

Skyline Serpentine Prairie

By Steve Edwards, Botanic Garden Supervisor

In the Oakland-Berkeley Hills there are just a few small hotspots of native plant diversity. Two of these are pre-eminent, not only because they support great diversity, including many beautiful wildflowers, but also because plants that are globally endangered depend on these sites for survival.

One of the two sites is Huckleberry Botanical Preserve.

The other is the Skyline Serpentine Prairie.

The great treasure that this prairie preserves is serpentine grassland. Serpentine is California's official state rock. Statewide, serpentine is critically important for the survival of many endangered species. It also supports many of the state's most spectacular wildflower displays as well as some of the most pristine remaining native grasslands. Although serpentine accounts for only 1.5% of the state's area, it supports 13% of California's endemic species—those found only in California.

This is because serpentine is very low in calcium and other essential plant nutrients, including nitrogen, and exotic annual grasses are not well adapted to this environment. Thus, exotic competition is limited on serpentine, leaving space for California native plants – often very rare ones – that have evolved serpentine tolerance over thousands to millions of years.

The Serpentine Prairie is thus able to preserve a remarkable array of native plants that cannot be found anywhere else in the Berkeley-Oakland Hills, and in some cases, anywhere else in the East Bay.

And the array of native grasses on the Prairie is astonishing. At last count there were 17 species, plus one or possibly two wild hybrids—thus 18 or 19 kinds of native grasses.

That kind of diversity in a space as small as the Serpentine Prairie has few rivals anywhere else in California. [There are a few places in the coast ranges that come close or may even equal it in numbers of grasses, but they, too, are isolated, precious and unique preserves that require protection. The John Thomas Howell Botanical Preserve on Ring Mountain in Marin County is an example.]

Owing to its position close to the bay, the Serpentine Prairie is able to support a unique mixture of coastal prairie and foothill prairie, so it is enriched from two sources.

In addition to grasses, the Serpentine Prairie supports the best displays of field wildflowers in the Oakland-Berkeley Hills. This is just a vanishingly small remnant of the floral splendor that covered the entire range, into the 1850s; and it exists only because of the protection serpentine affords from exotic annual grasses, by virtue of its low nutrient levels. [The prairie is especially noteworthy for its large patches of cream cups and yellow mariposas...]

The most famous endangered plant on the prairie is the Presidio Clarkia. This population was the focus of some fascinating genetic detective work in the early 1990s, that demonstrated that the clarkia population of the Prairie is very distinct from the only other populations of the species, in San Francisco.

In research conducted from the 1950s into the 1990s, especially at U.C. Davis, *Presidio Clarkia* played a significant part in shedding light on processes of evolution in plants, and in fact is famous in that respect.

The *Presidion Clarkia* is recognized by both the state Department of Fish and Game and the federal Fish and Wildlife Service as endangered. It is extremely endangered. [probably significantly fewer than 10,000 plants total for the entire species, a very small number for any annual, especially one growing exclusively in cities]...

Another endangered plant on the prairie is the Tiburon Buckwheat, a delicate and charming annual with red stems and pink flowers.

In addition to endangered plants, there are others that occur also on Mount Diablo, but in the Oakland-Berkeley Hills only on this small patch of serpentine. Among these are the falcate-leaved onion and Douglas' Coyote Mint.

Unfortunately the coyote mint has not made an appearance for the last ten years. Either it has already been eliminated—it grew only in one patch on a steep slope where people regularly walk off-trail—or, perhaps, its seed is waiting in the soil for a fire.

The Serpentine Prairie has long been admired for its soft, sumptuous meadows of Idaho Fescue. This is an elegant and beautiful bunchgrass that is very rare in the East Bay. These meadows were the most impressive in the East Bay. Unfortunately they have dramatically deteriorated in the last ten years, so that they now occupy no more than half the area they covered in 1990. More than any other feature in the Regional Parks, these meadows gave a sense of what the perennial grassland of the outer coast ranges looked like before it was replaced by exotic annual grasses.

A serious threat to the prairie is invasion by exotic grasses, facilitated by soil disturbance and increased nutrient input. This is linked to another serious threat, the planting and proliferation of trees, most of them exotic to the East Bay. The trees shade out native grasses and wildflowers. They enrich the soil with their litter, which is deadly for serpentine natives. And they concentrate fog drip, thus dramatically increasing yearly precipitation. These effects conspire to favor exotic annual grasses.

The Skyline Serpentine Prairie was, before the 1960s, twice as large as it is now. But at that time the west half of the prairie was turned into housing, and whatever botanical riches it preserved were lost forever. The remnant that remains is an exceedingly precious part of the biological heritage of California, but it has been deteriorating. Our window of opportunity for protecting it may be closing.



Stephen W. Edwards, Ph.D. has been director of the Regional Parks Botanic Garden (California native plants) since 1983. His graduate work at U. C. Berkeley (paleontology, emphasizing mammals and paleobotany, 1973-83) involved extensive training in geology, botany, and prehistory, and these fields have been passions ever since. He is especially interested in California ethnography and archaeology. But his principal work for some 30 years has been in field botany and native plant horticulture. He has a deep interest in grassland ecology and he has monitored the Skyline Serpentine Prairie since the early 1980s. He has been the author of many scientific and popular papers in botany, horticulture, paleontology, and archaeology.