

**Scientists attempt to save Bay  
checkerspot butterfly**

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Writers

EDGEWOOD COUNTY PARK — Springtime is the season of wildflowers, and of the colorful butterflies that rely on them for shelter and sustenance. But for the past four years, springtime at Edgewood County Park has not included any Bay checkerspot butterflies. Hikers and other regular visitors to Edgewood were not aware that the inch-and-a-half orange, black-and-white-checked butterfly had been disappearing from the rolling fields of the 467-acre park since 1998.

Not until Stuart Weiss began trying to restore them. The Stanford-trained biologist had been tracking the insect for more than two decades, documenting its disturbing population decline: from 5,000 adult butterflies at Edgewood in 1997 to none in 2003.

On Thursday, Weiss' campaign to bring the bay checkerspot back to its native territory culminated in the symbolic release of a dozen butterflies at Edgewood. Children and photographers crowded around pots of bright yellow flowers as the butterflies sat on the plants, undulating their wings.

Weiss congratulated the crowd — composed largely of park volunteers, rangers and county officials — for taking the first "big step" toward saving the species' sole remaining habitat in San Mateo County. The Bay checkerspot is more than just another butterfly: It is a species unique to the Bay Area, and its success or decline represents the stewardship or abuse of its human neighbors.

To let them go extinct "would be like burning a library we've only begun to check books out of," Weiss said.

Millions of Bay checkerspots existed in enclaves throughout the Bay Area at the turn of the 20th century, but development encroached on their habitat. The butterfly disappeared from the Oakland hills after the area was developed. Then a population at Jasper Ridge in Palo Alto went extinct in 1997 because of inclement weather, Weiss said. A robust population of more than 100,000, however, continues to thrive at Coyote Ridge, in the foothills between San Jose and Morgan Hill in the Santa Clara Valley.

Officials took notice of the bay checkerspot's decline, listing it as a threatened species under the U.S. Endangered Species Act in 1987. In 2001, the U.S. Fish and Wildlife Service designated 23,903 acres in San Mateo and Santa Clara counties as "critical habitat" for the butterfly, protecting it from projects that would destroy the plant, called plantain, that its larvae need to survive.

Those efforts did not prevent the decline of the population at Edgewood, which Weiss attributes to the effects of ammonia pollution from cars speeding by the preserve on Interstate 280.

According to his hypothesis, a new generation of catalytic converters installed in cars in the early 1990s, credited with reducing greenhouse gases and other pollutants, ironically increased the level of ammonia emissions.

"Catalytic converters have really been a miracle for air quality," Weiss said. "They just have a tendency under certain

conditions to create ammonia. They're a little too good at what they do."

That ammonia, emitted as gas, contains nitrogen, which is essential to life and serves as a potent stimulant to plant growth. Cars traveling at speeds in excess of 65 miles an hour also emit proportionally more ammonia than those moving at slower speeds, Weiss said.

With more than 100,000 cars daily traveling on Interstate 280 directly east of the park, many at more than 65 mph on the uncongested roadway, the ammonia from their exhaust is absorbed by plants directly from the air, Weiss explained, through openings in leaves called stomata.

"Right about when the morning rush comes by, plants are opening their stomata and, boom, they get a big pulse of ammonia," Weiss said.

Karen Caesar, a spokeswoman with the California Air Resources Board, said the agency had little say on the subject at this stage, as it was only beginning to analyze it.

"We really can't comment on the validity of this," Caesar said. "But we're very interested in it." Within a month, she said, a researcher with the Air Resources Board will visit Edgewood Park to examine the issue.

A 2000 study from a UC Berkeley scientist, Robert Harley, does bolster Weiss' linkage between car exhaust and plant growth. Harley found that as catalytic converters were fine-tuned to reduce certain pollutants, they created a new problem — higher levels of ammonia emissions. Harley estimated a typical car emits about a teaspoon of ammonia every 100 miles.

At Edgewood, Weiss said ammonia from auto exhaust spurred the growth of an invasive rye grass. That grass outcompeted native plant species adapted to the area's serpentine soil, including plantain, which the butterflies' larvae need to survive.

"The adult butterflies had really sickly plants to lay their eggs on," Weiss said.

Weiss said studies from Europe that linked the transformation of heathlands into dense stands of invasive grass to auto pollution suggested to him that a similar process might be under way at Edgewood.

"When we started seeing the invasive grasses taking over at Edgewood in the early 1990s, I think we knew that something was happening with the cars on 280," Weiss said.

In 1999, Weiss began developing a plan to restore a section of serpentine grassland. Its execution was simple: to mow the rye grass on a regular basis and allow the native plants to reappear. After obtaining a permit from the Fish and Wildlife Service, volunteers from the San Mateo County Parks and Recreation Foundation and a group called Friends of Edgewood began mowing a secluded, 15-acre piece of land that eventually would become the butterfly's new habitat.

In February, Weiss and his team deposited 1,000 caterpillars on the ground in Edgewood that they had taken from Coyote Ridge. About 500 caterpillars pupated and emerged as butterflies in late March. They will live no more than 14 days; each female will lay 500 eggs that will emerge as adult butterflies next spring.

Former Edgewood ranger Ricardo Trejo became instrumental in the campaign to restore the bay checkerspot after learning

about its decline from Weiss in 2000. By that time, the butterfly was so scarce he was surprised to learn it had been there in such numbers in the first place.

"When I met Stuart and he gave me the population count, I knew something was wrong," said Trejo. "You hear about the dinosaurs who are extinct. We're seeing evolution here, too, in our lifetime."

One of the easiest ways for humans to help protect the bay checkerspot, said Weiss, would be to drive the speed limit when passing Edgewood to avoid emitting as much gaseous ammonia. He also called on the California Air Resources Board to do a comprehensive study on ammonia fumes.

If Weiss' restoration plan pans out, the 500 butterflies that hatched last month will multiply over the coming years. With sunny

weather and an abundant food source, they easily could triple their numbers each year.

Thursday's festivities included a donation of \$10,000 from Pacific Gas & Electric Co. to continue mowing the area next year.

"The days of putting land aside and hoping everything's going to turn out OK are over," Weiss said.

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