

## Transcontinental Travelers

by Ann Swengel

The count column in the winter 2008 issue of *American Butterflies* summarized fascinating research on the “spatial synchrony” of Monarchs. This confirmed what butterflies already have a feel for: butterflies have remarkably similar patterns of up’s and down’s in numbers on a regionwide scale. In fact, Dr. Koenig’s analysis showed this similarity for sites up to 250-1000 miles apart. In this column I’m presenting additional research that adds another chapter to this story.

The graph on page 41 presents the numbers from Dr. Robert Vandenbosch’s Table 1 in a 2007 article in the *Journal of the Lepidopterists’ Society*, entitled “What do Monarch population time series tell us about eastern and western population mixing?” He looked at three different sources of information on Monarch abundance. The first is an estimate of the land surface area occupied by Monarch overwintering colonies in Mexico, for winter 1995-2004. More feasible than attempting to count individual butterflies, these results are expressed as hectares (1 hectare is 2.47 acres) occupied. These surveys occurred in late December, with a mortality estimate in January. Since he took into account winter storm mortality, he attributes these estimates to January of the stated year.

The second is from the NABA 4th of July Butterfly Counts. He summed the Monarchs per party-hour on five California counts held each year during 1994-2004 and regularly reporting this species (Cosumnes River, Dardanelles, Mt. Diablo, San Joaquin, Willow Slough). (Party-hours equal the sum of hours by each group, or party, counting butterflies.)

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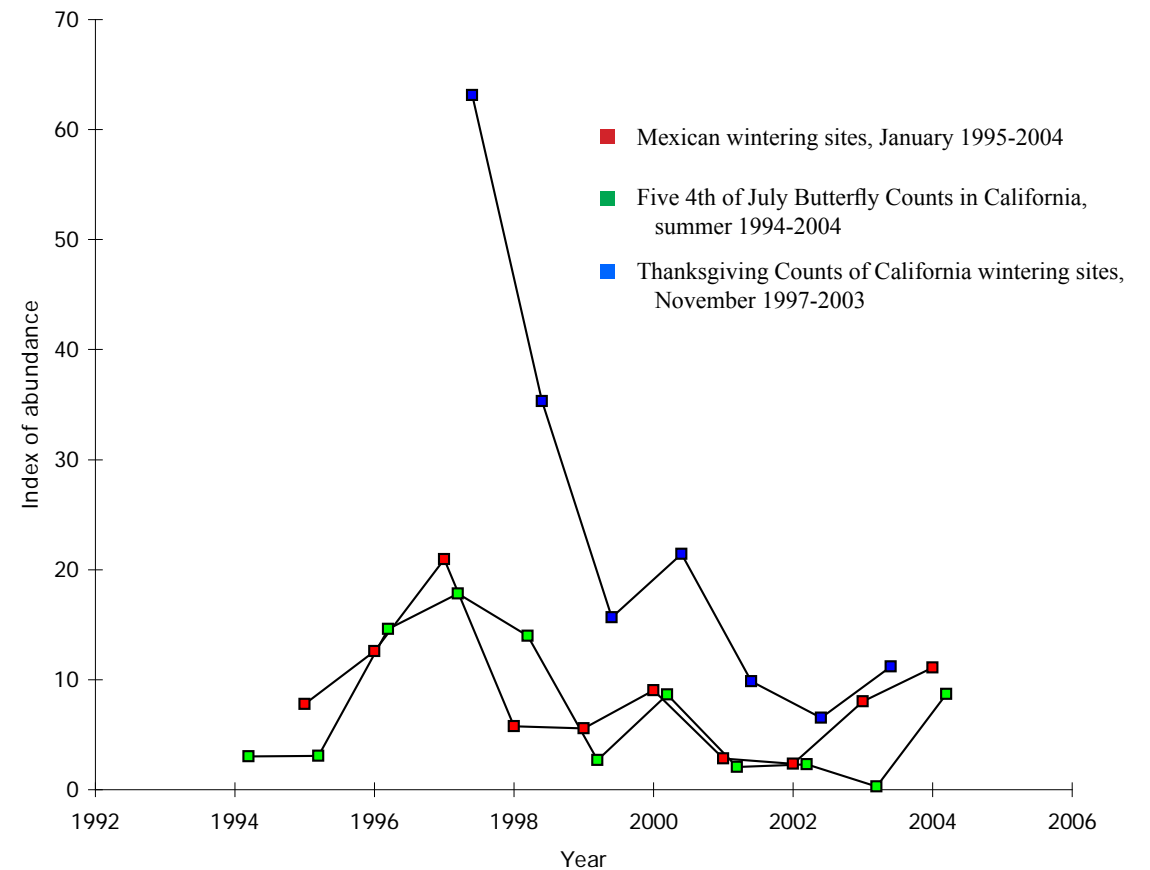
The third is The Monarch Program’s Thanksgiving Count of overwintering Monarch populations in California, for November 1997-2003. This consists of the sum of Monarch individuals observed at all surveyed sites -- about 100 in 15 California counties. I divided these sums by 10,000 to get them to fit on the graph.


The NABA 4th of July counts (from California in summer) positively correlated with the Thanksgiving Counts (from California in the following fall). This isn’t so surprising, based on Dr. Koenig’s results. But I still find it remarkable, as the generation overwintering is subsequent to the one counted in the 4th of July counts. As we butterflies know, in each generation, butterfly populations can show dramatic fluctuations in abundance in either direction.

But much more amazing was the positive correlation of the Mexican overwintering counts with the NABA 4th of July counts done the following summer. Until now, most people have believed that there is little “mixing” between Monarch populations east and west of the Rockies or, that if there is some mixing, it occurs via some “eastern” Monarchs moving southwest to overwinter in California.

The author noted that the correlation of the size of Mexican overwintering areas with the number of Monarchs present on California NABA 4th of July Counts supports a hypothesis that spring migration northward from Mexico contributes to both western as well as eastern Monarch populations. This is exciting news that brings more complexity to our understanding of the Monarch’s transcontinental movements.

## Correlation of Monarch Population Fluctuations in California and Mexico\*



These patterns are not so easily noticed by an individual butterfly. This demonstrates the value of large scale volunteer survey programs, including the NABA Butterfly Counts, and the benefit of researchers willing both to keep asking new and surprising questions and to listen to the unexpected answers they obtain. 

\*Data from Vandenbosch, R. 2007. *Journal of the Lepidopterists’ Society* 61: 28-31. Table 1.

### TO ORDER THE COUNT REPORT

Price for the 2008 report is \$11 (NABA members) or \$16 (non-members).

Price for the 2009 report is \$7 (NABA members) or \$11 (non-members) if your order is received prior to March 1, 2010. Send your check or money order payable to NABA (in U.S. dollars) to: NABA Butterfly Count, 4 Delaware Road, Morristown, NJ 07960 USA. For more information, visit [www.naba.org](http://www.naba.org).