Above: Site 6 consistently has the largest population of Santa Cruz tarplant in Wildcat Canyon Regional Park.
Inset: The flower heads are a composite of yellow ray flowers surrounding disk flowers with red to dark purple anthers.

SPECIES SPOTLIGHT: *by Michele Hammond*[1] *Photos courtesy of Seleney Sanchez*

Santa Cruz Tarplant (*Holocarpha macradenia*)

Tarplants add a wonderful sense of native smell and color to the late summer and fall grassland. I have always been fascinated by the phenological changes in species composition that I see throughout the year while hiking and working in my local parks. Purple needlegrass (*Stipa pulchra*) and California oat grass (*Danthonia californica*), native perennial bunchgrasses, turn shades of brown and gold with the non-native annual grasses as the coastal prairie dries out. Native summer annuals like the Santa Cruz tarplant (*Holocarpha macradenia)*, add bright yellow sunflowers with glorious sticky, resinous scents to the late summer grassland. This tarplant species was historically found in coastal prairie grassland on terraces along California's coast from Marin to Monterey Counties. As the coast developed and changed, the last refuges of the Santa Cruz tarplant have been found in the hills around its nominal city, Santa Cruz. Introduced populations of this rare tarplant are found in the East San Francisco Bay Hills and Wildcat Canyon Regional Park. The Santa Cruz tarplant was listed as California state endangered in 1979 and federally threatened in 2000.

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Identification

In Wildcat Canyon, an East Bay Regional Park in the hills above the city of Richmond, July is the best month for hikers to find a dense cluster of blooming Santa Cruz tarplant. Other mid-summer wildflowers, growing with the Wildcat population, are the native hayfield tarplant (*Hemizonia congesta* var. *luzulifolia*) and a non-native German chamomile (*Matricaria chamomilla*); two annual sunflowers that have white petals that differ from the yellow blooms of the Santa Cruz tarplant.

Tarplants are in the sunflower plant family, *Asteraceae*, the largest vascular plant family in California. An older name for this family is *Compositae* because the typical sunflower inflorescence is a composite head of two kinds of flowers; however, from a distance, the head appears to be a single flower. The ray flower's corolla is a single strap-like petal. The other kind of flower is called the disk flower, which lacks large petals in the corolla. Disk flowers occur in the center of the classic sunflower with ray flowers surrounding the disk. Another trait of California's tarplants is its smelly and sticky glands that grow throughout the vegetative parts of the plant. The

continued next page

Santa Cruz Tarplant *continued*

shape of the glands and where they grow on the phyllaries, leaves, or stem is used to determine the species of tarplant.

Santa Cruz tarplants are classic sunflowers with flower heads containing yellow ray flowers surrounding disk flowers with red to dark purple anthers. The glands appear as resin-filled pits at the tips of leaves and peduncle bracts (growths below the flower head). On fantastic and healthy specimens, this tarplant has distinctive tight clusters of flower heads at the end of multiple stems.

Introductions

In the early 1980s, the Santa Cruz tarplant was introduced several times and in different parks within the East Bay Regional Park District and adjacent East Bay Municipal Utility District. These introductions attempted to save what was thought to be the last population of this species from certain destruction or extirpation by commercial development. A group of native plant champions, spearheaded by Neil Havlik, collected mature plants and spread them out in protected park areas. They chose similar grassland conditions to the original location that became a shopping mall. In at least two different years and more than 30 sites, the tarplant was seeded into Sobrante Ridge Regional Preserve, Tilden and Wildcat Regional Parks, and properties owned by East Bay Municipal Utility District. The introduced populations continue to grow in only three locations, all of which are in Wildcat Canyon. Only Site 6, near Mezue trail, has a consistently large population that appears to be viable for years to come. This introduction story is a reminder of the importance of preserving intact rare plant communities.

Management

Non-native annual grasses are in constant competition with the Santa Cruz tarplant for light and water resources. Cattle manage this grass biomass year-round for the park by preferring to eat grass over the sticky and smelly wildflowers. It is well known that native grasslands in California need a managed disturbance regime to remain diverse and intact (Barry *et al.* 2015, Bartolome *et al.* 2014, Beck *et al.* 2014). Prescribed burns and cattle or sheep grazing are the most common methods land managers use to remove the annual grassland biomass that grows especially dense along the coast. Livestock grazing management has been shown to be effective in maintaining the diversity of native grassland species (Bartolome *et al.* 2013, Hayes and Holl 2003). The Wildcat Canyon population of Santa Cruz tarplant is actively managed with cattle grazing from November through June. Artichoke thistle (*Cynara cardunculus*), an aggressive non-native invasive, is a historical threat to the grasslands in Wildcat but has been locally eradicated from the tarplant sites. Part of the yearly monitoring of this rare tarplant includes an assessment of invasive plants and any other new threats.

Monitoring the Santa Cruz tarplant in July 2019.

Where to find Santa Cruz tarplant

The best time to spot this tarplant is in late July or early August in Wildcat Canyon Regional Park along the bottom of Mezue Trail. There is a natural growing population also accessible to the public in the City of Santa Cruz at Arana Gulch Park.

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