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Native and Drought Tolerant Plants



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Executive Summary for Native & Drought Tolerant Plants

UCLA is known for its beautiful landscaping, but this kind of landscaping can come at a significant cost, both financially and in terms of precious resources. Our goal as Team Native & Drought Tolerant Plants was to show that UCLA can introduce less water intensive plants without compromising its reputation for natural beauty. In order to make a serious statement about our commitment to a more sustainable future, we aimed our project at one of the university signs on the perimeter of campus. We chose the sign at the corner Hilgard Avenue & Wyton Drive, as it is a popular bus drop off for many students who live east of campus, including team member and shovelier extraordinaire Spencer Dunham. Not only would this location be a very public display, it would also help reduce water usage significantly from twice or more a week, to a low-flow drip system that will only be used once a month. One thing we learned early on in the project was that landscaping requires a lot more behind the scenes work than digging some holes and putting plants in the ground; we learned about the entire process, from drawing the blue print, to installing the plants. We received support from the school Architect and Landscaping Manager, but it was definitely a learning process. As a general rule, people supported our ideas, and then we implemented them. Initially it seemed that we were faced with tasks beyond our skill level, however, we faced these challenges with a positive attitude and proved to be victorious in getting our project approved. With the help of a few extremely dedicated volunteers, we removed the water intensive plants, amended the soil, planted the new drought tolerant vegetation and installed an entire new irrigation system. Sustainability on campus was possible, but it was no easy task. As conserving our natural resources is becoming increasingly important, we hope that this project inspires future efforts towards more sustainable landscape designs on campus.

Overview/Objectives/Project Goals

The goal of our project is to introduce the use of drought-tolerant plants into the design of the campus landscape. There are many biological and environmental benefits to using drought-tolerant plants in landscape designs, especially in southern California where we are currently experiencing water shortages. Using drought-tolerant plants makes good ecological and financial sense. Not only do they conserve water, they also reduce or even eliminate the need of chemical fertilizers. This reduces the amount of chemical pollutants that drains into the ocean and California's waterways. Lowered water usage and the elimination of chemical fertilizers or pesticides add up to much lower maintenance costs and help maintain a healthier environment. Our team evaluated several ways to promote the use of drought-tolerant plants and decided that replanting a site on the UCLA campus would be the best way to go. Not only will it be a visible, physical change on campus, we can also engage affiliates of the school directly by inviting them to help us replant the plot. Our team redesigned and replanted the UCLA signage on Hilgard Avenue and Wyton Drive. Our action research team collaborated with UCLA Extension Landscape Architecture Team to draw up an initial design for the plot. Upon working closely with Art Tieck, we revised the plan, decided on the final choices of plants to be used, and drew up the irrigation scheme. After the plan for the signage was finalized, we worked to obtain approval to replant the site. We then ordered the necessary materials and equipment for the replanting and gathered volunteers for the replanting.

We received much support throughout the process, which reflects the community's support for our cause. We hope that this project will raise more awareness in the community and promote the benefits of using drought-tolerant, or even native, plants in urban landscape. While we understand that it is not practical to replant all of UCLA with drought-tolerant plants, we

hope that this can serve as the pilot project for future efforts and to encourage using drought-tolerant plants in future landscaping projects.

Significance/Background/Current Policies

The use of drought-tolerant plants has significant benefits environmentally. In a state that imports the majority of its water, proper utilization of such precious resource is paramount. Stingy water users by nature, drought tolerant plants conserve water because they utilize every drop. The conservation of water is even more prevalent in the time when California is in a drought. Drought-tolerant plants are also efficient users of even the smallest amount of beneficial minerals and organic matter and their adaptability to a wide range of soils significantly reduces or even eliminates the need for chemical fertilizers. Therefore, the use of drought-tolerant plants not only reduces the watering cost, it also reduces negative impacts on the environment.

Despite the benefits of using drought-tolerant plants in urban landscape designs, the UCLA campus is currently short of such flora. While new constructions on campus incorporate the use of drought-tolerant plants in their designs (such as the South Campus Student Center and the student housing project on the hill), there are only a few areas on the UCLA campus where drought-tolerant plants can be currently found. These areas include Sage Hill, Stone Canyon Creek, and the Botanical Garden. However, none of these sites are directly incorporated on the UCLA campus where students regularly pass by on the way to class. The location of our site is located on the corner of Hilgard Avenue and Wyton Drive, the UCLA sign starting from the light post on the Wyton Drive side wrapping around the corner to the end of the stone brick wall on the Hilgard Avenue side. The decision on the location was based on perceived foot traffic and the obtaining of permission.

Initial Conditions

Prior to the installation of drought tolerant plants and drip lines, the sign at Wyton and Hilgard was covered with agapanthus growing all around the sign. The site was watered twice a week with a regular sprinkler system. The sprinkler system, especially due to California's continuing water crisis is a concern because of its efficiency. Some of the water would not reach the soil where it could be absorbed by the plant's roots and the spray would sometimes end up on the sidewalk, especially on windy days. The remaining UCLA campus is landscaped in a similar fashion; plants, grasses, shrubs and trees must be watered regularly in order to maintain their aesthetic beauty and continued growth. Some areas of the campus have drought tolerant plants and drip lines like the patio area at the Wooden Center, the landscaping at Courtside dorms, and in other areas as well.

We felt that the initial landscaping at the sign at Wyton and Hilgard could be improved to demonstrate UCLA's commitment to saving water and sustainability. The sign was capable of having a cleaner and more organized presentation. While agapanthus do bloom beautiful flowers once a year the plants had grown rampant and looked disorganized. Combining the need to save water and to uphold UCLA's landscaping beauty we proposed the agapanthus be removed and planted with drought tolerant plants and xeriscape irrigation.

Research Methodology

Initial Background and Preparation

This Action Research Project focused heavily on the "Action" part of this style of research. We were initially interested in what native plants there are on campus. A thorough search through campus revealed that there are not many native plants used in the general landscaping of the main campus. There are however, 3 regions that do have many native plants,

but these regions are “natural areas” as opposed to native plants incorporated into the landscaping.

The first region of campus that we really looked into that has many native plants was Sage Hill – located on the west side of campus along Veteran Street. The area does have many native plants and is the only (mostly!) untouched vegetative area left on campus. Ross and Sunny went on a tour with Professor Gillespie of the area where he pointed out native plants and gave a brief history. The area is an Oak Woodland featuring Coast Live Oak and various shrubs usually associated with this vegetation type. Professor Gillespie gave us a document created 10 years ago that highlights the different species types and reasons why the area should remain a part of UCLA campus. There is talk of developing the area for more housing, but as the last remaining native plant region on campus, there is lots of value for students studying native California species and a chance to get into the field – as done by Professor Gillespie's Forest Ecosystem class taught this Spring Quarter in an effort to remove invasive, non-native Species.

The next area of campus that we looked into was Stone Canyon Creek. This area is on the Northern part of Campus near the Anderson Business School. The area is currently under rehabilitation as overseen by Santa Monica Baykeepers. We contacted this organization and were able to get a plant list for the area they are rehabilitating. Although we were already determined to work on a re-landscaping project ourselves, we decided that a plant list for all native plants on campus could be an alternative if we were not able to do the re-landscaping, and could be a potentially valuable piece of information if there is going to be a native plants or drought tolerant Action Research Team next year. The area surrounds the last bit of exposed natural stream bed that used to run through campus, and features a Southern California Riparian zone ecosystem characterized by sycamores and water-loving shrubs.

The last remaining area of the UCLA campus that features a high density of native plants is the Mildred Mathias Botanical Gardens on the South Eastern edge of Campus along Hilgard Avenue. Ross and Sunny both have been volunteers at the Botanical Gardens and have a close relation with Joan Muench, the volunteer coordinator. Bonny talked with her and went to the gardens to make a compile a list of all the native plants, from the California Native Plant section of the garden. She compiled a list of over 20 species of plants native to southern California that was helpful to Joan and could be helpful for future projects cataloging native plants.

As great as it is that UCLA does have a few locations on campus that do have a large quantity of native plants, these plants are not representative of the plant selection of UCLA nor incorporated into any of the general landscaping space of the UCLA campus. One of the goals of our team from the beginning of the project was to highlight how native plants could be used in landscaping because they are well adapted to their climate – and here in Southern California this means that they require relatively low water. In addition to providing a habitat for other native species – mostly bees and other insects – the main purpose of landscaping with native and drought tolerant plants is to reduce the amount of water used on landscaping. This goal encompasses all three of the pillars of sustainability; ecological, equitable, and economical. High demand for water increases the amount of natural land that is required to fuel and transport this massive amount of water from northern California and the Sierra Nevada Mountains to southern California. Landscape watering represents 40% of urban water use – a large portion going to massive green lawns! Secondly, decreasing southern California water demands, more fairly treats northern California water sources and is not so draining of these sources. Finally, water prices are relatively cheap now – which is why there is not a harder push for drought tolerant landscaping more universally, but these prices are starting to raise, and as southern California

population continues to raise, these prices will too – drought tolerant landscaping will be an economically sound investment in the coming years.

This research lead us to the conclusion that we need to incorporate native plants into the landscaping of the UCLA campus. Our next step was to figure out how we could make this possible because none of our members had any experience landscaping.

Finding the appropriate site

The first thing we did was isolate an area of campus that could be in need of re-landscaping. The campus was divided into 5 pieces and each member was responsible for going to that section and finding areas that looked a little beaten, or had too much grass when it was not being utilized, or generally felt the section could use some changing. A Facebook group was created and pictures from the 5 areas of campus were uploaded so we could have a good idea of comparison for which area we would try to make our focus. It had been our dream to re-landscape a UCLA entrance sign, because that is something that is highly visible to the public and would make a strong statement about UCLA's commitment to water saving. Initially we thought the idea was too big and an unrealistic goal. However, a meeting with Cully Nordby convinced us otherwise. She suggested something or had a similar idea, or somehow a consensus was made that it was not too radical, that it may be achievable and it was a worthy goal.

From there we narrowed down potential UCLA entrance signs to one of three. One on the corner of Gayley and Strathmore, one on the corner of Veteran and Gayley, and the most promising – the entrance sign at the corner at Hilgard and Wyton. Cully Nordby came to and helped set up a meeting for Ross and Sunny with the School Architect, Jeffery Averill, the head of landscaping, Rich O'Hara, and the head of Facilities, Jerry Markham. This meeting concluded with some general support for our plan.

An Approved Design

The next step, we contacted the landscaping architectural program at UCLA Extension and told them of our idea. They loved the possibility, and up to nine students helped create a workbook with a plant palette and three possible designs for the corner. We worked with them and Jeff Averill to define what type of plan was needed and what type of plants we could use. It was determined that many California native plants are not ideally suited for such a sign because they often have dormant winter stages that find them looking brown and slightly dead. A better alternative for this situation was drought tolerant plants from different regions that require low water although are not necessarily California native plants.

Around this time, we determined that the corner was not under the jurisdiction of the general UCLA landscaping, but rather was a part of UCLA housing because it is actually a part of the UCLA guest house. This meant we needed to talk to Art Tieck, the landscaping manager of UCLA housing. We set up a meeting with him and met him at the site to discuss possibilities. He liked the plan from UCLA extension, but Jeff Averill insisted that it be more attuned to the “vehicular speed” as its site at a busy corner called for. This meant a reduction in the number of plants used and a simplification of the design. Art Tieck was ultimately the designer of the new plan; although we had to reduce the number of plants he used to a total of three and take out the boulder that his design called for. Jeff Averill approved of the latest design. Jeff was not sure if we needed more high up approval, but serendipitously, at this same time, a UCLA Chancellor's Sustainability Landscaping Subcommittee was formed, and Ross gained a position on the committee. He presented the idea to all the members and there was unanimous support and no reason for the project not to move on.

Working with Art Tieck

One major hurdle lay in our way yet. Although UCLA extension put his design on Auto Cad and we showed him the computer version, he is a little “Old School” and insisted there be a final hand drawn version. This presented a challenge to the team because exactly none of us had any experience that would be of use in creating such a blueprint. Luckily, Sunny remained fully optimistic, and went to the Architectural design store that Art insisted upon and purchased all the tools we would need – including pens of various thickness, blue pencils, circle drawing stencils, various papers, special rulers, special tape, and specialized stickies. We set to work drafting the design extremely carefully because we do not possess access to a T-square. Art provided great instructions onto the various thicknesses that each line need to be, sizes of font for various headlines, and every other detail that could be imagined for such a complicated drawing. Biweekly meetings with Art served as an introductory Landscaping Design class for Ross and Sunny.

Ordering Supplies

Ross and Sunny visited Las Flores Nursery in Orange which specializes in drought tolerant plants. Once there we selected the best looking plants and marked them so they would know which ones to deliver the following week. The Agave Attenuatas looked nice, but the Aeonium Sunbursts were a little lackluster. Efrain, the owner, insisted that he would contact another nursery in San Diego that had nicer looking plants and deliver those. He was true to his word, and all the plants he delivered were highly satisfactory.

Greenland Supplies was contacted one week in advance, and they delivered the mulch, soil, and fertilizer exactly when they said they would. Blue Ribbon was contacted one week in advance, and they delivered the final layer of mulch exactly when they said they would.

All the irrigation supplies were purchased at Smith Pipes in Santa Monica and transported to the site in large thanks to Sunny's truck.

Planting

Announcements and a Facebook event were created to help recruit workers for the actual planting. Demolition started at 8 am, Wednesday May, 19th and was finished by that afternoon. We took out the Agapanthas that covered the site prior to the current design. Roughly 600 plants were removed. UCLA maintenance picked up the plants and re-potted them so they could be used in future landscaping projects.

The next day we focused on clearing out the debris and Agapanthas bits remaining and preparing the soil for planting the next day. By the end of Thursday May, 20 we had spread out the soil and mulch and were nearly prepared for planting.

Friday May, 21 we mixed in all the soil amendments by noon. We received the plant order by 9 AM. Many volunteers this day allowed us to finish planting by 7 pm. It was a very happy evening.

We took Saturday off, but spend Sunday installing the irrigation system and trying to clean up. Mulch was spread throughout the following week. Art came out to test the irrigation and approved.

Irrigation

Dripline irrigation is the most water efficient method of providing water for landscaping. Art Tieck taught Ross and Sunny how to create such a system. He taught us where we could purchase the various valves, filtration devices, and dripline to install such a system. The system called for tapping into the mainline and installing a valve, filter, and pressure regulator. A 15-foot PVC pipe would come off this valve unit and attach to the dripline tubing. Art taught us how to install this system, which included PVC cutters, primer, and glue. This was a highlight of the

project. From the PVC, a splitter was installed and two lines of 1/2" dripline came off, which later broke into 5 lines that span the length of the site. This line is attached together using special connector pieces that are surprisingly easy to install. An aerator and a pressure relief valve were also installed, which Art assured us would prove to people that we "knew what we were doing." Art was a great teacher, because without his presence during installation, we were able to correctly install this system without any major problems.

Key Findings

The project has challenged the team as a whole. In terms of making this all work the team learned a lot about irrigation, plants, design, and landscaping. We found that it is not as simple as removing a bunch of plants and replacing them with drought tolerant ones. That it was not only the drought tolerant plants that make it sustainable but the irrigation that is placed along with it. If you have put in drought tolerant plants but continue to spray them with a sprinkler system the water is still being wasted. Physically the project was quite demanding, we worked from dusk to dawn, with breaks sparse in between. The more work we put into this project the more responsibility our stakeholders gave us. Overall it became clear to us that with determination, commitment, teamwork and perseverance a project such as this started out as a simple idea, an aspiration, something dreamt about at our meetings became two quarters later a project we broke ground at the corner of Wyton and Hilgard.

In terms of xeriscaping viability on the UCLA campus we found that it is definitely possible. With other areas of campus already utilizing drip lines and drought tolerant plants, this project moves forward in that spirit. Firstly drip lines and xeriscaping save a lot of water. The drip lines and low flow valve that we installed run at 0.6 gallons per hour. After the plants have fully settled this means the site would only need to be watered once a month. Secondly, while

these plants use less water, they still live up to the standards of UCLA landscaping and are aesthetically pleasing.

Recommendations

The Drought Tolerant Plants team is incredibly proud of our project and our results. We recommend that UCLA take steps toward using more drought tolerant plants and low water usage irrigation in landscaping projects. The plants we choose were carefully selected to be drought tolerant but also look appealing year around. The blue fescue is a grass that can provide ground cover, blue agave act as good anchor plants, and the aeonium sunburs is a succulent that was used to accent the whole site. We think that such proactive measures will reduce the amount of water that is used in watering plants while still maintaining the landscape beauty that UCLA prides itself on. We also understand however that to replace every green area with drought tolerant plants would be incredibly costly and an overwhelming project. Therefore we recommend that xeriscaping be integrated into future construction and re-landscaping projects. There are already plans to utilize drought tolerant plants at the new food court and the court of science and quite possibly in the landscaping of the new housing buildings being built. Also further new landscaping on campus, whether it is replacing new plants, or complete demolitions considering drought tolerant plants and drip line irrigation saves money and water in the long run.

Conclusion

Working on this project taught us a variety of lessons and skills. We learned that if you want to make your idea a reality, you have got to take things one step at a time. In our case, we started out with a vague idea of transforming an area of campus with water intensive plants, to an area with drought tolerant plants. Then we looked into the various kinds of drought tolerant plants

that were also aesthetically pleasing. After finding an area on campus that was both very public, and approved as an area we could re-landscape, we drew up plans and eventually were successful in implementing drought tolerant plants. We learned that perseverance and determination were necessary in seeing our plan come to fruition and with an unbridled enthusiasm and grassroots campaign; we were able to install our project for less than half of what the Art Tieck, the Landscape Architect for Housing, initially estimated. This project was a lot of work, and at times a lot of fun, but more importantly we hope it's the beginning of sustainable and water conscious landscaping designs on campus.

Appendices

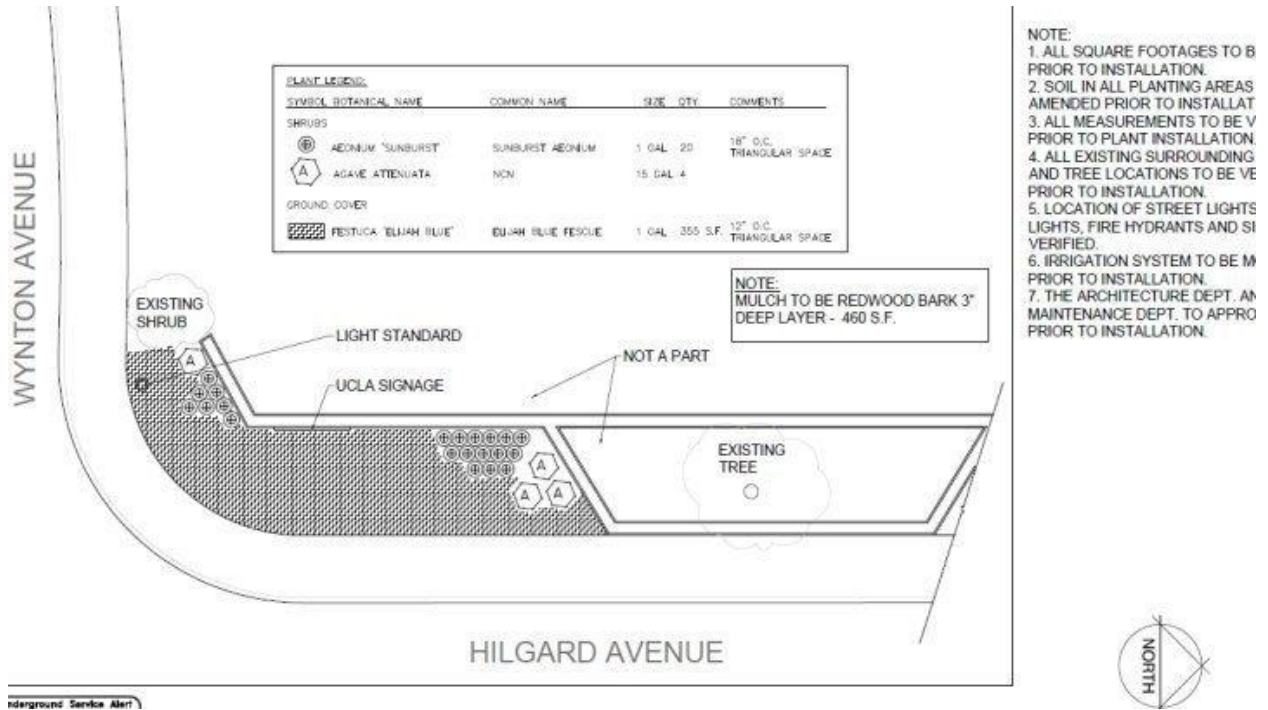


Figure 1: Final digital blueprint of site at Wynton and Hilgard

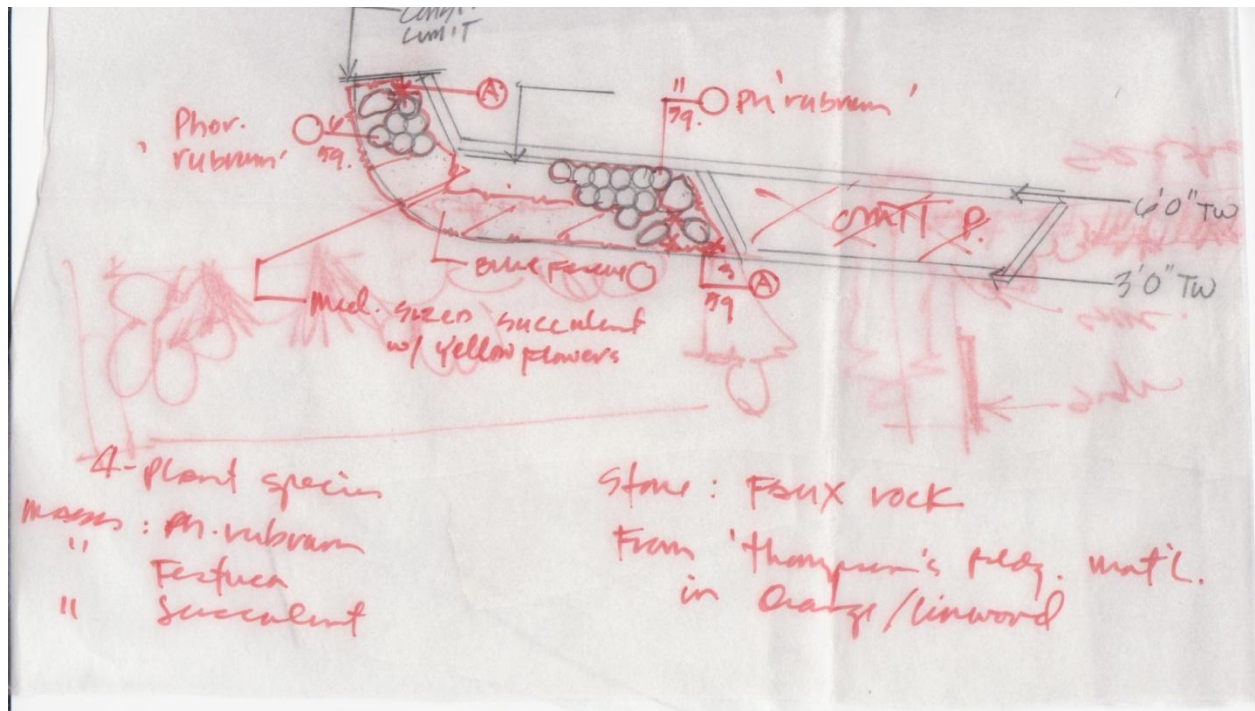


Figure 2: Hand-drawn draft of planting site



Figure 3: One of the original drafts proposed by UCLA Extensions



Figure 4: A more exotic draft plan that was shot down