

**Cars, cows, and checkerspot butterflies:  
Preserving the serpentine ecosystem in  
Santa Clara County**

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On Coyote Ridge, a thousand feet above the valley floor, dazzling carpets of California wildflowers - goldfields, yellow and white tidy-tips, red wild onions, purple linanthus and owl's clover, silvery dwarf plantain, orange poppies, dozens of species - fold over ridges and canyons studded with lichen-covered outcrops of greenish serpentine rock.



*Habitats on opposite sides of this fenceline demonstrate just how significant cattle grazing can be in native ecosystems. Cattle selectively graze the tall, nonnative grasses on the far side of the fence, allowing native plants -- and the other species that depend on them -- to thrive.*

Red, black and cream colored Bay checkerspot butterflies sip nectar from the tidy-tips and wild onions; three male butterflies chase a female laden with eggs, while others bask in the bright April sun. Tiny Bay checkerspot caterpillars eat dwarf plantain and owl's clover at my feet. A golden eagle soars upwind, above traffic jams on Highway 101, fields, orchards, and golf courses of Coyote Valley, and Silicon Valley sprawl fading northward into brownish smog.

I ascend the ridgetop, and two bachelor tule elk bolt east down a canyon, toward the dry upper reaches of Anderson Lake - beyond which Mt. Hamilton, dusted with snow from a late season storm, anchors vast expanses of oak woodlands and chaparral. The squish of a fresh cow pie interrupts my reverie, and I look across a barbed wire fence where the short flowers disappear into a tall sward of Eurasian grasses.

**Coyote Ridge, our regional biodiversity hotspot**

My boot is firmly planted at the epicenter of a local biodiversity hotspot - and an intricate scientific and conservation vortex. Thousands of acres of rocky, nutrient-poor serpentine soils on Coyote Ridge provide refuge for native flora, plant species crowded off richer soils by invasive Eurasian grasses and forbs. The Bay checkerspot butterfly, protected under the Endangered Species Act, absolutely requires several species of small annual native plants as caterpillar food and adult nectar, and is literally trapped on islands of serpentine soils. Bay checkerspot butterfly populations are more volatile than the NASDAQ, booming and busting according to yearly weather. Because the wrinkled terrain of Coyote Ridge offers innumerable microclimates that buffer populations from California's periodic droughts and El Nino deluges, this extensive habitat is the butterfly's main, and perhaps only, chance to avoid extinction.

Despite the listing of the butterfly in 1987 as a "threatened" species, by the year 2000 fewer than 100 acres of habitat out of thousands remaining were both permanently protected and well-managed. The listing of four endemic plants in the 1990s did little more for conservation. Hundreds of acres of serpentine have already been lost to subdivisions, landfill, and golf courses, with

other development proposals in the works. But saving habitat from big yellow Caterpillar tractors is only part of the battle. The other portion sits underfoot, and across the barbed wire fence line.

### **Cows...in native ecosystems?**

Amazingly, this ecosystem is an example of how cows - yes, cows - can help maintain native biodiversity. Whenever grazing cattle are removed from South Bay serpentine grasslands, the diminutive native wildflowers used for caterpillar food and adult nectar are overrun by Eurasian grasses, and butterfly populations go extinct. In our own local "environmental train wreck," the deliberate removal of cattle from disputed land in the Silver Creek Hills in the 1990's led to extinction of a robust butterfly population, regulatory standoffs, lawsuits, political arm-twisting, and hundreds of acres of habitat degradation. Serpentine grasslands in Santa Teresa County Park, protected from development, are devoid of butterflies because they are devoid of cows, like the habitat across the fence. How is it that we actually need cows to protect native ecosystems.

### **Clouds on the horizon**

The answer wafts in on northwest breezes gathering smog from the Peninsula and Silicon Valley, eventually bathing Coyote Ridge in reactive nitrogen gases that effectively serve as slow-release fertilizer. Each year, smog deposits about 10 pounds of nitrogen on each acre of grassland, alleviating the main nutrient limitation of serpentine soils. Without cows to keep them under control, annual grasses can then rapidly invade. The cattle selectively eat these nitrogen-rich annual grasses, thus removing nitrogen from the system (as beef) and redistributing nitrogen within the system. Cows eat globally and deposit

locally, as evidenced by the fence line and my messy boot.

### **Power plant provides conservation opportunity**

The advent of Calpine Corporation's Metcalf Energy Center, a 600 MW gas-fired power plant at the north end of the Coyote Valley, converted nitrogen deposition into innovative conservation policy. Calpine, the California Energy Commission, and the US Fish and Wildlife Service (USFWS) worked together to develop a mitigation strategy for NOx (nitrogen) and ammonia emissions from the plant, preserving serpentine acreage in exchange for incremental deposition. In April 2002, 116 acres of Tulare Hill and 15 acres on Coyote Ridge were transferred to the Land Trust of Santa Clara County - along with a \$1.4 million endowment for management and monitoring in perpetuity.



*Mitigation for the Calpine Energy Center at the north end of Coyote Valley (pictured here) is leading to the development of a regional Habitat Conservation Plan that could help provide broad habitat protection for Santa Clara County.*

The Calpine mitigation set a regulatory precedent and roadmap, so the next major projects that increase local NOx emissions - traffic from Highway 101 widening and Coyote Valley Research Park - were persuaded by USFWS to commit to preservation of 669 acres of habitat. Furthermore, Santa Clara County, San Jose, Valley Transportation Authority, and the Santa Clara Valley Water District are developing a regional Habitat Conservation

Plan (HCP) that could lead to preservation and management of virtually the entire remaining serpentine ecosystem, as well as habitat for the red-legged frog and other listed species.

**Environmental change requires innovative approaches to conservation**

If effectively developed and executed, the HCP will provide a template for broad-scale habitat protections for imperiled biodiversity of Santa Clara County. Committee for Green Foothills, Santa Clara Valley Audubon Society, the California Native Plant Society, and other local groups are carefully monitoring the nascent HCP process. Organizations such as the Santa Clara County Open Space Authority, Land Trust of Santa Clara County, The Nature Conservancy, and private foundations will undoubtedly play a major role in land acquisition and management, along with funding and political leadership by local, state, and federal governments.

As I wipe off my boot on a fencepost, my thoughts range beyond the snowy crest of Mt. Hamilton. Conservation in our age of global environmental flux - with unpredictable changes brought by invasive species, changing nutrient levels, land-use pressures, and climatic extremes - cannot be as simple as fencing off land and letting it go. The serpentine ecosystem at Coyote Ridge is a microcosm of such changes, and creating innovative and effective solutions for its conservation and management will be a never-ending challenge.

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