Conservation Design Internship - Native Landscape Design Program

Michelle Shanahan
Cal Poly Pomona - Master of Landscape Architecture

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Scott Kleinrock
Chino Basin Water Conservation District
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Acknowledgements

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This internship took place at the Chino Basin Water Conservation District’s Waterwise Community Center in Montclair, under the supervision of the Conservation Programs Manager, Scott Kleinrock.
Executive Summary

The Chino Basin Water Conservation District (CBWCD) has partnered with Valley View High School’s Career Technical Education (CTE) program to implement a Native Landscape Design course. My project was to create some helpful assets that would make this course possible and also serve as useful resources for the DIY programs at the CBWCD Waterwise Community Center.

Project Objectives

The first main goal of this project was to create a database of drought-tolerant and native plant images that had been clipped out, touched up and ready to use for a computer landscape design program (pg.4). The next goal was to create a basic, beginner how-to guide for native landscape design. This guide will be used in the Valley High School course as well as at the Waterwise Community Center for residents interested in converting their yard to a native landscape (pg.5). I also assisted in creating some other visual resources for the DIY programs through the CBWCD (pg.9).

Project Approach

My approach to achieve the first goal involved a series of steps. First, I was given a few spreadsheets of native plants that we wanted to include in the database. I consolidated the spreadsheets and updated them with the plants’ common names. Once the spreadsheet was refined to about 75 plants, I collected high-resolution images of each plant through searches and also took photos of plants out in the demonstration garden and Wilderness Park located on site. Once a majority of the images were collected I would edit, clip out, and save them as PNG files named with the botanical and common name for the plant.

The second goal involved quite a bit of research. I utilized the CBWCD Waterwise Community Center library to read up on DIY landscape design, California native plants, rainwater harvesting, and other topics that I felt would have beneficial information for the how-to guide. I also used some reputable California native plant online resources to gather information. I created an in-depth outline that I later thinned out myself and with my supervisor to make sure we hit only the key points that we wanted to include. A second intern on the project, along with our supervisor, also worked on creating a comprehensive introduction for the guide to provide context to ensure that the guide was as inclusive as possible for those who were entirely new to the idea of native landscape design.

The other various projects that I worked on during this internship mostly involved taking preexisting resources or information and putting them into an easy to use/read graphic layout.

Project Outcomes

I was able to complete the database of native plant PNGs and import them into the computer design program that will be utilized by the high school students. The how-to guide is a 15 page booklet complete with copy, graphics, images, examples, and outside resources to reference for further information. There is a printable version and a
digital version. So far, around 200 copies have been handed out to various DIY program participants and community center visitors. CBWCD also has access to the working file in case the need for updates arises in the future. It is currently in the process of being translated into Spanish.

Conclusion

During my time interning at the Chino Basin Water Conservation District I was able to create a database of Southern California native plant PNGs for Valley View High School’s CTE horticulture program to be utilized in their new native landscape design course. I also helped to create and complete a native landscape how-to guide for the students of the course, as well as interested visitors of the CBWCD’s Waterwise Community Center. Each component of this internship was extremely beneficial for my future endeavor of becoming a landscape architect. I was able to practice and refine some of my computer program skills that are necessary for landscape design, as well as dive into some very practical, technical, and crucial knowledge about the field I am entering and the positive impact it can have. I gained a greater understanding about the importance and benefits of landscaping with native plants in terms of sustainability, biodiversity, and low water use, and plan to utilize and spread this knowledge throughout my future career.
Goal 1 -
Native/Drought Tolerant Plant PNG Database
Resources
Online/Digital
- cfwc.org/
- inlandvalleygardenerplanner.org/
- www.cnps.org/
- theoedreevesnye.org/
- californianativeplants.com/
- www.twt.org
Books/Print
- "SoCal Yard Transformation - A Step-By-Step Guide to Get the Yard You Want" available at no cost at the Waterwise Community Center
- "Inland Empire Landscape Guidebook" available for download at injwwc.com/landscapeguide
- "The California Wildlife Habitat Garden" by Nancy Bauer
- "Wild Suburbia: Learning to Garden with Native Plants" by Barbara Eisenstein

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Introduction

California is a "biodiversity hotspot" with over 6,000 native plant species and subspecies and thousands of native insect species which depend on native plants to survive (and which depend on the insects, and on and on in a complex environmental web). "Native plants" are commonly defined as plants that have naturally grown in a specific area since human settlement. They are typically adapted to the soil and climate conditions that have been present for a long time. California’s unique climate and geography support a diverse range of native plant and animal species.

Due to habitat loss, ecosystem degradation, and other environmental issues, many native plant communities, and the animals that depend on them, are in trouble. At the same time, our urban landscapes (think lawns and shrubs) usually require a lot of water and frequent use of gas-powered equipment to maintain, creating environmental and resource issues.

But what if there was a better way to re-imagine and rebuild our urban landscapes?

We can do something better at all our homes, schools, businesses, and public places. In a way that is not only beautiful, but that makes an active contribution to the environment by reducing native plants, capturing and slowing rainwater, and providing habitat and food for beneficial insects, birds, and mammals. Many species of beneficial insects are "pollinators," which means that they require specific native plants that they evolved with at some point in their life cycle. Learn a few more basics and you’ll do fine. For them, the presence of native plants, and by providing them, we can also support a whole dynamic, and entertaining to watch, ecosystem in our urban landscapes.

But it’s not only about habitat. Native landscapes often rely on a mix of specific native plants that can thrive in our gardens and add an elevated look to our landscapes, with a colorful and year-round display of flowers. These plantings can thrive in this environment, usually requiring little water and no fertilizer or soil amendments.

This booklet will provide you with the basic fundamentals needed to design a California native landscape and connect you with additional resources where you can learn more about this exciting way to contribute to the environment while beautifying your home or community.

Definitions

Terms that will help you to explore your California native landscape design

Native plants:
Plants that grew in California before European contact. They evolved over a very long time with other essential lifeforms, forming the foundation of our native ecosystems. They are also most fit for California’s climate.

Invasive plants:
Non-native plant species that tend to take over natural areas and limit or prohibit native plants to grow. These plants act in such a way due to the absence of their native predators, such as pests, foraging animals, diseases or weather conditions that keep the balance among the plants able to grow and spread. These invasive species did not evolve with California’s natural communities and therefore do not provide much food or habitat for the native animals.

Ecosystem:
Community of living organisms that are linked to each other along with the non-living components of their environment. Members of the community function together as a system.

Microclimate:
The distinct climate of a small area regardless of the local region’s climate. This could be a few square meters around a water feature that are always cooler than the surrounding area, or the area of a shaded tree that is typically warmer due to the reflected heat off of the pavement, etc.

Watershed:
An area of land where rainwater and or snow melt drains into a common waterway. The areas served by the Chino Basin are a part of the Santa Ana River Watershed that drains all the way from the San Bernardino Mountains down to the ocean around Huntington Beach.

Water Harvesting:
Intentionally capturing and holding water when it rains, and allowing it to absorb into the landscape, rather than being redirected into the streets and gutters.

Hardscapes:
The hard, non-plant materials that are used in a landscape such as pathways, retaining walls, patios, rocks, etc.

Permeable Paving:
Paving that allows permeability, or the infiltration of water. This type of paving allows water to soak back into the ground rather than be immediately diverted off the site.

Site Analysis

What to look at on your site and how to use the data from your observation.

Step back and look at your site. Here are the general questions to ask yourself:

1. How large is your site?
- How much space do you have to work with?
- How much soil do you want to design around such as:
  - House: include windows and doors
  - Garages
  - Driveways
  - Walkways
  - Patios
  - Mature trees and shrubs
  - Topography
  - Telephone poles
  - Manholes
  - Any other utilities including your water meter, sewer clean-outs, irrigation valves, hose bibs, etc.

2. What is the permanent features?
Make note of these features you will want to design around such as:
- Dig a 10' soil hole in your soil (bottom does not need to be completely scraped)
- Fill it with water and let it drain completely (this may take overnight)
- Put a drainage grate across the top of the hole for measuring reference
- Fill the hole with water again
- Calculate the average drainage rate per hour

3. What will you remove in preparation for your project?
As you think about what landscaping elements you may want to get rid of, also consider ways of reusing those materials. A simple example would be removing broken concrete as permeable pavers, reusing existing pavers in a different area, and using chopped tree trunks or branches in the landscape to create habitat for small animals.

4. What kind of soil does your site have?
This doesn’t have to be scientific. You really need to know if your soil is heavy or light, and whether it drains well.
- How much space do you have to work with?
- How much soil do you want to design around such as:
  - House: include windows and doors
  - Garages
  - Driveways
  - Walkways
  - Patios
  - Mature trees and shrubs
  - Topography
  - Telephone poles
  - Manholes
  - Any other utilities including your water meter, sewer clean-outs, irrigation valves, hose bibs, etc.

5. What direction does your garden face?
- South Facing: garden is in the sun all day throughout the year
- North Facing: garden is in the sun all day throughout the year
- East Facing: garden is shaded in the morning, full sun in the afternoon
- West Facing: garden is shaded in the morning, full sun in the afternoon

6. What is the slope of your land?
- Do you have a slope?
- Do you need to do something with a slope?
- Do you need to do something with the slope?
- Do you need to do something with the slope?
- Do you need to do something with the slope?

7. Where does the water go?
This likely relates to the first question about slope, since water will flow downhill.
- Do you have a rain garden?
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Best Practices for Using Permeable Paving in California

<table>
<thead>
<tr>
<th>Permeable Paving Types</th>
<th>Best Use Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>Driveways</td>
</tr>
<tr>
<td>Crushed Rock</td>
<td>Patios</td>
</tr>
<tr>
<td>Decomposed Gravel</td>
<td>Retaining walls</td>
</tr>
<tr>
<td>Recycled Concrete</td>
<td>Pathways</td>
</tr>
</tbody>
</table>

BEST PRACTICES:
- Use permeable paving in all situations where it will not damage the soil or the underground pipes below.
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PRAINING TIPS:
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Plant Profiles

Overwhelmed with all the plant choices? Consider these low-water, native plants to help get you started on your plant search.

**Trees**
- Desert Willow
  - *Chilopsis linearis*
  - Mature size: 15-40' x 10-40'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun
- Large shrubs
  - Toyon
    - *Heteromeles arbutifolia*
    - Mature size: 12'-W
    - Exposure: Adaptations: Morning sun, Heat, Drought, All day sun, Partial sun
  - Catalina Cherry
    - *Pruus stictchii sap.
    - Mature size: 30'H x 20'W
    - Exposure: Adaptations: Morning sun, Heat, Drought, All day sun, Partial sun

**Perennials**
- California Fuchsia
  - *Eriogonum canum*
  - Mature size: 3'-4'H x 3'-4'W
  - Exposure: Adaptations: Drought, All day sun
- Desert Mallow
  - *Sphaeralcea ambiguis*
  - Mature size: 2'-5'H x 2'-3'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun
- De La Mina Verbena
  - *Verbenae californica*
  - Mature size: 2'-3'H x 2'-3'W
  - Exposure: Adaptations: All day sun

**Ornamental Grasses**
- California Fescue
  - *Fescue californica*
  - Mature size: 3'-2'H x 3'-2'W
  - Exposure: Adaptations: Partial sun
- Canyon Prince Wild Rye
  - *Leymus 'Canyon Prince*
  - Mature size: 4'-5'H x 4'-5'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun
- Deerglass
  - *Phleum variegatum*
  - Mature size: 2'-3'H x 3'-4'W
  - Exposure: Adaptations: Heat, Drought, All day sun
- Alkal Soaktan
  - *Atriplex hirsuta*
  - Mature size: 4'-5'H x 4'-5'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun

**Stems**
- Indian Mallow
  - *Abutilon palmeri*
  - Mature size: 3'-6'H x 4'-5'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun
- California Buckwheat
  - *Eriogonum fasciculatum*
  - Mature size: 3'-6'H x 4'-5'W
  - Exposure: Adaptations: Heat, Frost, Drought, Aridity, All day sun
- Poze Blue Sage
  - *Salvia stricta Blue*
  - Mature size: 3'-4'H x 3'-4'W
  - Exposure: Adaptations: Heat, Drought, All day sun

**Garden Inspiration**

Southern California gardens are on the Thalidomine Native Plant Garden Tour for more inspiration.
**Mantillo**

Asumiendo 4-6 pulgadas de profundidad

**Mantillo**

- Gratis aquí el primer y tercer sábado del mes
- $0.48-0.63 por pie cuadrado

¿Quiere un mantillo lujoso? = $1.53 por pie cuadrado and o llama un arborista.

- Gravilla de Granito
- Decompostado
- $1.02 para patios y caminos (con estabilizador)
- $0.62 para su jardín (sin estabilizador)

![Mantillo Gravilla](Image)

Si Ud. quiere recoger mantillo gratis de nosotros recuerda traer sus herramientas para llevarlo.

*chipdrop.com*

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**Irrigación**

El promedio incluye las válvulas, aspersores o red de goteo, y cables eléctricos.

- **Riego Aéreo**
  - $0.44-0.65 por pie cuadrado
- **Riego por goteo**
  - $0.61-1.18 por pie cuadrado

¿Le hace falta un controlador? Hay programas de reembolso y de instalación gratuita para nuevos controladores basados en el clima.

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**Plantas**

- **1 planta**
  - $0.65 por pie cuadrado
  - (precio promedio de una planta = $13)

Generalmente sólo recomendado por árboles frutales y plantas cuales solo son disponibles en este tamaño.

Si Ud. esta usando el reembolso se requiere 5 plantas por cada 100 pies cuadrados.

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**Por Ejemplo: Un jardín de 1,600 pies cuadrados en Ontario**

1. **Sacar el césped**
   - Mantillo y cartón = gratis
2. **Irrigación**
   - Riego por goteo: 1,600 x 135 = $1,850
   - Controlador: $120 - 80 = $40
   - Reembolso: 3
3. **Plantas**
   - 1,600 x 0.65 = $1,040
4. **Mantillo**
   - 1,600 x 0.65 = $1,000
5. **Adquiere**
   - $500
   - Rocas = $206
   - Banca = $200
6. **Total**
   - $5,000

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**1 Sacar su Zacate**

Hay 4 métodos comunes para matar su césped. Debajo tenemos los precios promedios por cada método.

- **Mantillo y cartón = ¡Gratis!**
- **Solarización = $100**
  - El costo promedio para una caja de lamina de plastico grueso y transparente.

**A Maquina**

- Rentar una maquina = $100/día
- Un contador = $50/día

**Heraquíticos**

- $24-60/botella

*su uso es controversial y esta información es solo para informarles no estamos preparado para uso.*