

# SUSTAINABLE AGRICULTURE PROGRAM

*ECOLIFE Conservation, San Diego Canyonlands, San Diego River Conservancy, and Helix Charter High School have come together to restore the riparian ecosystem of Shepherd Canyon.*

This project allowed the students at Helix Charter High School to explore the possible applications of aquaponics outside of cultivating produce for human consumption. Through this process, students were initially tasked with interpreting the interconnectivity of local habitats and their community at large.



The students tested the feasibility of using aquaponics to grow native plants for transplant into a local riparian habitat. Over the course of 4 semesters, these students would not only enrich their understanding of the natural world and what it means to live sustainably, but also leave a lasting impact on the community.

## SHEPHERD CANYON

Shepherd Canyon is a **riparian ecosystem in San Diego** where invasive plants have dominated native species. Reintroducing native species helps restore the **natural balance**. In collaboration with San Diego Canyonlands and San Diego River Conservancy, ECOLIFE's involvement in the habitat restoration project at Helix Charter High School allowed students to explore more sustainable methods of agriculture while restoring native habitats in their own community.



In this time they have increased their understanding of **watersheds, riparian habitats, pollution prevention**, and the importance of **native plants in their natural environment**; all while successfully determining the plausibility of **using aquaponics to cultivate native plants** for habitat restoration.

## ECOLIFE'S ROLE

From August '18 - June '19, ECOLIFE provided students with the following:

- **Taught caring for an outdoor aquaponics system & its benefits**
- **Semi-weekly visits** to teach lessons, oversee all methods of germination, plant measurements, water quality recordings, give feedback, answer questions, and examine the overall health of the system
- **Training on testing and tracking methods of water quality & usage**
- **Collected more than 4 months' worth of scientific data, tracked & logged by students**
- **Taught students** about aquaponics, riparian ecosystems, native plants of SD, watersheds, our impact on the environment, & the benefits of land restoration
- **Germination & documentation of 51 native plants**
- **Guided students to successfully propagate and transplant through 3 stages: Seed to system, System to pots, & Pots to Canyon**
- **Successful transplant of 63 student-grown native plants**

## STUDENT IMPACTS

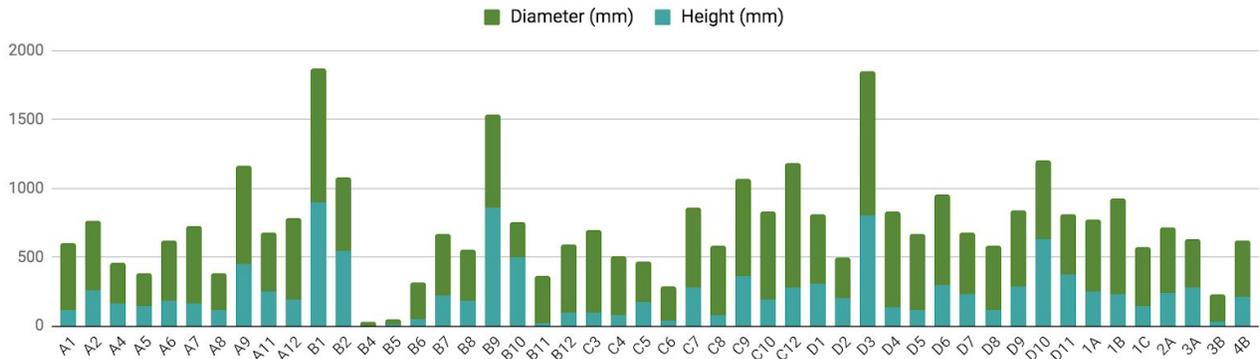
**60 students** participated in the project during the 2018/19 school year. Students spent the early weeks of school learning how to collect data on water quality in their system and recording measurements of their plants, then logged and tracked their findings after every session of data collection.



Each week, the classes **assessed the health and functionality of the system** as well as the overall health of their plants. They kept **careful record of each plant's weekly growth**, focusing on plant height & diameter. The first semester culminated with the **successful transplanting of 63 student-grown native plants** into the restoration site at Shepherd Canyon. Students involved with the project were tasked with preparing **final presentations** summarizing all that they had learned over the course of the project.

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Helix Charter High Cumulative Plant Growth



## WATER USE RESULTS

Over a one hundred day period from Oct. 03, 2018 to Jan 11, 2019, **182.7 gallons of water** needed to be replenished. After discounting water loss attributed to evaporation and testing purposes, calculations revealed that a total of **159.29 gallons were consumed by 51 plants**, making the total average water usage **3.12 gallons per plant**.

Water Replaced = 182.7 gallons  
 Evaporation Rate Over 100 Day Period = 0.232 gallons/day  
 Water Used for Testing = 0.21 gallons  
 Water consumed by 51 plants = 159.29 gallons  
**Average Water Use Per Plant = 3.12 gallons**

From designing and building their own aquaponics system in 2017 to the successful transplant 134 native plants in Shepherd Canyon, the students at Helix continue to serve as an example of the positive impact individuals, schools, organizations, and communities can have when united under a common goal. The educational programming put in place at Helix over the last two years will continue to aid students in applying classroom content to real world applications.

The aquaponics system and a continued relationship with San Diego Canyonlands will offer the opportunity to further apply that knowledge in a way that supports and strengthens the ecosystem around them.

