



Bringing Scientific Oak Collections to Life for Garden Visitors

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ABSTRACT

Many scientific tree collections in public gardens hold great value for conservation and research but are not particularly appealing to visitors. These collections represent a missed opportunity for engaging visitors in science learning and instilling an appreciation for the value of plant biodiversity. Over the last three years, the UC Davis Arboretum has transformed Shields Oak Grove from a traditional, underappreciated scientific tree collection into a lively destination. First planted 50 years ago, the collection includes beautiful, mature specimens of over 90 taxa of oaks from around the world. A new interpretive trail, student-created art/science fusion installations, visitor-tested interpretive signs, musical performances, and a cell phone audio tour now engage visitors to the grove in new ways. These innovative programs, exhibits, and installations bring forward rich and compelling stories related to the natural and cultural history of the oaks that resonate with visitors of all ages.

Keywords: *Quercus*, UC Davis Arboretum, Shields Oak Grove, interpretation, education, art/science fusion

Introduction

In addition to their value for research, conservation, and university-level teaching, scientific plant collections in public gardens have the potential to play a significant role in public education and outreach. The challenge is figuring out how to engage garden visitors, who likely have no background in plant science, with a traditional taxonomic collection.

Today's public gardens tend to draw from two major historic traditions: the academy garden and the pleasure garden. In academy gardens, plants were grown in collections to support scholarly pursuits related to teaching and research. In pleasure gardens, plantings were developed to entertain, relieve stress and provide beauty and sensory delight for visitors. The most successful public gardens combine these two traditions to provide places of extraordinary beauty and scientific value. However, many still struggle to connect visitors with the meaning and value of their scientific collections; and scientific tree collections rarely compare with children's gardens, orchid exhibits, rose gardens or train gardens as popular visitor destinations.

In 2008, the UC Davis Arboretum received a grant from the US Institute of Museum and Library Services and took on the challenge of developing an interpretive trail, signage and educational programs to enhance the visitor-friendliness and educational value of the Peter J. Shields Oak Grove. Four years later, Shields Oak Grove serves as an interesting case study of how a scientific collection can be enhanced to also serve as an enlightening visitor destination.

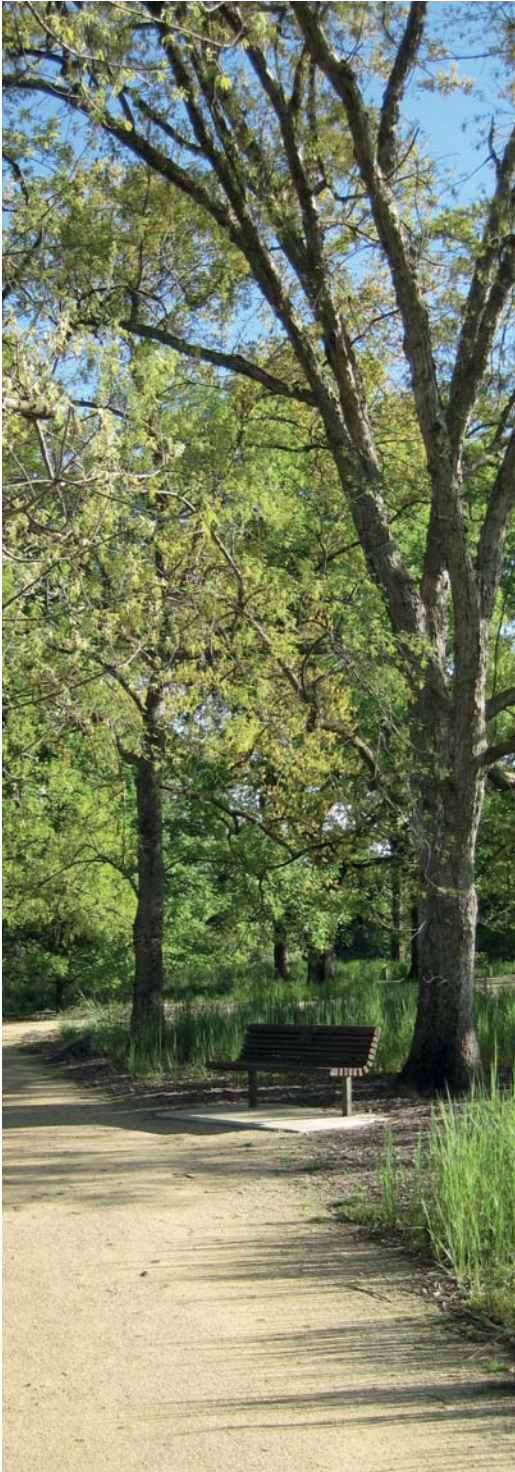
About Shields Oak Grove

Started in 1962, Shields Oak Grove contains almost 300 trees representing over 90 taxa of oaks spread out over 10 acres/4 hectares in a park-like setting, making it one of the largest collections of oaks in the United States. In 2007, the collection was inducted into the North American Collections Consortium (NAPCC) Multisite *Quercus* Collection in recognition of its diversity and conservation value. Researchers had been using the collection for decades for studies on oak taxonomy, ecology and pathology; and oak enthusiasts made annual pilgrimages to collect acorns and examine the trees. To a limited extent, the collection was also used for university teaching and laboratory exercises.

From the perspective of most visitors, however, Shields Oak Grove was a pretty park – a place to throw a Frisbee or have a picnic. Despite the presence of plant labels, the tremendous diversity of the tree collection remained largely invisible to casual visitors. Without a trail system, there was not a clear way to explore the deeper reaches of the grove. Some of our more urban visitors expressed fears that if they went in too deep that they would get lost and wouldn't know how to get back out. The occasional guided tour would reveal some of the rich stories about the oaks, but otherwise the arboretum's most significant scientific collection was largely unacknowledged and unrecognized by all but a few arboretum staff, docents and oak specialists.

Despite this situation, the arboretum staff saw in Shields Oak Grove the raw potential for a popular and engaging visitor exhibit. The collection had:

- *Beauty*: The grove was full of majestic, mature trees – many over 40 years old.
- *Name recognition and charisma*: Oaks are widely recognized and valued as an iconic element of the California landscape.



1/ A new trail system and benches contribute to visitor comfort in the oak collection. Native grass understory plantings complement the natural beauty of the trees.

- *Great visual variety:* With a mix of tree and shrub species from temperate, subtropical, and Mediterranean climates, the collection had examples of the diverse forms of oaks.

- *Cultural connections:* We could tap rich stories about ethnobotany of oaks, human uses of oaks around the world, and oaks in religion, mythology, literature, and art.

- *Horticultural promise:* The collection could be used to aid in tree selection for gardens and to demonstrate techniques for gardening under oaks.

- *Wildlife connections:* Oaks provide food and shelter for an extraordinary diversity of wildlife and insects. For visitors with a strong natural affinity for animals, these creatures can be a “hook” to encourage learning about plants

In order to have the broadest impact, we selected the regional visitor as the primary audience for the oak grove improvements, rather than, for example, university faculty or students. As a university garden, we aim to use the arboretum as a stage to showcase the academic work of UC Davis to our regional visitors. Our first step in the process of transforming Shields Oak Grove was to conduct a visitor survey to assess our regional visitors’ basic knowledge about oaks and interest level in various topics about oaks. The results of the survey showed that visitors were most interested in: traditional uses of oaks, cultural connections, gardening under oaks, Sudden Oak Death, the habitat oaks provide and the history of Shields Oak Grove. By tapping into visitors’ natural areas of interest, we knew we could make more compelling interpretive materials and educational programs.

Our efforts to transform Shields Oak Grove into a more educational and visitor-friendly destination included physical improvements to the site and the creation of new educational programs. The physical

improvements were designed to improve visitor comfort and access, highlight the beauty of collection, provide basic interpretation, and create artistic attractions.

Improve visitor comfort and access

Creating a new trail system had one of the most transformational impacts on the visitor experience in Shields Oak Grove. The trail provided a welcoming invitation to explore the grove in a more structured way and a guarantee against getting lost. After the Oak Discovery Trail and Oak Diversity Trail were installed, many long-time arboretum enthusiasts, and even several staff members, mentioned to me that the trail introduced them to parts of the grove that they had never seen before. The random-seeming meanders of the trail were carefully designed with the goal of escorting visitors past key tree specimens with interesting features for interpretation.

Along with the trail system, we added seating – both traditional park benches and a pair of long curved benches at the entry to the grove. Benches invite visitors to relax and linger in the collection and are particularly important as rest stops for visitors with limited mobility. The curved benches at the entry to Shields Oak Grove are sited under the cathedral-like canopies of four 90-foot tall *Quercus castaneifolia* C.A. Mey. The benches can seat 40 or more people and they serve as a gathering area for tours, an outdoor classroom, a venue for special events and a peaceful, shady refuge for visitors.

Highlight collection beauty

Our goal is for beautiful, mature, healthy, and well-maintained trees to be the centerpiece of Shields Oak Grove. Before we started our renovation, the ground plane under the trees was either mulch or turf. The flatness of the understory gave the grove a rather sterile, two-dimensional character and made the grove feel more like an urban park than a natural space. By adding an understory of native grasses and wildflowers, we were able to infuse more natural character back into the grove, giving it the feeling of an oak savanna. The understory grasses catch the light, sway in the breeze, and add more visual interest and complexity to the Shields Oak Grove environment. They create the sense of immersion in a natural habitat and prime visitors for learning about the nature and biology of oaks.

Provide basic interpretation

Ideally, a knowledgeable expert would always be on hand to lead oak tours and answer visitor questions. Since this is not possible, we use interpretive signs and plant labels to convey basic, foundational-level information about the trees for visitors. The seven interpretive signs along the Oak Discovery Trail address some of the topics that rated most highly in the visitor survey. A successful sign will attract and hold visitor attention and effectively communicate a message. Although this may sound simple, designing effective interpretive signs is challenging, because informal visitors come with their own personal agenda and interests.

The UC Davis Arboretum uses an innovative interpretive sign development process that involves teams of people from different disciplines and different audience segments to generate sign content. For this project, we had six arboretum staff, including both

horticultural and educational experts, and 14 community volunteers working for an intensive week on rapidly creating sign mock-ups, testing them in the grove with actual visitors, and revising them based on visitor feedback. Exhibit teams observed visitors interacting with the sign mock-ups and, finally, interviewed them about what they understood the messages to be (Photo 2). Following revisions from this formative evaluation, we submitted the most successful sign mockups to our graphic designer, who created the final designs. This process greatly increases the signs' ability to attract and educate visitors.

Display plant labels in Shields Oak Grove have been designed to hold information that would be of interest to both experts and casual visitors. This information includes the common name, scientific name, family name, section and/or subgenus name, native distribution and museum accession number.



2/ Arboretum interns evaluated the sign mock-up in Shields Oak Grove. Interpretation volunteers also observed casual visitors interacting with the sign to determine its effectiveness at attracting and holding visitor attention.

Create artistic attractions

We have found that art installations can attract new audiences to our plant collections and broaden their appeal among visitors. In Shields Oak Grove, we have focused on working with UC Davis academic programs to create site-specific art that helps visitors connect with educational messages about oaks.

The arboretum has partnered with the UC Davis Art/Science Fusion program since 2006 to create innovative collection-themed installations. Five of these projects over the

years have been in Shields Oak Grove, and we now have:

- “Tree of Life” – A mural focused on the biodiversity supported by the valley oak (*Quercus lobata* Née).
- “Oak Family Tree” – A mural depicting an evolutionary tree of oaks growing in the Arboretum collection.
- A series of 35 mosaic tree label plaques (Photo 3).
- “Oak Food Chain” – A bench-top installation showing a food chain connected to the coast live oak (*Q. agrifolia* Née).
- “Oak Circle of Life” – A bench-top installation illustrating the 800 year lifespan of an English oak (*Q. robur* L.) (Photo 4).



3/ One of the 35 mosaic tree label plaques that are positioned in front of key tree specimens along the trails.

The UC Davis Art/Science Fusion program is an undergraduate curriculum that links scientific learning with artistic expression. The co-founders of the Art/Science Fusion program, a ceramic artist and a faculty entomologist, teach an undergraduate class every fall – Entomology 1: Art, Science, and the World of Insects – in which students learn basic entomology and participate in the creation of a public ceramic art installation that depicts insects in the environment.

In fall of 2009, the Art/Science Fusion program created a series of 35 mosaic plant label plaques for key tree specimens along the Oak Discovery Trail and Oak Diversity Trail. Each student in Entomology 1 was responsible for making a label plaque profiling one oak species and an associated insect from the tree’s place of origin (Photo 3). Volunteer community members and local high school students also participated in making tiles of leaves, acorns and oak-associated wildlife for these beautiful plaques. The plaques have been very effective at drawing visitor attention to the unique features of each tree and

emphasizing the diversity and vitality of the collection. The expressive visual and tactile qualities of the plaques also make them very appealing to children.

The arboretum also serves as a rotating gallery space for students in the art, design and landscape architecture departments to mount temporary art installations. Last year, a landscape architecture student brought new life to a dying 150-year old valley oak (*Q. lobata* Née) by using the branches to create an impressive arch-shaped art installation in Shields Oak Grove. The installation calls attention to the “afterlife” of the tree as the decomposing bark and wood provide habitat for wildlife and insects. Temporary installations like this keep the garden fresh for returning visitors.



4/ “Oak Circle of Life” is a ceramic art installation on the surface of a curved bench at the entry to Shields Oak Grove. The bench serves as an outdoor classroom and informal gathering area.

Develop educational programming

To accompany and expand on the physical improvements to Shields Oak Grove, we developed a series of educational programs for arboretum visitors, UC Davis students and the regional community.

Attending a docent-led tour is a great way for visitors to get more in-depth information about a plant collection than interpretive signs could ever offer. Before the visitor-friendly physical improvements were made to Shields Oak Grove, only two arboretum docents were comfortable leading tours in the oak collection. Docent training became a key foundation to our plans for increased educational programming, because we needed a stronger base of volunteers who would feel knowledgeable enough about oaks to lead visitor tours and programs. In 2010, I led the first oak-themed docent training in over 15 years. Docents,

volunteers and student interns were invited to participate, and 30 individuals registered for the 12-hour training spread over four weeks. Participants learned about the basics of oak biology and ecology, human uses of oaks, oaks in horticulture and the history and management of the tree collection in Shields Oak Grove. In addition to leading public tours, the recently trained docents have assisted with interpretive sign development and helped with outreach events in the collection.

In addition to docents, UC Davis undergraduate environmental leadership interns, the “Arboretum Ambassadors,” have been integrally involved in the development and implementation of oak-related educational programs (Photo 5). The ambassador interns have planned major public outreach events, developed public tours of the oak collection, created a “*Quercus Crew*” club for kids and organized a series of environmental stewardship field day programs for underserved children in the region. The ambassadors effectively expand the scope and reach of our educational programs while they gain valuable experience in event planning, informal education, marketing and leadership. It is truly inspiring to see these college students get sparked with an interest in oaks and pass it along to children and families in the community.



5/ The Arboretum Ambassador interns in 2010 selected Shields Oak Grove as the focus of their outreach activities.

Arboretum Ambassadors were integral to the planning of Oak Discovery Day, an oak-themed festival, which was held in 2010 among the trees on the Oak Discovery Trail. With 18 activities ranging from an Arbor Day ceremony and oak song-writing workshop to natural history exhibits and a Native American acorn-grinding demonstration, the afternoon was packed with oak-related attractions. The event was also advertised as an International Oak

Society Oak Open Day, and Doug McCreary represented the Society with an information table. Hundreds of visitors attended this free event which served as a “grand opening” for the new visitor attractions in Shields Oak Grove.

Much as visual arts expand the audience for a scientific collection, so can performing arts. In summer of 2011, the arboretum hosted a progressive concert through Shields Oak Grove performed by the Sacramento City College World Music Ensemble. Named “Around the World in 80 Oaks”, the concert celebrated and honored the diverse origins of the oak collection. Over 200 people came to stroll through the grove, stopping along the way to hear music from some of the countries that are home to the (slightly more than) 80 varieties of oak trees in the arboretum. The program also included a poetry reading by the city of Davis poet-laureate and commentary by arboretum docents relating to the oak trees. We were overwhelmed by the positive response to this event and hope to be able to host similar events in the future.

Results

Because the arboretum is unfenced and integrated into the fabric of the UC Davis

campus, it is difficult for us to accurately track visitation. Observationally, we have seen a significant increase in visitors to Shields Oak Grove. It is now common to see visitors exploring the trails, reading the signs, enjoying the art installations, and relaxing on the benches. New tours and events in the grove have been well-attended. With increased attention on the oak collection, we have also received more private donations to commemorate trees, ceramic art, and benches that support the ongoing maintenance and development of the collection.

Next steps

Although we have made great strides to improve the accessibility of Shields Oak Grove, we still have room for improvement. We look forward to expanding our programming to continue sharing the riches of the oak collection with more visitors. The following are some of the plans we have been developing to build on the success of previous efforts with additional interpretation and educational programming.

Oak Discovery Day was a successful event but it required a large investment of resources to coordinate all the activities. If we scale back the number of activities, refine them so they are more attractive and educationally effective and increase volunteer training and involvement, we have the potential to be able to hold “Oak Discovery Drop-in Days” more regularly.

Visitors are hungry for more information about all the insects and animals depicted on the art/science fusion ceramic installations. However, we haven’t wanted to distract from the beauty of these art features by putting an interpretive sign next to each one. One alternative would be to create a paper brochure with labeled photos of the ceramic tiles. The brochure could be distributed at the entrance to the grove and made available on the arboretum website for visitors to download and print before their visit. Another more modern approach would be to integrate this information into an interactive smart phone application. UC Davis computer science students have already been working on programming a smart phone application that would serve as a visitor guide to the arboretum. After the first phase of development is complete, we hope to have them work on integrating an interactive map of Shields Oak Grove.

Hearing a story is quite a different experience from reading one – it can free your eyes to explore the environment and make observations. Many museums and botanic gardens are now making audio tours available for visitors via cell phone. Signage in the exhibit will prompt visitors with a phone number to call and a tour stop number to select in order to hear the message. The arboretum staff has been working on a cell phone audio tour that will reflect the voices of a variety of UC Davis experts speaking about the great diversity and many values and uses of the trees in Shields Oak Grove.

Photographers. Title page: Nikhil Joshi (in Shields Oak Grove). Photos 1, 3: Emily Griswold. Photo 2: Carmia Feldman. Photo 4: Allan Jones. Photo 5: Rose Swift.

Resources

You can find more information about the UC Davis Arboretum’s oak collection and copies of our interpretive signs by visiting our website (<http://arboretum.ucdavis.edu/oak-collection.aspx>). For more information about connecting visitors with collections, look to the National Association for Interpretation (<http://www.interpnet.com/>), an organization dedicated to supporting the profession of natural and cultural heritage interpretation, for publications and training events.