

**Virtual Monarch and Meadow Month Lesson: The Great Monarch Migration** *In this lesson, participants will learn about the journeys of the different monarch generations.* 



The "how and why" of animal migration around the globe is still one of nature's most fascinating mysteries; how do animals know when and where to embark on journeys that are sometimes thousands of miles long? The mass migration of the monarch butterflies (*Danaus plexippus plexippus*) is one of the most complex examples of this, consisting of a roughly 4,000mile round trip that is completed by three short-lived generations and one strangely long-lived generation of monarchs. The reason for this migration is the same as most other animals: shorter days and dropping temperatures are the

Hundreds of monarchs on a single branch.

signal for these insects to seek out more comfortable conditions, which they find in central and southwestern Mexico amongst the boughs of the oyamel fir tree, which is only found on the tops of a few scattered mountain ranges. Though the range of these trees is tiny (about 720 square miles), they play host to the hundreds of thousands of butterflies and provide us with a spectacular visual and auditory phenomena when on the wing; check out this incredible video by Entomologist Dr. Phil Torres to see and hear for yourself!



<u>Map of oyamel fir tree colonies</u> courtesy of Journeynorth.org

According to Pablo Jaramillo-López, a research scientist with the

National Autonomous University of Mexico, these oyamel firs provide what is called a *microclimate*, in which a temperature-blanketing effect prevents the butterflies from getting too cold or too warm and allows them to hibernate for 6-8 months. This particular "super-generation" of monarch is famous for

making the roughly 2,000-mile flight straight from their summer hatching grounds in the northern USA (such as the Duke Farms property!) and southern Canada.

There are several theories as to why this species has evolved to take on such a difficult migration, one being that a major monarch parasite called *Ophryocystis elektroscirrha* is at its peak in late summer when the monarchs leave the US, and any butterflies that are heavily infected with the parasite



Map courtesy of the Xerces Society

will die during the journey, thus weeding them out of the population and preventing the spread of the *O. elektroscirrha*. When these healthy monarchs re-animate out of hibernation, they spend the last few weeks of their lives migrating back up to Texas, where they lay their eggs. This new generation then repeats this process in the southeastern US, and the 3<sup>rd</sup> generation completes the cycle by laying their eggs (which will become the next "super-generation") in the northeastern US. <u>At Duke Farms</u> you can take a stroll through nearly 600 acres of native flowering meadows which are chock-full of host plants for a variety of native animals, including the various species of milkweed that the monarch butterflies depend on.



All the way across the US from the Duke Farms property in New Jersey, an even greater migration mystery takes place along the Pacific Coast: a population of monarchs breeds and migrates up and down the Coast, west of the Rocky Mountains, seemingly separate from the eastern majority population. Initially, it was believed that these two populations were distinct from one another, but that migration model was based on very sparse data, so further research tagging monarchs has shown that there is a small degree of interbreeding and migration blending. Why would a group of genetically identical butterflies only migrate through a relatively smaller region than their counterparts? What would make a butterfly born in New Jersey choose to fly north west to Oregon instead of retracing its steps, and vice versa? Continue to do your research to create your own hypothesis.