

Abstract

The Santa Rosa Plain is an 81,000 acre complex of wetlands, streams, and uplands in Sonoma County, California. Urbanization and agricultural expansion has destroyed 85% of the vernal pools that historically dominated the landscape. Many remaining pools are degraded but still support several endangered species of plants and animals. This study, now three years running, utilizes citizen scientists to collect critical demographic and ecological data on three endangered vernal pool plant species with the goal of informing management and aiding species recovery. Our work will result in a long term comprehensive database on species population status and habitat conditions using standardized assessment protocols.

Objectives

1. Establish long-term surveys of demographic and ecological data on Santa Rosa Plain endangered vernal pool flora.
2. Annually assess status and threats of endangered plant communities in vernal pool ecosystems on the Santa Rosa Plain.
3. Involve local community volunteers as citizen scientists by having each 'adopt' a site or pool to visit annually.
4. Utilize a web-based data entry and retrieval system available at: www.citizen-science.org.
5. Inform species management and effect species recovery.

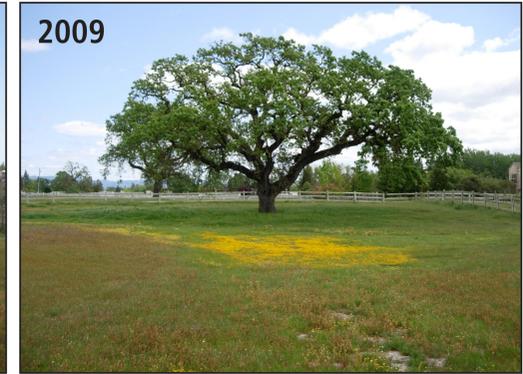
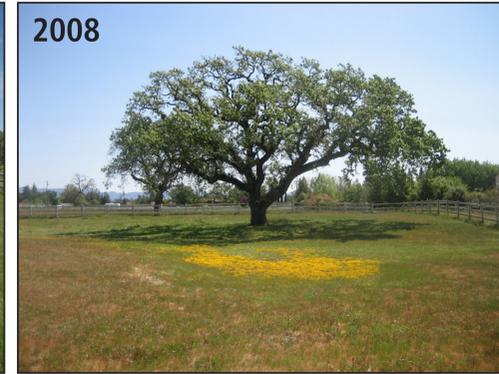
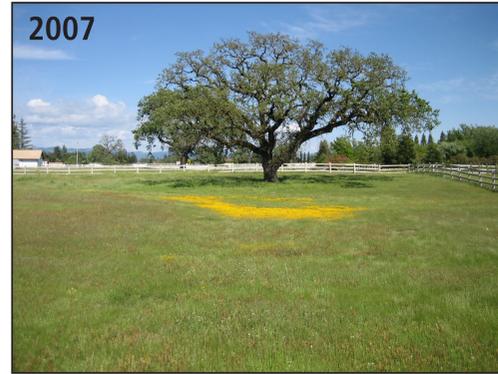
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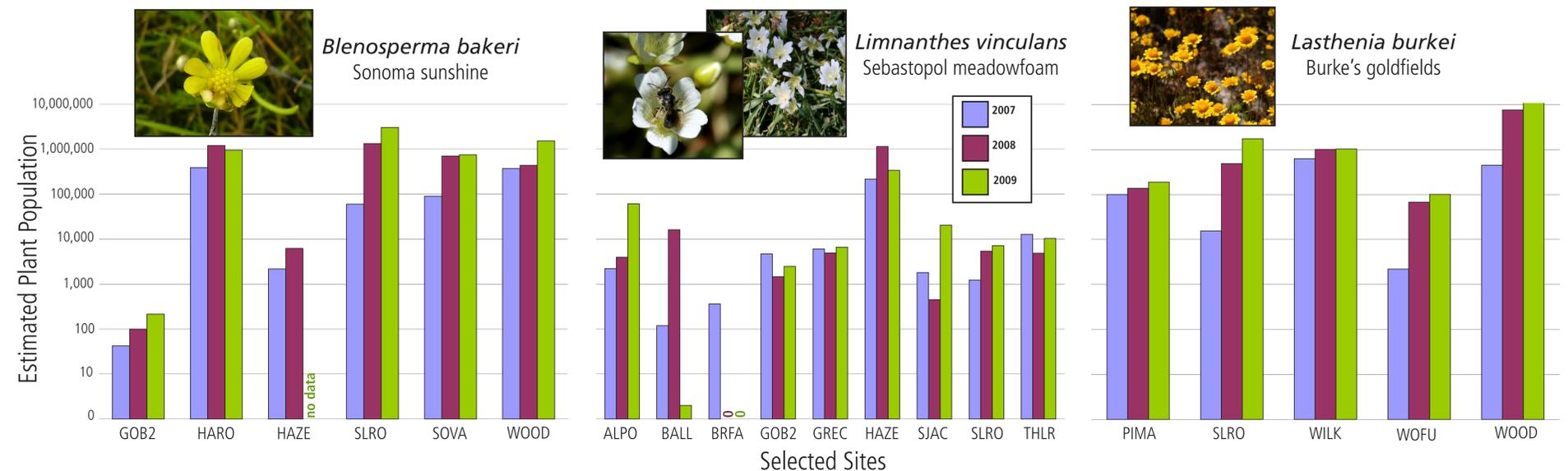


Lasthenia burkei
Burke's goldfields



Results

1. Trained and deployed 54 community residents as citizen scientists.
2. Surveyed 52 of 60 known extant occurrences of three endangered plant species.
3. Established an online database for site specific demographic and ecological data entry and retrieval to help track annual plant community status and threats.
4. Assessed potential threats to extant populations to identify and quickly implement site specific restoration. The main threats are from competing non-native species (e.g. *Mentha pulegium*, Pennyroyal mint) and human-induced disturbances (e.g. trash, tire tracks).
5. Plant abundance and density are variable from year to year and site to site.
6. Most *L. vinculans* patches surveyed are sparse with less than 10% cover whereas most *B. bakeri* surveyed contain greater than 35% cover.



Conclusions

1. Citizen scientists can play an important role in data collection and can fill a gap in funding for long term natural resource assessments.
2. Long term surveys of declining populations can establish the natural annual variability of endangered vernal pool plant populations and can so indicate trends toward loss or recovery and inform management.
3. Low density and isolated patches of individuals of *L. burkei*, *L. vinculans*, and *B. bakeri* may make it difficult for pollinators to find flowers and so reduce seed set. This may have implications for replenishment of the seed bank these plants rely on for long term persistence.
4. *Mentha pulegium*, an expanding invasive, non-native perennial weed species poses a threat to vernal pool ecosystems by direct competition with endangered plants.