

THE MYSTERIES OF

Monarch Migration

Tiny tags can tell us more about the monarch butterfly's amazing journeys

By Carla Burgess

Butterflies have intrigued people for centuries, and few species are as bewitching as the monarch. Admired throughout history for its graceful flight and vivid orange-and-black markings, it is celebrated today for an astonishing feat: A single monarch may travel as many as 3,000 miles—from Canada to Mexico—during its annual fall migration. It is the only butterfly known to migrate north and south as birds do.

Fascination with monarchs and a desire to learn more about them combine to produce a curious sight each fall: butterfly lovers catching and releasing monarchs as the butterflies make their way toward wintering grounds in the mountains of Mexico. These volunteer scientists give the monarchs a little package to take on their trip. It's a tiny round sticker, a little larger than a hole-punch, attached to the butterfly's wing. Each self-adhesive tag bears a unique identification number, an e-mail address, and a toll-free phone number for Monarch Watch, the University of Kansas-based program that has sponsored monarch tagging since 1992. Once the monarch is tagged, the handler sends the butterfly

on its way, often with a wish or a prayer for a safe journey.

Like sending a message in a bottle, there is a remote chance that the tagger might receive a response. After submitting the tag number to Monarch Watch, a person may monitor the Web site database to see if his or her butterfly is spotted somewhere down the line and how far it traveled. The odds of recovery are slim—of some 100,000 butterflies tagged each year, among tens of millions of migrating monarchs, only .03 to 3 percent of tags turn up (just over 10,000 since Monarch Watch began). But some people are lucky, like Charles Cameron of Greensboro.

Since he began tagging monarchs in 1999, 18 of his butterflies have been found and reported to Monarch Watch. Most of Cameron's monarchs made it all the way to El Rosario, Mexico, their largest winter refuge. The farthest one of his monarchs traveled was 1,693 miles.

"It was pretty neat that a monarch you had your hands on actually made it to Mexico," says Cameron, who has tagged about 1,800 monarchs. "But the downside is it didn't live to come back." As

monarchs range throughout the United States and Canada in spring and summer, they reproduce, cycling through three or four generations before the last generation migrates to Mexico. If they survive the winter, these monarchs return north in spring to mate and lay eggs, beginning the next generation. (Monarchs west of the Rocky Mountains overwinter in California).

The majority of tags are found on dead monarchs underneath trees in Mexico. Severe but atypical winter storms usually cause most deaths. In winter, monarchs do not hibernate; they are conscious and occasionally active, and may change roosts if conditions require. They roost at elevations close to 11,000 feet, choosing sites that are just above freezing—enough to stay alive, but cool enough to keep them from expending too much energy. They cling to fir trees in such incredible numbers that the branches often sag under their weight.

Monarch tagging by volunteers was the main way scientists confirmed, only in the past 30 years, that monarchs migrate to Mexico. (The practice of tagging monarchs dates to the 1930s).

Fall migration peaks in September and October in North Carolina, but stragglers continue through November.



Tagging has strengthened researchers' belief that fall migration is triggered by shortening day length. "We have learned that the timing and pace of migration is consistent with the hypothesis that the butterflies are responding to, or in some way are guided by, celestial changes in the fall sky," says Monarch Watch director Chip Taylor. Perhaps one day, volunteers will help unravel one of the most profound monarch mysteries: How do individuals in the last generation, who have never been to the wintering grounds in Mexico, find their way?

Besides providing essential data, tagging has fulfilled another of

Monarch Watch's objectives: promoting science education, particularly in primary and secondary schools, and enlightening the public about monarch conservation. Last year, 100,000 people in the United States and Canada, mostly schoolchildren, tagged more than 76,000 monarchs. Here in North Carolina, the N.C. Museum of Natural Sciences has distributed tagging kits to more than 130 schools throughout the state and trained teachers on how to use them properly.

Carla Burgess is a Carolina Country contributing writer and our gardening columnist. She can be reached at ncgardenshare@mindspring.com

How Do I Tag a Butterfly and Where Can I Get Tags?

Tagging kits from Monarch Watch start at \$15. To order supplies, visit <http://shop.monarchwatch.org>, or call toll-free 800-780-9986.

- Tagging a butterfly is less difficult than it sounds, and it's fun. If you handle a butterfly with reasonable care, you won't harm it. The tag doesn't interfere with vigor or flight—it accounts for only about 2 percent of a butterfly's weight. It's easiest to net monarchs while they feed on flowers. Remove the butterfly from the net by gripping the leading edge of the wings between your thumb and forefinger. Use your free hand to apply the tag to the largest ovalish "cell" on the underside of either hind wing, then release the butterfly. Tagging kits contain thorough instructions. A reminder: Don't use pesticides in your butterfly garden, and don't wear insect repellent while tagging butterflies.

- An easy way to collect butterflies for tagging is to raise the caterpillars. You'll first need "host" plants to invite monarchs to lay eggs in your garden. Monarch caterpillars feed only on plants in the milkweed family. Commercial nurseries sell many types of milkweed, including the popular orange-flowered butterfly weed. Or you can start seeds indoors, then set out plants. Once you find caterpillars on your plants, bring them inside and feed them fresh milkweed leaves. Caterpillars will eventually enter a pupal stage or chrysalis, from which the adult butterfly will later emerge. For more information about raising monarchs, go to

www.monarchwatch.org



Mike Dunn

Opposite page: Each self-adhesive tag bears a unique identification number, an e-mail address, and a toll-free phone number for Monarch Watch. The tag accounts for only 2 percent of the butterfly's weight.

Directly above: Female monarch butterflies lay eggs on milkweed plant leaves. Larvae emerge and grow into caterpillars. Caterpillars go into a pupal stage and form a chrysalis that later produces a butterfly.