

# Native Gardens as a Tool for Watershed and Ecosystem Health

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## Acknowledgements

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## Executive Summary

Cal State Dominguez Hills has multiple native gardens around campus varying in size, watering requirements, and the organisms they attract. This project focused primarily on maintenance and restoration activities in order to increase ecosystem function and improve watershed health in these gardens. There are a total of seven gardens at CSUDH. Two in particular are designed as bioswales. The first is Heritage Creek Nature Preserve. Heritage Creek is not irrigated and instead is sustained by the runoff it receives from the parking lot and the main campus which is 96% irrigated with reclaimed water. The second bioswale is Ocean-Friendly Garden. While this garden does receive runoff from the road, unlike Heritage Creek, it is irrigated on a weekly basis with potable water. The other five gardens: Butterfly Garden, Call Garden, Garden of Dreams, Pollinator Garden and the Urban Farm are all watered with potable water. Overall, the project was designed to work in these gardens and restore their ecological function as well as maximize bio-infiltration.

While no formal study was done to compare the ecosystems among the different gardens, weekly observations regarding animal visitations and plant health were recorded.



## Project Objectives

This project helped develop my understanding of watershed management in terms of how to responsibly manage reclaimed water run-off and support ecological functionality in a heavily urbanized environment. This experience will help me pursue a potential career with the USDA specifically in water management and conservation. I was responsible for designing the procedure to best water our campus gardens. Los Angeles is almost always in a drought and as much as people may want bright, colorful flowers in all the gardens, that is not a sustainable practice. California native plants are drought tolerant and require less water than the average plant. Unfortunately, in order to keep the gardens from becoming a fire hazard, they do require supplemental watering. As part of this project, I was able to work with the staff at Campus Housing to develop an efficient watering schedule for the Ocean-Friendly Garden. For the remaining gardens, excluding Heritage Creek, it was my responsibility to water them manually as needed.

Originally, this project was supposed to compare the functionality of the two previously mentioned bioswales, and study the impacts of using different water sources. Since reclaimed water is traditionally of poor quality, I had initially planned on taking soil samples and water samples from Ocean-Friendly and Heritage Creek. Throughout the course of this internship, the plan was revised and the project switched to encompass restoring all of the gardens, while continuing to maintain them.

## Project Approach

In order to make the CSUDH Native Gardens a more suitable habitat for wildlife, more functional living laboratories, and also more aesthetically pleasing for visitors, many procedures were carried out. Weekly visits to each garden consisted of an overall evaluation of the current condition of the garden, followed by the necessary steps to address any issues. This mostly required occasional watering, raking, pruning, plenty of weeding and trash pick up. Seasonally, new plants were planted in a few of the gardens where other plants may not have made it.

One of the main procedures throughout the gardens was removing invasive species. Invasive species can be detrimental to a native habitat and can make it an unsuitable habitat for wildlife. The major invasive species were Cheeseweed (*Malva parviflora*), Mustard (*Brassicaceae*), Wild Radish (*Raphanus raphanistrum*), and Russian Thistle (*Kali tragus*). The majority of the invasive plants we get in the gardens are annuals. It was really important to remove the plants before they set seed to inhibit them from coming back the following year. With multiple gardens, and a lot of ground to cover, I was fortunate to be able to organize “Days of Service” events. Students looking to complete community service hours would come out to the gardens, and help remove the invasive species, and maintain the native species.

I began this project with little knowledge regarding native plant species, and relied heavily on outside resources including books, online materials and especially faculty members from the Biology department. Working directly with the faculty has allowed me to develop the gardens to fit their needs for class, and turn the gardens into functional living labs. Different classes had lectures based on the environment and sustainability, and many students were able to

go out in the gardens to conduct their own research. This initiated the peer to peer education on native plants and ecosystem services.



## Project Outcomes

The outcomes of this internship are numerous. I am now much more knowledgeable on native plants, removing invasive species, providing sustainable habitat and how to improve watershed health. I was able to create relationships with staff and faculty members, who are now able to use the gardens in their own classes. I was also able to bring students who are not biology majors out into the gardens. My hope is they now have a better idea of what it means to be sustainable, and how to maintain a native habitat. Many of these students, like myself prior to this internship, were unaware that we even had native gardens on campus. Through our service days, I was able to inform fellow students about our gardens and a lot of them are now committed to restoration work and continue to help out on a weekly basis in the gardens.

Through the restoration work, I was able to see different species utilizing the newly cleared space after we removed the invasive plants taking over. Most notably in the Call Garden, I cleared a large area and planted a variety of milkweeds and ever since we have had monarch butterflies and a huge increase in the number of monarch caterpillars. We are continually in need of more milkweed, and because of this, a new garden is underway with a large portion dedicated to milkweeds.

The project gave me the opportunity to explore the habitats of different organisms. Each garden, while they are all full of California natives, have their own unique design and different plants. The large Mule Fat (*Baccharis salicifolia*) in the Garden of Dreams house numerous birds who perch and nest in the branches. The Bladderpod (*Peritoma arborea*) attracts countless insects including bees and butterflies. And the Bushtits (*Psaltriparus minimus*) in Heritage Creek



are always flying around the California Brittlebush (*Encelia californica*). Because of this project,

I can now identify local bird, plant and animal species.

Garden Name	Before Condition	After Condition	Ecosystem Metric
Heritage Creek	Poor Mostly inhabited by invasive weeds. Very few thriving native species, the majority are dry and dead. Did have high coyote activity.	Good Seasonally have large work days to remove invasive species such as mustard and cheeseweed before they set seed. A few new natives were planted and a trail was established for other people to enjoy.	Continues to have coyote activity, but much higher bird activity, along with more diverse bird visitations. Frequently see cottontails, lizards, and pollinator (mostly bees) visitations.
Ocean Friendly	Poor Full of eucalyptus saplings (invasive). Certain plants were taking over and not giving room to other plants	Good Very few eucalyptus still present. Automatic watering system established. Plants are well maintained and provide an aesthetically pleasing, sustainable garden in front of housing	Much higher insect activity, with numerous ladybugs, butterflies, beetles and more. Provides a safe walkway alongside the road for people and mammals.
Urban Farm	Poor Mostly bare ground. Only had two ferns and a small lemonade berry.	Great Around 30 different plants have been planted. The entire front of the garden is bright and welcoming to people and animals.	100% increase in pollinator visitation. The flowering native plants have brought bees and other vital pollinators to the farm.
Call Garden	Acceptable Previously established garden, on automatic watering system.	Great Many more milkweed planted to support monarchs. Overgrown grasses and shrubs were trimmed back.	Increase in monarch visitation, with caterpillars throughout the year. The addition of a bird bath has brought numerous birds to the garden. Newly planted Hummingbird sage in particular increased the hummingbird and bee visitations

Pollinator Garden	Poor Simply dirt with weeds sprouting up. A lot of bare ground	Good Planted pollinator favorite natives, and established trails for students to wander through the garden	100% increase in monarch butterfly visitations (from 0 to at least 3 different ones) Increased presence of hummingbirds
Garden of Dreams	Acceptable Already a well established garden. Very dry plants, still provided good habitat	Great More flowering native plants. A trail for people to walk through. Healthy, well watered plants to provide food and habitat	More insect activity: ladybugs, butterflies, beetles and moths. Numerous mourning doves feed near the bladder pods. Other birds nest in the lemonade berry and sages.
Butterfly Garden	Poor Very few plant species present. One large dead tree in the middle with a few shrubs around the outer edge	Great Much higher plant diversity offering food for pollinators and birds, as well as habitat for lizards and other insects	Much more insect activity; praying mantis, bees, butterflies, grasshoppers. Increase in hummingbird visitations due to establishment of specific plant species.



## Conclusions

There will be a need for continued work in the gardens. Restoration is an ongoing process as is garden maintenance. As part of the end of this project, I developed the Native Garden Intern Manual. The gardens have individual needs and requirements, and the manual should make the maintenance work and restoration efforts easier to begin and carry out.

The various native gardens around campus provide vital habitat for different organisms. They are also living laboratories that allow for students to investigate different phenomenon specifically relating to ecology. The gardens also add a unique beauty, that is specific to this area. The upkeep of these gardens is important for many reasons. They provide educational opportunities for students, a sustainable landscape that visually adds to the campus, and above all, they offer shelter to numerous organisms in a highly urbanized community.

