

To: Skyline Trail site plantings group
From: Glen Schneider, Skyline Gardens Project ([REDACTED])
Date: July 9, 2018

Subject: Skyline Trail plantings – background, map, and species list

I am looking forward to our site visit next Monday. By way of background, here's some thoughts on the bigger picture, followed by notes on the local ecology, the planting sites, a map, and the species lists for plants we have grown and planted in trailside sites.

Ecological Restoration

We find value in the definition of Ecological Restoration used by the Society for Ecological Restoration, the main national academic/trade group in the field: "Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed." There's a lot to this, and perhaps we can reflect on this together when we meet. I've attached a fuller description of "What is Ecological Restoration" from the SER Website, where they go in to some details, including their understanding of "degraded, damaged, and destroyed." For each of the planting sites we visit, I would suggest that we take time to collectively assess where each site would fall in this range of harm.

The High Ridge Volcanic Zone of the Bay Hills

The Skyline Gardens project area works in EBMUD Watershed land between and adjacent to Tilden and Sibley Parks, but we believe this Watershed area is the core of a larger, local ecological zone that we have named the High Ridge Volcanic Zone. From south to north, this zone runs from Gudde Ridge (in Sibley RP) north through the Watershed and ends just south of Inspiration Point (in Tilden RP). The zone is about six miles long and up to a mile wide. It has several interacting ecologic features that distinguish it from the rest of the East Bay and the immediate surrounding area:

- High Ridges: The ridgelines in the zone average 1,500 feet and up in elevation. The volcanic area is all well above 1,000 feet. These ridges have unique weather and create unique weather patterns and ecotones.

- Volcanic: The zone is underlain by the Moraga Volcanics unit which started some 10 million years ago and was tilted to nearly vertical. Volcanic soil has unique properties. (see attached Geologic cross-section and soil analysis).

- Precipitation: This is the highest rainfall area in the East Bay averaging over 30 inches a year. (see attached Isohyet (rainfall) map); and every ridgeline tree, shrub, and hummock combs out significant summer fog drip (not just the Eucs!).

- Climate: Ecologically, this is where the coastal fog meets the inland heat (and sometimes snow in winter.) On hot, rocky south slopes, there are plant associations very similar to the top of Mount Diablo; on north slopes are others similar to the North Coast.

Time and again, both in the field and through the Calflora database, we have noticed similar assemblages of plants up and down the zone: some typical of hot, rocky scree slopes; some typical of the wooded north slopes; some typical of springs and seeps, for which volcanic areas are famous. We are especially interested in the open, rocky, meadow-like ridgelines, where the concentrations of natives, especially native bunchgrasses and perennials, are the highest. We call these areas “high ridge rocky meadows” and they have been a big focus of our project. The Skyline Trail passes through two of these, at Diablo Bend and Siesta Nose.

Notes on the Bradley Method

There has been some back and forth about how the Bradley Method fits with Ecological Restoration and planting. The Bradley sisters of New South Wales, Australia, developed the Bradley Method. Their book, Bringing Back the Bush, is a great resource, and I have a copy if anyone would like to borrow it this week. It’s a quick and fun read, and they are real tool junkies!! Their key insight is that restoration is most effective when it starts by removing invasives from within areas of high native plant concentration, restoring those areas first, and then working outward from those recovering islands into more damaged areas, encouraging natural seed increase of natives to occupy cleared areas. They stress three principles:

1. Work outward from good areas to bad
2. Make minimal disturbance
3. Don’t over clear.

They do recognize that there are areas that have been greatly disturbed, reduced, or isolated and where regeneration by natural increase is almost impossible. They write, “Here planting local native trees, shrubs, and grasses may speed the process ...” In case you don’t have a chance to read the book, I’ve attached a scan of that section, on page 26, and have put a check mark by that part. To us, the Bradley method is a brilliant method, which we use and adapt to our local conditions. This method, however brilliant, is not the end goal; the real goal is ecosystem recovery, and we are continually experimenting with and learning effective ways to assist the recovery of Watershed area ecosystems.

Notes and map of the six trailside plantings.

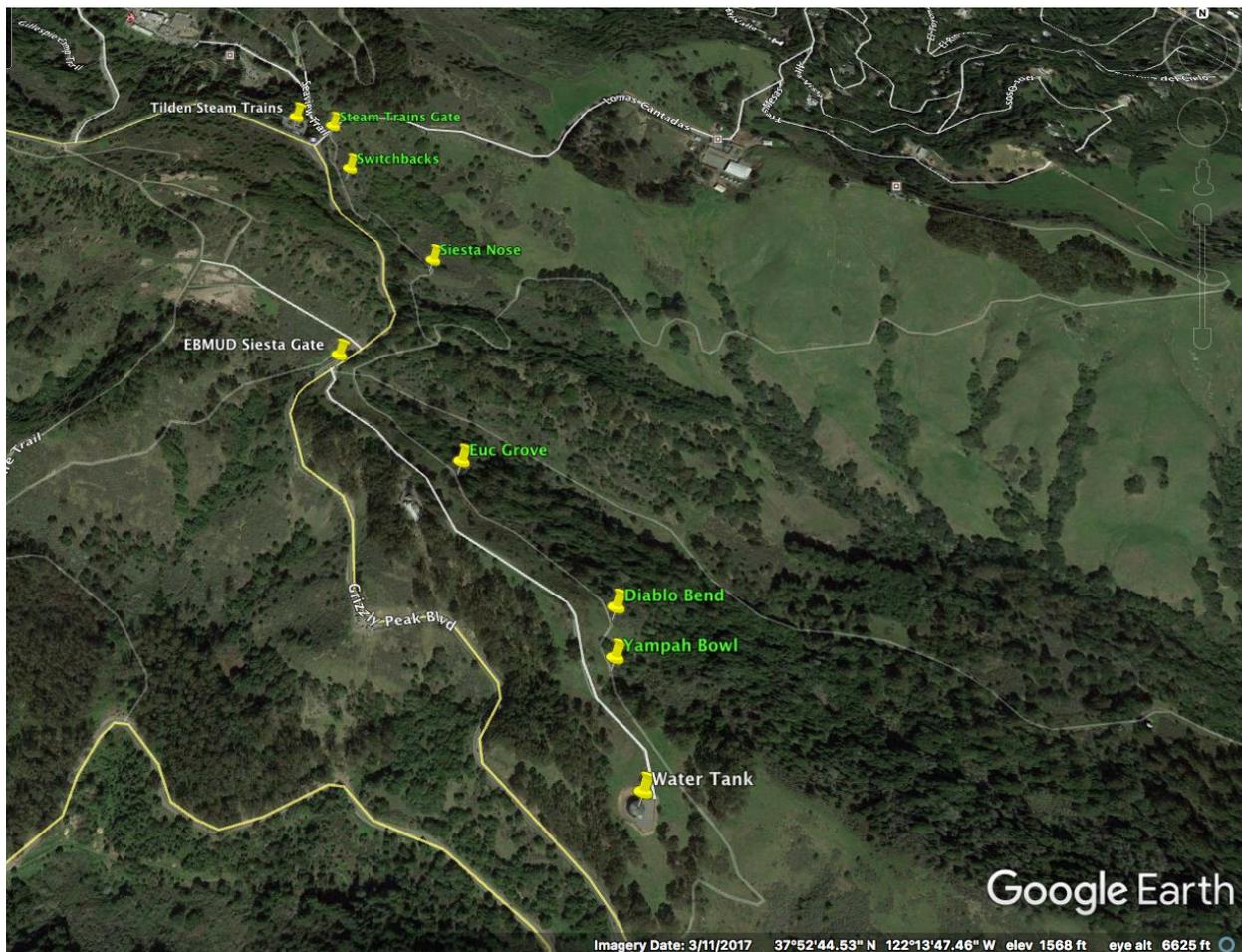
We have planted local native plants at six sites along the Skyline Trail on EBMUD Watershed between the Berkeley Hills Reservoir and Steam Trains Gate at Lomas Cantadas. The map below shows the locations. After the map, I have made some notes on each site, and then there follows a table showing when the sites were planted, and which species and numbers of each were planted at each site. All species planted are local species to the project area, and all were grown from locally collected seed gathered within the project area.

We use the smallest-sized possible plant starts, which we grow ourselves. For woody plants, we use Stubby tubes and for herbaceous plants we use cube trays. I’ll bring along samples of each container to show at the site visit. In growing these plants, we follow CNPS seed collecting guidelines and best nursery growing practices to prevent spread of Phytophthora and related plant diseases.

The planted sites along the trail are of two basic types: restoration plantings (filling out ecosystems) and erosion/trail repair plantings. Sometimes these categories overlap, and we try to cover both bases at the same site. We pay special attention to establishing sustainable populations of the project area's rare and significant plants, such as Fleshy Lupine and Cobweb Thistle. Compared to most restoration projects, we plant very sparsely. Our strategy is to plant a few plants at each site as colonizers, and then wait and observe if they will join ecosystem recovery by natural increase of their own seeding. Once plants are in the ground and settled with a shot of water, they are completely on their own. If they want to be at a site and increase, great. If not, that's up the them, too.

For the site visit, we will meet at Siesta Gate and go north, as this is where we've done the bulk of the trailside planting. If time permits, we could visit the plantings to the south, but they are much smaller and folks can visit them at any time.

Here's the map of the trailside planting sites (in green type):



Here's some quick notes on each site (from south to north). (As to names of the sites, we have held close to 400 workdays at Skyline Gardens; and out of love and necessity, we have named many of the sites and features; partly so we can find each other, note what we've seen, or say where we will meet. The naming is really fun, too.)

- Yampah Bowl: As the name suggests, this is a trailside grove of Yampah, but a small one. We planted out a number of Yampah seedlings to hopefully increase the population of this important butterfly food plant. Also, this site is one of our test spots (similar slope and aspect) for re-establishing viable populations of Fleshy Lupine (*L. affinis*) in the Watershed – a species that was thought to have been extirpated in the East Bay until we found a population along Grizzly Peak Blvd. in 2018. The first year’s plantings mostly thrived, and made a lot of seeds, so we’re hopeful on that score. By the way, the yellow flags on the slope do not mark plantings; they mark patches of high density natives, and we are testing hand weeding a three foot circle around each flag, sort of a mini-Bradley islands, than could hopefully expand and connect together. We don’t yet have the people power to hand weed the whole slope, but over three years, we have nearly extirpated the Italian Thistle here, which was a huge job in itself.

- Diablo Bend: this is the largest trailside ‘high ridge rocky meadow’ where we have done extensive invasive removal along the trail and trail shoulder. The slope is so steep that we have only been able to effectively work along the trail edge and shoulder. We test-planted a few Chia and Cobweb Thistle here to see if they wanted to be part of the ecosystem. First year results: probably not, but the jury’s still out...

- Eucalyptus Grove: the bare soil trail shoulder has been sloughing off and we planted a small number of native woodland grasses and Woodland Lupine to help stabilized the trail shoulder.

- Siesta Nose: this is the second “high ridge rocky meadow” along the trail, bordered by woodland and coastal scrub on all sides. With good borders and a workable slope gradient, it’s a promising site for complete restoration, as once cleared, annual invasives will have a hard time moving back in through the perimeter woods and brush. Also of note, this site is summer grazed by cattle, and that’s an important factor we are testing to asses the feasibility of a complete restoration in a grazed area, monitor weed introduction, etc. It’s also the best site to see ‘before and after’, as we have worked intensively in the section above the bench, and done almost nothing on the section below the bench. I would rate this site as heavily degraded, initially. For two years we have diligently removed invasives from the upper section and uncovered the bones of a good set of native grasses, perennials and annuals there. In December of 2018, we planted a mix of perennials and annuals – species that we have found to be representative of less degraded sites of similar slope and aspect – to fill out the native plant gaps in the ecosystem at this site.

- Switchbacks: This part of the trail was completely reconstructed by the Trail Dogs in December of 2016. The culvert at the bridge above this section had plugged up, and water had run down the trail bed, cutting a long, deep, nearly impassible-in-winter V in the trail center. Many yards of crushed rock and soil fill were hauled in and the trail was reconfigured to switchbacks. The new trail bed was great, but there was a long and wide gash of bare soil on all sides. To provide cover and stabilize the trail edges, and to discourage trail cutting, we used “field to field” transplants of likely species – dug up and planted all in the same afternoon.

- Steam Trains Gate: This site is both a trail shoulder and the road shoulder for Lomas Cantadas. In ecological terms, I would describe this spot as an artificial, destroyed ecosystem. This is likely the result of the culvert installation that runs underneath and long-ago grading of the road bed for Lomas Cantadas. The underlying soil appears to be a mélange of fill, with erratic volcanic stones, and chunks of asphalt and concrete. Before the installation of steps in the trail

bed two years ago, this trail section was also steep and dangerous. To make room for the trail steps, the trail shoulder was partially graded. The initial plant cover was a dog's breakfast of weedy invasives, with the exception of one Wild Cucumber, two browsed Live Oak saplings, some Coyote Brush, and a Few Mountain Dandelions (*A. grandiflora*). Since the slope faces south, we planted to mimic the nearby Coastal Scrub (the "three Sisters of Coyote Brush, Sticky Monkey and Silver Lupine"). We planted densely here, for quick cover, and to discourage mountain bikes from cutting down the slope. We also installed a split rail fence to mark the trail entry and discourage cross-cutting. It's hard to know how to classify this site, part restoration and part trailside stabilization. We did our best. The plants seem to love it; of the 75 plants planted in February of this year, 69 are alive and they are thriving. Nine of the eleven native species planted here are found close by on the ridge spur of Tilden Park to the east and above Lomas Cantadas. This site was planted by Cal students of the UC Decal Class in Ecological Restoration that we led in the spring of 2019.

The plant list is on the next page (it's a pdf, inserted):

Skyline Trail Plantings - EBMUD Section - Skyline Gardens Project EB CNPS

May, 2016 - June, 2019

All plants are project area native species; sourced in project area

Trail Site (from south to north)	Yampah Bowl	Diablo Bend	Eucalyptus Grove	Siesta Nose	Switchbacks Area	Steam Trains Gate	Totals
Planting date	Mar 13, '19	Jan 3, '19	Jan 28 '18	Dec 15, '18	Jan 5, '17	Feb 6, '19	
Total Planted per site	37	10	25	89	59	75	295
Plant Species:							
Buckeye (A. calif.)					3		3
Calif. Poppy (E. calif.)				27		10	37
Chia (S. columbariae)		5		8		5	18
Columbine (A. formosa)				1			1
Coyote Bush (B. pilularis)				5			5
Fuchsia, Calif (E. canum)				2			2
Gooseberry (R. menziesii)					1		1
Grass, Coast R. Melic (M. torryeana)			10				10
Grass, Squirreltail (E. multisetus)				10		15	25
Grass, Wild Rye (E. glaucus)			10			5	15
Lupine, Fleshy (L. affinis)				7			19
Lupine, Silver (L. al bifrons)	12			3		5	8
Lupine, Woodland (L. latifolius)			5	1		4	10
Mule's Ears (W. helenoides)				3		5	8
Phacelia, Calif (P. calif.)				6	10	15	31
Phacelia, Imbricate (P. imbricata)				6			6
Phacelia, Woods (P. nemoralis)					10		10
Soap Root (C. pomeridianum)					5		5
Sticky Monkey (M. aurantiacus)					5	6	11
Strawberry (F. vesca)					20		20
Thistle, Cobweb (C. occidentale)		5		10		5	20
Yampah (P. kelloggii)	25						25
Yarrow (A. millefolium)					5		5