



Bahia de Todos Santos WHSRN Site in Mexico. Photo: Laura Chamberlin

## Lesson Two: Migration Mania

### What is Migration?

Each year, shorebirds travel thousands of miles from their overwintering grounds to their breeding grounds and back again. This long-distance journey, also known as migration, is timed perfectly to align with the availability of food resources around the world. Although scientists are always learning more about migration, it is thought that birds are taking advantage of the abundance of seasonal food sources in their nesting grounds. In order to have a successful migration, shorebirds must time their flights perfectly so that their stopover sites and nesting ground arrivals coincide with food availability. Due to the strenuous nature of the journey, any disruptions along the way could have devastating effects on migrating shorebird populations.

### Migration Flyways

The western hemisphere is home to three major pathways that birds take to go from their wintering grounds to their breeding grounds. These pathways are known as flyways, or the routes that migratory birds follow during migration. Each year, thousands of birds follow these general paths resting at stopover sites along the way.

**Pacific Flyway:** Western coast of the Americas

**Atlantic Flyway:** Eastern coast of the Americas

**Midcontinental Flyway:** Inland route through the Americas

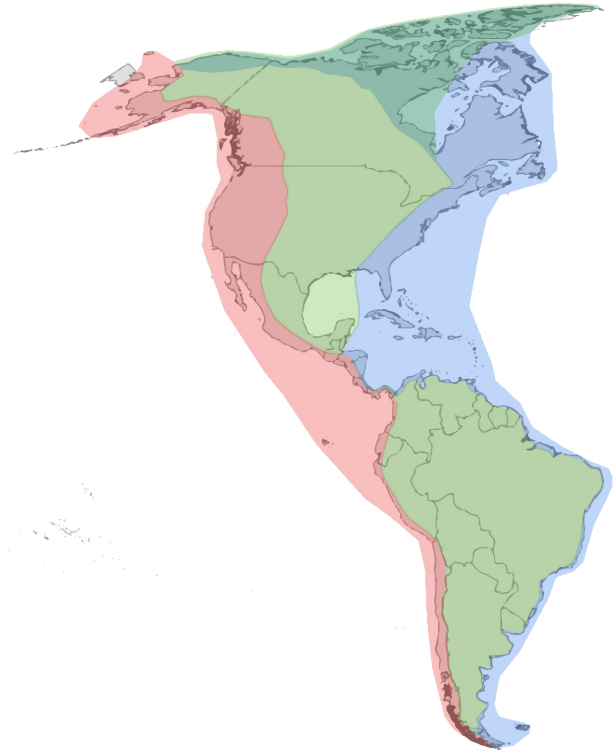
Scientists are able to study the migration pathways of birds using technology such as radio telemetry and the observation of banded or flagged birds. By monitoring birds as they are migrating, researchers are able to make efforts to protect key habitats needed during shorebird migration.

## Migration Timing

Compared to other birds, shorebird migration can take a long time. Some shorebirds will begin their migration to breeding grounds as early as February and won't return back to their overwintering grounds until October! There are many factors that influence migration timing including food availability or changes in weather patterns across the hemisphere. Early arrival to nesting grounds before it is warm enough could result in the water and ground still being frozen.

In the spring, there is a major rush for shorebirds to get to their breeding grounds, find a mate, and build a nest. An entire population of shorebirds will arrive within a few days of each other at their breeding grounds to ensure they are able to find mates. For shorebirds that breed and nest in the Arctic, there is only about a two month window that is suitable for finding mates, laying eggs and raising a family. After this two month period, the shorebirds are ready to head back to their overwintering grounds.

Fall migration is a much more leisurely journey for shorebirds, as they are not racing against the clock to find mates and set up nesting sites. Because of this, birds will head to their overwintering grounds in waves from anytime in late June through November. Typically, the first birds to leave nesting grounds are those that were not successful at raising chicks and shortly after successful breeders will follow.



## Migration Needs

Migration is a long, energy expending journey that requires a lot of resources! If birds are not able to meet their needs, they may not be able to make it to their nesting grounds in time, which could result in an unsuccessful breeding season. The migration journey looks different for birds depending on which flyway route they travel by and the distance from their wintering grounds to their nesting grounds. Although many shorebirds nest in the Arctic, some will nest in areas further south.

Migratory shorebirds can be divided into three groups based on the length of their migrations.

**Long-distance migrants:** fly more than 8000 miles one way

**Medium-distance migrants:** fly 3500-7000 miles one way

**Short-distance migrants:** fly <3000 miles one way

To prepare for these flights, shorebirds must stock up on food at their overwintering grounds and increase their fat reserves so they have energy to fly. Some birds will gain more than half their weight in stored fat in preparation! Timing is critical when it comes to migration. Alignment of flight departures and arrivals at stopover sites to when resources are most abundant is critical for shorebirds to get the energy they need to continue their long journeys. *Stopover* sites are where migrating birds rest and refuel after the first leg of migration. This is imperative so that they are able to continue onward to their nesting grounds or overwintering grounds (depending on the time of year) without using all of their energy. Birds that are unable to meet their dietary needs during migration do not survive the journey.

Shorebirds are highly dependent on wetlands and estuaries as stopover sites that will provide them with safe resting grounds and an abundance of food while they prepare for the next leg of their journeys. Due to their specific needs, large numbers of shorebirds will congregate at the same stopover sites for several days or weeks. These habitats that are used by many shorebirds at the same time during migration are known as staging areas.

One crucial staging area in Canada is Shepody Bay in the Bay of Fundy. The bay's mixture of marshes and mudflats provides the perfect habitat for birds to stop during their long journeys. From mid-July to early September, over one million Semipalmated Sandpipers will visit this site!

## Migration Threats

One of the greatest threats to migratory shorebirds is the loss of suitable habitat. By the time shorebirds make it to their stopover sites, which are typically the same locations each year, they do not have the energy to find alternative sites if the habitat no longer provides them with the protection and food they need to rest and refuel. Humans are one of the major causes of habitat loss for migrating shorebirds. Pollution, development, and agriculture expansion are just some of the anthropogenic influences that can cause devastating effects to the successfulness and survival of migrating shorebirds.

## Migration Methods

Exactly how are shorebirds able to follow the same paths, stop at the same locations and find their nesting grounds successfully each year? Researchers are learning more about shorebird migration all the time and although their methods of navigation are not fully known, there are many theories as to how shorebirds are able to travel thousands of miles each year without getting lost. One theory is that shorebirds will use stars in the night sky to keep them on track. This is supported by observations of large flocks of shorebirds seemingly losing their way and becoming confused when they fly over metropolitan areas and areas of high light pollution. Another theory is that birds are guided by an internal magnetic compass that keeps them oriented and aligned with the earth's magnetic routes while in flight. Although this may sound surprising, the use of earth's magnetic fields for navigation is something that can also be seen in sea turtles and salmon as they are navigating long distances in the water!

### Additional Resources:

#### Explore the World of Shorebirds:

<https://migration.pwnet.org/pdf/Flyways.pdf>

#### Shorebird Flyways

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

#### Pacific Flyway

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

#### Atlantic Flyway

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