

BUTTERFLIES:
Drop is significant
across varieties

Continued from page 17

of biodiversity since they experience the same types of pressures from land-use changes, climate change and habitat degradation as other insect groups.”

The data from Ohio enabled population trends to be estimated for 81 butterfly species and found three times as many species were trending downward as upward – three out of every four species with a positive or negative trend grew less abundant over the course of the monitoring. Forty of the analyzed species had no significant trend up or down.

“Species with more northern distributions and fewer annual generations declined the most rapidly,” he said, adding that these species are adapted to cooler regions and may do worse in Ohio with warming temperatures.

Wepprich noted that even some invasive species associated with human-dominated landscapes are declining, which suggests the trends are rooted in widespread environmental causes.

“Analyses of insect declines are dominated by European studies about butterflies, but our study is showing that the rate of change in Ohio butterfly abundance is very similar to that found in monitoring programs in the UK, the Netherlands and Spain,” Wepprich said. “The rate of total decline and the proportion of species in decline mirror those documented in comparable monitoring programs. What’s common among all of the monitoring programs is that they are in areas with a high human impact and made possible by dedicated volunteer recorders.”

Even though the common

butterfly species aren’t yet close to extinction, declines in those species will nevertheless have an outsized, negative impact on ecosystem services provided by insects, he said.

Earlier studies involving intensive, long-term monitoring of individual butterfly species have allowed for rigorous estimates of declines in those species, Wepprich said. Over the past two decades, the migratory eastern North American monarch has declined by more than 85 percent and the western North American monarch by more than 95 percent, said Wepprich, adding that some of the rarest butterflies have also fallen off sharply.

“Monarchs and rare species were monitored because people are worried about them going extinct,” Wepprich said. “In Ohio, they monitored every species they could and found declines in species previously not on the radar for conservation.”

The rate of butterfly decline in Ohio is greater than the global rate of 35 percent over 40 years, and is closer to the estimated rate for insects in general: a 45 percent decline over 40 years.

“Our study adds another example of declines in common butterfly species thought to be well suited to human-modified habitat,” he said.

The Ohio Lepidopterists, the Ohio Department of Natural Resources, the Ohio Biological Survey, the Cleveland Museum of Natural History and the Dawes Arboretum sponsor the long-term monitoring program. Supporting this research were the U.S. Department of the Interior and North Carolina State University.

Collaborators included scientists from Michigan State University, Georgetown University, the University of Oregon and the Ohio Lepidopterists.



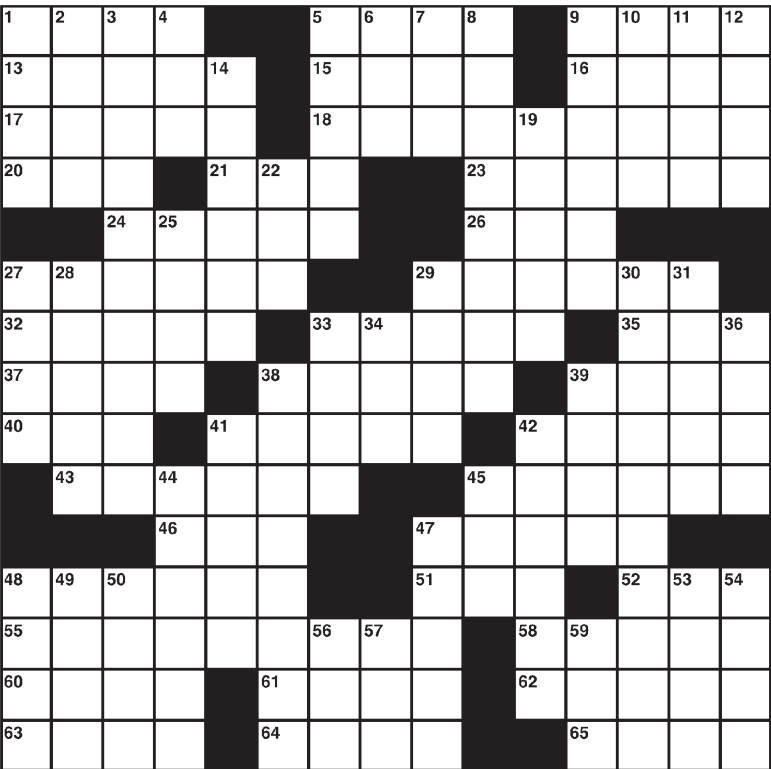
PHOTO PROVIDED

A massive study is sounding the alarm about butterflies.

The Nugget Newspaper Crossword

By Jacqueline E. Mathews, Tribune News Service

- ACROSS**
- 1 Baby bed
 - 5 Jokes
 - 9 ___ suey; Chinese restaurant dish
 - 13 Type of eclipse
 - 15 Street uprising
 - 16 Lois ___; Clark Kent’s love
 - 17 TV’s “___ World Turns”
 - 18 Sassiness
 - 20 Sorority letter
 - 21 Sewing aid
 - 23 Ma or Bob
 - 24 ___ and groans; complains
 - 26 Mammoth
 - 27 Unimportant details
 - 29 Hydras
 - 32 Passenger
 - 33 Meghan Markle’s hubby
 - 35 Holbrook or Linden
 - 37 Simile middle
 - 38 Two points
 - 39 Salad cheese
 - 40 Animal in the house
 - 41 Gifts for little girls
 - 42 Hysterical fright
 - 43 Bring around
 - 45 Royal seat
 - 46 Small number
 - 47 Provide with fresh guns
 - 48 Yell
 - 51 Koch & Marinaro
 - 52 File drawer, perhaps
 - 55 Too muffled to be heard
 - 58 “Sesame Street” character
 - 60 Low
 - 61 Cozy corner
 - 62 Dispensed
 - 63 Jekyll’s alter ego
 - 64 Spaces; openings
 - 65 Wingless insect
- DOWN**
- 1 What fans do
 - 2 Hurry
 - 3 Frighten; cow
 - 4 “___! Humbug!”
 - 5 Happy expressions
 - 6 “Ready, ___, fire!”
 - 7 DDE’s party
 - 8 Hardheaded
 - 9 Bishops & pastors
 - 10 Aaron or Azaria
 - 11 Storybook start
 - 12 One’s equal
 - 14 Fix
 - 19 “Chicago Tribune,” for one
 - 22 ___ flash; instantly
 - 25 Pizza place
 - 27 Pitfall
 - 28 Early ___; one up at dawn
 - 29 Old hands
 - 30 Outstanding
 - 31 Coat lining fabric
 - 33 Golfer’s target
 - 34 “___ in a day’s work”
 - 36 Frilly trimming
 - 38 Blanketing
 - 39 “Mash” star
 - 41 Ate



Created by Jacqueline E. Mathews 7/17/19

— Last Week’s Puzzle Solved —

M	U	M	S	T	R	I	P	S	L	O	W
B	O	N	A	C	H	I	C	O	K	I	W
O	P	E	N	R	E	C	E	P	T	I	O
G	E	M	L	U	R	E	D	R	I	N	S
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A	U	N	T	S	I	N	K	S	A	R	C
L	A	K	E	P	O	K	E	Y	U	G	H

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- 42 ___ out; got rid of gradually
- 44 One book from a set
- 45 Rose Kennedy’s youngest
- 47 Has a strong odor
- 48 “___ Noon”; Gary Cooper film
- 49 In name ___; nominally
- 50 Praise
- 53 Dossier
- 54 ___ kick out of; enjoy
- 56 Deadly reptile
- 57 ___ off; sever
- 59 Game caller

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