Lauren Webster's Oakland Hillside Garden – A Permaculture Approach to California Native Gardens & Hillside Erosion Control with Rainwater Harvesting: dry stack stone walls, wetlands, swales & native plant community

*Native plant communities–*

*Coastal Sage Scrub Community & Mixed Evergreen Community*

California Oak tree plant community– most of the plants surrounding the oak tree naturally occur there or are compatible with the environment. There is no mulch introduced within the oak tree line because the fallen oak leaves actually activate and encourage the growth of mychorriza that support the oak tree’s health.

Both the coastal sage scrub and mixed evergreen plant communities exist naturally in this area. And most of the plants in this garden come from these communities. Plants are chosen not simply for themselves but for the environment they create—whether a wetlands, deep shade, a sunny hillside, etc. and for how they interact – color and texture. They also provide habitat and food for birds, lizards, and other wildlife. The gentle shift from trees to smaller trees, and shrubs to perennials and grasses provides cover amid flight and at rest for birds.

*Shade plants*

Shade/Part Shade alongside the cottage

Manzanita 'sunset', native currant, snowberry, evergreen currant, along with iris and columbine, prosper together in the shade along the cottage.

*Plants flowing down hillside – in Pistache tree planting bed*

In dappled sunlight the Island snapdragon, evergreen currant and coyote bush 'pigeon point' & fescue grass accentuate the downward flow of the hillside.

Goldenrod and milkweed bring in butterflies.

*sun plants, wetlands & house entrance*

The splash of colors from the penstemons, California aster, orange sedge, blue eyed grass, Island snapdragon and Douglas iris draw the eye up the hillside to the wetlands and front entrance of the house.

Island snapdragons, coffeberries, manzanita 'Howard McMinn', huckleberries, manzanita 'Louis Edmunds', redbud and mock orange form a loose hedge and backdrop for the garden.

*plants by magnolia & rock walls*

Where water collects either in a wetlands or swale or because of rock walls - ferns, reeds, sedges and strawberries thrive.

*oak community plants*

Above the rock wall that’s above the oak

salvia clevelandii, manzanita Sentinel, wooly blue curls, grass,

manzanita Pacific mist, salvia dara’s choice

Above the oak

monkeyflower, manzanita emerald carpet, honeysuckle,

Island poppy, coyote bush, prostrate chemise

*Rainwater Harvesting –*

Bringing roof water, etc. into the garden with wetlands & swales

to benefit plant life

Wetlands & overflow swale; swale; dry creek bed;

Rock walls

*rainwater capturing features –*

*wetlands, dry creek bed, overflow swale;*

*swale, wetlands*

This garden is on a hillside where there was a lot of erosion because of the steep slope and water running down the hillside from the roof, the sump pump, and rainwater. While the slope is steep - running vertically from the house, I noticed that the ground running horizontally to the house had a slope of only 1-2%. This 1-2% slope is very modest and allows the water to be captured and flow only when there is overflow. With caution I could create one wetlands to capture the water from the sump pump and another to capture the rainwater, and potentially some roof water as well. I used dry stack stone walls to moderate the hillside down slope. The stone walls also slow & break the flow of rainwater down the hillside. This design follows permaculture design principles and aligns well with a native plant garden by working with the natural existing topography of the land and creating a natural environment for native plants.

*Sump pump wetlands*

This wetland captures the water from the house sump pump. There is an overflow with wetlands plants (reeds and sedges) to capture the excess water. Wetland plants are ideal (because they love water!) during the rainy season, and are drought tolerant during the dry season. The water from the sump pump had been emptying onto and eroding the hillside with the Pistache tree. The water was redirected into wetlands created below the hill.

*The wetlands and dry creek bed*

This wetlands and dry creek bed captures rainwater. Because of the soil composition in this garden the soil percolates the water but also retains the moisture and raises the water table, so water is available longer in this garden for the plants to draw on. As a result of the installation of the rainwater harvesting feature, the irrigation system that will be used while the plants are getting established, can be turned on later in the season.

*Overflow swale & plants*

The overflow swale is a safety precaution so that the wetlands doesn’t overflow down the vertical slope of the hillside which is most vulnerable to erosion. All the water features are slightly sloped to capture water & to allow water to flow slowly when the soil becomes saturated. The direction of the slope determines how & where the water flows.

*Wetland plants*

Wetlands – the wonder of wetlands is that the plants love water- even lots of it!- in the winter and are drought tolerant during the summer. Because the wetlands dries out after the rainy season it also doesn’t breed mosquitoes. The plants in the wetlands here are –

Blue lobelia, Berkeley sedge, redtwig dogwood

*The rock walls*

The dry stack walls are embedded in the soil and tilted back into the earth for stability and backed with amended soil to alleviate pressure on the wall, since a clay soil expands 6 times its size when wet. The wall is actually a double wall with the front and back wall-of smaller stones- are interlinked to allow for stability & movement. The rock walls moderate the steep slope so that rainwater can be more readily captured & the flow slowed down to minimize hillside erosion.

The rock walls also define the different plant areas & communities