

## Plant Communities in the Sausal Creek Watershed

This article is the last of three newsletter articles accompanying updated plant lists on the Friends of Sausal Creek website. This article and its spreadsheet ([www.sausalcreek.org/sausal/nature\\_pdf/Plant\\_Community\\_Chart\\_Sausal\\_2012.pdf](http://www.sausalcreek.org/sausal/nature_pdf/Plant_Community_Chart_Sausal_2012.pdf)) focus on the plant communities of the watershed. We developed this list to help us in our restoration planning. Given the 260 species of native plants in the watershed, what plants are appropriate to choose when we're revegetating an area that we've cleared of invasive species?

The checkmarks in the chart are based on information from *The Jepson Manual* and from the CalFlora website and from FOSC's observations of where plants are growing in the watershed. It's not always easy to assign a plant to a plant community. California has the most diverse plant life on the continent, so broad categories don't always apply to our area. Also, given the diverse soils, hydrologic conditions, and microclimates, we have a great variety of vegetation types in a relatively small area. Disturbance by humans and animals, from Ohlone days to the present, add to the complexity of the picture, as do nonnative species.

The very term "plant communities" is really layperson's terminology. It's not the dominant tree species that determines what grows there but the amount of available sunlight, soil type, and hydrology. In California as a whole, altitude and temperature also play a role in determining plant communities, but these factors are not important on our scale. For instance, many of our understory plants are found in both oak forest and redwood forest. Some examples of plants found under both oaks and redwoods are wood, sword, and licorice ferns, yerba buena, and woodland strawberry, to name only a few. Likewise, many grassland plants mix into coastal scrub areas or can be found in the partial shade of open oak woodlands and savannahs. Poison oak is our most indiscriminate species; it is found everywhere but salt marshes and aquatic communities.

For nearly a century, plant scientists have been developing classifications to order and record the relationships of plants that grow together. The different analyses have had varying purposes and philosophies and worked at varying geographic scales. The main concerns of the USDA's Forest Service were predicting fire hazards and commercial forestry harvests. The Nature Conservancy developed a classification system to help understand and manage its holdings. Other classifications were developed to study and help preserve rare plant species or to understand and enhance habitat values. Many of these systems are hierarchical, similar to the way that the naming of biological species uses the family-genus-species hierarchy. The current California Native Plant Society (CNPS) edition of *A Manual of California Vegetation* lists 485 vegetation types.

One striking feature that is related is aspect—the direction a slope faces. On many valleys that extend east and west, the north-facing slope is heavily wooded, while the south-facing slope is coastal scrub or grassland. The hillsides above the Sunset Trails, from Cinderella Creek and eastward, would probably show this characteristic quite clearly if they had not been so heavily planted with Monterey pines and cypresses. One good example in the East Bay is the hillsides above the Leona Trail, east of Merritt College, easily visible on Google Maps.

This article will briefly describe the following plant communities, highlighting some of the species found in each community as well as FOSC's work with them:

- Coastal Strand
- Wet Meadow/Freshwater Wetland
- Riparian
- Grassland
- Coastal Scrub
- Chaparral
- Oak Savannah, Oak Woodland, and Oak Forest
- Mixed Hardwood Forest
- Redwood Forest
- Bay Forest
- Disturbed Areas



MIKE PETOUHOFF

Shepherd Canyon

## Coastal Strand

Sausal Creek's terminus may be the most affected portion of the watershed: Old maps show Oakland and Alameda connected by marsh where Sausal Creek now meets the Oakland estuary. Watershed boundaries here are more defined by storm drain infrastructure than natural landforms, and the Sausal Creek Watershed has only a few dozen feet of shoreline. We've only spotted four native species here: salt grass, marsh gumplant, marsh jaumea, and pickleweed. The site also has invasive cordgrass, many other weeds, and much trash. Some time in the future, we hope to augment the semi-annual trash cleanups with planting more of these natives and other nearby shoreline natives, perhaps with help from Save The Bay's nursery at Martin Luther King Regional Shoreline.

## Wet Meadow/Freshwater Wetland and Riparian

As a creek restoration group, much of FOSC's restoration work has focused on our riparian areas and wetlands, starting in 1996 in Dimond Park and lower Dimond Canyon. The Fern Ravine wetland in Joaquin Miller Park, where work started about three years ago, is technically labeled an emergent shrub-scrub or palustrine wetland. Another wetland area occurs on one of the small tributaries of Cinderella Creek, and the silt dam on Larry Lane develops a good mix of wetland species during the rainy season.

In lower Dimond Canyon and Dimond Park, white alder is the dominant tree species, with red and arroyo willows and creek dogwood as other dominant species. Somewhat higher in elevation, but in areas with long-lasting soil moisture, we find buckeyes with their baseball-sized seeds.



MEGAN HESS

Fern Ravine wetland



KAREN PAULSELL

*Carex leptopoda*

Riparian understory is highly diverse, with nearly 100 riparian species in the watershed, including lady and giant chain ferns, many sedges and rushes, and three species of horsetails. Shrubs include twinberry, ninebark, and red and blue elderberry (blue elderberry also occurs in nonriparian areas). Other plants that are strictly riparian or wetland plants include seep and scarlet monkeyflower, creek parsley, and watercress.

Below Dimond Park, riparian areas of the watershed have been negatively impacted by decades of development. In most areas, the creek is either culverted or in an extremely deep bed. Not

only does this reduce the amount of riparian area available for native plants, but it dewateres the surrounding uplands, reducing their ability to support native species.

Starting near the Leimert Bridge, the steep hillsides along Sausal Creek are mainly bay forest, which is dominated by the bay laurel. These trees become huge and multitrunked, casting extremely deep shade. As a result, native understory tends to be sparse, with low species diversity, made worse by the amount of Algerian ivy that thrives there.

Besides Fern Ravine, FOSC volunteers work in many riparian areas in the tributaries that form Sausal Creek.

- Beaconsfield Park has a unique stand of black cottonwoods. It's the only stand in the Berkeley/Oakland hills. Understory vegetation was decimated by the installation of a culvert and fire road when there were plans to develop the area.
- The lower portion of Cinderella Creek is mainly bay forest; other areas are largely unexplored due to the terrain. One of its three main tributaries has a small wetland area, also barely explored.
- Palo Seco Creek is lined with redwoods throughout its course, including most of its tributaries; the banks are heavily infested with ivy.
- Escher Creek has riparian vegetation persisting along its upper stretch where it exits the culvert under Bagshotte Drive. However, most of the creek bed below the stretch with lush riparian vegetation was filled to create the soccer field, and the creek was pushed over into a new channel with little or no established riparian species. A project funded by Measure DD has recently addressed some serious hydrologic problems in the area and is adding willows, dogwoods, and other riparian plants.

Other stretches of creeks in Shepherd Canyon and the Cobbledick drainage have been culverted, filled, or channeled. There are remnants of riparian species, however, including willows, creek dogwood, elk clover, giant vetch, and more along the small portions of open creek.

Our wetland and riparian areas are host to many invasive species, most notably Himalayan and thornless blackberry, Algerian ivy, Cape ivy, and poison hemlock. Elms, both English and American, also extensively invade riparian and wetland areas. Without the use of herbicides or a backhoe, control of these resprouting elms in some areas is probably beyond the scope of volunteer activity. But FOSC has had good success, with persistent attacks on other nonnative species, replacing three or four species of low habitat value with 30 or 40 native plants of much greater use to our local wildlife. FOSC's bird monitoring efforts confirm this success.

### **Grassland**

The only remaining major grassland in the watershed is along the Sunset Trail in western Joaquin Miller Park. The other grassland areas in that park, near Sanborn Drive, are in the Peralta Creek Watershed, including the grasslands within the Joaquin Miller Native Plant Nursery fence. Many of the native grassland species can also be found mixed into other plant communities, including open oak forests and coastal scrub areas.

Much of the Sanborn Drive area is underlain with serpentine, visible in the road cuts and in the cut-and-fill area of the nursery. Portions of the Sunset grassland also are underlain by serpentine. This rock is characterized by high amounts of some chemicals inimical to most plants and by a shortage of some key plant nutrients such as calcium. As a result, serpentine areas throughout California are home to many of the state's rarest species of plants that have adapted to the soil. Locally, we find many of Joaquin Miller Park's rarest plants and the best stands of native needlegrasses in the serpentine areas of the park. One benefit of serpentine soil is the low competition from other species, including the invasive annual grasses.

The vegetation cover on the serpentine areas depends to some degree on the amount of soil that has developed on top of the serpentine rock. In areas with thicker soils, nonnative grasses, such as Italian wildrye and wild oats, tend to dominate these grassland areas. These robust early-growing species tend to shade out the native grasses and wildflowers. But in areas where the soil cover is thin and the serpentine chemistry dominates, we find some of the best mix of native grassland plants, including the needlegrasses, June grass, California melic, blue-eyed grass, buttercups, sheepburr, Tiburon buckwheat, serpentine spring beauty, three species of lupine, gumplant, gold nuggets, jewelflower, Venus thistle, Oakland star tulip, and more. Many of these plants we find *only* on the high-serpentine soil areas.

Unfortunately early residents of our hills viewed grasslands and coastal scrub areas as "wastelands" and established invasive, nonnative trees in the grasslands. Monterey pine and cypress (which are California natives but not found locally), acacia, and, to some extent, eucalyptus seem to tolerate various amounts of serpentine. All of these trees make thick duff layers, burying the generally small serpentine grasses and wildflowers. The Monterey pines in particular develop thick mulchy soil layers that dilute the serpentine influence and tend to favor the invasion of either nonnative species or more common natives, to the detriment of the rare serpentine plants. This can easily be seen near the Browning Monument in Joaquin Miller Park, right on the watershed boundary of Sausal and Peralta creeks. Here our best Oakland star tulip site is invaded with nonnative grasses, English plantain, and some native coastal scrub species.

Another major negative impact on the watershed's grasslands has been fuel management. The cheapest way to control grasses on steep hillsides is goat grazing, which has taken place almost annually since the Tunnel Fire in 1991. For the last five years, FOSC has worked with Oakland Public Works Agency, Oakland Fire Department, and the goat grazing contractor to minimize the impact to rare plants in the grazed areas with positive results.

### **Coastal Scrub**

This vegetation type is present throughout the coastal regions from southern California into Oregon. It is often called coastal sage scrub after its signature species, California sagebrush, *Artemisia californica*. Species vary depending on locality and moisture, so there are distinctive names, such as Southern



*Ribes sanguineum* and *Artemisia californica*

PETE VEILLEUX

and Northern coastal scrub, mesic (moist) coastal scrub, and dry coastal scrub, reflecting differences in species composition.

All coastal scrub types are composed largely of small to medium shrubs. Many of them have aromatic leaves. To preserve moisture, some have waxy coatings, some have pale gray leaves or hairy leaves, and most have small leaves.

In our area, some of the common shrubs are coyote brush, toyon, bush monkeyflower, and California sagebrush, with coffeeberry and pink-flowering currant in moister areas. Less common shrubs are found in various locations, including blue witch, deerweed, redberry, barberry, and blueblossom Ceanothus. There are generally native bunchgrasses and a variety of perennials, annuals, and biennials, depending on shade and moisture conditions.

Many of these coastal scrub plants are part of the drought-tolerant demonstration garden along FOSC's nursery fence and within the nursery, many with information signs visible from Sanborn Drive. We plan to complete a trail on the inside of the fence that will provide access to the other diverse species we've installed there.

One of the major invaders of our coastal scrub communities is French broom. In areas with small amounts of French broom mixed with coastal scrub, fire department clearing efforts have largely favored the conversion of the sites to broom stands since broom regrows much more quickly after cutting and deposits huge seed loads which germinate after disturbance.

### **Chaparral**

Much of the chaparral area in our watershed was overplanted with Monterey pines and cypresses that have shaded and killed the brittleleaf manzanitas—the signature plant of our chaparral community. Chaparral communities are dependent on infrequent fires to suppress shading trees and to remove old wood. Many chaparral plants also require the heat of a fire to germinate their seeds. The brittleleaf manzanitas form large burls at the base of their multiple trunks; fire burns the old trunks, and causes sprouting from the burls.



Alice Cummings

Brittleleaf manzanita

In the one accessible chaparral stand in Joaquin Miller Park, the brittleleaf manzanitas are joined by chamise, deerweed, huckleberry, and the lone chinquapin in our watershed. Nearby are other chaparral species such as blueblossom Ceanothus and western leatherwood, hinting at the larger area that the chaparral may have covered before tree cover and fire suppression limited it. Beneath this stand of chaparral are pinegrass, Pacific sanicle, coastal black snakeroot (the only location in the watershed), and balsam bird's foot trefoil (the only location in Alameda and Contra Costa counties). This chaparral area is considered to be part of a rare plant community called "maritime chaparral." While most inland chaparral areas are extremely hot and dry in summer and fall, those in areas influenced by summer fogs are adapted to more moisture and cooler temperatures.

Another chaparral species that's present in our watershed is the endangered pallid manzanita. Interestingly, the area where the plants are located is an area where oak understory and redwood forest meet, not a chaparral site at all.

### **Oak and Mixed Hardwood Forest**

Our principal oak species, the coast live oak, occurs in a variety of plant community types:

- Oak savannah—widely spaced oaks with grassland beneath
- Oak woodland—oaks closer together, with a mix of shade-loving and more sun-loving plants beneath
- Oak forest—with an overstory composed almost entirely of oaks with understory plants that like deep shade. One of the best stands of pure oak forest is in Shepherd Canyon on property owned by PG&E. It's above the Bishop Court end of the Montclair Railroad Trail. A small spur trail leads uphill to the edge of the area.

- Mixed hardwood forest, also called mixed evergreen forest since most trees are non-deciduous—where oaks share the area with other tree species such as madrones, bay laurel, big-leaf maple, buckeye, and toyon.

Only oak forest and mixed evergreen forest are included on the spreadsheet. The other oak communities are really points in a continuum, from widely spaced oaks to dense, closed-canopy forest. In all these variations, understory depends on the mixture of shade and moisture so the mix of plants is highly varied. In more open areas there are grassland and coastal scrub species in the understory; in the denser oak forests, only the most shade-tolerant species are present.

Two other species of oaks occur in small patches in Joaquin Miller Park. Canyon live oak grows near the top of Cinderella Trail, and interior live oak grows along Sinawik Loop Trail. Both of these areas also have coast live oaks.

Sadly, Sudden Oak Death (SOD) now occurs in several locations in the Sausal Creek Watershed. FOSC has promoted participation in the annual SOD Blitz events that track the spread of the disease and has helped organize and publicize educational events for homeowners. We realize that the pathogen will keep spreading—slowing its movement is our primary goal. One thing that all open space users can do is to clean footwear well between hikes. See [www.matteolab.com](http://www.matteolab.com) for more information on Sudden Oak Death, including a schedule of the lab's Treatment Training Workshops.

### **Redwood Forest**

The redwood forests of the East Bay hills were logged following the population boom spurred by the Gold Rush, with all the trees being cut by 1860. There's some evidence that a partial second cut took place.

Except for some areas in the rain shadow of the Santa Cruz mountains, the East Bay redwood forest grows in one of the warmest, driest places that still produce redwoods. We suspect that, in a warming world, their genes are worth preserving, so we encourage the planting of redwoods from local seed sources whenever possible.



Denuded redwood understory in Joaquin Miller Park

KIMRA MCAFEE

The East Bay redwood forests are considered lacking in the degree of biodiversity found in other redwood areas. In Joaquin Miller Park, FOSC and Friends of Joaquin Miller Park have also been extremely concerned about the cumulative effects of off-trail recreational use on the redwood understory: denuded areas continue to expand, with soil compaction and erosion into the headwaters streams of Palo Seco Creek.

As in other parts of the watershed, Algerian ivy is very invasive in redwood understory, and, especially on the steep slopes of most of our redwood forest, the added biomass of the ivy can destabilize the tree. We have also found small

amounts of Cape ivy in the redwoods in Joaquin Miller Park. Himalayan blackberry is widespread in Dimond Canyon and in some of the lower elevation redwood areas of Joaquin Miller Park but is not widespread in the areas near Skyline Boulevard.

One of the most troublesome newer invasives of the redwood forest areas is veldt grass (*Ehrharta erecta*). This clump-forming grass produces huge numbers of tiny seeds, easy hitchhikers on damp footwear. With extremely long stems, it's capable of climbing trail cuts in a year or two. Veldt grass can thrive on fog drip such as that provided by redwoods or Monterey pines and cypresses. When clumps grow large and dense over time, veldt grass can obliterate smaller understory plants and can pose a threat to small and medium-sized shrubs.

## **Bay Forest**

Bay forest is dominated by huge bay laurel trees, casting extremely deep shade. Understory is sparse and limited to the few species that can survive in deep shade—our list includes only half a dozen natives. Most of the bay forest is too steep to explore easily and not much fun for a native plant lover. Of course, Algerian ivy and Himalayan blackberry are present in some bay forest areas.

## **Disturbed Areas**

As reflected in the descriptions above, it sometimes seems like the whole watershed qualifies as a disturbed area. However, in our reference sources, disturbed areas generally mean sites like roadsides, building sites, and trail edges, or sites that have had natural disturbances such as fire or landslides. Some of the plants are “invasive natives,” plants that produce copious seed that disperses easily or that reproduce readily from spreading roots. Two species of fireweed are persistent at the nursery, and we had to take stern action to keep coast tarweed from taking over the nursery demonstration garden. We do use many of these species in restoration, but for a home garden you should investigate how quickly they spread.

## **Choosing Garden Plants Based on Plant Community**

In the introduction to *The Manual of California Vegetation*, the authors interrupt their technical discussion of vegetation change to say, “However, the accuracy of science will never be a substitute for our aesthetic appreciation of the beauty of vegetation patterns across the landscape.” Any FOSC volunteer with a few days of experience starts to see the “before and after” differences at our work sites. For example, the difference in the Fern Ravine wetland after the removal of broom, thistles, and nonnative blackberry is subtle but significant.

If you have chosen to landscape your home garden with natives, using the plant community descriptions in this article and the online spreadsheet can help you determine which species to plant based on your light, soil, and moisture conditions. For the annual native plant sale, we try to arrange our nursery stock so that plants are grouped by plant community as much as we can, given the constraints of space. It’s also helpful when we’re loading plants for a workday: Most of the plants for the oak or redwood understory will be in our shadehouse, while the grassland or coastal scrub plants are grouped in the sun.

Of course, the hands-on approach is the best way to learn about plant communities, and there is a workday somewhere in the watershed nearly every weekend offering you just this experience. Nature provides your classroom, and we provide tools and instruction, from the regularly scheduled monthly workdays like Bridgeview Trailhead (second Sundays, 10 a.m.), where you can liberate the native plants beneath the ivy and work to restore oak understory and coastal scrub, to the randomly scheduled workdays at Fern Ravine, where you might hear a Pacific chorus frog as you give the wetland plants room to breathe, restore the grassy uplands, or replant the denuded redwood understory. Check out the FOSC calendar (<http://www.sausalcreek.org/volunteer/calendar.html>) and be part of the human community enhancing the local plant communities.

## **Resources**

The previous two newsletters with articles about our watershed’s natives are the June-July 2012 and August-September 2012 editions, available at <http://www.sausalcreek.org/about/news.html>. The August-September 2012 newsletter contains an article on FOSC’s efforts to protect the pallid manzanita (<http://archive.constantcontact.com/fs016/1106683795891/archive/1110712504572.html>).

*A Manual of California Vegetation*, second edition, by John Sawyer, Todd Keeler-Wolf, and Julie Evens provides descriptions of 485 California vegetation types. Available from CNPS at [http://cnps.org/store.php?crn=65&rn=451&action=show\\_detail](http://cnps.org/store.php?crn=65&rn=451&action=show_detail). Information from the first edition is available at <http://davisherb.ucdavis.edu/cnpsActiveServer>.

“Triple Threat from South Africa” describes veldt grass and other invasive plants, see page 21 of [http://www.cnps.org/cnps/publications/fremontia/Fremontia\\_Vol31-No4.pdf](http://www.cnps.org/cnps/publications/fremontia/Fremontia_Vol31-No4.pdf).

Las Pilitas is a native plant nursery in southern California. If you can make some mental adjustments for climate differences, you’ll find the plant and plant community information on their website very thorough and helpful. See <http://www.laspilitas.com/>.

--Karen Paulsell