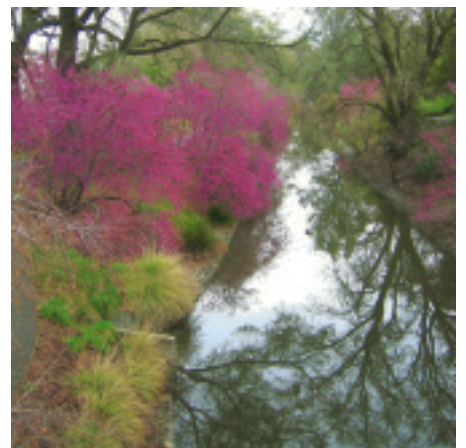
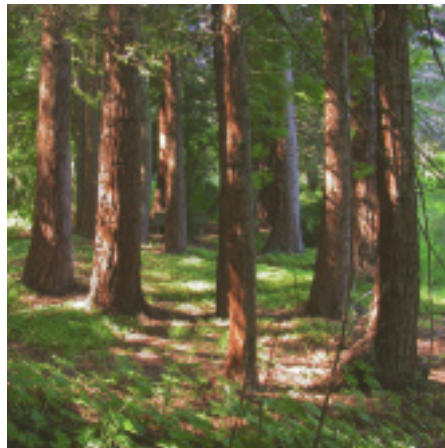


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FREMONTIA

JOURNAL OF THE CALIFORNIA NATIVE PLANT SOCIETY



SPECIAL ISSUE: PUBLIC GARDENS OF CALIFORNIA NATIVE PLANTS

FREMONTIA

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California Native Plant Society

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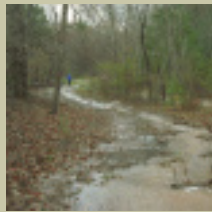
This special double-issue of Fremontia is dedicated to a precious resource for everyone interested in California and its native flora: our public gardens. The following nine examples are conveniently presented from south to north. Collectively, these gardens represent nearly five hundred years of hard-won horticultural experience with our native plants. All offer knowledge, inspiration, and beauty to everyone who visits them. As articles become available, additional public gardens of California native plants will be featured in future issues of Fremontia.



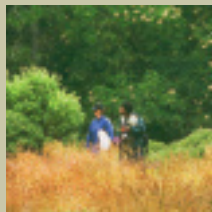
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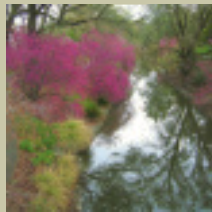
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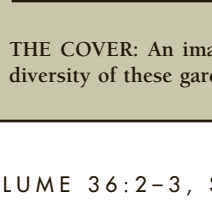
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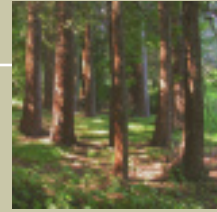
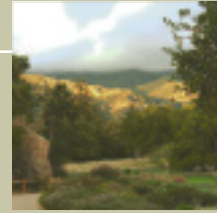
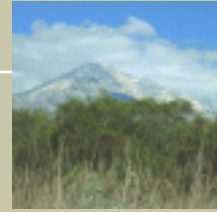
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THE COVER: An image from each of our nine featured public gardens of California native plants conveys the beauty and diversity of these gardens at all times of the year.



A view over the sages growing in the coastal sage scrub community. Mature trees of western sycamore (*Platanus racemosa*) and Fremont cottonwood (*Populus fremontii*) frame the northern end of the Garden. All photographs by D. Songster.

GOLDEN WEST COLLEGE NATIVE GARDEN: A LEARNING EXPERIENCE

by Dan Songster

The oak leaves crunch beneath your feet, bushtits dash and thrash among the branches of the Nevin barberry, a student stoops to identify a monkey-flower, hummingbirds sip quickly from the fragrant sage and glowing foothill penstemon flowers, and the scarlet blooms of island snapdragon hang like jewels from the lower branches of the bishop pine it has entwined.

The California Native Garden at Golden West College is a small affair tucked between our math/science building and a nearby parking lot on the west side of the campus. Less than an acre and a half, it is surrounded on three sides with an eight-foot tall berm creating some inter-

esting slopes for planting, while providing a sense of isolation from the busy campus. Almost anytime of year you can sit within its boundaries and enjoy the antics of birds foraging, fighting, and frolicking among the plants in a manner unlike the rest of campus. Students, faculty, and staff visit daily during breaks. They enjoy the Garden's warmth, breathe in the sages, stroll the pathways, or chat among themselves much like the birds. I have witnessed a lot of thoughtful expressions in the Garden but have seldom seen a visitor wear a frown, at least for long.

Of course the Garden's original purpose was not for such wholesome and pleasurable interludes from a day's studies. The intention

in 1975 was to have a native garden serving as an outdoor classroom and lab for the science department's biology, botany, and environmental studies classes. Back in the 1970s, this idea was cutting edge. People were not acquainted with California natives and I was no exception. So began a long study effort with equal parts of the old *A California Flora* by Philip Munz, and visits to many native gardens, nurseries, plant experts, and other native resources throughout the state. As the Garden progressed in the mid 1980s, Rod Wallbank became involved with the Garden and we began sharing duties as Co-Directors. Being assigned the task of designing and eventually installing the Golden West College

Native Garden has introduced us to many interesting and inspirational plants and people over the last 30 years. I wonder if today's new crop of native plant enthusiasts can imagine the difficulty we had finding reliable information about natives or how rare it was to see a native in a landscape back then. But I digress.

GARDEN OVERVIEW

The Garden currently allows college students, faculty, staff, and anyone with an interest in native plants, to observe and learn about over two hundred species of native trees, shrubs, and perennials of various ages, and at least another fifty species of vines, bulbs, and annuals. Since the Garden's mission is anchored in studying these native plants, it was an easy choice to design the Garden in a series of coherent plant communities much like Rancho Santa Ana Botanic Garden's rear acreage. These plant groupings are found naturally throughout California and are an effective way to study our state's botany. Of course, the Garden cannot approach the diversity found in California's wild plant communities, but we are satisfied if we can present a representative variety of plants from a community, deliberately arranged in what could be considered a natural manner.

The communities we have installed include Foothill Woodland, Redwood Forest, Oak Woodland, Chaparral, Coastal Sage Scrub, and Mixed Evergreen Forest. We also have a section for some of the intriguing plants from the Channel Islands. A grassland is planned beneath a somewhat vacant portion of the Oak Woodland, and a small ornamental meadow, with an emphasis on our lovely native bulbs, is intended for the area near the glasshouse. Though we have no moving water, a nod to riparian systems was attempted by including riparian species along the edges of various com-



CLOCKWISE FROM TOP: A hummingbird favorite, fuchsia-flowering gooseberry (*Ribes speciosum*), grows with Munz sage (*Salvia munzii*). Both provide late winter color. • A white sage (*Salvia apiana*) in full bloom glows in the morning light. Elegant clarkia (*Clarkia unguiculata*) and lemonadeberry (*Rhus integrifolia*) are in the background. • Chaparral yucca (*Hesperoyucca whipplei*) provides a stunning flowering accent between Cleveland sage (*Salvia clevelandii*) and bushrue (*Cneoridium dumosum*). Last year's dead flower stalk is now a perch.

munities (willow, alder, poplar, etc). We also have several pockets for spring wildflowers to catch the visitor's eye. Certainly they attract a lot of attention and perhaps people



ABOVE: Early summer bloom of Matilija poppy (*Romneya coulteri*) with elegant clarkia (*Clarkia unguiculata*) peeking through from slightly uphill. • RIGHT: The Baja, or small-leaved, rose (*Rosa minutifolia*) is endangered in California but survives the Garden's clay soil.

attracted by their vibrant colors will return to enjoy different aspects of the Garden in other months. Throughout the Garden, we have included plants with flowers, berries, and fruits that are attractive to several kinds of fascinating creatures. The variety of birds and butterflies are of great interest to our students and other Garden visitors.

Pathways wind through the Garden, helping tie the various communities together while allowing visitors a close-up view of the plants. Stone benches have been placed along the paths and in the evening simple bollard lighting makes the garden feel friendly and inviting. In the northwest corner there is a small glasshouse, lath house, and potting shed where the botany and biology classes grow plants for their needs. We also use these facilities to propagate natives for planting in the Gar-



den, gifts to friends, and occasional plant sales. Built into the berm in the north end of the garden is our lovely stone amphitheater, and on the south end, perched among the coastal sage, is a plateau with seating for study groups and the evening astronomy class.

COMMUNITIES

Despite the Garden's small size, we have tried to include enough indicator species and species of interest from each plant community to give our visitors the flavor of that particular community. Let's take a quick walk through some of the Garden.

The Channel Island section, at

the northern entrance to the Garden, is dominated by three trees, a bishop pine (*Pinus muricata*), cloaked with dark green needles, that is finally happy after a very slow first 12 years. Nearby is the hybrid island mountain mahogany (*Cercocarpus betuloides* var. *blancheae* x *C. traskiae*) with tall, sculpted trunks soaring twenty feet, topped with a light canopy of dark olive-green leaves. The arboreal triangle is completed by a multi-trunked, fern-leaved Catalina ironwood (*Lyonothamnus floribundus* spp. *asplenifolius*) with its shredded, cinnamon-colored bark and its large umbels of creamy flowers perched high on the branches. Catalina cherry (*Prunus ilicifolia* ssp. *lyonii*), island bush poppy (*Dendromecon harfordii*), Catalina Island snowflake (*Eriophyllum nevinii*), and Santa Cruz Island gooseberry (*Ribes thacherianum*) are also thriving here.

The Coastal Sage Scrub section is striking with coast sunflower (*Encelia californica*), bladderpod (*Isomeris arborea*), several California buckwheats (*Eriogonum* spp.), and the drama of chaparral yucca (*Hesperoyucca whipplei*). Other dependable plants include coyotebrush (*Baccharis pilularis* var. *consanguinea*), lemonade berry (*Rhus integrifolia*), and the pungent California sagebrush (*Artemisia californica*). Of course, with many sages (*Salvia* spp.), the area is deliciously fragrant.

Our Foothill Woodland section holds two of the oldest plants in the garden, planted in 1975, a coast live oak (*Quercus agrifolia*) and a western redbud (*Cercis occidentalis*). Nearby, a valley oak (*Quercus lobata*) emerges from a rambling mass of basketbush (*Rhus trilobata*), spilling down a small hillside. In spring, among the nodding needlegrass (*Nassella cernua*), we enjoy bulbs like the single-leaf onion (*Allium unifolium*), Ithuriel's spear (*Triteleia laxa*), and various mariposa lilies (*Calochortus* spp.).

Chaparral is very difficult to rep-

licate in any garden, but with our heavy soils it is more than a design challenge. Obviously, it would be easier if we had better-draining soils for some of our favorites, such as manzanitas, woolly blue curls, and flannelbush. We still try to grow them with varying degrees of success: flannelbush (*Fremontodendron* spp.) lasts longest for us, averaging about six years; manzanita (*Arctostaphylos* spp.) four to six years; and sadly, we often treat woolly blue curls (*Trichostema lanatum*) as a biennial. We add to these somewhat transient residents more long-lasting species such as laurel sumac (*Malosma laurina*), sugarbush (*Rhus ovata*), mountain mahogany (*Cercocarpus betuloides*), Tecate cypress (*Cupressus forbesii*), toyon (*Heteromeles arbutifolia*), scrub oak (*Quercus berberidifolia*), California coffeeberry (*Rhamnus californica*), and numerous California lilacs (*Ceanothus* spp.).

The Mixed Evergreen Forest section carries the sharp scent of the California bay (*Umbellularia californica*), the stunning spring floral display of the pink flowering currant (*Ribes sanguineum* var. *glutinosum*), and includes the astounding green of the incense cedar (*Calocedrus decurrens*). Next to one of our madrones (*Arbutus menziesii*), a white-flowered form of California lilac (*Ceanothus thyrsiflorus* 'Snow Flurry') stands over twenty feet tall and almost as wide, casting dappled shade beneath for the appreciative coral bells (*Heuchera* spp.), meadow rue (*Thalictrum fendleri* var. *polycarpum*), Douglas iris (*Iris douglasiana*), and California polypody fern (*Polypodium californicum*).

Our Oak Woodland consists of coast live oak (*Quercus agrifolia*), a juvenile interior live oak (*Quercus wislizeni*) just starting to assert its size and shape, and the gracefully eccentric Englemann oaks (*Quercus engelmannii*) staggered on each side of the walkway. Several of these oaks are tall enough to plant under now,



A western red cedar (*Thuja plicata*) provides excellent color contrast standing in front of a group of coast redwoods (*Sequoia sempervirens*).

and deer grass (*Muhlenbergia rigens*), hummingbird sage (*Salvia spathacea*), and blue-eyed grass (*Sisyrinchium bellum*) are starting to spread beneath these trees.

GARDEN CARE AND CONCERNS

As in any garden, maintenance is a year-round activity. Our year begins with fall planting, pruning mainly during the winter months, and weeding all winter and spring. Summer months involve mulching, specific watering, and hardscape projects.

The most time-consuming and least enjoyed chore for our understaffed Garden is weeding. We try to avoid herbicide use, and that means hand weeding where mulch has worn thin or in communities in which we don't use mulch. It's pretty easy getting together a large number of friends for our annual planting day, but it takes a bit of arm-twisting just to get a small group for weeding.

Pruning is also an important part of this garden's maintenance. As in many gardens created by plant lovers, space becomes an issue. Sometimes plants grow larger than expected or are simply spaced too closely together by an optimistic gar-



ABOVE: Spring blooms of lilac verbena (*Verbena lilacina*) and coral bells (*Heuchera* sp.) in the morning sun. • LEFT: Catalina Island snowflake (*Eriophyllum nevini*) provides a lovely accent near the amphitheater.



dener who should have known better. When plantings become too crowded, pruning becomes more

than a means to enhance the structure and beauty of the plants involved. It is also a way to keep some of the shrubs and trees from directly interfering with each other's growth, allow more air movement to combat potential disease, create planting space beneath large shrubs or small trees, and allow light to penetrate to understory plants beneath larger trees. Being crowded also means it is essential we remove the fast growing seedlings of large shrubs and trees such as elderberry, lemonade berry, oak, and coyote brush or the garden will be choked! There is little room for just letting the Garden be, although that is how it looks to most visitors who say they like our "natural garden."

As noted earlier, our Garden has

clay soil that is a challenge for growing many of the natives whose descriptions in any publication invariably read "need good drainage." We do have many gentle slopes that help with drainage and we do make clever attempts to improve drainage, but these heavy soils have led to the demise of some of our favorite plants. Possibly the only good thing about growing our native plants in clay soils is that we have learned a few things about gardening in such conditions over the last 30 years. Since people who live in Orange County generally garden in some form of clay (try as they might to alter it), we understand their plight, temptations, and most of all, we have hard-won advice to give. Sometimes we simply offer a shoulder to cry on.



TOP: Point Sal purple sage (*Salvia leucophylla* 'Point Sal') adds a pastel touch to a section near the coastal sage scrub community. Shaw's agave (*Agave shawii*) and California sunflower (*Encelia californica*) are in background. • BOTTOM: A winter view in the mixed evergreen forest section with the graceful Claremont flowering currant (*Ribes sanguineum* var. *glutinosum* 'Claremont') in full bloom.

Using as little water as we can and retaining rainwater on-site has been important to us from the beginning. With the exception of the redwood and mixed evergreen forest areas, the plants don't normally need or appreciate much more than winter rainfall. (We will be introducing a low-volume irrigation system for the redwood and mixed evergreen forests.) Very dry winters mean we have to turn on the water for a healthy, presentable garden. We try to do this during cool, cloudy winter days to avoid the chance of root rot or other fungal activity harming the plants. Since we have no sophisticated irrigation systems, we simply set out impact heads to water the garden, moving the sprinklers to prevent runoff and allowing water to soak in. It works.

ENJOY

The Golden West College Native Garden may be small, but it is packed with plants. Although it contains several of California's rare and endangered species, many drought-loving natives, and dozens of plants attractive to both bird and butterflies (and more), the Garden is not a pure botanic garden, nor is it a water district showpiece or a butterfly garden. It is a garden whose mission is the same as ever, to provide a learning experience for its visitors. Whether you are a student studying for the upcoming quiz, a local resident thinking about replacing the front lawn with a water-saving landscape, a conservationist, or bird lover preparing for some backyard restoration with local natives, the Garden has something for you. It is a learning experience.

Golden West College Native Garden, 15744 Golden West Street, Huntington Beach, CA 92647; (714)892-7711; www.goldenwestcollege.edu/maps/cngmap.html • Dan Songster, dsongster@gwc.cccd.edu



White sage (*Salvia apiana*), in the foreground, contrasts with dark green trees and snow covered San Gabriel Mountains in the Plant Communities area of Rancho Santa Ana Botanic Garden (RSABG). All photographs by B. Eisenstein.

HORTICULTURAL CONTRIBUTIONS OF RANCHO SANTA ANA BOTANIC GARDEN

by Barbara Eisenstein

Gardeners—whether landscape architects, professional horticulturists, or homeowners—span a wide range of knowledge and abilities. Some have a rich understanding of plants and can grow nearly anything. Others know how to grow traditional landscape plants, but have little acquaintance with California natives. Still others have no knowledge of plants at all, though they may have a large yard requiring landscaping and maintenance. Rancho Santa Ana Botanic Garden (RSABG) meets this broad of spectrum of hor-

ticultural needs through its various programs and departments. This article begins with a description of programs geared for the gardening newcomer, and progresses to programs for the horticultural expert and general contributions to the field of horticulture.

FOR THE NOVICE

Grounds

The grounds of the Garden provide novice gardeners and those with little awareness of the diverse plant palette that California natives

offer with a pleasant way to learn about native plants and California's natural heritage. Each day, visitors stroll along the paths of RSABG. Some come for planned events and others for informal, outdoor recreation. Interpretive signage throughout the Garden provides information on California's floristic provinces, cultivars, plant communities, and more. Plants in the Garden's living collection have accession tags, and many are identified with signs that include the common and botanical names and plant families. Experiencing a garden landscaped

with native plants is a first step toward incorporating these plants in one's own garden.

Though RSABG has an informal, naturalistic style, hardscape elements, especially in the mesa area, provide visitors with examples of native landscapes that can be used as models for residential, commercial, and public gardens. Winding paths, pergolas, seating, and fountains in the Cultivar Garden provide a backdrop for the native cultivars, many of which make excellent garden specimens. The potted plants displayed in the Container Garden offer landscape ideas appropriate for small yards and patios, as well as larger gardens.

Weekend visitors, often families with children, experience our Discovery Carts. These interactive displays are created by the Education Department and are staffed by volunteers. Though not specifically horticultural in scope, these changing displays provide background information on native plants and natural history, again a first step in educating the public on native plant horticulture.

Garden Shop

The casual visitor can purchase native plants at our Garden Shop. From late fall through spring, a changing selection of native plants is available. This, too, provides an excellent opportunity to educate the public. The plants are loosely arranged by different plant associations. Woodland plants are grouped together in the shady section of the outdoor patio, while the desert plants occupy the sunny, hot area. Signage identifying the plant association is placed by each group of plants. In late spring, plants are removed from the shop, except for a small number of container plants, mostly cacti and other plants from desert and riparian regions. At this time signage informs the visitor that it is best to wait until late fall to purchase and transplant most native plants.

Hotline and Outreach

In addition to the casual visitor, homeowners with little knowledge of gardening often approach RSABG when confronted with ever-increasing water bills. Cities and water distributors are making serious efforts to educate the public on the importance of water conservation. Announcements in various media inform the public that use of appropriate plants can reduce outdoor water and maintenance costs. In 2004, with funding for a three-year period from Metropolitan Water District of Southern California (MWD), RSABG initiated a horticultural outreach program. Recognizing that more than sixty percent of residential water is consumed outdoors, MWD is interested in promoting low-water-use landscapes. The program goal is to facilitate the increased use of California native plants by home gardeners and landscape professionals.

Through this program, a Horticulture Outreach Coordinator was hired to: (1) answer questions on a Garden hotline and through email; (2) develop horticulture information sheets; (3) give talks at the Garden and offsite; (4) develop materials for an informative website; (5) write engaging and educational articles for newspapers, magazines, and newsletters; and (6) further assist people in the successful use of native plants in gardens.

Since the start of the program, calls and email contacts have grown significantly. To provide accurate information, the Outreach Coordinator consults with RSABG horticulturists, researchers, and staff from the seed program, herbarium, and nursery. This gives the public access to the Garden's broad horticultural expertise.

The internet provides an important way to disseminate information. Our dynamic website is frequently updated with new horticultural information. Each week a new native plant gardening tip appears on the



TOP: Claremont redbud (*Cercis occidentalis* 'Claremont'), Blue Cascade wild lilac (*Ceanothus* 'Blue Cascade'), and California poppies (*Eschscholzia californica*) bloom behind the California Courtyard in spring. • MIDDLE: California Glory flannelbush (*Fremontodendron* 'California Glory'), true to its name, is in glorious bloom in May. • BOTTOM: Buckthorn cholla (*Cylindropuntia acanthocarpa* var. *coloradensis*), propagated from a plant collected in 1936 from the Clark Mountains in the eastern Mojave Desert, blooms in the Plant Communities in June of 2006.



A visitor enjoys Point Reyes meadowfoam (*Limnanthes douglasii* ssp. *sulphurea*) and Pacific Coast Hybrid irises (*Iris* Pacific Coast Hybrids) in the riparian meadow on the Mesa.

homepage. Changing plant images reinforce the message that California native plants can beautify gardens. The “Gardening with Native Plants” section includes plant lists, gardening tips, and articles. The “Gardening Tips” section contains short, introductory information on many topics, including how to start a native garden, irrigation options, sources for native plants, and places to see native gardens.

For beginners, native plant gardening is often overwhelming. Hobbyists and professionals throw around long, intimidating Latin names. The sheer number of new and unfamiliar plants, even when labeled with more understandable common names, is daunting. With this in mind, the Garden developed “The California Classics Plant Palette.” This document provides five lists for different planting situations: Oak Woodland, Riparian Woodland, Chaparral and Scrubland, Mojave Desert, and Colorado Desert. Each list includes a small number of garden-worthy native trees, shrubs, and perennials. This document is

distributed through the Garden Shop and can be downloaded from the website.

Community Education Classes

Community Education Classes are offered throughout the year. Classes are directed at various levels, though many are designed for the novice. Some provide hands-on experience with horticultural techniques, including propagation and container gardening. Other classes provide seasonal tips for the native garden. Attendees are encouraged to share their gardening experiences during these classes. Garden tours led by staff and volunteer docents also help familiarize the public with native plants in horticultural settings.

THE BROAD MAJORITY

Outreach

Many people have some background in horticulture and are aware of the appropriateness of native plants for gardens. Often they are interested in using native plants, but lack important information. Some

need to know where they can buy or see native plants. Others want plant suggestions for specific garden needs. Others request horticultural information on plants that are performing poorly in their gardens. Again, through the Horticulture Outreach program, these individuals have access to the collective horticultural expertise of the Garden.

Others who fit in this intermediate group have expertise in traditional, non-native horticulture. Not only do they lack information on appropriate native plants, they often do not understand the need for different horticultural practices. RSABG offers classes and symposia to Master Gardeners and landscape professionals that highlight the maintenance differences between native and non-native gardens.

Much of the information on our website is geared toward this intermediate group. These individuals know enough about plants to ask fairly specific questions. Plant lists with suggestions for high elevation, seaside, slope, and habitat gardens are especially helpful to these gar-

deners. They often request additional information that is handled through the Garden Hotline or email, and may require research or consultation with RSABG experts.

Annual Plant Sales

In addition to the ongoing Garden Shop plant sales, RSABG holds two large sales each year. The fall sale is scheduled for the first week-end in November, an ideal time for planting a native garden, especially in our hot, inland climate. The spring sale is much smaller in size and features perennials that are better adapted to spring planting. These plant sales meet several horticultural needs. First of all, despite increasing interest in California natives, their availability is still woefully inadequate. Our fall sale offers about 14,000 potted plants of nearly 800 different taxa. Two weeks before the



California fan palms (*Washingtonia filifera*) in the palm oasis display in the Desert Garden.

sale, a preliminary plant list appears on our website. Gardeners from all over California and beyond consult

this list. The list helps gardeners learn about the enormous diversity of California native plants, and assists in plant selection.

Staff members from all departments participate in the plant sale. The Education Department offers horticulture classes at various levels during the fall. At the sale, customers find researchers, students, herbarium staff members, librarians, and the entire nursery and horticulture crew eager to assist them in selecting the perfect plants for their gardens. It is truly an institution-wide event aimed at disseminating both native plants and horticultural information.

The spring plant sale is much smaller in scope (about 6,000 plants and 500 different kinds), but draws many gardeners who cannot resist planting during our glorious spring. Again, its very scope is informative.

Young Joshua trees (*Yucca brevifolia*) and pink fairydusters (*Calliandra eriophylla*) accompany (left to right, front to back) a hybrid prickly pear (*Opuntia engelmannii* x *Opuntia phaeacantha*), giant beargrass (*Nolina parryi*), spiny rush (*Juncus acutus* ssp. *leopoldii*), California fan palm (*Washingtonia filifera*), desert agave (*Agave deserti*), and Fremont cottonwood (*Populus fremontii*) in the Desert Garden.





TOP: California fuchsia cultivars (RSABG's introduction, *Epilobium* 'Route 66', is in full bloom on the left) provide vibrant color in October in the Cultivar Garden. • BOTTOM: White sage (*Salvia apiana*), deer grass (*Muhlenbergia rigens*), Pigeon Point coyote brush (*Baccharis pilularis* 'Pigeon Point'), Russian River grape (*Vitis* 'Russian River'), and *xChiranthofremontia lenzii* 'Griff's Wonder' south of the Lantz Outdoor Classroom on the Mesa.

The absence of native trees and shrubs reinforces the common-sense practice of fall and winter planting in Southern California, and any disappointment felt by gardeners is assuaged by the large variety of grasses, coral bells, Pacific Coast Hybrid irises, penstemons, and numerous other showy and useful perennials.

Volunteer Program

RSABG's volunteer program

makes a significant contribution to the Garden and its efforts in native plant horticulture. Nearly 200 volunteers donate over 20,000 hours of work each year. Before joining the cadre of volunteers, participants attend classes on native plants for four weeks, totalling 12 hours of training. Those who become Garden docents continue to take additional classes. In effect, the volunteers become Garden ambassadors who disseminate native plant horticultural information to the public. In addition to leading tours and working in every department of the institution, volunteers also participate in "work days," working side-by-side with Garden staff throughout the grounds. Students from local colleges often join the group. This collective activity allows staff and community members to share hands-on, horticultural experiences.

Integrated Pest Management

The Garden recently hired an Integrated Pest Management (IPM) professional to improve its horticultural practices. As the Garden continues working toward effective and environmentally sound practices, the information is shared with the pub-

lic through many of the activities mentioned above, especially the Garden Hotline. As we experiment with new IPM approaches, the information is presented to the public on our website and with Garden signage. The use of soil solarization for weed control in Fay's Wildflower Meadow is a good example. Confronted with a serious weed problem in our large annual wildflower display, the Garden collaborated with Dr. James Stapleton, University of California IPM Plant Pathologist, on soil solarization of the area. Signage at the Garden and information on our website educate the public on this practice.

NATIVE PLANT EXPERTS

Symposia

RSABG hosts and participates in professional-level symposia to foster the continued development of native plant horticulture. The sixth symposium of the *Out of the Wild and Into the Garden* series was held at RSABG in April 2008. These provide an opportunity for horticultural experts to share information among themselves and with the public. The last day of the three-day 2008 sym-

Outstanding specimens of Joshua trees (*Yucca brevifolia*) flower in March in the Plant Communities.





A nearly 40-year-old bigberry manzanita (*Arctostaphylos glauca*) in the Plant Communities.

posium featured talks on the seasonal performance of California native plants in gardens. The general public was encouraged to attend the Saturday session. Proceedings of the first three symposia are published as part of the Garden's *Occasional Publications*.

Cultivars

RSABG has released over 106 cultivars. It continues to select and evaluate promising plants for horticultural purposes. A list of these cultivars can be found in Bart O'Brien's article "The Horticultural Contributions of Rancho Santa Ana Botanic Garden" (Rancho Santa Ana Botanic Garden Occasional Publications 3, 1999. Claremont, CA, pp. 65-78).

Herbarium and Research Library

The Garden's herbarium of over one million dried specimens is approximately the eighth largest in the United States. It is recognized throughout the world for its strength

in plants of California, which constitute nearly 40 percent of the total collection. The holdings from Southern California are unsurpassed by any other herbarium. The historic distribution of native plants that can be gleaned from herbarium specimens provides valuable guidance on horticultural practices. For example, plant lists for revegetation projects along riparian corridors have been developed from both written and herbaria research of the historic flora.

RSABG's Research Library contains approximately 48,000 volumes and 750 current journals and periodicals. The collection has a strong focus on systematic, floristic, and evolutionary botany, horticulture, California natural history, and ethnobotany of California and southwestern North America. Its collection contains important historic and current materials. It houses the Garden's institutional archives, which contain staff publications, original manuscripts, field notes, original artwork, photographs, cor-

respondence, and historical documents from both the original Orange County and current Claremont sites. The library is an outstanding resource for researchers and the general public.

CONCLUSION

Since the Garden's establishment in 1927, it has been dedicated to research and the dissemination of information on California's native flora. Increasing environmental concerns have further focused attention on native plant horticulture. RSABG actively promotes the advancement of California native plant horticulture through its many departments and programs. It meets a broad range of needs, and is always reviewing these programs to develop new ways to better fulfill this mission.

Rancho Santa Ana Botanic Garden, 1500 N. College Avenue, Claremont, CA 91711; (909)625-8767; www.rsabg.org • Barbara Eisenstein, barbara.eisenstein@cgu.edu



A view of Theodore Payne Foundation from Wild Flower Hill. Photograph by K. Gilliland.

THE THEODORE PAYNE FOUNDATION GARDENS

by John Wickham

There's something about the gardens at the Theodore Payne Foundation in the Los Angeles community of Sun Valley. Something that attracts both experienced and neophyte native plant gardeners. The place isn't easy to find. Most freeways skirt the area, and the Foundation's property is

hemmed in on all sides by homes and horses. If you were looking to locate a nursery, display gardens, and educational facility in the best spot for reaching the metropolitan masses of Los Angeles, this wouldn't be your first choice.

Yet once you drive up that old dirt road and step out into the val-

ley sun, it all starts to make sense. You're keenly aware of the scents of sage and sagebrush; the sounds of hummingbirds and quail; the pale grays, muted greens, and warm golds of native foliage; the floral waves of red, yellow, and blue. You instantly leave the new California of highways and subdivisions and

enter the old state of sycamores and oaks. The Foundation, an educational non-profit organization, was established in 1960 to continue the work of Theodore Payne (1872-1963), the noted horticulturist and nurseryman who introduced more than 400 species of California native plants to gardeners around the world. Payne's inspiring talks, his work with the Southern California Academy of Sciences, his founding of the California Association of Nurserymen, and his breadth and depth of botanical and horticultural knowledge garnered worldwide respect. He regularly explored the undeveloped California landscape in search of new native plants for his nursery. Over the years, Payne's catalogs offered an expanding range of seeds, either grown at his nursery on Los Feliz Boulevard in Atwater Village (near downtown Los Angeles) or gathered by Payne and his friends in the wild. Upon Payne's retirement from the nursery business, a group of horticulturists and botanists formed the Foundation to continue his work. In keeping with Payne's objectives, one of the Foundation's missions was to ensure that California native plants would be made available to home gardeners.

After years of looking for a site for the Foundation's home, Eddie Merrill, owner of La Tuna Nursery and one of many California nurserymen who knew and respected Theodore Payne, donated his 20-acre property in Sun Valley. Merrill's gift provided the Foundation with space for growing and offering native plants and a relatively unspoiled setting where these plants could be viewed and appreciated by the resi-

TOP: California bells (*Phacelia minor*), cliff desert dandelion (*Malacothrix saxatilis*), and laurel sumac (*Malosma laurina*) are naturally occurring species on Wild Flower Hill. Photograph by J. Wickham. • BOTTOM: Southern California's bush lupine (*Lupinus longifolius*) blooms in the entrance garden. Photograph by K. Gilliland.





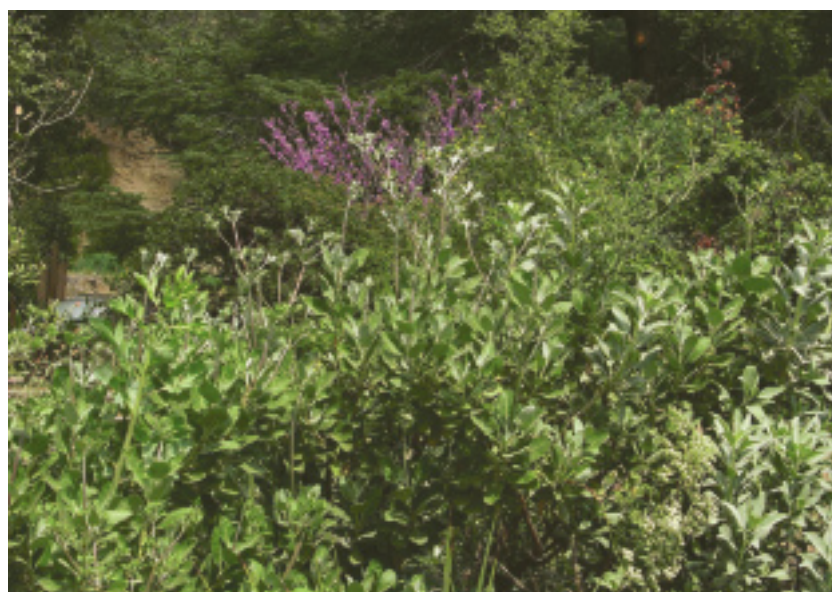
TOP: Joyce Coulter ceanothus (*Ceanothus* 'Joyce Coulter') and California poppies (*Eschscholzia californica*) bloom in the nursery sales yard demonstration garden. • BOTTOM: Nevin's barberry (*Berberis nevinii*), a species popularized by Theodore Payne in the early 1900s, and California sunflower (*Encelia californica*) are planted on a sun-drenched, south-facing slope. Photographs by K. Gilliland.

dents of Los Angeles—in honor of a great man. The Foundation has always been supported by the efforts of creative volunteers dedicated to our mission to promote the use and appreciation of California's native flora. As a result, garden plantings have ranged from inventive, individualistic amateur projects to beautifully designed plans by such notables as landscape architect Bob Perry. The overall aesthetic effect, though, has ebbed and flowed with the ardor and availability of such volunteers. Today, the Foundation's gardens reflect the strong "bones" of previous efforts and the potential for refinement and rejuvenation. Over the last five years, dedicated staff and volunteers have made huge strides in bringing a fresh approach to the Foundation's gardens. There are three main sections to the Foundation's gardens: demonstration plantings in our retail nursery, where visitors can see what young plants in pots will look like when full grown; gardens around our bookstore and education center that typify home garden plantings; and Wild Flower Hill, a largely wild area of coastal sage scrub dedicated to wildlife and wild flowers.

As anyone who has been to a plant sale knows, it can be difficult to imagine how a little stick in its tiny pot can become a 15-foot-tall big berry manzanita (*Arctostaphylos glauca*) or a ten-foot-wide carpet of Bee's Bliss sage (*Salvia* 'Bee's Bliss'). For context, the grounds of our year-round nursery feature mature examples of many different trees, shrubs, and perennials. Riparian, desert, and other "theme" gardens show customers how to group plants by common cultural needs.

A set of rain gardens was re-

TOP: The Foundation's new rain garden is designed to capture and slow storm water runoff from the nursery service road and sales yard. Photograph by J. Wickham. •
 BOTTOM: Saint Catherine's lace (*Eriogonum giganteum*) begins to bloom in the entrance garden. Photograph by K. Gilliland.





An unnamed *Ceanothus* hybrid in the nursery sales yard demonstration garden. Photograph by K. Gilliland.

cently installed, with a desert theme planting, to highlight the importance of managing stormwater runoff by capturing rainwater. One rain garden, located in the hottest, sunniest spot on our grounds, features penstemons, sunflowers, wild flowers, and grasses found in our local deserts. Another, in a shadier spot, provides an opportunity to showcase a meadow as an alternative to a lawn.

The gardens around the ranch-style house that serves as our bookstore, seed store, and art gallery are designed to help gardeners understand how native plants can be used around a home, in intimate scale and with typical landscape elements. Visitors are greeted by a “lawn” of red fescue (*Festuca rubra*), waves of bright green to brighten a woodland garden. Handsome hedgerows, perennial beds, small shrubs, groundcovers, and flowering annuals are found throughout. Behind the build-

ing, a grove of mature western sycamores is a perfect spot for a picnic lunch, complete with butterflies and birdsongs.

Tucked up behind the nursery is a small 1940s era cabin that has been recently renovated for use as an education center. The shelter provided by surrounding hills allows species found on the Channel Islands and in coastal plant communities to thrive. Ironwoods, coral bells, Catalina currant, and island oak give this small garden a comfortable feel that new gardeners can appreciate.

Wild Flower Hill, overlooking the nursery, was once a prime attraction at the Foundation. The late Kevin Connelly worked tirelessly for years to create displays of spring wild flowers, always the stars of the show at our annual Poppy Day celebrations. Great masses of poppy, phacelia, chia, and others graced the sun-drenched slopes, drawing visi-

tors up the trail to bathe in amazing swaths of color. But over time, without constant attention to clearance, the force of habitat succession reasserted itself on Wild Flower Hill and elements of the Verdugo Hills coastal sage scrub community reestablished their dominance. This is as it should be: an opportunity for all to see how components of a natural plant community produce visual harmonies that can be translated to the home garden.

Wildlife and plant-animal relationships are important elements of the Foundation’s gardens. Many gardeners want landscapes with butterflies and birds, in order to admire and study their behavior. Our diverse plantings include species that attract pollinators and beneficial insects; support larval and adult butterflies and moths; and provide food and habitat for birds and mammals. Lizards do push-ups and play hide-and-seek between stones in the dry

stacked walls around the parking lot. Our gardens reveal how California natives come to life in fascinating, unexpected ways. Over 60 species of birds have been identified in the Foundation's gardens. On any day, visitors can usually spot Cooper's hawks circling above the canyon or thrashers skimming through the dense chaparral. A morning trek up Wild Flower Hill will flush out a covey of quail. The Anna's hummingbird that nests each year in the sycamore outside our bookstore window is as likely to feed on the Manzanita blossoms near your head, as to sit in the nearby scrub chittering at you to move along. Alas, the albino western to-whoe has moved on.

Weekday visitors may find their reverie interrupted by the chatter of school children. Following lessons in leaf adaptation or plant-animal interactions or Native American life ways, teams of exuberant nine-year-olds can be found speed-walking (they know not to run) through the gardens, looking for plants with fuzzy or waxy leaves. Educational programs have been developed to combine scientific and cultural instruction with hands-on experience with plants in the gardens. Interaction with native plants, outdoors, is an essential part of the learning experience, and a critical purpose of the Foundation's gardens.

At Theodore Payne Foundation, there are no majestic vistas, imposing backdrops, or large water features. Instead, our gardens are partly cultivated, rather rustic, and comfortably wild, expressing the ever-evolving vision and hopes of our volunteers and friends and exhibiting that certain something that entices visitors to return again and again to this distinctly California place.

Theodore Payne Foundation for Wild Flowers and Native Plants, 10459 Tuxford Street, Sun Valley, CA 91352; (818)768-1802; www.theodorepayne.org • John Wickham, jwickham@sbcglobal.net



TOP: The shaded picnic grounds are beneath a grove of western sycamore (*Platanus racemosa*).
 BOTTOM: Entrance to the Theodore Payne Foundation nursery sales yard and demonstration garden. Photographs by J. Wickham.



The iconic meadow at the Santa Barbara Botanic Garden, framed by the Blaksley Boulder, coast live oaks, the Ground Cover Display, and the Santa Ynez Mountains. All photographs by C. Bornstein.

HORTICULTURE AT THE SANTA BARBARA BOTANIC GARDEN

by Carol Bornstein

Founded in 1926 as an educational and research institution, the Santa Barbara Botanic Garden is the oldest botanic garden devoted to California's native flora. Located in Mission Canyon in the foothills of the Santa Ynez Mountains, the garden was conceived by Frederic Clements, eminent plant ecologist, to exhibit, conserve, demonstrate, and experiment with native plants as well as exotic species. According to his vision, "[T]he chief function of a botanical garden is exhibition, by which the kinds, names, uses, behavior, and relationships of

plants are made available to all those interested, at the same time that it develops the interest of others."

Based on Clements' scheme, the Garden was organized into naturalistic plant communities (coast redwood forest, oak-madrone woodland, chaparral, prairie, sagebrush, desert, and giant sequoia); experimental gardens; and taxonomic collections. Under the dedicated leadership of co-directors Elmer and Ervanna Bissell, the young garden began to take shape. Within the first year, beds and paths were carved into the initial 13.7-acre parcel. Thousands of feet

of water lines were laid; sandstone boulders were moved or split into manageable sizes for steps or to define beds; and seeds and plants were obtained from such notable collectors as Theodore Payne, Carl Purdy, and Lester Rowntree. Hundreds of taxa were planted in the new lath house or directly in the ground. An island section devoted to plants of the California Channel Islands was also added to the plan. In keeping with its educational goals, plants were labeled with the common and scientific name, family name, and natural habitat.

This was an era of considerable interest in, but scarce horticultural information about, California's native flora. Despite severe funding limitations and heavy losses due to pests, diseases, and inexperience, the Bissells and their small staff persisted in their efforts, and successes eventually eclipsed failures. By 1931, most of the original garden sections were well established, ground was broken for new taxonomic collections (e.g., the genus *Eriogonum*), and word of the beautiful young Garden began to draw visitors from far and wide.

During its first decade, all of the Garden's displays were designed by Eryanna Bissell, whose flowery articles and correspondence expressed her ideas about the botanic garden, native plants, and the compositions she created. In 1931, she wrote "[T]he garden's aim is not to recreate a wild garden. Its object is to use plants native to wild places, and adapt them to cultivated surroundings. . . . Because a plant once grew in poor, rocky soil is no reason why it should always struggle with poverty. The chief endeavor is to find a plant's 'range of tolerance' and carefully increase it." This sentiment articulated a horticultural mission for SBBG that is still relevant.

The Bissells were so busy growing the Garden that they made no attempt to maintain plant records of any kind. It was not until Maunsell Van Rensselaer was hired in 1934 that such documentation was initiated, setting in place curatorial practices that continue to this day. Serving as director from 1936 to 1950, Van Rensselaer also launched numerous educational and research programs and promoted these activities in the community. His interest in trees—both native and exotic—and in the genus *Ceanothus* culminated in two publications: *Trees of Santa Barbara* in 1940, and *Ceanothus*, co-authored with Howard McMinn, in 1942. He was instrumental in the effort to adopt coast redwood as the state tree. It

was largely due to his urging that in 1936 the Garden's board of trustees restricted all future plantings to California natives.

Another legacy of Van Rensselaer's tenure was involving Lockwood de Forest and Beatrix Farrand in the redesign of key parts of the grounds, in particular the meadow, courtyard, and entrance. Although these highly respected landscape architects often held conflicting views about the appropriateness of formal design elements within the botanic garden (de Forest was strongly opposed to any formality in the Garden and preferred a naturalistic aesthetic), their collaboration had an enduring impact on the character of these core areas. Farrand's design for the courtyard, with the now-70-year-old clipped hedge of lemonade berry (*Rhus integrifolia*) flanking the view of the Blaksley Boulder from the library steps, is one of the very few public examples of California native plants used in such a classically formal way.

Building upon Van Rensselaer's efforts, Director Katherine Muller (1950–1973) expanded the research and educational programs and took up the pen herself, writing leaflets and articles about the flora and the ornamental virtues of native plants. In addition to co-authoring a new edition of *Trees of Santa Barbara*, she taught the popular "Trees about Town" class, and led field trips to see wildflowers. One of her most significant contributions to California horticulture was hiring Horticulturist Dara Emery in 1955. Dara's first project was to grow plants for the new Home Garden, a small, low-maintenance garden designed by Ralph Cornell to showcase natives that were easy to obtain and grow. *Sunset* magazine featured the Home Garden in 1958, boosting homeowners' interest. This display represented a departure from Clements' plant community and taxonomic scheme, yet demonstrated Muller's understanding of the need for the

Garden to remain relevant to various audiences. In the same vein, the Garden responded to visitors' requests for lawn substitutes and ground-hugging plants by creating a ground cover display below the meadow, a site it still occupies. Both experimental and time-tested species of *Baccharis*, *Ceanothus*, *Eriogonum*, *Arctostaphylos*, and other genera were planted.

In his first year at the Garden, Emery began teaching plant propagation, one of our most popular and enduring classes. A series on gardening with native plants soon followed, and became another favorite. Through these and other classes, lectures, and publications, Emery shared his enthusiasm and knowledge with countless people, many of whom went on to pursue careers in horti-

Desert beargrass (*Nolina bigelovii*) in flower, with giant beargrass (*Nolina parryi*) to the right, and California fan palm (*Washingtonia filifera*) in the background, in the Garden's Desert Section.





A late summer scene of California buckeye (*Aesculus californica*) and bunchgrasses.

culture as a result of his mentoring.

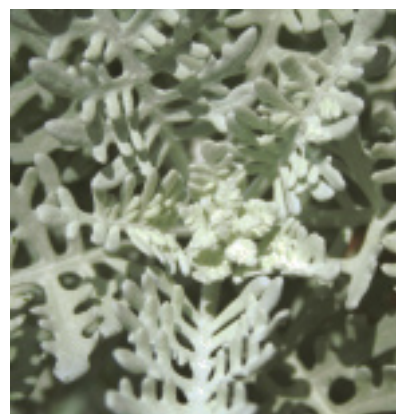
While propagating thousands of plants for the living collections, Emery conducted extensive germination trials on a long list of native seed, as precious little written information was available to guide his earliest endeavors. His research culminated in the publication of the leaflet, *Seed Propagation of Native California Plants* in 1964. Twenty years later, he embarked on an exhaustive review of his records to write the more comprehensive 1988 edition. This invaluable reference is still widely used and considered the “gold standard” for professional and lay propagators.

As interest in gardening with native plants grew, availability did not keep pace. A practical man, Emery came up with the idea to sell surplus nursery plants to botanic garden members, thereby initiating our ever-popular annual fall plant sales. Once funds were raised to build a new and larger nursery, he proposed that the newly formed Garden Growers volunteer group take over the old facility to propa-

gate and sell native plants to the public on a regular basis. Now open daily, the Garden Growers Nursery has become an important source of California natives and unusual drought-tolerant exotics. The nearby Garden Shop has a widespread reputation for its fine selection of gardening and botanical books.

Resuming the breeding work that Van Rensselaer had begun, Emery took up the charge articulated in the Garden’s 1939 annual report: “The

The lacy-white foliage of Catalina Island snowflake (*Eriophyllum nevinii*).



garden . . . proposes to use every means at hand to improve the quality of [native] plants by selection, budding, grafting, breeding, etc. . . . [T]he far-reaching significance of this policy will probably not be noted for some years to come but it is bound eventually to have a marked beneficial effect on the value and greater use of California plants as ornamentals.” He saw plant breeding as a pathway to wider acceptance of California natives in gardens. The goal of his breeding program was to create plants with greater adaptability to typical garden conditions, and with support from directors Muller and Ralph Philbrick, he started the garden’s plant introduction program. With several fine *Heuchera* cultivars to his credit (e.g. *H.* ‘Canyon Duet’ and *H.* ‘Canyon Delight’) and his award-winning selection, *Iris* ‘Canyon Snow’, Emery was responsible for 22 of the Garden’s 39 introductions. Other notable Garden introductions are Dara’s Choice sage (*Salvia* ‘Dara’s Choice’), De La Mina lilac verbena (*Verbena lilacina* ‘De La Mina’), and Silver Carpet California-aster (*Lesingia filaginifolia* ‘Silver Carpet’). Gardeners can thank Dr. Philbrick’s interest in the flora of the Channel Islands for a stream of cultivars from these horticulturally rich locales, including Canyon Sparkles island manzanita (*Arctostaphylos insularis* ‘Canyon Sparkles’) and Canyon Silver island snowflake (*Eriophyllum nevinii* ‘Canyon Silver’), as well as his own selections, Canyon Gray California sagebrush (*Artemisia californica* ‘Canyon Gray’) and Canyon Prince wild ryegrass (*Leymus condensatus* ‘Canyon Prince’).

Another horticultural outcome of Philbrick’s leadership (1973-1987) was his support for changing the scope and look of the Garden’s meadow. Long admired for its famous springtime display of annual wildflowers, this focal point was weed-choked and rather disappointing the rest of the year. Staff interest

in grasslands spurred a shift toward creation of a native prairie anchored by perennial bunchgrasses and forbs woven among the wildflowers. This extended the aesthetic interest beyond spring, increased the botanical diversity of the composition, and provided a rich habitat for wildlife. Other goals were to reduce water needs and improve the heavy texture of the soil. Native grasses are latecomers to the gardener's palette of ornamental plants and the Garden continues to champion their utility and beauty while simultaneously using the meadow to enlighten visitors about the need to protect California's endangered grasslands.

Under Director David Young's leadership (1988-1991), a new series of landscape symposia for landscape professionals and home gardeners was initiated and offered for

ten years. Through lectures and tours of local gardens, these events focused on the art and science of garden design in California, emphasizing landscape traditions, floras of Mediterranean climate regions, and ecologically responsible practices.

During the height of a prolonged drought, Young earmarked funds for a new home demonstration garden. This timely, comprehensive display



showcased water-thrifty native plants in a residential setting (surrounding a 1920s-era California cottage). Designed by landscape architect Ron Lutsko in collaboration with garden staff, the display includes numerous interpretive signs that describe the principles involved in creating and maintaining a water-conserving landscape. It remains a popular destination for gardeners seeking ideas on how to use native plants for year-round beauty, and features hedges, ground covers and turf sub-

ABOVE: The bright, rosy-violet flowers of the recent SBBG introduction, Amethyst Bluff purple sage (*Salvia leucophylla* 'Amethyst Bluff').
 • BELOW: Chaparral yucca (*Hesperoyucca whipplei*) and California buckwheat (*Eriogonum fasciculatum*) grow along the Porter Trail.





A composition of silver and green foliage in the Ground Cover Display punctuated by vibrant California poppies.

stitutes, container gardens, and various hardscape elements.

In the 1990s, a renewed effort to label plants for the public was bolstered by grant funds. Staff also wrote a number of horticultural brochures and bulletins that offered visitors handy, inexpensive references on the myriad uses and ornamental quali-

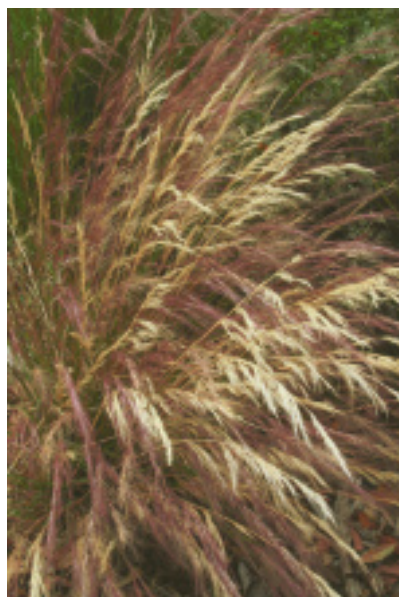
ties of California native plants. Examples included tips on designing a water-wise perennial border, what to plant in the understory of established oak trees, bunchgrasses for the garden, etc. Precedent for these publications dates back to the 1940s, when the Garden's leaflet series was started. Written by Van Rensselaer,

Muller, Emery, and guest authors, these occasional articles covered a range of botanical and horticultural topics.

Several certificate and training programs were developed or formalized in this period. Our knowledgeable docents share all manner of botanical, horticultural, and natural history information with visitors. The Garden Growers propagate native plants to sell, and impart helpful gardening information to customers. The botanic garden co-sponsors a Master Gardener program with University of California Cooperative Extension, training avid gardeners about appropriate gardening practices for our region. They, in turn, volunteer their time answering gardening questions and providing hands-on assistance with horticultural projects in the community. Recently, SBBG became a co-sponsor of the Certified Green Gardeners, a program supported by several local agencies that trains and certifies professional gardeners in resource-efficient landscape maintenance practices.

When Edward Schneider became Director in 1992, funds for Emery's plant breeder position were no longer available. Schneider strengthened the Garden's plant introduc-

BELOW LEFT: Multicolored flower stalks of purple three-awn (*Aristida purpurea*). • BELOW RIGHT: Drifts of Canyon Gray California sagebrush (*Artemisia californica* 'Canyon Gray') and Island Pink yarrow (*Achillea millefolium* 'Island Pink') lead the eye to bunchgrasses, rushes, and sedges in the meadow.



tion program by recommending that prospective cultivars undergo a formalized external evaluation. Carol Bornstein established a network of botanic gardens, arboreta, and wholesale nurseries to serve as test sites for Garden selections. Staff members garner valuable cultural information from these trials to share with landscape professionals, the nursery industry, and customers once a clone is officially introduced.

The generous gift of an authentic Japanese teahouse presented an opportunity for the Garden to reach new audiences. The ancient tradition of the tea ceremony is deeply interconnected with the surrounding tea garden, and together they signify a cultural reverence for nature, an aesthetic that the Garden has embodied since its inception. Sitting the structure amidst mature oak, manzanita, madrone, Port Orford cedar, and massive boulders, the “bones” for this naturalistic tea garden of California native plants were well established. From a horticultural perspective, this display demonstrates a novel approach to an ancient garden style emulated worldwide.

With encouragement from Dr. Schneider, this writer collaborated with David Fross and Bart O'Brien to co-author *California Native Plants for the Garden*, a national award-winning book published by Cachuma Press in 2005. The following year, Timber Press published a new and completely revised edition of *Ceanothus*, co-authored by Fross and Garden botanist Dieter Wilken.

Behind the scenes, yet integral to these activities and accomplishments, is the Garden's library. From its humble beginnings to its current, bursting-at-the-seams facility, the Blaksley Library houses an outstanding collection of books, journals, and images that are used by staff, volunteers, visiting scientists, landscape professionals, and home gardeners. It is a little-known trea-



The vertical flower stalk and spiky rosettes of chaparral yucca (*Hesperoyucca whipplei*) contrast with the rounded canopy and horizontal flower clusters of California buckeye (*Aesculus californica*).

sure that contains a remarkable store of horticultural knowledge.

The next horticultural frontier at the Santa Barbara Botanic Garden will undoubtedly build upon the 82-year legacy of research, education, conservation, and display set forth by Frederic Clements. With new partners, we are creating public demonstration sites and school gardens, and restoring degraded habitats in the community, reaching gardeners young and old. Planned upgrades to the Garden's antiquated irrigation systems will conserve water, and will increase the Garden's ability to grow and display a wider array of California native plants. This will yield valuable information about the water needs of native species that will then

be shared with gardeners. These and other endeavors will continue to foster an appreciation and understanding of California native plants that will help conserve them for future generations.

A special note of thanks to Elizabeth Collins for her thoughtful improvements to this account and to Mary Carroll for her scholarly history of the Garden, “A Garden for All Time: The Santa Barbara Botanic Garden,” in 2005, *Noticias* 50–51(4–1):1–58.

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CALIFORNIA NATIVES IN THE UNIVERSITY OF CALIFORNIA, SANTA CRUZ ARBORETUM

by Brett Hall

California natives have been at the heart of University of California, Santa Cruz (UCSC) Arboretum collections since our beginnings in the early 1970s, but to some degree they have grown under the shadow of

our other Pacific Rim collections (Australia, New Zealand, etc). Current Arboretum thinking is bringing our native plant program to the forefront. Trips into the wild for native selections have been ongoing over the years, and many horticultural

introductions from UCSC have flourished in the nursery trade. Our current focus is a little different, with an emphasis on field work, ecology, and developing gardens based on plant communities and associations. This is our “life after cultivars” phase in native plant gardening. Acreage for developing native gardens is greater than any other geographic region represented in the Arboretum. It is larger than the acreage designated to Australia, New Zealand, and Africa combined! Many of the Arboretum’s oldest trees are natives. Overall, approximately 57 acres of land are committed to native plants.

Two main Arboretum areas set aside for natives are the Entrance Native Garden, which was conceived as a relatively small “natives-come-first” section near the present Arboretum entrance, and the 55-acre California Province Gardens, which we are in the process of developing.

The Entrance Native Garden serves both as a repository and exhibit place for attractive native species. It is a relatively small garden loaded with local species, species outside our region, and cultivars available in the nursery trade. It is a place where people can learn about natives and their pollinators, ethnobotany, taxonomy, garden design, and many other topics. Outcrops or rock gardens are featured, as well as splashes of wet meadows, coastal bluffs, grasslands, woodlands, and shrublands.

SPECIALTY COLLECTIONS

Native Bulb Collection. This collection includes mariposa lilies (*Calochortus* spp.), triteleias (*Triteleia* spp.), fritillarias (*Fritillaria* spp.), fawn lilies (*Erythronium* spp.),

Brett Hall collecting seeds of Santa Lucia fir (*Abies bracteata*) on the east side of Cone Peak in the Santa Lucia Mountains in September 2007. Photograph by C. Hudson.





Northern riparian woodland eco-region in the Arboretum during a storm in February 2008, with the author's son, Austin, in the background. Photograph by B. Hall.

and wild onions (*Allium* spp.), among others. Bulbs have special collection care status in the Arboretum due to their particular cultivation requirements. Our success ebbs and flows with our ability to keep up with weeding and keeping predators at bay. We love them and grow them as much as we can. Most are housed in containers, but frequently find their way into the Garden.

Conifer Collection. Our conifer collection is extensive, as our holdings include most of the known genera in the world. Most of the southern hemisphere Podocarpaceae genera and many species of *Araucaria* and *Agathis* (Araucariaceae) are among these. Our native conifer collection is impressive, but not exhaustive, and has room to expand.

Central Coast Region Collection. We are building a significant

Santa Cruz and Central Coast collection with much in seed storage awaiting planting, and more still to be collected and grown. Over the last year, with the help of local botanists (especially Jim West and Randy Morgan) we have acquired a hefty seed bank from northern coastal watersheds of Santa Cruz County. In the next year we plan to work diligently to get this collection well-established in the nursery and then in the Garden.

Dudleya Research Collection. This collection contains 30 of the 35 rare and endangered species in the genus. As such, the Arboretum's *Dudleya* collection is a significant gene bank. Of the species that grow in California, the Arboretum has 25 of the 26 *CNPS Inventory's* list 1B species, making it an important collection of California native

plants. Six of the list 1B taxa and some of the Baja California species are rarer than some of the Federally listed species. Eight of the California taxa of *Dudleya* are officially listed as U.S. endangered or threatened species.

The *Dudleya* collection consists of several thousand plants with collection data. The collection is increased, whenever possible, by trading with other gardens and by propagation in cultivation. Results of artificial hybridization experiments have provided insight to the evolution of species within the genus. Several hundred hybrid plants are being evaluated to choose those with the greatest horticultural potential.

By conserving rare plants in the Garden and sharing cuttings with other botanic gardens, we help to insure the long-term survival of the



species. Some of these species exist on only one island or one bluff on less than an acre of land. Development pressures are considerable in coastal Southern California where several of these species grow. Through plant sales of plants propagated in cultivation, we have helped to distribute the plants and reduce collection pressure on wild populations.

ABOVE: A low mounding form of California sagebrush (*Artemisia californica*) grows in the Entrance Native Garden coastal bluff display. • LEFT: El Tigre pitcher sage (*Lepechinia fragrans* 'El Tigre') was originally collected on El Tigre Mountain on Santa Cruz Island. Photographs by B. Hall.

CALIFORNIA PROVINCE GARDENS

The wildest and most topographically diverse portion of the Arboretum, often referred to as the “back forty,” is being developed as California Province Gardens. It will showcase flora from two broad regions, Central Western and Northern California. The Province Gardens area encompasses 55 acres in the jointly managed northwestern part of the Arboretum and Campus Natural Reserve. The site is on an ancient marine terrace and alluvial material with gentle to moderately steep hillsides facing south, east,

and west. Elevation ranges from 600 feet at the top of the coastal prairie knoll near Oakes College to 395 feet at the bottom of the Arboretum reservoir in the Northern California Province. Much of the area is former pastureland dating back to the late 1800s, when the Henry Cowell Ranch occupied the site. Somewhat degraded coastal prairie occurs over the area with patches of native bulbs and wildflowers, including extensive sweeps of sky lupine (*Lupinus nanus*), California poppy (*Eschscholzia californica*), and healthy colonies of pretty face (*Triteleia ixioides*), yellow mariposa lily (*Calochortus luteus*), and har-

vest brodiaea (*Brodiaea elegans*), among others.

Three small canyons run through the site, carrying seasonal runoff into a series of limestone sinks and the historic abandoned reservoir located inside the Arboretum's boundaries. Riparian portions of these drainages are home to breeding populations of the threatened California red-legged frog (*Rana aurora*) and a very vocal population of Pacific tree frogs, which prompted Ken Norris, father of the UC Reserve System, to affectionately remember the area as "frog heaven." Numerous other animal species occur in the area, including coyote, bobcat, mountain lion, deer, raccoon, rabbit, squirrel, and several species of snakes, lizards, newts, and salamanders. The avifauna is rich, including many kinds of raptors, with the occasional golden eagle, many species of hawks, hummingbirds, quail, thrashers, swallows, etc. Naturally occurring trees in the canyons and throughout the area are coast redwoods, Douglas-firs, ponderosa pines, and mixed evergreens, including madrones, California bays, and coast live oaks. California buckeyes, willows, and hazelnuts are common as well.

THE LAND

A fairly rich assemblage of geologic bedrock and soil diversity occurs here. Rock types include granite, schist, quartzite, limestone, and several types of sandstones, as well as marine and stream terrace material. Overlying soils are mostly loam to sandy loam with some clay soils. Soil pH ranges from slightly acid to slightly alkaline.

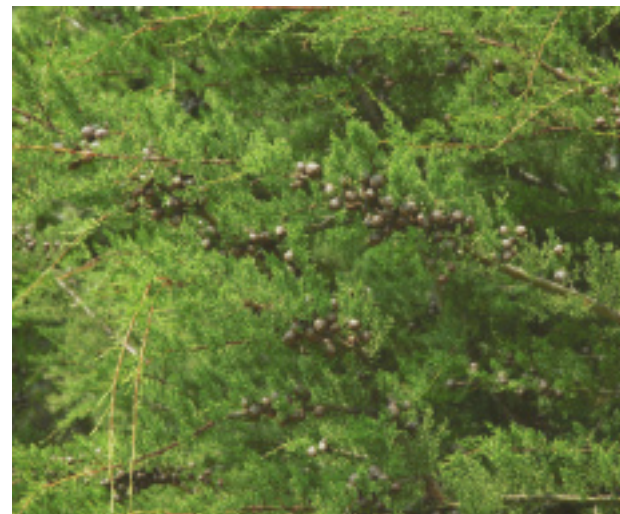
THE CLIMATE

Average rainfall is about 35 inches. Summer highs are normally in the 70s and 80s with an occasional few days in the mid-90s, and, rarely, with temperatures nudging just over 100 degrees Fahrenheit (the



temperature reached 105 degrees Fahrenheit on June 20, 2008). Summer fog and the marine influence provide for a relatively "easy going" summer. Winter temperatures rarely drop below freezing, although it does happen. Our coldest recorded temperature, 18 degrees Fahrenheit, occurred on the coldest night of the great freeze of December 1990, and lasted about four hours. The temperature was even colder in the lowest portion of the old reservoir, where we estimated it may have been 13 degrees Fahrenheit, based on known temperature gradients recorded previously.

Over half of the acreage is being dedicated to the Central Western California Province, represented by the region extending from the Santa Cruz Mountains and San Francisco Bay region through the Central Coast ranges to San Simeon in San Luis Obispo County, or possibly as far south as Point Conception in Santa Barbara County. The Central Western California Province also features a California Channel Islands Garden. Regions which will receive extensive attention for collection, dis-



TOP: Butano Ridge flannelbush (*Fremontodendron californicum* 'Butano Ridge') is one of three known individuals of the species that is native to San Mateo County. • BOTTOM: Santa Cruz cypress (*Cupressus abramsiana*) growing in the central coast closed-cone conifer eco-region of the California Province Gardens. Photographs by B. Hall.

play, and field research are the Santa Cruz Mountains, Santa Lucia Mountains, coastal bluff and maritime chaparral, and the San Carlos Range, among others. Other ecologic and geographic themes will be featured,



ABOVE: California fuchsias (*Epilobium* spp.) have been an ongoing interest of Arboretum staff for many years. Photograph by B. Hall. • LEFT, TOP TO BOTTOM: *Dudleya* hybrid created by Stephen McCabe. Photograph by S. McCabe. • Bowltube iris (*Iris macrosiphon*) growing in the Arboretum Entrance Native Garden. This specimen is originally from the north coast range of Sonoma County. Photograph by B. Hall. • Cobra lily (*Darlingtonia californica*) grown from seed collected from a cross between a plant from the Klamath Range and a plant from the Sierra Nevada. Photograph by B. Hall. • Anna's hummingbird visits a non-native *Grevillea* in the Arboretum. Photograph by anonymous Arboretum volunteer.

including rare plant communities, endemics, endangered and threatened species, dominant species in local communities, exceptional populations, forms, and occurrences, riparian habitats, serpentine communities, and populations of disjuncts.

The rest of the 55-acre area will be devoted to the Northern California Province, which includes natives from the San Francisco Bay Region, North Coast Ranges, Klamath Ranges, southern Cascades, and the Sierra Nevada. The concept

is one of wild gardens featuring plant communities, habitats, and ecological themes that combine species from different geographic areas within Northern California. Examples include woodland, riparian, mixed evergreen, conifer forests, montane, subalpine, alpine, prairie, meadows, chaparral, and various shrublands. Smaller regional communities and associations within Northern California will develop as opportunities to build collections from particular "hot spots" emerge.

A bobcat visits the Arboretum's maritime chaparral eco-region in the Central Western California Province Garden. Photograph by R. Flores.





ABOVE: With funding from the Elvenia J. Slosson Endowment Fund, Arboretum staff and students build a rockery in the Entrance Native Garden. • BELOW, RIGHT: Plantings along the entrance road to the Arboretum include Pajaro manzanita (*Arctostaphylos pajaroensis*), purple sage (*Salvia leucophylla*), and flannelbush (*Fremontodendron californicum*). Photographs by B. Hall.

PONDEROSA PINE

As noted, the native Province Gardens are located in the wildest portion of the Arboretum. One aspect of the wildness that enticed us to locate the Gardens here was the natural occurrence of ponderosa pine (*Pinus ponderosa*). In 1975 there were only two ponderosa pines on the site, but now there are twenty to thirty or more naturally occurring individuals, plus a handful of planted individuals collected from Marshall Fields on the upper portion of the campus. The Santa Cruz stands of ponderosa pine are disjunct from the main montane distribution of ponderosa pine in California and are perhaps the most maritime ponderosa pines anywhere. Dr. Bob Haller has been working on the taxonomy of ponderosa pines and the

local stands in the Santa Cruz Mountains for decades. These trees are well-incorporated into the Garden. *Pinus ponderosa* is the mascot of the native Garden and we will conserve its genetic localism. Great attention will be paid to provenance and genetic integrity issues on a taxon by taxon basis throughout the building of our collections and displays.

We are excited about the development of the Province Gardens and we are actively raising funds, building collections, and encouraging collaborators to accelerate its future. More detailed on-the-ground planning is off and running. For example, an extensive trail network is in the works, and locations for interpretation and wayfinding displays, vistas, benches, and rock gardens (among many other attributes) are being decided. If we can garner the resources,



this coming decade should reveal great progress on the ground.

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Coast redwood (*Sequoia sempervirens*) and redwood sorrel (*Oxalis oregana*) in the Hildegard Grove. All photographs copyright by Yerba Buena Nursery; Sonja Wilcomer and Jennifer Leech, photographers, unless otherwise noted.

GERDA ISENBERG NATIVE PLANT GARDEN AT YERBA BUENA NURSERY

by Kathy Crane and Matt Teel

Situated at 1,200 feet elevation in the Santa Cruz Mountains, between the Pacific Ocean and the San Francisco Bay, the Gerda Isenberg Native Plant Garden enjoys a mild climate with extremely wet winters, brief, hot summers, and very little fog. A natural spring feeds the Garden pond and is also piped underground to feed Woodruff Creek below. A private, well-maintained, unpaved road curves through forests for two beautiful miles before arriving at the two-and-a-half acre garden.

HISTORY AND INSPIRATION

In 1974, Gerda Isenberg began to develop her vision of a California Native Plant Demonstration Garden on her ranch property where she had already established Yerba Buena Nursery. She was over 70 years old at the time. Her idea was to create a garden where people might see how the plants would look as they grew to maturity. She wanted to create a place where people would become more at ease with using natives as garden plants.

Her target audience was homeowners, who in many cases had no other place to see examples of a native plant garden. Gerda believed that visitors, given the opportunity to walk through the garden and see fully grown specimens, labeled with botanic and common names, would then be inspired to use these plants in their own gardens.

Plants viewed in the Demonstration Garden would then be available for purchase in the neighboring nursery. The nursery would use the Garden for propagation materials

and for experimentation to determine growing conditions best suited for each type of plant. The Garden would also provide habitat for some rare plants such as western leath-erwood (*Dirca occidentalis*), *Trillium*, and unusual forms of manzanitas (*Arctostaphylos* spp.).

Gerda selected an area that had been used as a pasture for the dairy cattle on her ranch—a hot, dusty, rocky hillside covered with grasses and surrounded by a naturally wooded area. She walked around the pasture, defining the pathways and specific areas where the various plants should go. Based on her innate sense of the hotter and colder areas, she grouped plants primarily by genus. A layout of a meadow area was made, with micro-environments for plants ranging from drought tolerant to bog dwellers. Winding pathways, changes in elevation, sun and shade, wet and dry areas and contemplative bench locations were all considered in the design of the Garden.

Over the course of a summer, much of the Garden was planted by Nancy Hardesty and Gregory Tye. Nancy recalls being so exhausted at digging holes in rock-hard soil, that on one occasion she fell asleep at a stop light while driving home.

CHALLENGES

The Garden was originally unfenced from deer, although some deer-favored plants such as bush poppies (*Dendromecon* spp.) were individually caged. And careful lists were kept of what the deer did and did not eat. Shep, the nursery dog, kept the deer at bay. After Shep's passing, the Garden had to be fenced.



Camas lily (*Camassia quamash*) grows at the bottom edge of the wildflower meadow.

Constant weeding was necessary to prevent the young plants from being overtaken by exotic grasses. Brent Wilcox recalls that since the center of the Garden was originally unplanted, prior to each weekend

(when visitors would come), he would mow the tall grass.

Although there are a few hose stands scattered throughout the Garden, there is no regular or automated irrigation system. New plants were, and still are, primarily installed during the wet season to give them the opportunity to become established prior to the dry summer. A simple hose and wand are used to provide supplemental water, if necessary. Hence, the Garden is primarily a dry garden.

Another challenge was providing permanent legible plant identification markers. Plants were originally identified with hand-crafted, hand-lettered porcelain tiles. These tiles were made and fired on the property. The identification tiles

were beautiful, but were susceptible to cracking after freezing temperatures, rain and heat. The wooden posts didn't fare much better—they were eaten by termites before too long.

One of many exquisite local forms of giant trillium (*Trillium chloropetalum*) found in the Santa Cruz Mountains blooms in the Garden.



THE YOUNG GARDEN

There was not much public interest in the Garden for the first few years, as the plants were small and almost invisible compared to the weeds and grasses. With passing years the plants grew to noticeable sizes, giving visitors a first view of Gerda's planned "Demonstration Garden" for native plants.

Like any garden, the Gerda Isenberg Native Plant Garden is a

reflection of the people who have passed through it and who have influenced its look with their tastes and interests. The prized manzanita collection is due largely to the efforts of a former nursery manager (who has gone on to edit a notable native plant journal—Bart O'Brien). A nearby neighbor, Betsy Clebsch, has kept on the lookout for cultivars of the native sages. One of Gerda's early employees, Hildegard Jackson, left behind a priceless legacy, a grove

of redwood trees she planted almost 40 years ago, now carpeted beneath with redwood sorrel (*Oxalis ore-gana*).

PLANNING FOR THE FUTURE

In Gerda's later years, she recognized that a plan was needed for the Garden and Nursery if it were to continue after her death. During the late 1970s and early 1980s, Gerda worked hard to interest the California Horticultural Society and Western Horticultural Society to assume operations. Both declined. Gerda later attempted to establish an independent non-profit foundation in 1989, drawing up a mission statement and selecting a board of directors, but the project was abandoned.

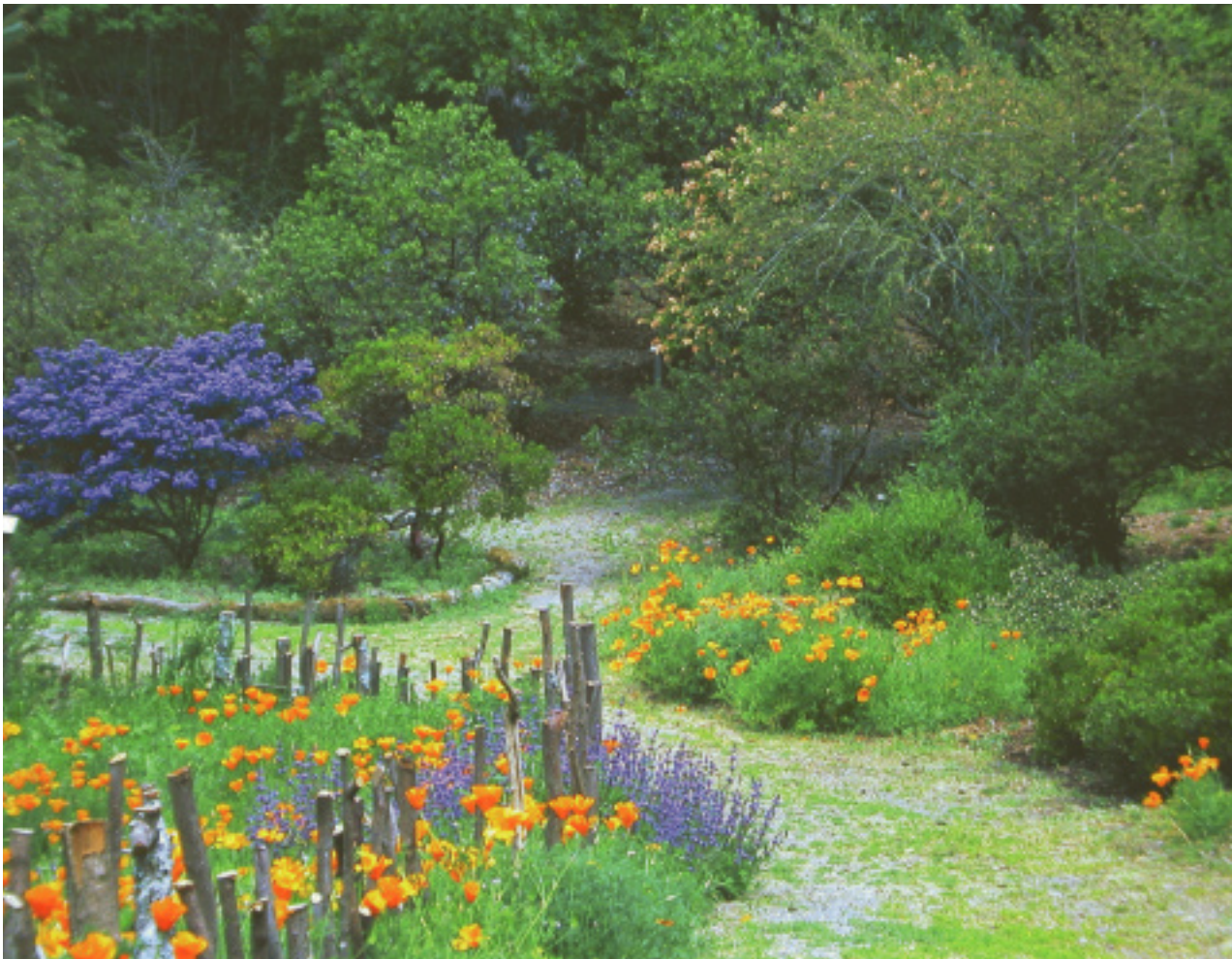
With her decline in health, it appeared likely that the land would be sold with the likelihood that the Nursery and Garden would be closed. Fortunately, Gerda made the acquaintance of Kathy and David Crane, who were looking for a property on which to build a home. The importance of continuing the Nursery and Demonstration Garden created by Gerda was apparent to the Cranes, who decided to accept the challenge to carry on Gerda's dream. Hence, Gerda's desire that the property remain a native plant sanctuary was realized. Kathy Crane has been the owner/operator of Gerda's legacy since 1995.

THE GERDA ISENBERG NATIVE PLANT GARDEN IS DEDICATED

In June of 1997, Gerda's Demonstration Garden was dedicated as the "Gerda Isenberg Native Plant Garden" to honor her birthday. Unfortunately, Gerda was too ill to attend. Gerda passed away not long after. Her vision of a garden demonstrating the uses of native plants had

Western bleeding heart (*Dicentra formosa*), Barrie Coate currant (*Ribes sanguineum* var. *glutinosum* 'Barrie Coate'), and various ceanothus (*Ceanothus* spp.) in bloom.





Spring bloom in the Garden, with California poppy (*Eschscholzia californica*), Dara's Choice sage (*Salvia* 'Dara's Choice'), sugar bush (*Rhus ovata*), and Vandenberg ceanothus (*Ceanothus impressus* 'Vandenberg').

come to fruition, and because of her vision and tireless effort, thousands of gardeners learned that landscaping their homes did not have to begin and end with lawns and flowering exotic plants. Gerda's Garden showed the beauty of native plants in a garden setting and the value of these plants in providing food and shelter for wildlife.

THE GARDEN TODAY

The numbers of people who have been "converted" to using native plants because of their inspirational visit to this Garden is astounding. Many landscape designers send their clients to visit this Garden to show them how a garden full of native plants looks, feels and smells. Plants

can be photographed without having to hike into the wilderness or climb through poison oak. Easy-to-read identification markers offer botanical and common names for plants—a feature also not usually offered on a parkland hike. Occasionally, laminated photographs of plants will accompany the signs to help the visitor distinguish between adjacent specimens.

Human visitors are not the only ones to take notice of Gerda's garden. The wild creatures that inhabit and visit the native plants in this garden include banana slugs, California newts, San Francisco garter snakes, bobcats, coyotes, raccoons, rabbits, hummingbirds, butterflies, and hundreds of other species of birds and insects. For some people,

their visit to the Garden marks the first time they have seen many of these creatures. This experience drives home the value of native plant gardens as wildlife habitat in a way that no book or lecture ever could.

VISIT

The Garden is on private property, yet is open to the public year-round. No entry fees are charged for self-guided tours, although purchases made by visitors are vital for the continued maintenance of the Garden.

A unique facet of visiting the Gerda Isenberg Garden is the opportunity to combine a garden visit with a high-tea lunch. Kathy Crane serves tea-lunches in the Great Room of the 1905 Farmhouse, inspired by



Farewell-to-spring (*Clarkia amoena*) blooms on a fog-shrouded summer morning in the Garden.

her travels to British botanical gardens. Gerda was an early and devoted customer, claiming that if she were ten years younger, she might have opened a tea room herself. Tea is always offered to visitors on foggy mornings and on select dates throughout the year guests can make a reservation for a traditional tea before returning to the garden paths.

While the Garden features varied terrain and changes in elevation, paths are maintained to accommodate visitors of all abilities. When Gerda was confined to a wheelchair, a project was undertaken to widen the main pathways to allow for wheelchairs or electric carts to traverse the Garden. Benches are strategically placed should guests need to rest along the way. The Hildegard Grove of coast redwoods

offers a moist, shady respite during the hot summers.

The operation of this garden is unique in that it is one of the only public native plant gardens whose existence and maintenance is funded entirely by nursery plant sales, rather than as part of a foundation or educational establishment. The garden is tended by one full-time gardener, whose primary duties are planting, weeding, pruning, meadow maintenance, path maintenance, and basic repairs. Nursery staff, and occasional volunteers, assist with seasonal projects.

ORGANICALLY GROWN

The Garden has been installed and maintained with the utmost respect to the truly native inhabit-

ants, the flora and fauna that have long resided in the surrounding forest. No chemicals are used in the Garden—no pesticides, herbicides, or fertilizers as these could inadvertently harm the many creatures living in the soil and water here. This philosophy extends to the adjacent Nursery. New Garden plantings are planned around heritage shrubs and trees. Mature oaks and buckeyes ring the perimeter of the garden, providing ample opportunity for shady paths and beds. Two mature western leatherwoods (*Dirca occidentalis*) line the path to the pond, one reaching nearly nine feet tall. On the opposite side of the garden, a local blue blossom (*Ceanothus thyrsiflorus*), nearing 30 feet tall, threatens to reach the power lines a few feet above it, but seems

to know it's reached a good place to slow down.

As in any garden, plants decline and pass on, allowing opportunities for fresh ideas and plantings. Our wildflower meadow was once in the shade of a mighty Douglas-fir. It was sad to lose it in a storm in 1995, but its absence created a bright sunny meadow of nearly half an acre, which delights visitors to the garden in spring and summer with its succession of annual wildflower blooms. The branches from the fallen Douglas-fir were used to create unique fencing, which rings this meadow. A lavender-flowered bigpod ceanothus (*Ceanothus megacarpus*) was a fragrant spring delight for years. A heat wave a few years ago proved too much for it, but the graceful, lichen-covered skeleton was a beautiful component of the garden until this past winter, when a strong gust finally took it down. We now have a new addition, desert willow (*Chilopsis linearis*), growing in its place.

The original plantings still form the core architecture of the Garden. Declining plants have been replaced, and some trees originally planted



Gerda on the Jaqua bench by the meadow. Photograph courtesy of Ami and Richard Jaqua.



Gerda coming out of the Yerba Buena Nursery office in 1990. Photograph courtesy of Ami and Richard Jaqua.

too closely together are scheduled for thinning or removal. Since this is a "Demonstration Garden," there is an ongoing question whether to show a variety of plants or follow aesthetic design principles in plant placements. We strive to have a Garden specimen of every plant for sale in the Nursery with the goal of displaying these in the most attractive way possible.

Challenges to Garden upkeep include managing wildlife (gophers, birds, rabbits, coyotes, bobcats, and occasional deer); visitors (keeping people on the paths, reminding them not to pick the flowers, touch the wildlife, or collect anything—"leave only footprints, take only memories"); weather related factors (such as excessive summer heat, rain-caused drainage issues, and freezes); fencing issues; and plant diseases and pests (such as sudden oak death and pest overabundance such as periodic population explosions of oak moths).

SUMMARY

The Garden attracts the native plant enthusiast as well as the novice. For many, a visit to the Gerda Isenberg Native Plant Garden is their first exposure to the concept of such a garden. The drive down the long gravel road from Skyline Boulevard, winding through forests of native vegetation, can be an inspiration in itself. Upon entering the confines of the property that Gerda Isenberg dedicated to honoring and promoting the value of native plants, one is filled with the wonder of California's flora and the idea that this aspect of California that does not have a voice of its own is worth protecting and treasuring.

Gerda Isenberg Native Plant Garden, Yerba Buena Nursery, 19500 Skyline Blvd., Woodside, CA 94062; (650)851-1668; www.yerbabuenanursery.com • Kathy Crane and Matt Teel may be reached at the nursery.



Tufted hairgrass (*Deschampsia cespitosa*) and purple needlegrass (*Nassella pulchra*) in full bloom in the meadow in late summer. All photographs by D. Mahoney.

SAN FRANCISCO BOTANICAL GARDEN NATIVE PLANT GARDEN

by Don Mahoney, Terry Seefeld, and Barbara Pitschel

The native plantings at the San Francisco Botanical Garden have roots that reach back to the early days of Golden Gate Park. In the 1897 annual report for Golden Gate Park, the area where the current native Garden now sits was a large part of an area designated as a site for an arboretum. Trees planted at that time included two Torrey pines (*Pinus torreyana*), one of which still stands and towers over the western edge of the native meadow. The second giant Torrey pine fell on a still, foggy night just two years ago. According to Victor

Reiter Jr. (1975. *California Horticulture Journal* 36(2):64), the Redwood Grove was also planted between that time and the 1906 earthquake. The last few redwoods were planted in the area “a few days after that substantial temblor.”

The whole site has had an interesting history. Originally, the native Garden was part of a sunken sand dune area. At its low point, where the current meadow sits, there was a small lake, which was fed by a subterranean stream originating in the nearby southern hills. John McLaren, the “father” of Golden Gate Park,

developed this wet spot into a large pumping station, complete with immense, dome-shaped, brick cisterns and settling basins. He did this because he considered the rates for water from the local water department to be exorbitant. Part of the area was plowed every year and sown in hay to feed park animals. Possibly this was the initial source of some of the weeds that remain hard to control to this day. During the 1894 Midwinter Fair, a railroad spur was built at the east edge of the current native Garden, and for a number of years thereafter, street sweepings

(primarily horse manure) were dumped in this area “courtesy of the railroad,” to be used by the park for fertilizer. Most of this information comes from the Reiter article.

HISTORY

Many special plants, including more native trees, continued to be planted for the next 30 years, but it wasn’t until 1937 that the Strybing Arboretum was officially begun, when Eric Walther, who started as a park gardener in 1916, “was given by John McLaren the herculean task of developing a botanical garden with gangs of WPA workers and little else” (Elizabeth McClintock. 1970. *California Horticultural Journal* 31(2):60). Helene Strybing had left a bequest to the City of San Francisco in 1926 for a botanical garden, but this could not be used until her siblings had all passed on. In 1939, this money (\$200,000 at that time) became available, and Eric Walther began a serious expansion of the Arboretum.

As part of the bequest, Helene Strybing had instructed that the botanical garden was “to contain especially a collection of trees, shrubs, and plants indigenous to, or characteristic of, California.” In these early days, Eric Walther planted various slopes in native California wildflowers, but all of those slopes now hold other collections. Around 1960, when the master plan of the Arboretum was designed by landscape architect Robert Tetlow, five acres (not including the redwood grove) were set aside for plants “native to, and characteristic of, California,” as specified by the Helene Strybing bequest. These five acres are the current site of the native Garden. Around this time, a young gardener, Arthur L. Menzies, who had started at Golden Gate Park as a gardener in 1953 (after working for a few years for Victor Reiter), became assistant director of the arboretum. He was an avid collector of native plants, especially manzanitas (*Arctostaphylos* spp.). Within

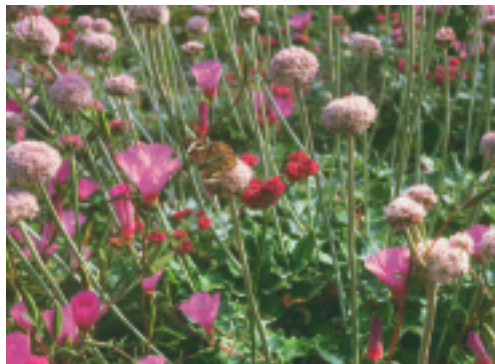


TOP: Humboldt fuchsia (*Epilobium septentrionale*) and California-aster (*Lessingia filaginifolia*) bloom in the rock garden in autumn. • BOTTOM: Every spring, the arroyo can be depended on to reliably provide color from meadowfoam (*Limnanthes douglasii*), California poppy (*Eschscholzia californica*), and western azalea (*Rhododendron occidentale*).

four years, the Garden was planted with some 300 kinds of native plants, including 71 species, varieties, and hybrids of manzanitas.

FIFTY YEARS LATER

Nearly 50 years later, in 2008, there are still 107 of those 300 early accessions in the Garden. Only two



of these are original manzanitas however, which speaks to the life spans of many of our chaparral species. The two remaining manzanitas, interestingly enough, are our two local natives, *Arctostaphylos tomentosa* ssp. *crustacea* and ssp. *rosei*, both originally collected in San Francisco. Other notable early plantings that still persist include the understory and groundcovers in the Redwood

TOP: Douglas iris (*Iris douglasiana*) has naturalized in many colors in the Garden.

• MIDDLE: California-aster (*Lessingia filaginifolia*) is one of the best nectar sources for pollinators. • BOTTOM: Coast buckwheat (*Eriogonum latifolium*), shown here with ruby chalice clarkia (*Clarkia rubicunda*) is also a good nectar source.

Grove. These have not only survived, but have filled every niche to make this our most authentic and weed-free garden in the entire botanical garden. Pines and other conifers were highly valued by Menzies, and 14 conifer species from the early plantings still exist. Another 16 species of broadleaf trees are also still present after 50 years.

One of the original coast redwoods from around 1906 produces abundant albino shoots from its burl every spring. While documentation is scarce, it is believed that this tree was collected from the grove discovered on the San Francisco Peninsula around 1900. (Albino redwood history is discussed in: George James Peirce. 1901. Studies on the coast redwood. *Proceedings of the California Academy of Sciences, Third Series, Botany* 2(3); and in: Ro Peterson. 1987. Albino redwoods: forest phantoms. *Fremontia* 14(4): 25-26.)

After the untimely death of Art Menzies in 1973, the native Garden

was renamed the “Arthur L. Menzies Memorial Garden of California Native Plants,” with unanimous approval of the governing bodies of the park. At that time, we were fortunate to have Jake Sigg as the Recreation and Parks Department gardener assigned to the native section, and also to have John Kipping as education director of the Strybing Arboretum Society. Both men were, and still are, avid supporters and appreciators of our native flora. During his tenure here, Jake, with city landscape architect Hugh Schmidt, initiated the first of several major renovations of the Garden. By this time, the Strybing Arboretum Society, a nonprofit support group founded in 1955, was providing financial and moral support for Garden improvements. Jake was eager to remove a central lawn area, which had been a major problem because water from the lawn was continually killing nearby natives. The lawn was removed in 1975 and replaced with a dry arroyo. Much regrading was done, and large French drains were installed in the lower end of the Garden. Large rounded sandstone boulders were placed to mimic a dry watercourse. A final phase was the installation of a stone wall and observation platform at the western end of the Garden, built out of limestone blocks from the Hearst monastery stone. During that first spring and summer, numerous annuals were planted from seeds that had been pre-started in flats in the nursery. And during that first spring and summer, “masses of bloom” from a long list of California annuals greeted visitors to the Garden. This was one of many attempts to get annuals to reseed in the Garden.

FOR VISITORS

According to a *California Horticultural Journal* article (1975. 36(4): 59) by John Kipping, during this time, “a natural aspect prevailed, rather than a planned landscape.” Jake Sigg is quoted as saying, “Paths

were placed so every plant can be seen close up and where people seem to want to walk.” By the 1980s, then-director Walden Valen was eager for a more designed native Garden, as visitors “roam freely through the Garden unable to distinguish between paths and planted areas.” Landscape architect Ron Lutsko was hired to do a complete renovation of the Garden, which was completed in 1988.

When Lutsko approached the Menzies Garden, “It was an incredible repository of plants. Basically, it was a collection, not a garden.” What was missing was an overall design. Lutsko created a plan that included a distinct entry to the Garden at the head of the arroyo. He opened up the center of the Garden, reinforcing the edges to create a big central space. Three rock gardens were added with rock placement by Phil Johnson. “We approached it like designing a big house with a great room, provided

with subspaces defined by shrubs and rocks.” With the exception of several large trees and also the Garden’s periphery, most of the plants were removed or repropagated. The Garden was designed to have representatives of distinct ecotypes, including coastal scrub, evidenced in low-key edges of three- to four-foot-tall plants defining smaller subspaces; trees and forest at the absolute periphery of the Garden; and finally, the meadow, “like a carpet in the living room.” To unify the design, theme plants were chosen to be planted in greater numbers. These were madrone (*Arbutus menziesii*), Stanford manzanita (*Arctostaphylos stanfordiana*), Julia Phelps ceanothus (*Ceanothus* ‘Julia Phelps’), pink flowering currant (*Ribes sanguineum* var. *glutinosum*), California fuchsia (*Epilobium canum*), Santa Cruz Island buckwheat (*Eriogonum arborescens*), coastal gumplant (*Grindelia stricta*), and Douglas iris (*Iris dou-*

glasiana) selections. Over the years, all of these species have persisted and proven successful. The “carpet,” or meadow, consisted mainly of bunchgrasses, which began to reseed tremendously. Among these reseeding grasses, weedy grasses came up from the long-buried seed bank. The gardener at that time, King Sip, spent endless hours weeding and trying to introduce appropriate annuals. She and the current gardener, Terry Seefeld, found greater success by introducing more perennials and bulbs, and fewer annuals, into the meadow. Annuals were confined to smaller pockets and at the edges of the rock gardens.

Each year, particular perennial species produce spectacular bloom, and the next year may produce few or no flowers at all. It is the diversity of species that ensures that something is always in bloom. This also means that no two years are the same. Some species bloom more con-

The rock garden is colorful year-round. As the ruby chalice clarkia (*Clarkia rubicunda*) is finishing its bloom, the yellow blossoms of gum plant (*Grindelia* sp.) are just starting.





TOP: In early spring, the rock garden is a mix of annual and perennial wildflowers. • BOTTOM: Even when not in bloom, the rock garden is attractive with the silver foliage of the California-aster (*Lessingia filaginifolia*) and various lupines.

sistently. California poppy (*Eschscholzia californica*) has a very long flowering period. In early spring, checker bloom (*Sidalcea malvaeflora*) can almost form pink sheets between the grasses. Franciscan wallflower (*Erysimum franciscanum*) and Point Reyes wallflower (*E. menziesii* ssp. *concinnum*) bloom at this time also. Blue-eyed grass (*Sisyrin-*

buckwheat (*Eriogonum* spp.) bloom in the rock gardens and meadow. Coastal gumplant (*Grindelia stricta*) lines the main pathway with yellow in summer and fall. Yellow is also added by three goldenrods (*Solidago californica*, *S. spathulata*, and *S. confinis*). California-aster (*Lessingia filaginifolia*) and coast aster (*Aster chilensis*) add pink and lavender to

the fall color scheme. One of the showiest autumn plants is the bright red California fuchsia (*Epilobium septentrionale*), which blooms along with the lighter red *Epilobium canum*.

GRASSES

Tufted hairgrass (*Deschampsia cespitosa*) is probably one of our most popular California native grasses, standing about two-and-a-half to three feet high and giving great motion with the slightest breeze. Needlegrasses (*Nassella pulchra* and *N. lepida*) are the most numerous in the Garden, forming smaller, coarser bunches with wider leaves than the hairgrasses. Deer grass (*Muhlenbergia rigens*) sends up tall flower stalks in late summer and holds them through late fall and into winter. This species is used by native Californians for basket making. Canyon

Prince California wildrye (*Leymus condensatus* 'Canyon Prince') is a prominent blue-gray grass with wide leaves. Two types of California fescue (*Festuca californica*) grow in the wetter parts of the meadow. Two varieties of Idaho fescue (*Festuca idahoensis*) grow on the north and south sides of the arroyo. Short-leaved fescue (*Festuca brachyphylla*) is a shorter, blue-green, sometimes reddish grass that is a personal favorite, as it remains compact and reseeds, but not excessively. Red fescue (*Festuca rubra*) is listed as a bunchgrass, but has short rhizomes that can creep outward. It has narrow leaves that, together with the stems, often have a distinct reddish cast.

In 1991, Lutsko won the National Award of Merit from the American Society of Landscape Architects for this Garden. In *The Natural Habitat Garden* (Clarkson Potter, 1994), author Ken Druse writes, "Beyond a collection, it is perhaps the most beautifully planned and maintained public garden in the country dedicated to habitat-style planting."

MAINTENANCE

Maintenance is very time-consuming. While the Garden is intended to look very natural and care-free, it is anything but that. Maintenance is required because of the resident weed seed bank in the soil, as well as an overabundance of snails and slugs during the rainy season, when most annuals like baby blue eyes are totally devoured. There is also an overwintering population of white-crowned sparrows that see emerging seedlings as their private salad bar. Gophers and moles make most bulb plantings troublesome. *Calochortus* are difficult because all the aforementioned creatures will eat them. The meadow can be covered with frost many winter mornings and also be covered with fog for weeks on end in the summer. Even

California poppies may not open except for a few days a week in the summertime.

CHANGES

One more renovation is planned for this fall, when some pathways will be regraded. The last remaining south-facing slope to the north of the meadow will be redesigned and replanted as a new manzanita bed and several dozen new *Arctostaphylos* taxa are being propagated for this purpose in the nursery. The native Garden will continue to grow. Currently, there are upwards of 500 taxa in the Garden that are permanent. Many more annuals and bulbs are added on a temporary basis from year to year.

In spite of, or because of, all this, the native Garden here at the San Francisco Botanical Garden at Strybing Arboretum (our official title) is always a memorable Garden to visit and provides an experience of wild nature complete with beautiful flowers, bees, birds, and butterflies. It is a wonderful education for those who want to learn about our natural and native environment.

San Francisco Botanical Garden at Strybing Arboretum, 1199 9th Avenue, San Francisco, CA 94122; (415)661-1316; www.sfbotanicalgarden.org • Don Mahoney, dmahoney@sfbotanicalgarden.org; Terry Seefeld, NativeGarden@sfbotanicalgarden.org; Barbara Pittschel, bpitschel@sfbotanicalgarden.org

A typical summer afternoon in San Francisco.





The succulent stemmed giant coreopsis (*Coreopsis gigantea*) dominates this scene from the Garden's Channel Islands section. All photographs by N. Smith.

THE UNIVERSITY OF CALIFORNIA BOTANICAL GARDEN AT BERKELEY

by Nathan Smith

Many a native plant gardener is inspired by California's natural landscapes, and many strive in some way to bring that beauty into their home gardens. This venerable tradition of highly stylized natural landscapes has a long history in Japan, where an idealized nature is evoked by a prescribed use of garden elements and forms. Public gardens are planted to recall landscapes from around the world. The California area at the University of California Botanical Garden at Berkeley is unique in the degree

and specificity with which it draws inspiration from nature to replicate natural plant habitats. From the five-acre redwood grove planted in the 1930s to the vernal pools which are renewed every year, the Garden shows the many and varied California plant communities.

All gardens, to some degree, simplify and stylize nature in their displays. Much as natural landscapes are shaped by physical and environmental factors, the primary influence on the development of gardens is the people who cultivate them. Gardens often thrive or fail based

on the efforts of a few individuals. Looming large in the history of the UC Botanical Garden are horticulturists Roger Raiche and Wayne Roderick. Their names are familiar to many a native enthusiast and are attached to popular garden cultivars such as *Vitis* 'Roger's Red' or *Eriogonon* 'W.R.' Both have been popular speakers at CNPS meetings and symposia. I have had the pleasure of spending some time in the field with both of these extraordinary horticulturists. They opened my eyes to the California flora in a way that continues to transform and inspire

my daily experience on this fragile planet.

The selection and introduction of superior horticultural forms has popularized the use of native plants in the landscape, and by extension, improved awareness of our native flora. The role of public gardens in inspiring and educating designers and gardeners should not be understated. The masses of deer grass (*Muhlenbergia rigens*) planted in the UC Botanical Garden and others to evoke the natural savannah have been replicated in commercial and residential landscapes around the state. The Garden's plantings and promotion have helped popularize the use of leafy reed grass (*Calamagrostis foliosa*), a truly wonderful feathery native bunchgrass from the north coast. Public gardens provide an opportunity to share great plant combinations and to experiment with plants for difficult situations. The Garden's two annual plant sales and daily plant sales help make some of the diversity of garden-worthy natives available to the public. As more gardens begin to include California natives, our native flora can again become a daily part of the urban/suburban experience. Raising awareness is critical to the conservation missions of the Garden and CNPS.

CONSERVATION EFFORTS

The Garden is actively involved with many conservation efforts in partnership with the Center for Plant Conservation, California State Parks, California Department of Fish & Game, U.S. Fish & Wildlife Service, National Park Service, and Bureau of Land Management. Most prominently in the recent press was the Garden's work with the Mt. Diablo buckwheat (*Eriogonum truncatum*). This annual species was presumed extinct, having last been seen by Mt. Diablo flora author Mary Bowerman in 1936. UCB graduate student Michael Park rediscovered the plant in 2005 within Mt. Diablo State Park.

The Garden has grown plants from seed collected from this very small population for two seasons, producing tens of thousands of new seed, some of which was used in a reintroduction effort in late 2007. Mt. Diablo buckwheat will make a wonderful garden subject one day. Similar conservation efforts led by curator Holly Forbes are underway for Presidio manzanita (*Arctostaphylos montana* ssp. *ravenii*), Presidio clarkia (*Clarkia franciscana*), Baker's larkspur (*Delphinium bakeri*), yellow larkspur (*Delphinium luteum*), white sedge (*Carex albida*), Kenwood marsh checkermallow (*Sidalcea oregana* ssp. *valida*), Marin dwarf flax (*Hesperolinon congestum*), San Mateo thornmint (*Acanthomintha duttonii*), and Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*).

The Garden is a participant in "Seeds of Success," part of the federal Native Plant Materials Develop-

ment Program. Seeds of common taxa are collected in large quantities for future use in restoration/rehabilitation efforts following disturbance (for example, for re-seeding following wildfire). Half of the seeds are stored at the USDA National Center for Genetic Resources Preservation at Fort Collins, Colorado, and the other half at the Millennium Seed Bank in England.

Nearly all the specimens in the Garden are field collected. Detailed records are kept concerning their place of origin, which enhances their scientific value considerably. The Garden is exceptionally well-labeled with each accession accompanied by a public display label including an accession number, family name, scientific name, place of origin, and where appropriate, common name, making it possible for visitors to identify virtually any plant in the Garden. Growing on the Garden's

The dangling tassels of James Roof silktassel (*Garrya elliptica* 'James Roof') are framed by the pink flowers of Paradise manzanita (*Arctostaphylos pajaroensis* 'Paradise') and the dense green foliage of Vandenberg ceanothus (*Ceanothus impressus* 'Vandenberg') in the Garden's deer-frequented cultivar bed.





34 acres are plants from around the world. The 12,500 different species and subspecies that compose the collection represent 2,669 genera in 308 plant families, making it one of the largest and most diverse plant collections in the United States.

COLLECTIONS

The Garden has the most diverse collection of California natives in the state with 1,613 taxa growing in over 14 acres. The California collection is high in diversity for families, genera, species, and subtaxa. Even within a given taxon, emphasis frequently is placed on showing odd variants, color forms, growth forms, or habitat extensions.

Roderick's and Raiche's prodigious collecting and horticultural ef-

forts are responsible for much of the current collection. Of the 2,531 living accessions in the California area, 278 are Roderick collections and 1,220 are Raiche collections from his 22-year tenure at the Garden. The Garden's history of selection and informal introduction of superior plants into the nursery trade has resulted in an abundance of superior native cultivars (sidebar, p. 49). The majority of these introductions are Raiche collections, evidence of his extraordinary plants-manship. In addition to recognizing plants with horticultural potential, Raiche's observational skills led to the recognition of three new taxa that were named in his honor: *Arctostaphylos stanfordiana* ssp. *raichei* (Raiche manzanita), *Clarkia concinna* ssp. *raichei* (Raiche's red ribbons), and *Calo-*

TOP: Pajaro manzanita (*Arctostaphylos pajaricensis*), silver bush lupine (*Lupinus albifrons*), and California fescue (*Festuca californica*) make textural and sculptural statements about foliage and form in a naturalistic setting. • BOTTOM: Rare and endangered Burke's goldfields (*Lasthenia burkei*) with the similarly endangered Sebastopol meadowfoam (*Limnanthes vinculans*) in the Garden's vernal pool display.



chortus raichei (Cedars' fairy lantern). Roderick was similarly honored by the naming of *Ceanothus roderickii* (Pine Hill buckbrush), *Fritillaria roderickii* (Roderick's fritillary), and *Erythronium citrinum* var. *roderickii* (Roderick's fawn lily).

ROGER RAICHE

Much of the collecting was done by these horticulturists on weekends or other non-work time. Roger would complain that he could not afford to take time off from weeding the California area at the Garden to go collect. For a time Roger lived in a guest apartment in the house of Myrtle Wolf, a generous benefactor to the Garden and early member of CNPS. She told me that nearly every weekend Roger would come home from work, toss his camping gear into the car, and head off on Friday night, spending the entire weekend botanizing, and not returning again until late Sunday. During the time that I worked with him, toward the end of his career at the Garden, the pattern was similar. Most weekends he would head up to camp at The Cedars, a serpentine wonderland in Sonoma County. This remarkable area is home to seven endemic species. In the late 1990s Roger and his partner purchased a significant portion of The Cedars, creating a private natural preserve.

SERPENTINE FLORA

Roger's abiding interest in the serpentine flora inspired the construction of one of the few gardens in the world to feature the California native flora adapted to serpentine soils. Ten percent of the native flora is adapted to this unique and botanically-rich substrate, which is also the state rock of California. Designed by landscape architect and noted native plant enthusiast Ron Lutsko, the serpentine area was constructed using tons of salvaged serpentine rock and soil from Marin and Amador coun-



TOP: Masses of deer grass (*Muhlenbergia rigens*) remind the gardener of California's natural savannah landscapes, and have been used extensively in public and private gardens. • BOTTOM: This combination of coast blue blossom (*Ceanothus thyrsiflorus*), California fescue (*Festuca californica*), and Douglas iris (*Iris douglasiana*) from the Garden's coastal beds could easily be translated into a residential setting.

ties to make the first planting of its kind in California. The serpentine bed features such unusual plants as the Presidio manzanita (*Arctostaphylos montana* ssp. *ravenii*), which is known from only a single surviving

individual in habitat, a serpentine endemic fairy lantern (*Calochortus raichei*), a lovely pink-flowered selection of the western azalea (*Rhododendron occidentale* 'Myrt's Blush'), California pitcher plants (*Darling-*



ABOVE: Myrt's Blush western azalea (*Rhododendron occidentale* 'Myrt's Blush') in full bloom in the Garden's unique serpentine bed. • BELOW LEFT: The rare and endangered Pitkin Marsh leopard lily (*Lilium pardalinum* ssp. *pitkinense*) is one of many Garden rarities that are preserved in the Garden's collection. • BELOW RIGHT: Myrt's Blush western azalea (*Rhododendron occidentale* 'Myrt's Blush').

tonia californica), and a suite of rare and unusual annuals. While generally austere in appearance, the serpentine bed has seasonal flourishes

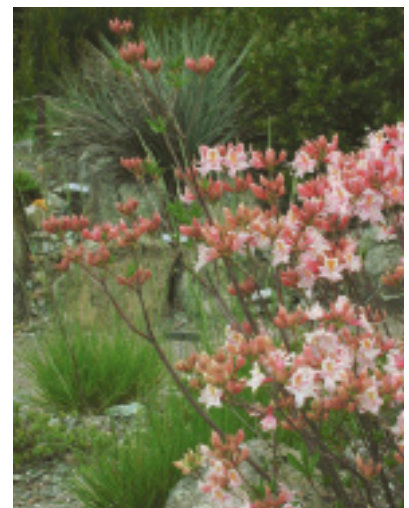


of color that are inspiring. The soft pink blossoms of *Rhododendron occidentale* 'Myrt's Blush' against the emerald green to teal blue marbled serpentine rocks is one such remarkable combination.

WAYNE RODERICK: VERNAL POOLS

Horticulturist Wayne Roderick led the Garden's pioneering effort to recreate a vernal pool. A vernal pool is a depression underlain by an impermeable soil layer that fills up with water in the winter and dries slowly through spring. Two factors, the degree of salinity at different depths of the pool, and the tolerance of plants to periods of extended

inundation create distinct rings of plants around the pool. Rare annuals such as Sebastopol meadowfoam (*Limnanthes vincularis*) and Burke's



goldfields (*Lasthenia burkei*) produce vibrant color bands of gold and cream. Thousands of children, students, and adults are exposed to this unique phenomenon at the Garden, raising awareness and helping to foster the conservation of this threatened habitat.

WAYNE RODERICK: PYGMY FOREST

Wayne Roderick likewise led the effort to create a pygmy forest of edaphically dwarfed conifers. Underlain by a clay hardpan and growing on extremely poor, acidic, sandy soils in Mendocino and Sonoma Counties, this unusual plant community hosts a number of rare endemic plants. Pygmy cypresses (*Cupressus goveniana* ssp. *pigmaea*), Bolander pines (*Pinus contorta* ssp. *bolanderi*), huckleberries (*Vaccinium ovatum*), and rhododendrons dominate the scene. Garden horticulturists maintain this idealized display much like a bonsai gardener maintains a specimen tree through horticultural practices, which include creating a hardpan under the trees, root and tip pruning of the trees, and acidifying the soil.

Other special plant community displays in the California area include an alpine fell-field, redwood forest, grassland, coastal scrub, riparian, and knobcone pine woodlands. Each area features a distinct aesthetic and suite of plants. Within each natural community are plants of exceptional horticultural value for home garden situations.

The Garden offers a diverse range of public programs on horticulture, botany, and natural sciences to audiences of all ages. Specialty brochures describing the California serpentine area, and a self-guided tour of California's native plants and peoples are available year-round.

The Garden is an inspiring place of beauty and a reminder of the wonder and brilliance of the natural

CALIFORNIA NATIVE PLANT CULTIVAR INTRODUCTIONS FROM THE UC BERKELEY BOTANICAL GARDEN COLLECTION

Arctostaphylos densiflora 'Baby Bun'
Arctostaphylos hookeri ssp. *hearthiorum* 'Marshall Olbrich'
Arctostaphylos nummularia 'Small Change'
Arctostaphylos pajaroensis 'Myrtle Wolf'
Arctostaphylos pajaroensis 'Warren Roberts'
Arctostaphylos uva-ursi 'Mount Vision'
Brodiaea elegans 'Midnight'
Calamagrostis nutkaensis 'The King'
Ceanothus 'Berkeley Skies'
Ceanothus 'Joan Mirov'
Ceanothus griseus 'Kurt Zadnik'
Epilobium canum 'Solidarity Pink'
Epipactis gigantea 'Serpentine Night'
Eriogonum fasciculatum 'Zaca Peak'
Festuca californica 'Serpentine Blue'
Festuca californica 'Mayacmas Blue'
Festuca rubra 'Patrick's Point'
Garrya elliptica 'Evie'
Lupinus succulentus 'Rodeo Rose'
Penstemon heterophyllus 'Lodoga Pink'
Rhamnus californica 'Leatherleaf'
Rhamnus californica 'Mound San Bruno'
Rhamnus californica 'Curly'
Rhododendron occidentale 'Myrt's Blush'
Ribes malvaceum 'Montara Rose'
Ribes sanguineum var. *glutinosum* 'Inverness White'
Ribes sanguineum var. *glutinosum* 'Joyce Rose'
Ribes sanguineum var. *glutinosum* 'Pink Drops'
Salvia 'Bee's Bliss'
Vitis 'Roger's Red'

world. The Garden relies on the generosity of its members, individuals, and the University of California for the resources it needs to support programs and events, the fantastic and diverse teaching and research collection, and the extraordinary community of staff and volunteers

who keep it growing. Please support the Garden and come visit us!

University of California Botanical Garden, 200 Centennial Dr., Berkeley, CA 94720-5045; (510) 643-2755; <http://botanicalgarden.berkeley.edu> • Nathan Smith, ncsmith@berkeley.edu

CALIFORNIA NATIVE PLANTS AT THE UC DAVIS ARBORETUM

by Ellen Zagory

The University of California Davis (UC Davis) Arboretum occupies approximately 100 acres along the southern edge

of the UC Davis campus, about 15 miles west of Sacramento, on the historic banks of the north fork of Putah Creek. The UC Davis Arbo-

retum is unusual both because it has no fences and because it is physically connected to the central campus landscape. In addition to garden visitors interested in plants, the Arboretum is used by students, faculty, and recreational visitors as a bicycle, walking, and jogging path, and as a natural area for relaxation and wildlife viewing. A wide variety of classes utilizes the Arboretum and its collections, such as plant taxonomy, wildlife biology, and entomology, as well as art, dance, and music classes. Large native oak trees and year-round water in the Arboretum waterway create habitat for wildlife, and the garden is home to many birds, insects, and small mammals. The mature oaks and pines of the Arboretum, combined with the campus' iconic white water towers, create a scenic horizon for those passing along Interstate 80. The California native plants of the UC Davis Arboretum represent the largest planted landscape of California natives in the Great Central Valley of California. We estimate that nearly half of the Arboretum's 100 acres is planted with California native plants, some in intensively cultivated demonstration gardens and others in large "landscape"-scale plantings of towering trees, sweeping swaths of native grasses, and large shrubs.

Interior live oak (*Quercus wislizeni*) with dune sedge (*Carex praegracilis*) and island alum root (*Heuchera maxima*). All photographs by E. Zagory.



Our California native plant collection is exceptional for a number of reasons: (1) a large section is devoted to an intensively maintained, "gardenesque" series of home-scale vignettes that are labeled and interpreted with information about native plants recommended for gardens; (2) our gardens demonstrate species' tolerance of Central Valley heat and drought; and

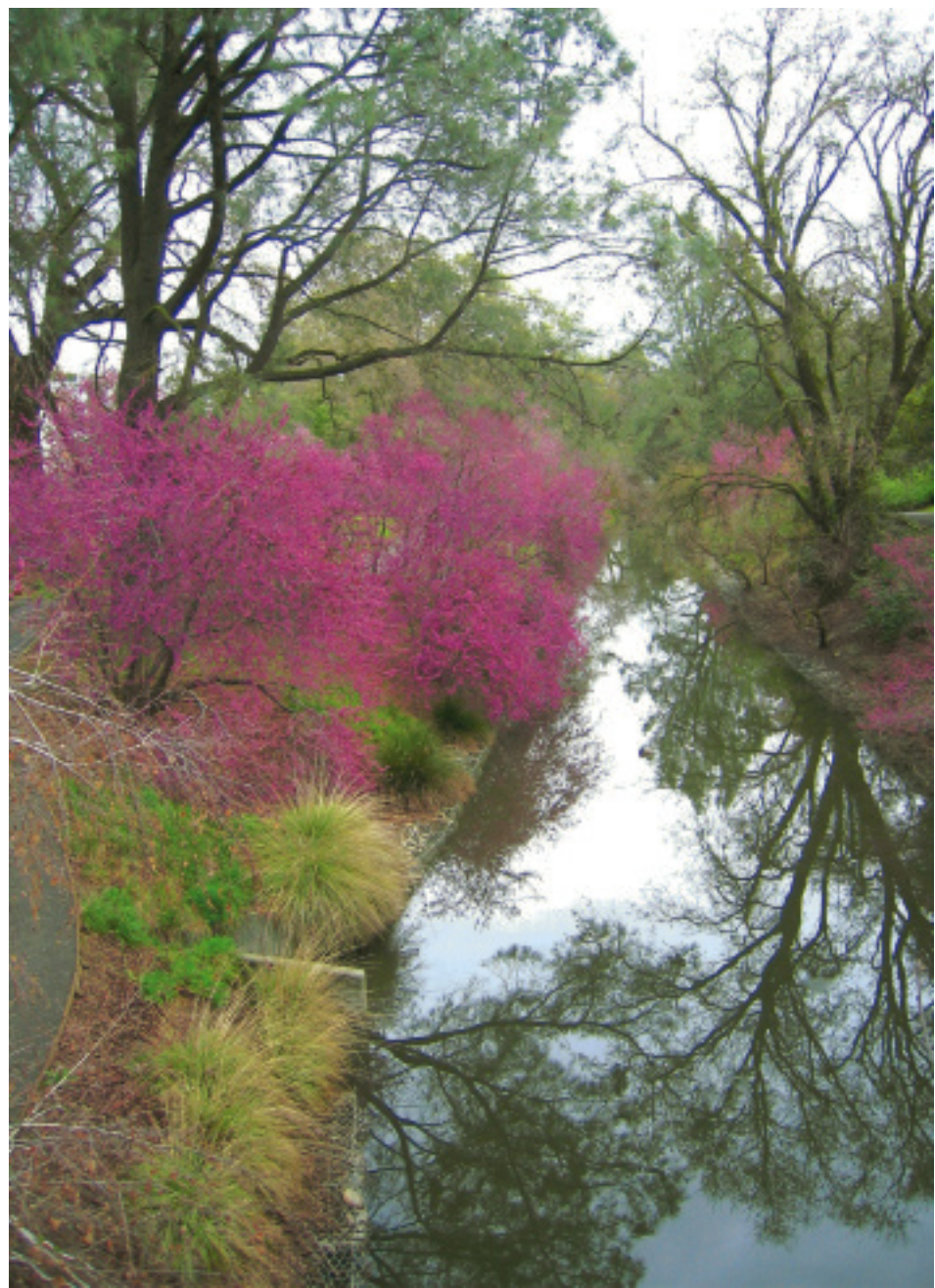
(3) our irrigation water is high in boron (a toxic ion), bicarbonates, and calcium, leading to rising soil alkalinity in summer months. Hence, plants that survive here may be recommended to gardeners with similar water problems and perhaps to those using reclaimed water systems.

MARY WATTIS BROWN GARDEN OF CALIFORNIA NATIVE PLANTS

Our premier garden for visitors interested in learning about gardening with California native plants is the Mary Wattis Brown Garden. Named for the close friend of a founder of our support group, Friends of the UC Davis Arboretum, it is supported by an endowment from Mary Wattis Brown's family. Arranged in a pleasing series of themed plantings, the garden contains species and cultivar collections of many native plant genera such as *Ribes*, *Ceanothus*, *Epilobium* (*E. canum*), and *Eriogonum*, under the shade of native oaks, pines, and other trees, including California bay, alder, and box elder. Manzanitas (*Arctostaphylos* spp.) have proved problematic for us, probably due to water quality issues, although we do have some, particularly *A. densiflora* hybrid cultivars, which grow well with infrequent summer water. Our oldest and largest manzanitas grow in a separate area without summer irrigation.

In this garden, the primary asphalt path accommodates faster-moving traffic, while a secondary, decomposed granite path winds its way through the plantings for the visitor seeking a deeper experience. Let's take a tour of this area as you would see it when you visit.

Starting at the west end of the garden, the sentinel plant is a towering valley oak (*Quercus lobata*), one of many large, heritage oaks native to the banks of the old north fork of Putah Creek. This plant is reputed



Western redbud (*Cercis occidentalis*), deer grass (*Muhlenbergia rigens*), and foothill pine (*Pinus sabiniana*) along the Arboretum waterway.

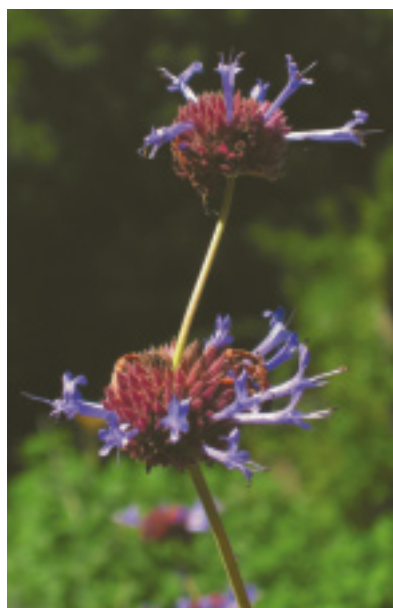
to be the marker for the boundary of the original Mexican land grant given when this area was first occupied by European settlers. At the entry you are greeted by a planting of Margarita BOP penstemon (*Penstemon heterophyllus* 'Margarita BOP'), blue grama grass (*Bouteloua gracilis*), and Shasta Sulphur buckwheat (*Eriogonum umbellatum* var. *polyanthum* 'Shasta Sulphur'). California wild rose (*Rosa*

californica) and wild cucumber (*Marah fabaceus*) run along the less accessible steep slopes, as they likely did along the wild creek. In the same area are trees of higher elevations, such as Jeffrey and ponderosa pines (*Pinus jeffreyi*, *P. ponderosa*), and incense cedar (*Calocedrus decurrens*), combined with deer grass (*Muhlenbergia rigens*), California goldenrod (*Solidago californica*), sul-

fur buckwheat (*Eriogonum umbellatum*), California fuchsia (*Epilobium canum*), coral bells (*Heuchera* varieties), and chaparral currant (*Ribes malvaceum*). In spring and summer the area sparkles with lupines, both the locally native, yellow flowering Ed Gedling lupine (*Lupinus microcarpus* var. *densiflorus* 'Ed Gedling') and the silver bush lupine (*Lupinus albifrons*), a nearby foothill species. Both above and below the central path, the steep banks are also planted with hummingbird sage (*Salvia spathacea*) and toyon (*Heteromeles arbutifolia*), creating prime places to look for hummingbirds and cedar waxwings in winter.

Next, we see some of the species found repeatedly throughout the garden: Valley Violet ceanothus (*Ceanothus maritimus* 'Valley Violet'), our dark-flowered form which is good for the small garden, western redbud (*Cercis occidentalis*), and golden currant (*Ribes aureum*) with bright yellow blooms in February and March. Traveling further east, a pair of blue oaks (*Quercus douglasii*) has a "very low summer water" garden within their drip lines planted with yampah (*Perideridia kelloggii*), California fescue (*Festuca californica*), deer grass (*Muhlenbergia rigens*), coral bells (*Heuchera maxima*, H. 'Rosada'), and currants (*Ribes viburnifolium*, *R. malvaceum*). A striking mature buckeye borders the area, its silvery bark a beautiful feature in the gray winter light, as are the long flower spikes in spring. Upslope is a large island bush poppy (*Dendromecon harfordii*) with gray-blue foliage and buttery flowers. Nearby, large mature California bay trees flourish on the bank.

Next is the "meadow vista," a constructed grassland of blue grama (*Bouteloua gracilis*), deer grass (*Muhlenbergia rigens*),



Winifred Gilman sage (*Salvia clevelandii* 'Winifred Gilman').

purple needlegrass (*Nassella pulchra*), and alkali sacaton (*Sporobolus airoides*), combined with California fuchsia (*Epilobium canum*), wire grass (*Juncus patens*), and the beautiful Queen Fabiola Ithuriel's spear (*Triteleia laxa* 'Queen Fabiola'), as well as a rambunctious distribution of California poppies (*Eschscholzia californica*). A relatively new species for us, golden bush (*Ericameria linearifolia*), has grown into a small shrub with showy yellow daisy flowers over a long season. One of our

Everett's Choice California fuchsia (*Epilobium canum* 'Everett's Choice').

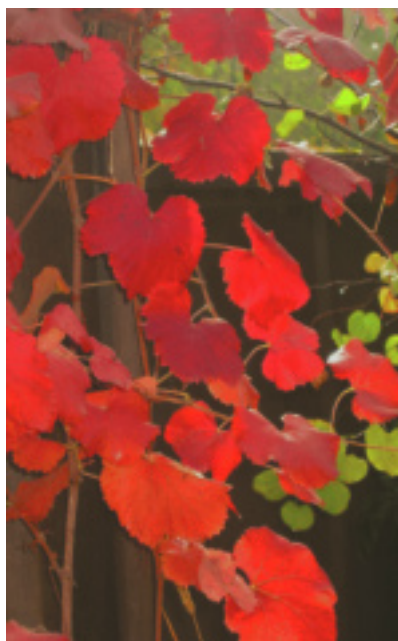


best performing California fuchsias is found in this area: *Epilobium canum* 'Bowman's #1', an upright, fine-foliaged green form to about two-and-a-half feet tall that makes a fountain of flaming orange-red flowers in summer and fall. Also in this area is a fine selection of California goldenrod (*Solidago californica*) with compact form and dense, showy flowers, originally selected by Roger Raiche from Cascade Creek in San Mateo County.

Continuing down the winding path, you come upon one of the largest specimens known in cultivation of the Catalina cherry (*Prunus ilicifolia* ssp. *lyonii*), a stately specimen casting its deep shade on spicebush (*Calycanthus occidentalis*), Canyon Snow Iris (*Iris douglasiana* 'Canyon Snow'), and island alum root (*Heuchera maxima*), and bordered by lemonade berry (*Rhus integrifolia*), Santa Catalina Island mountain mahogany (*Cercocarpus traskiae*), and greenbark ceanothus (*Ceanothus spinosus*).

Leaving the shady woodland area, a massive interior live oak (*Quercus wislizeni*) is bordered by layers of coral bells (*Heuchera maxima*, H. 'Rosada'), Pacific Coast Hybrid iris, and grasses and grass-like plants (*Sporobolus airoides*, *Muhlenbergia rigens*, *Juncus patens*, and *Nassella pulchra*). The purple Heritage valley oaks (*Quercus lobata*), with purple needlegrass (*Nassella pulchra*).

Purple needlegrass always generates comments from campus native plant enthusiasts when their spikelets sparkle golden in the summer sun. Continuing on the trail leads to a shrubby planting with Saint Catherine's lace (*Eriogonum giganteum*), an enormous specimen of Santa Ana coyote brush (*Baccharis pilu-*



laris 'Santa Ana'), island oak (*Quercus tomentella*), and island mountain mahogany (*Cercocarpus betuloides* var. *blancheae*). Amethyst Bluff sage (*Salvia leucophylla* 'Amethyst Bluff'), a Santa Barbara Botanic Garden introduction, makes a pleasing silver mound with pink-purple flowers from which the plant gets its name. Various other shrubby native sages can be found in this same section: *Salvia* 'Whirly Blue', *S.* 'Bee's Bliss', and along the asphalt path, *S. leucophylla* 'Point Sal', *S. clevelandii* 'Winifred Gilman', and *S. mellifera* 'Point Mugu'.

As we approach the eastern end of the garden we enter a small grove of fern-leaved Catalina ironwoods (*Lyonothamnus floribundus* ssp. *asplenifolius*) planted around a decomposed granite seating area that attracts students and visitors to rest in the shade. To the south in spring you can easily see the strange pipe-shaped flowers of the California pipevine (*Aristolochia californica*), and later, the spiky "road warrior" orange and black larvae of the pipevine swallowtail butterfly. On the slope above, the white, felt-like foliage of island hazardia (*Hazardia detonsa*) lights up this area along with Canyon Snow iris (*Iris dou-*



LEFT: Roger's Red grape (*Vitis* 'Roger's Red'). • RIGHT: Ed Gedling lupine (*Lupinus microcarpus* var. *densiflorus* 'Ed Gedling') with California poppies and elegant clarkia (*Clarkia unguiculata*).

lasiana 'Canyon Snow') and Lillian's Pink coral bells (*Heuchera* 'Lillian's Pink'). Prominent to the east is a large specimen of Skylark barberry (*Berberis* 'Skylark'), with showy, golden blooms followed by blue fruit.

Finally, at the eastern end of the garden, just before the coast redwood trees (*Sequoia sempervirens*) signal the approaching T. Eliot Weier Redwood Grove, a seaside-themed planting happily combines Pajaro manzanita (*Arctostaphylos pajaroensis*), Wayne Roderick seaside daisy (*Erigeron* 'W.R.'), David's Choice sandhill sagebrush (*Artemisia pycnocephala* 'David's Choice'), California fuchsia (*Epilobium canum*), Saint Catherine's lace (*Eriogonum giganteum*), and San Clemente Island bushmallow (*Malacothamnus clementinus*). A single malva rosa (*Lavatera assurgentiflora*) grows happily, and amazingly, undamaged by last winter's cold.

T. ELLIOT WEIER REDWOOD GROVE

T. Elliott Weier, professor of botany, arrived in the 1940s to the campus of what was then a small agricultural college. Under his instruction, coast redwood seedlings were planted on the sandy terrace formed by the seasonal flooding of Putah Creek. Now, 60 years later, these trees form a cathedral-like grove that provides greatly appreciated cooling shade in summer. With a Lutsko Associates design in hand, we recently renovated the grove, adding drainage and grading improvements, new primary and secondary paths, and thousands of plants from species native to the coastal redwood ecosystem. Completing our new exhibit, interpretive signage provides visitors with an opportunity to learn more about redwood trees, and plant labels identify the plantings. We added ground covers, including red-



TOP: The Mary Wattis Brown Garden's "original California lawn" planting. • BOTTOM: UC Davis Arboretum's Terrace Garden features Joan Mirov ceanothus (*Ceanothus* 'Joan Mirov'), deer grass (*Muhlenbergia rigens*), Otto Quast Spanish lavender (*Lavandula stoechas* 'Otto Quast'), and De La Mina lilac verbena (*Verbena lilacina* 'De La Mina').

wood sorrel (*Oxalis oregana*), woodland strawberry (*Fragaria vesca*), and yarrow (*Achillea millefolium*). Herbaceous perennials include western meadowrue (*Thalictrum fendleri*), dog violet (*Viola adunca*), western columbine (*Aquilegia formosa*), cow parsnip (*Heracleum lanatum*), Pacific water parsley (*Oenanthe sarmentosa*), and coltsfoot (*Petasites frigidus* var. *palmatus*). Ferns include giant chain fern (*Woodwardia fimbriata*), western sword fern (*Polystichum munitum*), and southern maidenhair fern (*Adiantum capillus-veneris*). Spiky-form plants include Pacific Coast Hybrid iris, wire grass (*Juncus patens*), and the larger, more green-leaved soft rush (*Juncus effusus*). Shrubs like creeping barberry (*Berberis aquifolium* var. *repens*) and longleaf barberry (*Berberis nervosa*), creek dogwood (*Cornus sericea*), spicebush (*Calycanthus occidentalis*), Pacific wax myrtle (*Myrica californica*), and ninebark (*Physocarpus capitatus*), and others add height and depth to the plantings. Picnic benches and tables complete this area to make it one of the most popular study spots in the UC Davis Arboretum.

CALIFORNIA FOOTHILL AND VALLEY OAKS

A dramatic feature of the UC Davis Arboretum is its collection of towering heritage valley oaks (*Quercus lobata*). With immense trunks and massive branches, these goliaths are prominent in our Foothill Collection. Other oak tree species have been planted in the area, including canyon live oak (*Quercus chrysolepis*), California black oak (*Quercus kelloggii*), and Engelmann oak (*Quercus engelmannii*). Evergreen trees, like incense cedar (*Calocedrus decurrens*) and California bay (*Umbellularia californica*), punctuate the plantings in winter. Larger shrubs, such as coffeeberry (*Rhamnus californica*), sugar bush (*Rhus ovata*), and bush anemone (*Carpenteria*

californica), are planted along with oak gooseberry (*Ribes quercetorum*), chaparral currant (*Ribes malvaceum*), and snowberry (*Symphoricarpos albus* var. *laevigatus*). Evergreen currant (*Ribes viburnifolium*), prostrate chamise (*Adenostoma fasciculatum* var. *prostratum*), and Twin Peaks #2 coyote brush (*Baccharis pilularis* 'Twin Peaks #2') are planted repeatedly as evergreen groundcovers. Large swaths of grasses cover slopes and banks, such as the locally native purple needlegrass (*Nassella pulchra*), foothill needlegrass (*Nassella lepida*), June grass (*Koeleria macrantha*), and dune sedge (*Carex prae-gracilis*), all easily maintained with a once-a-year mowing. Fifteen-year-old specimens of Canyon Gray California sagebrush (*Artemisia californica* 'Canyon Gray') now have mounded to two feet tall and help control erosion on the banks. Lovely in fall, Roger's Red grape (*Vitis* 'Roger's Red') drapes a footbridge and provides dangling, deep burgundy to orange-red accents.

THE DEMONSTRATION GARDENS

As the UC Davis Arboretum has grown, we have added "home demonstration" gardens to teach visitors about the best plants for Central Valley gardening. Expanding our educational mission to include garden plants that support native creatures such as birds and pollinators has led to more mixing of California native plants with drought-tolerant non-natives. Two gardens exhibit this combination: the Arboretum Terrace Garden and the Ruth Storer Garden. In the Terrace, natives are woven with Mediterranean and southwest U.S. plants. Cleveland sage (*Salvia clevelandii*) cultivars, deer grass (*Muhlenbergia rigens*), golden currant (*Ribes aureum*), Canyon Snow iris (*Iris douglasiana* 'Canyon Snow'), island mountain mahogany (*Cercocarpus betuloides* var. *blancheae*),



Heritage valley oaks (*Quercus lobata*), with purple needlegrass (*Nassella pulchra*).

Howard McMinn manzanita (*Arctostaphylos* 'Howard McMinn'), and Wayne Roderick seaside daisy (*Erigeron* 'W.R.') are compatibly planted with rosemary (*Rosmarinus officinalis*), Texas ranger (*Leucophyllum frutescens*), autumn sage (*Salvia greggii*), Betty Rollins oregano (*Origanum* 'Betty Rollins'), and others.

In the Storer Garden, Dara's Choice sage (*Salvia* 'Dara's Choice'), Silver Carpet California-aster (*Lesingia filaginifolia* var. *californica* 'Silver Carpet'), and August Delight and Calistoga California fuchsias (*Epi-lobium canum* 'August Delight', *E. c.* 'Calistoga') grow happily with narcissus, cistus, oregano, and many other heat-tolerant garden plants.

STILL MORE

Other collections also hold native species, like the Peter J. Shields Oak Grove, where island oak (*Quercus tomentella*), coast live oak (*Quercus agrifolia*), blue oak (*Quercus douglasii*), and others are planted.

The west end of the UC Davis Arboretum has towering Fremont cottonwoods (*Populus fremontii*), part of the original flora of the waterway. Native pines like ponderosa, Jeffrey, Coulter, and Torrey (*Pinus ponderosa*, *P. jeffreyi*, *P. coulteri*, *P. torreyana*), and bigcone Douglas-fir (*Pseudotsuga macrocarpa*) can also be found in a grove along the campus entrance. Since space is too limited here to discuss every plant, we invite you to come and visit us, or visit our website at <http://arboretum.ucdavis.edu>. Come and learn more about the beauty and importance of California native plants for saving water, supporting pollinators, and conserving biological diversity. We hope that you will take away a greater respect and admiration for California's native plants.

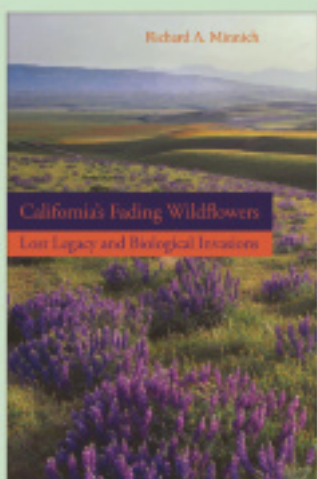
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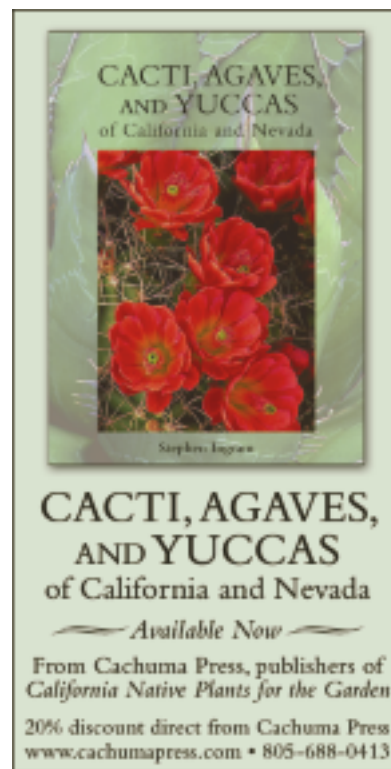
Nathan Smith currently manages the plant sales and volunteer plant propagation program at the UC Botanical Garden, Berkeley. Previously, he was a horticulturist at Santa Barbara Botanic Garden for three years and horticulturist for the California collection at the UC Garden for six years.

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John Wickham is President of the Theodore Payne Foundation, a volunteer position. He works as a legislative analyst with the City of Los Angeles. He is responsible for the exhibits at the Theodore Payne Art Gallery, and his garden has been featured on the annual Theodore Payne Garden Tour.

Ellen Zagory is Director of Horticulture at UC Davis Arboretum where she has worked full-time since 1985. Recently, she has been working on the "Arboretum All Stars" program that focuses attention on some of the best plants in the Arboretum's collection for gardens. She is an avid birder and has a particular interest in habitat gardening.



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