Migration Workshop:

Question 1: Everyone probably knows the saying that "Birds fly south for the Winter." But, there is no saying for when the birds fly back north for the Summer. However, this is the classic example of what is known as migration. Use the resources available to you and give below a "textbook" definition of migration.

Migration is seasonal movement of animals from one region to another to take advantage of resources at destination site.

Question 2: While birds have already been mentioned and most migration activities is focused around the birds, the strategy of migration exists in many other types of animals. Please list other types of animals that also migrate below.

Monarch Butterflies, whales, salmon, eels, bats, elephants, zebra, buffalo, and other African land grazers, etc.

Question 3: We are going to use the eBird website for the next few questions. Visit the site and we are going to explore a shore bird called Red Knot on the "species explore" map. The link is the following: https://ebird.org/map (Stay focus to the Western Hemisphere – North & South America.)

Type in "Red Knot" and focus on the dark purple spots. Where are the most northern and southern location sightings for this bird found? When are the birds at these locations?

Northern: Arctic Circle and the Northern Islands of Canada. **Time:** July

Southern: Argentina and the Southern tip of South America. **Time:** January

Question 4: Look at the area between these Northern and Southern Points. Where is the population of Red Knots concentrating as it migrates between these locations? (Again, stay focus on were you see the darkest shades of purple.) What is it following when migrating north and south?

Red Knot is coastal migrant and is following the Atlantic or Pacific Coast Flyways.

What is a flyway and what area the main ones through North America?

The paths followed by migratory birds in North America and grouped into 4 general "highway"-type systems, called the Atlantic, Mississippi, Central and Pacific Flyways which follow the topographical features of the United States in a north-to-south direction.

To see the other flyways, in turn, explore the species: Greater White Fronted Goose and Mountain Plover. Which Flyways can they be found in?

Greater White Fronted Goose: Mississippi & Pacific Flyways

Mountain Plover: Central and Pacific Flyways

Please explore other species that you know of that migrate.

Question 5: Enter the year "2019" into the date option for both the beginning year and the ending year. Let the map update and again focus on the Atlantic Flyway along the United States. Select a few of the dark purple areas and zoom into and explore these areas.

How concentrated are the point locations for the various sightings?

Sightings are concentrated around peninsulas, along tips and bays of the coastal beaches and along the barrier islands of the Atlantic Coast.

What are most of these concentrated point locations?

Most of these points are concentrated on or around National Wildlife Refuges, parks or other protected areas.

Would the Red Knot population be able to support itself if some of these locations were lost?

No, the population would crash because the species would not have enough rest areas along the route to feed at or recover from the previous fight. Think of the longest driving vacation you have taken and what the trip might be like if you did not have gas stations, hotels and restaurants to use during the trip.

Question 6: During the fall migration, birders seems to focus on raptor migration. Do a search for hawk watching sites and read about the physical locations of these sites. What do most of them seem to have in common?

Most of these locations are on mountain ridges or outlooks.

Why are these locations important to the raptors?

The air currents associated with mountain ridges allow migrating hawks to conserve energy during flight, and hawks will follow these ridges as long as they point in the general direction of migration

Question 7: African game, such as elephants, zebra, buffalo and others are known for marching great distances as part of their land migrations. What factor plays the driving force since these area of the world does not have a Summer/Winter season?

These animals migrate when the challenges of highly seasonal environments, such as to escape a drought during a dry season, or to access more nutritious food or more abundant water during a wet season. These movements also bring them into conflict with the needs of the local human populations.

Question 8: Aquatic species such as the whales and salmon take advantage of seasonal warmings to return to their spawning grounds to take advantage of new resources for their breeding cycles. There is a fish in the Delaware River that is also famous for doing this. Which fish is this and when does it normally return to the river to spawn?

Atlantic Shad and it begins to return to the Delaware River by the end of March.

Question 9: Monarch Butterflies are probably the most commonly known insect that migrates. What may not be known is that the insect that starts the journey is not the same insect that ends the journey.

What is the destination for their southern migration? Mexico

How many generations does it take to complete the journey?

Monarch butterflies may take five generations to migrate to US. Monarch butterflies may take as many as five generations to make it from Mexico to southern Canada and back again.

Question 10: In Hunterdon County if a species does not migrate to meet the challenges of the winter season, there are two other strategies that it can apply. What are they and explain them?

Hibernation: The period of time in which an animal spends in a dormant state during the winter season.

Winter Adaptation: The species changes physically (such as a growing a winter coat or changing color) to deal with the challenges of the winter, uses a behavior feature to survive (such as creating a food reserve to eat from, or combination of both.