greater Yellowlegs
Lesser Yellowlegs
Spotted Sandpiper
Whimbrel
Ruddy Turnstone
Sanderling
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
Short-billed Dowitcher
Laughing Gull
Gull-billed Tern
Caspian Tern
Royal Tern
Sandwich Tern
Common Tern
Black Skimmer

b. Waterbirds

Brown Pelican *
Great Egret
Snowy Egret
Little Blue Heron
Tricolored Heron
Reddish Egret
Cattle Egret
Black-crowned Night-Heron
Yellow-crowned Night-Heron

SECTION 7

7. Breeding Landbirds: Southwest U.S. and Mexico; Wintering: further south into Middle America

(Common Black-Hawk)	(White-eared Hummingbird)
Gray Hawk	(Berylline Hummingbird)
Zone-tailed Hawk	Buff-bellied Hummingbird
Aplomado Falcon *	(Violet-crowned Hummingbird)
Red-billed Pigeon	Blue-throated Hummingbird
White-winged Dove	Magnificent Hummingbird
Groove-billed Ani	Lucifer Hummingbird
Elf Owl	(Elegant Trogon)
Whip-poor-will	Northern Beardless-Tyrannulet
(Broad-billed Hummingbird)	

II. INTRA-NEOTROPICAL MIGRANTS

(most movements within tropical zones, but occasionally disperses northward into the southern U.S.)

a. Landbirds

(Ruddy Ground-Dove)
(Tamaulipas Crow)
(Clay-colored Robin)
(Rufous-backed Robin)
(Rufous-capped Warbler)
(Flame-colored Tanager)

b. Waterbirds

(Blue-footed Booby)
Magnificent Frigatebird
("Great White" Heron)
Fulvous Whistling-Duck
Black-bellied Whistling-Duck
(Masked Duck)
(Northern Jacana)

III. NEARCTIC-TEMPERATE MIGRANTS

1. Breeding: Temperate; Wintering: southern North Temperate and northern Neotropics (major shifts between breeding and non-breeding distributions)

a. Landbirds

Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Long-eared Owl
Short-eared Owl
Belted Kingfisher
Yellow-bellied Sapsucker
Red-naped Sapsucker
Williamson's Sapsucker
Eastern Phoebe
Say's Phoebe
Tree Swallow
Brown Creeper
Sedge Wren
Marsh Wren

Golden-crowned Kinglet
Ruby-crowned Kinglet
Townsend's Solitaire
Hermit Thrush
American Pipit
Cedar Waxwing
Yellow-rumped Warbler
Vesper Sparrow
Savannah Sparrow
Swamp Sparrow
White-crowned Sparrow
Western Meadowlark
Brewer's Blackbird
Cassin's Finch
Pine Siskin
(Evening Grosbeak)

1. Breeding: Temperate; Wintering: southern North Temperate and northern Neotropics (major shifts between breeding and non-breeding distributions) (continued)

b. Waterbirds

Pied-billed Grebe	Bufflehead
Eared Grebe	Ruddy Duck
Western Grebe	Black Rail
Clark's Grebe	Virginia Rail
American White Pelican	Sora
American Bittern	Snowy Plover
Great Blue Heron	Piping Plover *
Green-winged Teal	American Avocet
Northern Pintail	Willet
Northern Shoveler	Marbled Godwit (Surfbird)
Gadwall	Long-billed Dowitcher
American Wigeon	Common Snipe
Canvasback	Ring-billed Gull (California Gull)
Redhead	Herring Gull
Ring-necked Duck	
Lesser Scaup	

2. Breeding: Temperate; Wintering: southern North Temperate and northern Neotropics (minor shift between breeding and non-breeding distributions)

a. Landbirds

Turkey Vulture	American Robin
(Northern Goshawk)	Northern Mockingbird
Red-tailed Hawk	Loggerhead Shrike
"Northern" American Kestrel	Pine Warbler
Mourning Dove	Spotted Towhee
Burrowing Owl	Red-winged Blackbird
(Northern Saw-whet Owl)	Eastern Meadowlark
White-throated Swift	Brown-headed Cowbird
"Red-shafted" Northern Flicker	House Finch
Black Phoebe	Red Crossbill (all types)
Horned Lark	Lesser Goldfinch
Chihuahuan Raven	
Rock Wren	b. Waterbirds
Bewick's Wren	Mallard
Eastern Bluebird	American Coot
Western Bluebird	Killdeer

SECTION 7

3. Breeding and wintering: Temperate (can include northern Mexico; major shifts between breeding and non-breeding distributions)

a. Landbirds

Bald Eagle
"Harlan's" Red-tailed Hawk
Rough-legged Hawk
Golden Eagle
(Lewis' Woodpecker)
(Red-breasted Sapsucker)
Red-breasted Nuthatch
Winter Wren
(Varied Thrush)
(Bohemian Waxwing)
(Northern Shrike)
American Tree Sparrow
Henslow's Sparrow
Le Conte's Sparrow
Nelson's Sharp-tailed Sparrow
Fox Sparrow
Song Sparrow
White-throated Sparrow
(Golden-crowned Sparrow)
Harris' Sparrow
Dark-eyed Junco
Lapland Longspur
Smith's Longspur
(Snow Bunting)
Rusty Blackbird
Purple Finch
(Common Redpoll)
American Goldfinch



b. Waterbirds

(Red-throated Loon)
(Pacific Loon)
Common Loon
(Yellow-billed Loon)
Horned Grebe
(Red-necked Grebe)
Northern Gannet
Double-crested Cormorant
(Tundra Swan)
(Trumpeter Swan)
Greater White-fronted Goose
Snow Goose
Ross's Goose
(Brant)
Canada Goose
(American Black Duck)
Greater Scaup
(King Eider)
(Harlequin Duck)
(Oldsquaw)
(Black Scoter)
Surf Scoter
White-winged Scoter
Common Goldeneye
(Barrow's Goldeneye)
Hooded Merganser
Common Merganser
Red-breasted Merganser
Yellow Rail
King Rail
Whooping Crane *
(Purple Sandpiper)
Dunlin
Bonaparte's Gull
(Mew Gull)
(Thayer's Gull)
(Iceland Gull)
(Western Gull)
(Glaucous Gull)
(Black-legged Kittiwake)

4. Breeding: Temperate; Wintering: Southwest U.S. and Northern Mexico (arid temperate)

a. Landbirds

Ferruginous Hawk
 Prairie Falcon
 Common Poorwill
 Anna's Hummingbird
 (Costa's Hummingbird)
 Gray Flycatcher
 Mountain Bluebird
 Sage Thrasher
 Sprague's Pipit
 Phainopepla
 Gray Vireo
 Green-tailed Towhee
 Cassin's Sparrow
 Clay-colored Sparrow
 Brewer's Sparrow

Black-chinned Sparrow
 Lark Sparrow
 Black-throated Sparrow
 Sage Sparrow
 Lark Bunting
 (Baird's Sparrow)
 McCown's Longspur
 Chestnut-collared Longspur
 Yellow-headed Blackbird
 (Lawrence's Goldfinch)

b. Waterbirds

Sandhill Crane
 Mountain Plover
 Long-billed Curlew

5. Breeding and wintering: Temperate (including northern Mexico; minor shift between breeding and non-breeding distributions)

a. Landbirds

Red-shouldered Hawk
 (Snowy Owl)
 Red-headed Woodpecker
 "Yellow-shafted" Northern Flicker
 Blue Jay
 American Crow
 Fish Crow
 Brown Thrasher
 Eastern Towhee
 Bachman's Sparrow
 Field Sparrow
 Seaside Sparrow
 Common Grackle
 (Pine Grosbeak)
 (White-winged Crossbill)

b. Waterbirds

Glossy Ibis
 Wood Duck
 American Woodcock
 (Great Black-backed Gull)



SECTION 7

**IV. NEARCTIC-PALEARCTIC/
PANTROPICAL MIGRANTS**

- 1. Breeding Waterbirds: Arctic/Alaska; Wintering: Tropical Pacific Islands**
(Wandering Tattler)
- 2. Breeding Landbirds: Arctic/Alaska; Wintering: Eastern Hemisphere and/or Alaska away from breeding sites**
(Northern Wheatear)
- 3. Breeding Waterbirds: West Indies; Non-breeding: Disperses northward**
(Black-capped Petrel) (Audubon's Shearwater)
- 4. Breeding Waterbirds: Southern Hemisphere; Non-breeding: Disperses northward**
(Greater Shearwater) (Wilson's Storm-Petrel)
(Sooty Shearwater)
- 5. Breeding Waterbirds: Eurasia (Eastern Atlantic); Non-breeding: Disperses west and east**
(Cory's Shearwater) (Little Gull)
(Manx Shearwater) (Black-headed Gull)
(Eurasian Wigeon) (Lesser Black-backed Gull)
- 6. Breeding Waterbirds: Pantropical; Non-breeding: Disperses northward**
(Audubon's Shearwater) (Roseate Tern)
(Band-rumped Storm-Petrel) (Bridled Tern)
(Red-billed Tropicbird) (Sooty Tern)
(Masked Booby) (Brown Noddy)
(Brown Booby) (Black Noddy)
(Red-footed Booby)
- 7. Breeding Waterbirds: Gulf of California; Non-breeding: Disperses northward**
(Heerman's Gull) (Elegant Tern)
(Yellow-footed Gull)

8. Resident species in both Nearctic and Neotropical Zoogeographic Regions (“resident” includes species with movements within their breeding range)

a. Landbirds

Black Vulture
 Wild Turkey
 Northern Bobwhite
 Barn Owl
 Eastern Screech-Owl
 Western Screech-Owl
 Great Horned Owl
 (Northern Pygmy-Owl)
 (Spotted Owl)
 Barred Owl
 Acorn Woodpecker
 Hairy Woodpecker
 Western Scrub-Jay
 Steller’s Jay
 Common Raven

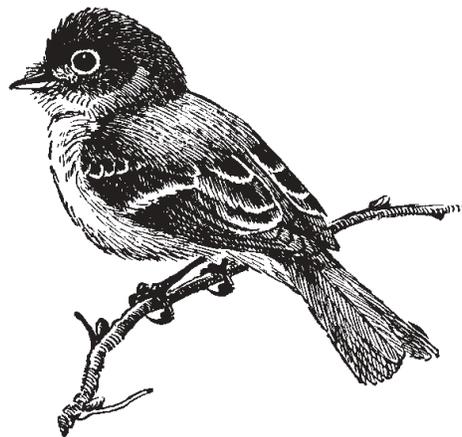
Tufted Titmouse
 Bushtit
 White-breasted Nuthatch
 Pygmy Nuthatch
 Canyon Wren
 Carolina Wren
 (American Dipper)
 Hutton’s Vireo
 Northern Cardinal
 Great-tailed Grackle

b. Waterbirds

Mottled Duck
 Clapper Rail
 American Oystercatcher

9. Resident species or subspecies found primarily within Nearctic Zoogeographic Region

“Southeastern” American Kestrel
 “Attwater’s” Greater Prairie-Chicken *
 Lesser Prairie-Chicken
 Red-bellied Woodpecker
 Downy Woodpecker
 Red-cockaded Woodpecker *
 Pileated Woodpecker
 (Pinyon Jay)
 (Clark’s Nutcracker)
 (Black-billed Magpie)
 (Black-capped Chickadee)
 Carolina Chickadee
 Mountain Chickadee
 Juniper Titmouse
 Brown-headed Nuthatch
 Boat-tailed Grackle



SECTION 7

10. Resident species within southern North Temperate and Neotropical Zoogeographic Region

a. Landbirds

Hook-billed Kite
White-tailed Kite
(Snail Kite)
“Northern” Sharp-shinned Hawk
Harris’s Hawk
Broad-winged Hawk[†]
(Short-tailed Hawk)
White-tailed Hawk
Crested Caracara
Plain Chachalaca
Montezuma Quail
Inca Dove
Common Ground-Dove
White-tipped Dove
(Mangrove Cuckoo)
Ferruginous Pygmy-Owl
Common Pauraque

Ringed Kingfisher
Green Kingfisher
Golden-fronted Woodpecker
Ladder-backed Woodpecker
Great Kiskadee
Green Jay
Brown Jay
Mexican Jay
Long-billed Thrasher
Olive Sparrow
White-collared Seedeater
(Yellow-eyed Junco)
Altamira Oriole
Audubon’s Oriole

b. Waterbirds

Least Grebe
Neotropic Cormorant

[†] not nesting in tropics

11. Resident landbird species centered in Southwest U.S. and Northern Mexico

Scaled Quail
Gambel’s Quail
Greater Roadrunner
Verdin
Cactus Wren
Black-tailed Gnatcatcher

Curve-billed Thrasher
Crissal Thrasher
Pyrrhuloxia
Canyon Towhee
Rufous-crowned Sparrow

LEGEND:

* = endangered species/subspecies

(species) = species in parentheses are considered either very rare and local in Texas or as a vagrant in Texas

TRANS-GULF MIGRANTS

Defined as those bird species that cross the Gulf of Mexico from the Yucatan Peninsula to the U. S. Gulf Coast (Texas to Florida). Trans-Gulf migration is characteristic of the following species, but does not exclude the possibility of some circum-Gulf passage either. Bird migration is not black or white. In the biological world there are rules, but there are always exceptions. This is not a complete list.

Chimney Swift	Northern Parula
Ruby-throated Hummingbird	Yellow Warbler
Belted Kingfisher	Chestnut-sided Warbler
Yellow-bellied Sapsucker	Magnolia Warbler
Black-billed Cuckoo	Cape May Warbler
Yellow-billed Cuckoo	Black-throated Blue Warbler
Common Nighthawk	Yellow-rumped Warbler
Chuck-will's-widow	Black-throated Green Warbler
Whip-poor-will	Blackburnian Warbler
Olive-sided Flycatcher	Yellow-throated Warbler
Eastern Wood-Pewee	Prairie Warbler
Eastern Phoebe	Palm Warbler
Great Crested Flycatcher	Bay-breasted Warbler
Eastern Kingbird	Blackpoll Warbler
Western Kingbird	Cerulean Warbler
Scissor-tailed Flycatcher	Black-and-white Warbler
White-eyed Vireo	American Redstart
Blue-headed Vireo	Prothonotary Warbler
Yellow-throated Vireo	Worm-eating Warbler
Warbling Vireo	Swainson's Warbler
Philadelphia Vireo	Ovenbird
Red-eyed Vireo	Northern Waterthrush
Purple Martin	Louisiana Waterthrush
Barn Swallow	Kentucky Warbler
Cliff Swallow	Common Yellowthroat
House Wren	Hooded Warbler
Marsh Wren	Yellow-breasted Chat
Veery	Summer Tanager
Gray-cheeked Thrush	Scarlet Tanager
Swainson's Thrush	Rose-breasted Grosbeak
Hermit Thrush	Blue Grosbeak
Wood Thrush	Dickcissel
Gray Catbird	Bobolink
Cedar Waxwing	Orchard Oriole
Blue-winged Warbler	Baltimore Oriole
Golden-winged Warbler	
Tennessee Warbler	
Nashville Warbler	

SECTION 8

CIRCUM-GULF MIGRANTS

Defined as those bird species that generally migrate by “hugging” the coastline from Mexico through Texas in spring and the reverse in fall (usually do not cross Gulf waters). Again, bird migration is not black or white. This list is meant as a tool, not a rule. This is not a complete list.

Turkey Vulture
Swallow-tailed Kite
Mississippi Kite
Northern Harrier
Sharp-shinned Hawk
Cooper’s Hawk
Broad-winged Hawk
Yellow-bellied Flycatcher
Least Flycatcher
Tree Swallow
Bank Swallow
Ruby-crowned Kinglet

Blue-gray Gnatcatcher
American Pipit
Orange-crowned Warbler
Mourning Warbler
Wilson’s Warbler
Canada Warbler
Chipping Sparrow
Vesper Sparrow
Savannah Sparrow
Swamp Sparrow
Indigo Bunting
Painted Bunting



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