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# Butterflies fall victim to rain

## Foul weather fells colorful insects

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**A** KEY INGREDIENT of springtime beauty is all but missing from the riotously colorful wildflowers and deep green grasses draped like bunting across Northern California's rain-soaked hills and valleys.

From San Francisco Bay to Santa Cruz the high Sierra, there is hardly a butterfly to be seen.

"This is unbelievably ghastly," exclaimed Arthur Shapiro, an entomologist at UC Davis. Shapiro has been surveying butterfly populations at sites spanning California's midsection for 24 years, and he has never seen so few.

The same conspiracy of weather factors that produced an abundance of flowers also clobbered the butterflies, said Shapiro, one of the state's leading authorities on butterflies.

### Diseases attack eggs

The drought last year reduced egg-laying. Heavy rains and prolonged cloudiness in the winter and spring have spread fungus and other diseases among eggs, caterpillars and pupae. Floods along creeks washed many away.

In the Sierra foothills the other day, Shapiro stood on Placer County's narrow, winding Iowa Hill Road, which climbs the steep, verdant canyon walls above the raging North Fork of the American River. He gazed down the flower-flecked slope, empty net in hand.

Here and there, to be sure, a butterfly could be seen. A *Propertius dusky* wing (named after Shapiro's favorite Roman poet), a Western brown elfin, a bedraggled Sara orange-tip. But there were not many species, and not many of each.

"We should see butterflies all over the place," he lamented. "I've seen more butterflies at Thanksgiving than now."

Overall, Shapiro said, the number of butterflies he is seeing is a mere 10 percent or less of normal.

In locales where he expects to find dozens of species cavorting through the air, settling in puddleclubs (the proper term for a gathering of butterflies), he has in recent weeks seen just five or six types — and often just a sprinkling of each.

One species, the colorful Pipevine swallowtail, a big, handsome black butterfly, is at near normal levels, probably because it lays eggs high in trees. But most others have been knocked for a loop.

### A serious science

While for many people butterflies are mere ornaments on the landscape, for Shapiro and other lepidopterists, they are serious science. Their fluctuating populations, their invasions and retreats across various territories, their shifts in coloration, and their intimate relationships with the plants they depend on provide superb examples of evolutionary biology in action.

Shapiro, who has had an interest in butterflies since he was a boy growing up on the outskirts of Philadelphia, does not drive. Many a day finds him a passenger on a Greyhound bus, most often on Interstate 80, asking the driver to let him out at some isolated stop.

The key to the professor's study is his chain of 10 sites along a "transect" of the state, all within a few hours' walk of the freeway or other highways traversed by public transit. For sites he visits less often, he catches a ride with a student or friend.

One day this week, traveling by car with a reporter and photographer, he got friend-



Shmuel Thaler/Sentinel file

Butterflies such as the monarch are in short supply across Northern California this spring, including Natural Bridges park in Santa Cruz.

ly greetings from passers-by on the small roads where he is usually seen striding on foot. "Got any butterflies today, doc?" came a voice from a pickup.

Despite the slim pickings, he was a fountain of scientific lore. He looked up at a hillside rich in serpentine, the state rock, where a red-flowering succulent called *dudleya* perched. "There should be Sonoran blues around here," he said, naming one of the seemingly vanished butterflies, whose larvae feed on the *dudleya*.

### Not a fragile insect

Along came a little rusted-looking butterfly. "Painted lady," he said. "Probably born somewhere between Fresno and San Bernardino."

He talked of common misconceptions about butterflies. "People think butterflies are fragile," he said. "Anything that can fly from the Imperial Valley to the Willamette Valley ain't fragile."

Some people, Shapiro said, are surprised to learn that butterflies are highly sexual creatures. Their adult hours are nearly consumed with sex. In high elevations, mating often occurs around rocky peaks — both sexes know that is where to get a date.

"If a male sees another male heading uphill, he accelerates to pass him. There

could be a female waiting at the top."

And that yellow stuff on a windshield? That is splattered butterfly fat. On this day's drive, there is precious little yellow on the windshield.

California's recent weather, ranging from drought to flood and back, has been more variable than in any period since the Gold Rush, said Shapiro. But over the long haul, the bad weather of late occupies a mere blip in time. California's butterflies have survived much worse.

So, Shapiro assured, nearly all the state's 250 or so species of butterfly should rebound without harm, leaving lessons for biologists like him. Sex, and a butterfly's ability to store up fat, will help a lot.

Some may take a few years to recover, but many produce several generations a year. Given the profusion of fresh vegetation for caterpillars, and nectar-dripping flowers for adults, things should be much better by mid-summer.

Shapiro stopped at a small, silvery plant protruding from a yellow rock along a back road in the Gold Country, his trained naturalist's eye alerted by holes gnawed in a leaf. A small caterpillar squirmed along. A tiny orange egg protruded from another leaf nearby.

"Good signs there," he said. "Another generation coming along."