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## **Big effort to save a little butterfly**

### **Once-common bay checkerspot given boost from devoted team of biologists, nature lovers**

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For the past few springs, people have flocked to the popular Edgewood Park and Natural Preserve in the hills above Redwood City to admire the wildflowers. But they haven't seen a single bay checkerspot butterfly, once a vibrant presence in the rolling serpentine-rock grasslands.

On Thursday, a small band of biologists and park lovers hiked into the preserve, carrying a precious cargo that they hope will return the red-and-black butterfly to its home. They gently lifted hundreds of plump, inch-long black, bristly caterpillars from a cooler and placed them on the ground among their favorite food, the plantain, a native plant.

By April, they hope, the caterpillars will transform into butterflies and begin to populate part of the 467-acre park.

"Here we're trying to make a little piece of the world better. We can't sit back and check off extinctions," said Stuart Weiss, the biologist in charge of the project.

The species is unique to the San Francisco Bay Area. In some years, the numbers of the remnant population on the Peninsula dip as low as tens of thousands. At Edgewood Park, exhaust emissions hurt the butterfly by fertilizing the invasive grasses, which choke off the plantains.

At another spot where the butterflies disappeared, Jasper Ridge in Palo Alto, Stanford University scientists found that as temperatures climbed and the frequency and severity of extremely wet and dry years increased in past decades, the Bay Area's annual browning of terrain occurred earlier in many years, killing off plantains just at the time the caterpillars needed the food. The bay checkerspot couldn't find food by moving because neighboring habitat had been covered by houses and highways.

The caterpillars that were set out Thursday at Edgewood had been hunkering down on another protected area since last spring, first feeding, then remaining dormant in cracks in the ground, waiting for the winter rains to green up the plantains. Then they could come out to eat.

"They find a sunny, slightly wind-sheltered spot, and curl up and warm in the sun," said Weiss. He describes that stage of their life as "a good California lifestyle."

That's where Weiss and his helpers found 352 of the caterpillars on Wednesday, on the ground on Coyote Ridge, between San Jose and Morgan Hill. They took them to Edgewood on Thursday.

In a few days to a week, the caterpillars will pupate, weaving a silken pad on which they metamorphose from the larval stage to adulthood. Twenty-one days after pupation -- if all goes well -- they will emerge as butterflies.

They live only 10 to 14 days, long enough to sip nectar from goldfield wildflowers, mate and lay eggs that turn into caterpillars.

But in past years, things haven't gone well in the Edgewood preserve, which borders Interstate 280. In the 1990s, with a new design of the catalytic converter, cars began spewing ammonia gas. The gas fertilized non-native Italian rye grass, which pushed out the plantain. The caterpillars lost their food supply.

Weiss, who got his Ph.D. studying under eminent entomologist Paul Ehrlich at Stanford, began to figure out the connection between the traffic, the ammonia in the emissions and the grasses in the late 1990s. He credits Ehrlich's nearly four decades of research on the bay checkerspot -- and the generations of scientists who studied at Ehrlich's laboratory -- with laying down the body of work that led to his discovery.

Weiss started the recovery efforts in 2003 with the permission of San Mateo County, which owns the preserve, and the U.S. Fish and Wildlife Service, which protects threatened species. Working on grants through the San Mateo County Parks and Recreation Foundation and a group called Friends of Edgewood, a crew mowed down the invasive grass, leaving room for the reappearance of the plantain, or *Plantago erecta*.

This year, the plantain appeared after this season's rains, and the caterpillars, at least the remaining ones on Coyote Ridge, followed.

On Wednesday, Weiss gathered the caterpillars along with Julia Bott of the foundation and Kathy Korbholz of Friends of Edgewood. Weiss kept the caterpillars in a cooler overnight, taking time to weigh each one.

The release Thursday, the first of three over several weeks, was a big day for those trying to save the butterfly. Korbholz had fought for the establishment of the park in 1993, helping to organize against the county's plans to turn it into a golf course. In the '60s and '70s, developers had eyed it for a hotel and a state college.

But the presence of the imperiled bay checkerspot helped to save it. The special serpentine grassland is a disappearing ecosystem in California.

The bay checkerspot used to thrive in four or five populations bounded by southern Santa Clara County, San Bruno Mountain and the East Bay.

"Clouds of butterflies," estimated at 100,000, flew in Edgewood Park 25 years ago, recalled Weiss, who was at Stanford then and now runs his own company, Creekside Center for Earth Observation.

The powerful El Niño of 1982-83 knocked back the population, and it hasn't recovered. By 1997, the numbers were down to 9,000 caterpillars. On nearby Jasper Ridge, they disappeared in 1997. At Edgewood, scientists saw the last caterpillar in 2002, and after that, none.

The only bay checkerspots in the world are confined to Coyote Ridge and a few nearby areas in Santa Clara County, Weiss said.

Whether the bay checkerspots will establish at Edgewood is unknown. They can probably weather the rain that is forecast in the coming weeks as long as it doesn't come when they start to fly.

Weiss is hopeful, at least for now. When he thinks of the range of the bay checkerspot, he thinks of Edgewood Park.

"It's a watershed moment after years of trying to get the butterfly back."

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## Bay checkerspot butterfly

*Euphydryas editha bayensis*

Status: Listed as threatened in 1987.

Range: Once found in four or five populations bounded by Santa Clara County, San Bruno Mountains and the East Bay. Now found only on Coyote Ridge between San Jose and Morgan Hill.

Numbers: In a good year, a few million butterflies. In a poor year, down to tens of thousands.

Life cycle: Female butterflies lay eggs on plantain plants, the food supply. The caterpillars emerge to feed, and then go dormant until the rainy season, when the plantain plants appear. In the spring, the adults emerge.

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