All eyes on monarch's Mexican wintering grounds

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Favorable weather along the monarch butterfly's migratory route and in its U.S. and Canadian summer habitat have spurred one of the imperiled insect's largest summer populations

in recent years, raising conservationists' hopes for a bumper population in the butterfly's Mexican wintering grounds.

Citizen scientists and experts report large numbers of monarchs making the fall migration from the northeastern United States and southeastern Canada to their upland, oyamel

fir (Abies religiosa) overwintering habitat in the Mexican states of Michoacán and Mexico. (A small percentage of West Coast monarchs also migrate to wintering grounds in California.)

Based on fall migration counts taken so far, experts say, the winter population in Mexico will likely occupy some five hectares (12 acres) of forest this year, up from 2.48 hectares

(6.1 acres) last year. That's a significant swing, given that each hectare accommodates 10 million to 50 million roosting monarchs. Experts say that if the forecast proves true, the 2018-19

overwintering population would be the largest in a decade.

Orley "Chip" Taylor, a professor at the University of Kansas and director of Monarch Watch, a conservation organization, says that a confluence of positive factors—perhaps the

best conditions since 2001—allowed the population to thrive this year. "You've got to have good numbers, good temperatures, good overwintering population, good timing," he says. "We got lucky."

The number of hectares covered by monarchs in the oyamel-forest wintering grounds in central Mexico serves as a bellwether for the species' wellbeing. That number peaked at around 18 hectares (44 acres) in 1997, but has

dropped dramatically in recent years. It hit a low of 0.67 hectares (1.7 acres) in 2013 due possibly to a combination of increasingly volatile weather, deforestation in Mexico and destruction in the United States of milkweed, a critical

food source for monarch caterpillars.

Six hectares key

If the 2018-19 overwintering population does cover five hectares, that would still be below the average of six hectares that scientists believe is needed for the monarch population to sustain itself over the long term, says Tierra

Curry, senior scientist at the Center for Biological Diversity's office in Portland, Oregon. Nevertheless, scientists would consider an increase to the five-hectare level a welcome improvement—one that they would attribute

to favorable weather.

Karen Oberhauser, director of the University of Wisconsin-Madison Arboretum and an expert on the monarch, says the butterflies were not hit by winter storms in Mexico and had a "great spring" in the southern United

States, where they reproduce. The young butterflies then encountered clement weather conditions as they flew north to spend the summer and reproduce in turn. For the butterflies, the weather "can't be

too hot, can't be too cold; can't be too wet, can't be too dry," says Oberhauser. This year "was a perfect storm in a good sense."

Taylor says the butterflies had a relatively strong winter population that reached the milkweed areas of south and central Texas "in good condition, in good numbers." The monarchs then stayed in Texas for

most of March and April, he says, hemmed in by colder weather to the north. This meant that they laid most of their eggs there. The warm Texas weather is beneficial for the larvae, which develop more quickly and can reproduce

sooner, he says.

Summer population estimates are an “anecdotal best guess” based on monitoring from different sources, says the Center for Biological Diversity’s Curry. Groups such as the Monarch Larva Monitoring Project at the University of Minnesota;

Journey North, a citizen-science monitoring project that ranges from Canada to Mexico; and the North American Butterfly Association monitor the monarch population at different stages of the cycle: counting eggs on milkweed

plants, recording sightings of monarchs roosting in trees or flying southward.

No guarantees

Scientists caution that a large summer population does not guarantee a large winter one. Some believe that monarch counts, which tend to take place where there are butterflies rather than where there are not, overestimate

the population. Plus, monarchs can face challenging conditions as they fly south. Wet weather in Texas has slowed the migrating butterflies, which had barely begun entering Mexico as of the last week of October,

according to online maps published by Journey North. The rain meant that there was plenty of nectar for butterflies, which feed on plants including aster, sage and sunflower, but late migration has in the past presaged a smaller

winter population, says Taylor.

Assuming the monarchs arrive in Mexico in the relatively large numbers forecast, there is no guarantee the population will remain robust next year, experts say. Extreme weather is the principal factor in population swings

from one year to the next, but loss of habitat has contributed to the downward trend in monarch numbers.

Taylor says efforts to curb deforestation in the monarch’s winter habitat and to restore milkweed in migratory areas where herbicide use has taken a toll on the plant are too marginal to account for the monarch’s recovery.

“We’re losing about a million acres of grassland a year and another million acres due to development,” he says. “We’re not restoring enough habitat to compensate for that loss.“ Given that the weather is unlikely to settle

down anytime soon, conservationists must redouble efforts to restore habitat so the monarch population can withstand climate fluctuations, experts say.

“The habitat issue puts a cap on the size of the population even under the best of conditions,” says Taylor. “This is the last big population that we are likely to see.”