

Schaus Swallowtail

by Annette Thompson

Watch the flexing of a Schaus swallowtail's wings and you may see it do something no other butterfly can. It flies backward and then stops in midair before flitting forward. Without this aerial trick, you might mistake it for its larger, more common cousin, the Giant swallowtail. The Schaus's glossy chestnut brown side, punctuated with yellow and blue, spans only 4 inches. Each graceful wing lift reveals a golden underside.

This odd little flier was once the rarest North American butterfly. Nowadays, you're likely to spot them leisurely working lantana blossoms along golf course fairways in the Florida Keys. You wouldn't be seeing them at all, however, if not for a caring college professor.

At the beginning of the 1900s, Schaus swallowtails thrived in tropical hardwood hammocks from Miami south through the

Keys. As the region urbanized, the butterfly's range shrank until only a few colonies remained between Biscayne Bay and Key Largo—one of the chain's northernmost islands. By 1980 sightings were rare. A concerned U.S. Fish & Wildlife Service official asked Dr. Tom Emmel, his former University of Florida biology professor, to study the remaining Schaus in 1984.

Tom trudged through the South Florida hammocks and found fewer than 70 adults in 4 tiny colonies. "The report was taken very seriously," he says. Tom discovered that loss of habitat and an intensive chemical mosquito-control program had forced the decline.

"Pesticide use was not only impacting the swallowtail, but also 50% of all insect species there," Tom says. "That affected the rest of the ecosystem—in particular the millions of migrating birds that come

through Florida to breed in eastern North America each year. It was horrendous."

Tom returned to Gainesville and organized a statewide forum to examine the impact of pesticides. Afterward, local governments became more



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savvy¹ about intrusive mosquito control and reduced pesticide strengths. Later, in 1991, the region stopped spraying for mosquitoes during the butterfly's crucial flight season.

That same year, Tom found six small breeding colonies; by 1992 there were eight. Meanwhile, he appealed to state and federal agencies to establish a captive breeding program of the endangered butterfly at the university. "That summer we finally got permission to remove swallowtail eggs from the wild," Tom recalls. "Even after pesticide spraying stopped, it would take years to re-establish populations naturally." In June 1992 he received permission to collect 100 eggs.

Then, two months later on August 24, Hurricane Andrew swept South Florida. "It came ashore over the main colony," Tom says. Suddenly the Gainesville breeding program became the only place on Earth where the Schaus existed. Tom and his students carefully raised eggs to the pupa stage, and then began reintroducing the

butterflies to the wild in the spring of 1995. Within five years a dozen colonies were re-established.

However, Tom didn't stop there. He wanted to expand the Schaus habitat. "We started looking at maps and saw several large golf courses with dozens of acres of beautiful land. We thought, 'Why not get them to help by planting hundreds of nectar plants and wild lime and torchwood trees [the larva's only known food source]?' They responded with great enthusiasm."

Now, in between excursions into the South Florida jungle, the soft-spoken professor shares his passion for the importance of the environment with students. "I voluntarily choose to teach the largest introductory biology classes. This generation is key to preserving our resources. We must study nature in order to value it," he urges.

Dr. Emmel understands deeply the need to be mindful of the natural world. For he, too, did something most rare. He helped the Schaus stop in midair in its flight toward extinction.

¹ savvy: knowledgeable



Migration of the Monarch Butterfly

Unlike most other insects in temperate climates, monarch butterflies cannot survive a long cold winter. Instead, they spend the winter in roosting spots. Monarchs west of the Rocky Mountains travel to small groves of trees along the California coast. Those east of the Rocky Mountains fly farther south to the forests high in the mountains of Mexico. The monarch's migration is driven by seasonal changes. Day length and temperature changes influence the movement of the monarch.

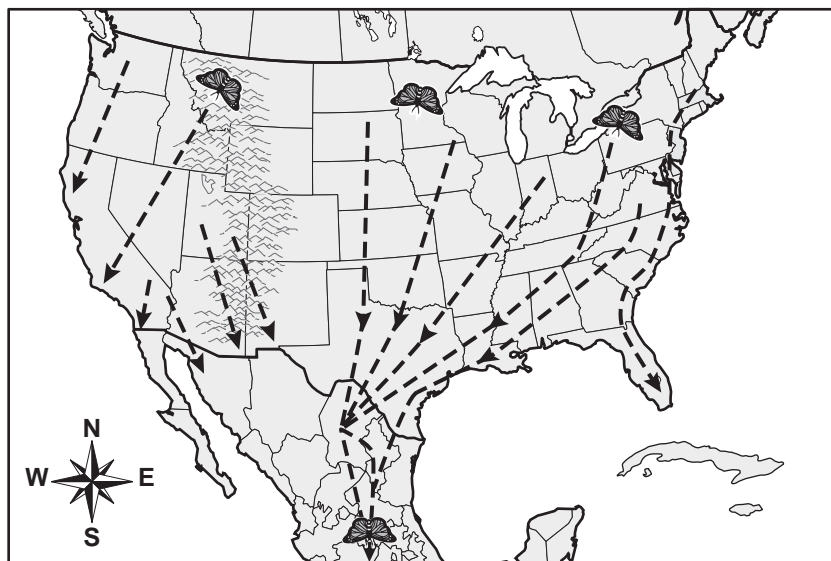
In all the world, no butterflies migrate like the monarchs of North America. They travel much farther than all other tropical butterflies, up to three thousand miles. They are the only butterflies to make such a long, two-way migration every year. Amazingly, they fly in masses to the same winter roosts, often to the exact same trees. Their migration is more the type we expect from birds or whales. However, unlike birds and whales, individuals only make the round-trip once. It is their children's grandchildren that return south the following fall.

When the late summer and early fall monarchs emerge from their pupae, or chrysalides, they are biologically and behaviorally different from those emerging in the summer. The shorter days and cooler air of late summer trigger changes. In Minnesota this occurs around the end of August. Even though these butterflies look like summer adults, they won't mate or lay eggs until the following spring. Instead, their small bodies prepare for a strenuous flight. Otherwise solitary animals, they often cluster at night while moving ever southward. If they linger too long, they won't be able to make the journey; because they are cold-blooded, they are unable to fly in cold weather.

Fat, stored in the abdomen, is a critical element of their survival for the winter. This fat not only fuels their flight of one to three thousand miles, but must last until the next spring when they begin the flight back north. As they migrate southwards, monarchs stop to feed on nectar, and they actually gain weight during the trip! Some researchers think that monarchs conserve their "fuel" in flight by gliding on air currents as they travel south. This is an area of great interest for researchers; there are many unanswered questions about how these small organisms are able to travel so far.

Another unsolved mystery is how monarchs find the overwintering sites each year. Somehow they know their way, even though the butterflies returning to Mexico or California each fall are the great-great-grandchildren of the butterflies that left the previous spring. No one knows exactly how their homing system works; it is another of the many unanswered questions in the butterfly world.

Monarch Butterfly Migration Routes



Monarchs west of the Rocky Mountains return each fall to the California coast. They cluster near bays, sheltered from the wind, or farther inland where they are protected from storms. The millions of monarchs from areas east of the Rockies, including the central and eastern Canadian provinces and the eastern and midwestern United States, migrate each year to the mountains of central Mexico.

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