

Biodiversity Restoration: Giving Sage Hill a Physical, Educational, and Digital Presence

Sustainability Action Research -Team Biodiversity

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Abstract

Sage Hill, a biodiversity hotspot home to many California native plants, has huge potential to serve as an educational and recreational spot for the UCLA community, as well as a shelter for native wildlife. However, this patch of land suffers from a lack of maintenance and awareness, making it difficult for people to find and appreciate this area. The 2017 SAR Biodiversity team developed a restoration plan for Sage Hill which involved removing invasive species and repopulating the site with native species. We weeded around *Artemisia californica* plants and transplanted seventy *Encelia californica* plants to seven three-by-three meter plots, chosen to help connectivity between native species. To promote awareness and education of the importance of Sage Hill, we created a sign that includes descriptions of native plants and information regarding local ecology and history. Finally, we cataloged the names and locations of the natives we planted through the citizen science mobile app iNaturalist. We have worked to ensure the survival of native species, turning Sage Hill into a model of what native Californian vegetation should look like.



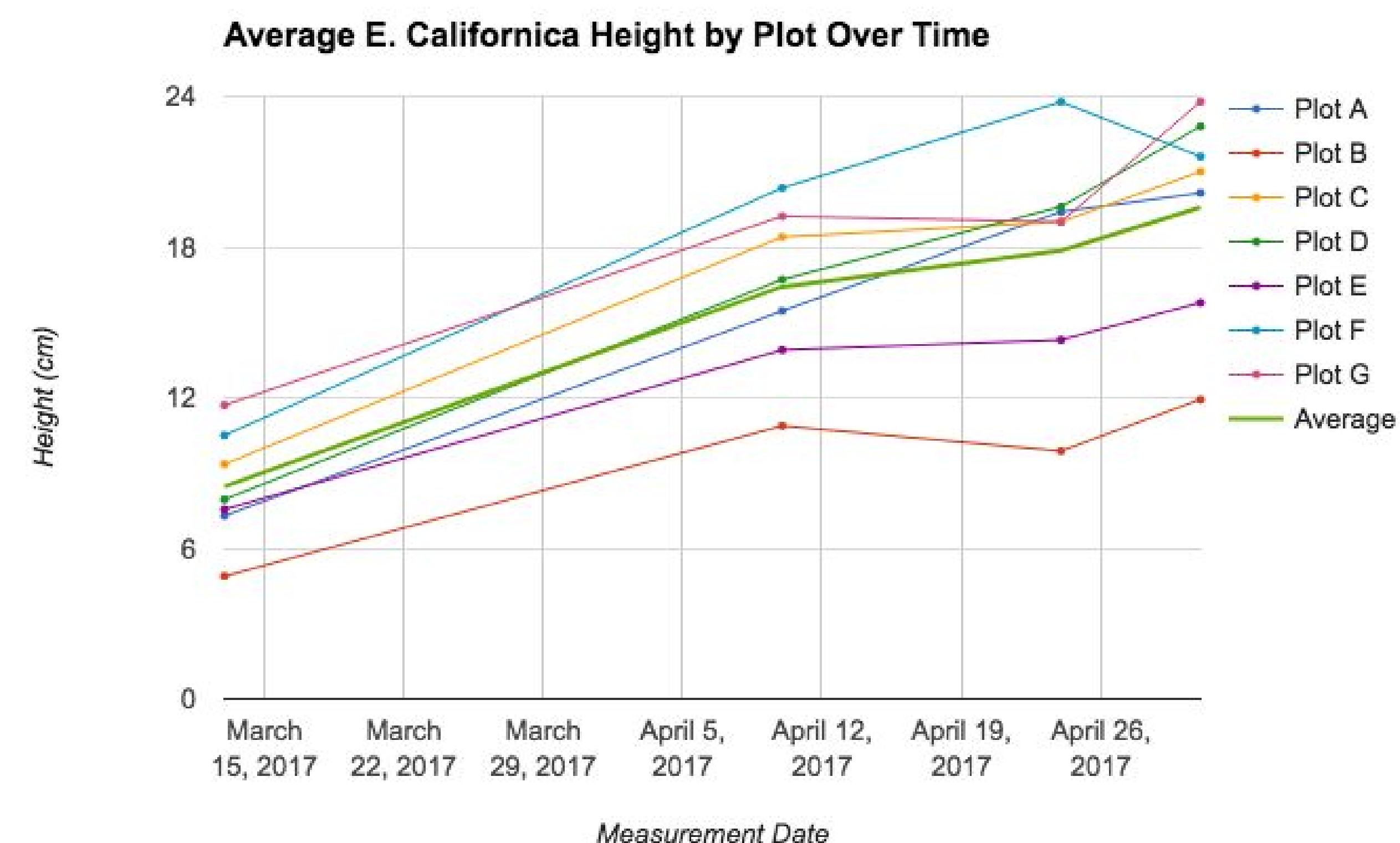
Methods

- Created seven 3-by-3 meter plots at various locations around Sage Hill
- Transplanted 10 *Encelia californica* individuals into each plot (70 total transplants)
- Monitored plots weekly over the course of six weeks
- Measured and recorded height of each individual transplant at four different timepoints



Data

Plots	Plant Height (cm)			
	March 13, 2017	April 10, 2017	April 24, 2017	May 1, 2017
Plot A	7.3	15.5	19.4	20.2
Plot B	4.9	10.9	9.9	11.9
Plot C	9.4	18.4	19	21
Plot D	8	16.7	19.6	22.8
Plot E	7.6	13.9	14.3	15.8
Plot F	10.5	20.4	23.8	21.6
Plot G	11.7	19.2	19	23.8
Plot average	8.5	16.4	17.9	19.6

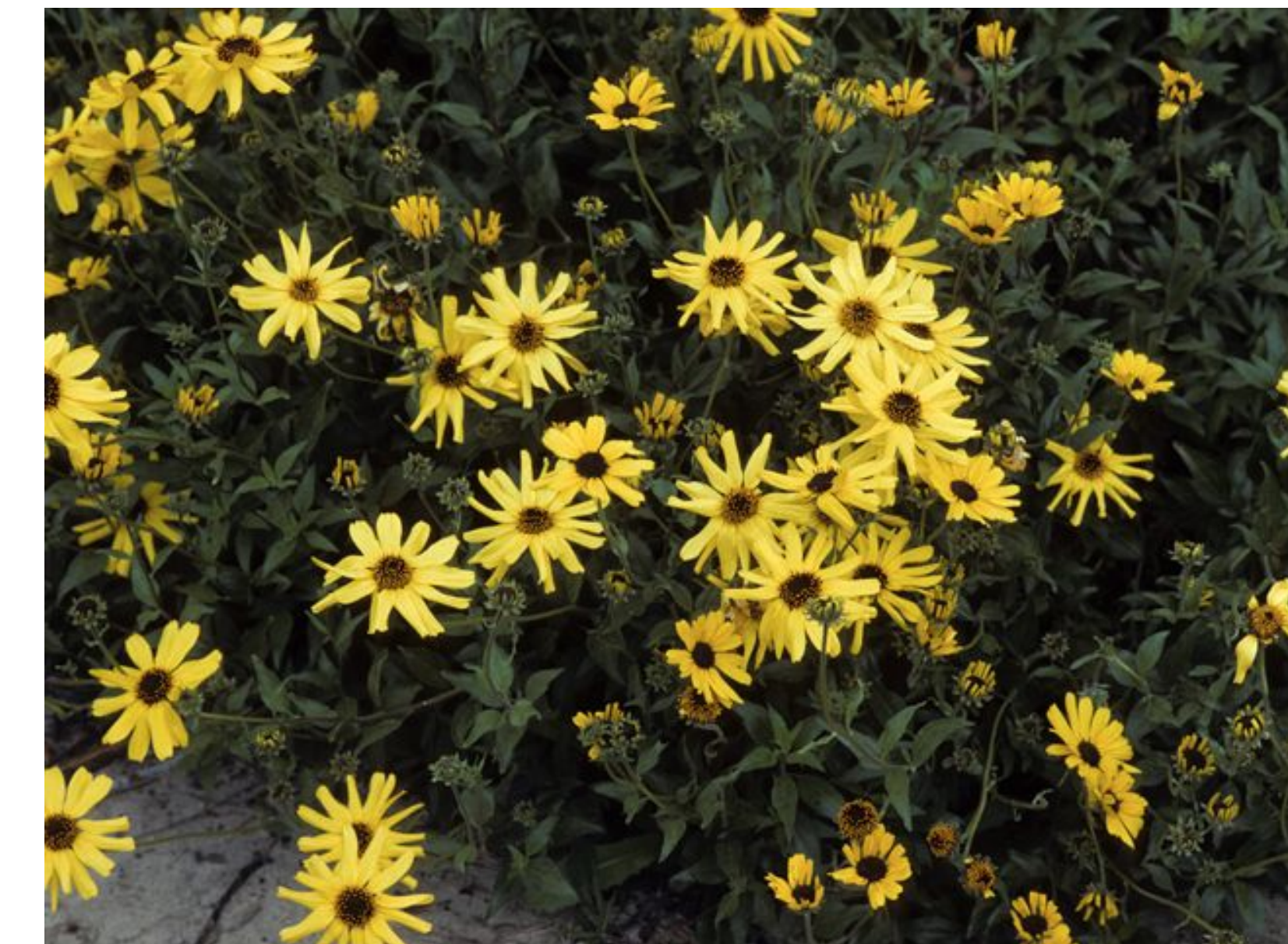


Results

- On average, all seventy plants started out at 8.5 cm and grew to an average of 19.6 cm (an average growth of 11.1 cm) over seven weeks.
- Watering the plants twice a week (10 seconds per plant) helped the plants grow more successfully
- Plot D experienced the most growth, with an average growth of 14.9 cm. Plot B, which had an average growth of 7 cm, experienced the least growth (likely due to the rocky soil and that they had the smallest plants to begin with).
- In addition to having the smallest amount of growth, Plot B also had the most deaths (three plants). Plot G had one dead plant, and plot E had one broken plant. All other plants survived, giving a 93% success rate.
- Plots B, F and G experienced dips in plant height measurement throughout the seven weeks. This may have been due to broken stems, changes in plant conditions, or human error and measurement inconsistencies.
- There seems to be no clear trend in what location of plots perform the best; the three plots with the most growth (D, A and G) were far apart from each other, and plots that were very close to each other performed very differently (plots A and B performed second-best and worst, respectively; plots D and E performed best and second-worst, respectively).
- Transplants in open areas not blocked by other plants on average grew taller compared to transplants growing in the shade of other plants
- Regarding mortality rate, most transplants died due to external factors such as people passing by and accidentally stepping on the plants

iNaturalist

Native species at Sage Hill were catalogued through an app called iNaturalist that tracks the species distributions of flora throughout the world by participating citizen scientists. Keeping a record of the species that thrive in this area is vital to the preservation of these plants in the long term. As Sage Hill develops into an official educational site, iNaturalist can provide an interactive outlet to visitors and students who may not be familiar with California natives.



Outreach

- BioBlitzes:** Biodiversity participated in two BioBlitz events, where we catalogued native species around Sage Hill using iNaturalist and informed other participants of our research



- Sign Installation**
 - Funding: The Green Initiative Fund (TGIF) will sponsor the sign
 - Developing sign content: Names and photos of native vegetation, mammals, herptofauna, and birds are highlighted on the sign.
 - Installation: The UCLA Sign Shop will install the sign.
- Earth Day Fair**
 - Goals:
 - Increase awareness of Sage Hill among UCLA students and faculty
 - Raise concern about the protection and restoration of natural areas
 - Get people to participate in our Bioblitz events

