

In search of butterflies

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Dr. Stuart Weiss is trying to bring back the butterfly habitat at Edgewood Park east of Redwood City and off Interstate 280.

Twenty years ago, Edgewood Park and Nature Preserve was an undervalued, weedy bit of land abused by weekend ATV enthusiasts and neglected by its former landowners. But still it managed to support a thriving population of Bay checkerspot butterflies. The orange and black butterfly, well-studied and documented by population biologists in the '60s, numbered in the thousands.

Today, the butterfly no longer exists in the park and is listed as a threatened species under the Endangered Species Act. But a small band of people — parks personnel, volunteers, researchers and writers — working separately but continuously for years in the park may be the butterfly's best chance at survival.

"Extinction is totally irreversible. The value of other life forms range from the aesthetic to the scientific and I don't underestimate the value of aesthetics," said Dr. Stuart Weiss, a freelance ecologist and environmental biophysicist. "I'd rather come to Edgewood and see fields you can't see anywhere else. And God knows how much is out there that could be useful for medicine. I want someone to be able to come out here in 50, 100 years and see the wildflowers."

Weiss first studied the Bay checkerspot butterfly in Edgewood Park as a Stanford University undergraduate in the '80s. He returned year after year to the little park on the western edge of Redwood City and east of Interstate 280. He counted butterflies by the thousands. In the late '90s, there were approximately 9,000 Bay checkerspot caterpillars which roughly translate into 5,000 butterflies. Then in 1997, he saw the population

collapse. By 2002, his practiced eyes couldn't find a single one.

"If they're out there, I'm not aware of them. To the best of my knowledge, they're gone," Weiss said.

Ironically, the culprit responsible for the butterflies' disappearance is the catalytic converter designed to reduce air pollution. Rather than converting pollutants from cars into non-reactive, inert nitrogen, the catalytic converter produces ammonia molecules which spew from exhaust pipes and drift on the wind to adjacent areas.

Ammonia acts as a fertilizer, encouraging Italian rye grass, a non-native weed, to grow in thick mats that prevent native plant seeds from germinating. Without sheltering plants and food, particularly the California plantain favored by the caterpillars, the Bay checkerspot butterfly population eventually succumbed.

Serpentine soil

Weiss noticed a similar deterioration in butterfly habitat in a much larger area he was simultaneously studying in South San Jose. Both sites contain serpentine, a type of rock associated with seismic regions where land is pushed down and brought up relatively fast in geological terms.

Serpentine soil is poor in nutrients and abundant in heavy metals toxic to most plants. Through thousands of years, plants in serpentine soil have eked out an existence through special adaptations. Some believe these unique plant communities have evolved ways to efficiently use the scant nutrients or to shunt heavy metals, perhaps naturally warding off disease and insects. But very little research is being done in this area; all the more reason to preserve it.

Meter for meter, a landscape pocked with serpentine contains a great diversity of plants and animals. At Edgewood Park, almost 40

percent of the land is made up of serpentine rock, which isn't the healthiest environment for most plants. More than 400 species of native plants occur within the park that occupies an area that is less than one square mile.

"The parks can't close the freeway or control auto emissions," said Julia Bott, executive director of the San Mateo County Parks and Recreation Foundation. "With Stu's expertise, we're out in the field and looking at conditions. We're trying to find a reasonable fix that's practical with a seasonal staff. There're so many outside influences. We have to manage the habitat. It won't do it by itself. We have to actively protect the land."

For 2005, the foundation secured a grant from Pacific Gas and Electric whose vested interest in the land is a natural gas pipeline and towering electrical wires which run through the park. The county hired a company to precision mow a 10-acre living laboratory which Weiss will continue to monitor. Well-timed mowing reduces the seed bank of Italian rye grass and breaks up the inches thick layer of thatch and duff. So far, the results are promising. Weiss says there's been a three-fold reduction in the cover of Italian rye grass, and the native plants are returning, so much so that Weiss plans to reintroduce the butterfly into the park next Spring.

Largest butterfly habitat on Peninsula

The next step is to find funding. If successful, it will be the largest population of butterflies on the Peninsula, Bott said. But the parks, buoyed with Weiss' reports and data, will have to prove to the U.S. Fish and Wildlife Service that they have a viable plan to sustain the restored habitat before removing hundreds of butterflies from the South San Jose site.

"Frankly, where else are we going to get them," Weiss said.

Weiss is finishing up a last draft of a report to the California Energy Commission. It is the first statewide look at what Weiss and his colleagues are calling the "biggest global

change – bigger than global warming – that nobody's heard of."

It's a sleeper issue waking up in a terrible way," he said. "I can't emphasize how worried I and my colleagues are about nitrogen fertilization."

Animal extinction

At conferences, Weiss said his colleagues wryly refer to this age as the "anthropocene." Man and his behavior has become a geologic force which in the future will be described as a layer of mass animal extinction.

"Global environmental change is not going away. It is going to be real ugly for us. We're totally dependent on the planet for providing everything for us," he said. "But, there're rays of hope. We can figure out what happens and know how to remedy it."

The parks foundation hope to build an interpretive center in Edgewood Park that would aid in teaching the public about wildlife and what people in an urban setting did to preserve it.

"The butterfly story embodies that success," Bott said. "We're working together and using good science."

Box info:

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