

A FLORISTIC STUDY OF THE CAL POLY SWANTON PACIFIC RANCH AND A NEW  
COMBINATION IN *SANICULA CRASSICAULIS* (APIACEAE),

*SANICULA CRASSICAULIS* VAR. *NUDICAULIS*

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by  
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Ranch and a New Combination in *Sanicula*  
*crassicaulis* (Apiaceae), *Sanicula crassicaulis* var.  
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## ABSTRACT

### A Floristic Study of the Cal Poly Swanton Pacific Ranch and a New Combination in *Sanicula crassicaulis* (Apiaceae), *Sanicula crassicaulis* var. *nudicaulis*

Reed J. Kenny

Globally we are experiencing a biodiversity crisis and potentially a sixth mass extinction event. Plant specimens are one of the best, most concrete records of biodiversity that we can create. Despite this, the rate of plant collecting has declined steeply since World War II. Now more than ever, plant collections are vital, both for the purpose of quantifying the plant biodiversity in an area and for discovering previously unrecognized diversity.

In Chapter 1, we conducted a floristic survey of the Cal Poly Swanton Pacific Ranch. The Swanton Pacific Ranch (SPR) is located north of the small town of Davenport California, in Santa Cruz county. SPR is 3,200 acres and contains areas of salt marsh, coastal bluff, coastal prairie, riparian forest, redwood forest, mixed conifer forest and chaparral in approximate ascending order of elevation. The property extends over an elevational gradient from 0 m to 420 m (1400 ft). We documented 634 taxa at SPR. In total, 974 specimens were collected during this project, 405 specimens in 2017 and 569 in 2019. We reviewed 211 historic specimens. We vouchered 546 taxa between 2017 and 2019 and observed but did not collect 6 taxa. 53 taxa are represented from historic collections and were not relocated. There are 30 taxa listed as historically present from personal observations of the authors but without vouchers. Though these do not have the same value as a physical specimen, we believe that all information is valuable and have included them with a clear indication of the source of the record. There were 465 native and 169 non-native taxa documented in the study area. There were 93 families represented, with Asteraceae, Poaceae and Fabaceae being the top three most speciose respectively. There were 83 taxa noted as locally rare following Neubauer, of these 16 taxa have a California Native Plant Society (CNPS) rare plant rank. We vouchered one new taxon for Santa Cruz County, *Senecio aphanactis*, which has a CNPS rare plant rank of 2B.2

In Chapter 2, we describe a new combination in the *Sanicula crassicaulis* species complex. During the project detailed in Chapter 1, we observed and collected several specimens that keyed to *Sanicula crassicaulis* Poepp. ex. D.C. but were notably distinct from other *S. crassicaulis* that we collected in the area. On further investigation, we found that these plants match the type specimen of *S. nudicaulis* Hook & Arn., described in 1839 and later synonymized with *S. crassicaulis*. This taxon is distinguished primarily by its long, sinuate marginal leaf trichomes, in contrast to the short, straight marginal trichomes of *S. crassicaulis*. Additionally, the length of the most proximal prickles on the schizocarps is about the same as the length of the most distal rather than the distal prickles being much longer as in *S. crassicaulis* and the angle of attachment of the prickles is more or less perpendicular as opposed to acute in *S. crassicaulis*. The known range of this taxon is between the San Francisco Bay Area and Santa Barbara County, generally near the coast. Here we recognize this taxon as a variety in *S. crassicaulis*, *Sanicula crassicaulis* var. *nudicaulis*. We provide a diagnosis, a map of the known range of the taxon and a key to the varieties of *S. crassicaulis*.



Overall this project has significantly increased our knowledge and documentation of the flora of both SPR and Santa Cruz county. In addition to the immediate benefits of this study (a complete species list for SPR, the discovery of a new taxon, and the mapping of all rare species at SPR) we have also contributed almost 1,000 physical specimens to the Cal Poly Hoover herbarium which may be used in future taxonomic and ecological studies.

Keywords: Floristic Study, Swanton Pacific Ranch, *Sanicula crassicaulis* var. *nudicaulis*

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## CHAPTER 1

### A FLORISTIC STUDY OF THE CAL POLY SWANTON PACIFIC RANCH

#### 1.1 PRIMARY OBJECTIVES

The primary objectives for this study were to 1: Catalogue, voucher and create a checklist for the flora of Swanton Pacific Ranch. 2: Document and voucher the rare plant populations at SPR. 3: To facilitate further study, document the abundance of ecologically unusual specimens, taxonomically difficult specimens and putative hybrids found at SPR.

#### 1.2 SIGNIFICANCE

Ecological studies rarely last more than 10 years (Hughes et al., 2017). When there is an opportunity to utilize a dataset that extends back for decades, it should be seized. This publication represents not only the result of two years of collections at Swanton Pacific Ranch (SPR), but also the accumulated observations of 50 years spent studying the flora of the Swanton area. Not all historical observations included in this study have voucher specimens, but we believe they still represent a valuable source of information. The notes on putative hybridization and taxonomic oddities stem from decades of observing the same forms, persisting in stable populations year after year. These aspects make the study unusual, but also uniquely valuable.

A lifetime of observing the plants of one watershed can lead to a markedly unique view of nature. For one, it leads to the idea that biodiversity and human use of a landscape are not mutually exclusive. You see clear cuts grow back, logging roads become havens for cryptic *Trifolium* species, and observe rare plants growing on roadcuts. The landscape is defined by cataclysms and slow recoveries. You see that biological, geological and human forces are intimately connected. You ask, what was the effect of the mass harvest of Tanoaks in the

watershed? Can leaf litter change the frequency of landslides? Over long periods of time, small details in the landscape propagate and gain significance. This is a worldview that is hard to arrive at as a young scientist. Since the 1990's, Cal Poly students have been coming to SPR and are exposed to these ideas in a largely oral and experiential tradition. In addition to the important issue of documenting biodiversity and the value of collecting physical specimens, one goal of this project is to preserve a small part of this worldview for posterity.

### **1.3 DESCRIPTION OF AREA**

#### **1.3.1 Circumscription**

Swanton Pacific Ranch is located in northern Santa Cruz county, just north of the small town of Davenport (population 400). The ranch's holdings total 3,200 acres and include areas of salt marsh, coastal bluff, coastal prairie, riparian forest, redwood forest, mixed conifer forest and chaparral in approximate ascending order of elevation. The property extends over an elevational gradient from 0 m to 420 m (1400 ft). The property is bounded for the most part by Highway One and the Pacific Ocean to the west and extends 4.5 km (2.8 miles) inland. This floristic study took place within the boundaries delineated in Fig 1.1. These boundaries represent: 1. The property boundary around Swanton Pacific Ranch and small inholdings 2. A ten-meter buffer on either side of Swanton Road where it borders the ranch 3. The roadcut on the south side of Swanton Rd. for ca. 200 m before the southern entrance to the ranch 4. The roadcut on the north side of Swanton Rd. for ca. 200 m before the northern entrance. The sections outside of the strict property boundaries were included due to their immediate accessibility and the presence of rare and locally rare species that may be threatened by road maintenance.



### **1.3.2 Notable Features**

The defining watershed of Swanton Pacific Ranch is that of Scott Creek. Scott Creek flows generally from north to south for about 7 km (4.3 miles) through the ranch. The majority of the Scott Creek riparian corridor on SPR has an extremely steep cliff face to the west, with a more gently rising slope to the east. The largest sub-watershed within the ranch is that of Little Creek. Little Creek flows primarily southwest and joins Scott Creek in the middle of Swanton Ranch (Fig 1.1). In contrast to Scott Creek, both sides of the Little Creek riparian corridor are extremely steep. This is predominately where redwood forest is found at SPR.

The Scott Creek Marsh is formed where Scott Creek forms an estuary with the Pacific Ocean (Fig 1.2). The name Scott Creek Marsh is something of a misnomer as it is in reality a seasonally bar closed lagoon. The lagoon can be separated into three sections. A manmade channel with berms on either side runs down the center of the lagoon and is perennially filled with brackish water. The southern section of the lagoon consists of a mostly freshwater pond that was excavated to provide soil for the berms. The northern section of the lagoon is only seasonally inundated. It contains the historic stream channel and has characteristic salt marsh vegetation.

To the north of the Scott Creek Marsh is a large section of rolling coastal prairies which gently slope towards the ocean, referred to as the Western terrace (Fig 1.3). The Western terrace is regularly interspersed with large, deeply cut, gullies, each of which acts as a small watershed and drains into the ocean. The largest and most diverse of the gullies is Big Willow Gulch, so named for the stand of extremely large and old willows found at the beginning of the gulch. Big Willow Gulch runs east to west and consists of a marshy area at the head of the gulch, a steep canyon with riparian vegetation at the bottom, coastal scrub on the sides, and a relatively flat mouth where it drains under Highway One. Other notable features are the perched marshes found at the lip of the gulch. These appear to be formed by subsurface water flows that emerge as seeps

on the side of the gulch. All of the gulches in the coastal prairie zone contain similar features but are generally less complex.

The final notable feature is the Schoolhouse ridge, or more accurately the Schoolhouse ridge complex (Fig 1.4). The Schoolhouse ridge complex forms the northernmost section of the ranch. It is bounded on the east by Mill Creek, and contains the steep, mostly inaccessible, south facing section of the Mill Creek watershed. The top of that watershed forms the Schoolhouse ridge proper, with the rest of the area defined by several smaller more or less parallel ridges and gulches which step down to Scott Creek to the west. This section contains the largest areas of chaparral, interior coastal prairie and the unusual vertical grasslands which host many of the most interesting taxa found at SPR.

### **1.3.3 Climate**

Similar to the surrounding regions, Swanton Pacific Ranch has a Mediterranean climate, with cool wet winters and long dry summers. Rainfall is concentrated between December and March, with almost no rain from June to August (Fig 1.5). Summer fog is a common occurrence and is likely an important summer water source for some plants at SPR. Summer fog occurs on a gradient with the most input to the Western terrace and the least to the eastern ridgetop areas. The average annual rainfall from the years 2000 to 2014 was 84 cm (37 in). February, on average, was the wettest month with 19.3 cm (7.6 in) during that period and there were on average 74 days of rain per year with a minimum of 24 and a maximum of 109. Precipitation data is reported from a tip-bucket rainfall gauge located in the upper portion of study region 25, at about 300 m (1,000 ft) in elevation. The average air temperatures are generally similar (within 2°C) across the ranch, with the coastal regions generally being warmer and experiencing less variation in temperature and the inland regions being colder with larger fluctuations in temperature. The mean annual air temperature for the ranch is 13-14°C (55-57°F). The mean annual variation in temperature is 12-

13°C (53-55°F). December and January are coldest months of year with mean temperatures of 8-10°C (46-50°F). August is the hottest month of the year with mean temperatures of 15-17°C (59-62°F). Air temperature data is reported from the Chelsea global climate model and represents the years 1979 to 2013 (Karger et al., 2017).

#### **1.3.4 Geology**

The parent material for the vast majority of the ranch is siliceous mudstone, with only the upper half of the Little Creek watershed underlain by quartz diorite (Cochrane et al., 2015). The soils range from sand, to loam, to the extremely weathered siliceous mudstone that is sometimes referred to as “chalk” (Fig 1.4). Sand and sandy loam is found on the coastal bluffs and extends inland to discrete areas of the Western terrace where the sandy soil has resulted in much greater amounts of erosion. The majority of the Western terrace, interior coastal prairies and forests have loam soil. The “chalk” or extremely weathered siliceous mudstone is found only on the ridgetops. Notable soil features include areas of exposed or nearly exposed mudstone in the coastal prairies, which often harbor higher percentages of native species and steep, often actively sliding areas in mixed conifer forest which harbor unique herbaceous communities.

A defining feature of the coastal regions of the ranch, generally west of Scott Creek, are the coastal terraces. These step-like formations are found primarily to the south of the ranch, with the area around Santa Cruz showing evidence of five separate terraces. They are believed to form during periods of high sea level, when wave action cuts a smooth plane into the bedrock. New terraces may be formed as sea level rises and falls, but eventually the terrace is lifted above the high sea level mark and begins to erode. At SPR, there are generally only signs of the youngest two terraces, found closest to the ocean. The first terrace, which forms the coastal bluffs, is believed to be about 70-80,000 yrs old and the second and higher terrace, which forms the

Western terrace (Fig 1.2), is believed to be about 100,000 yrs old (White et al., 2008).

Presumably, the gullies cutting across the Western terrace were formed by the erosive activity of waterfalls running over the cliffs formed by the coastal terraces. This erosive activity is referred to as a head cut. Over time, the head cuts eroded the terrace until there was no longer a vertical drop. This created the steep gullies that abruptly flatten out as they reach the downslope edge of the terrace formation.

A distinct feature of the Western terrace is the syncline that divides it into two watersheds. The northeastern portion of the coastal prairie is tilted east and forms part of the Scott Creek watershed. This geological oddity hosts some of the most pristine coastal prairie on Swanton Ranch and many uncommon and rare species. The rest of the Western terrace is west facing and drains via the many gullies into the ocean.

Another notable aspect of the geology is the extreme topography. The erodible nature of the mudstone bedrock has led to steep canyons being formed wherever water flows. The fact that Scott Creek and Little Creek flow more or less perpendicularly to each creates slopes that face all of the compass points. This extreme topographic heterogeneity is likely one reason for the high local species richness that we observe at SPR (Yasuhiro et al., 2004). Indeed, as the authors have noted after much scrambling, many of the most interesting specimens are found on extremely steep slopes.

### **1.3.5 Disturbances**

Fire is the natural disturbance with the largest impact on the flora of the ranch. In 2009 the Lockheed fire burned 1,136 acres of the ranch. The fire mostly burned through mixed conifer forest, with low to high severity. Most of the burned areas have undergone extensive regeneration

of *Ceanothus thyrsiflorus* Eschsch. var. *thyrsiflorus* (blue blossom). This has extremely altered the understory in burned areas which were previously open and dominated by herbs and grasses.

The major anthropogenic disturbances in botanical areas are cattle grazing and timber harvests. About 70 acres of valley bottom are still used to grow row crops and about 4.5 are apple orchard. These are significant disturbances but are limited to small areas of the ranch.

Grazing takes place primarily on the coastal prairie, west of Scott Creek, and on a few small pastures in the southwest corner of the ranch. It is difficult to determine the impact of grazing on the native flora. Studies elsewhere have shown both positive and negative effects of grazing on coastal prairies (Dremann & Shaw, 2002; Skaer et al., 2013), although at least one study of the local area specifically found it to be beneficial, at least to native annual forbs (G. F. Hayes & Holl, 2003). One factor that I observed during this study is that many of the rare plants exist in patches of increased native cover and tend to be on steep slopes with minimal signs of grazing. Other areas of increased native cover tend to be in areas of very thin soil that are unlikely to provide good forage, but also in wet areas which are regularly grazed. Rangeland management at SPR also involves the removal of encroaching shrubs. This is likely beneficial to native species diversity as *Baccharis pilularis* D.C subsp. *consanguinea* (D.C.) C.B. Wolf (coyote brush) and *Toxicodendron diversilobum* (Torr. & A. Gray) Greene (Western poison oak) are aggressive invaders of coastal prairie and do not support a diverse understory. This practice is also mimicking, in some ways, the frequent burning that would have occurred under the management of the indigenous Cotoñi people.

Timber harvests are conducted infrequently and selectively. There have been four harvests in the last 30 years, one of which was a post fire salvage operation in 2010. Due to the non-industrial nature of the harvests and the defined botanical conservation areas in the timber harvest plan, the native flora is unlikely to be unduly harmed by timber harvest activities. However, invasive species are always a concern with large scale disturbances such as timber

harvests, and the utmost care must be taken to avoid the spread of invasive species. The forested areas of the ranch have many rarely used logging roads where the majority of invasive species are found. The installation of skid trails and logging roads is particularly prone to spreading invasive species due to the large degree of soil disturbance involved. Strict regulations to prevent the spread of invasive species should be adopted when constructing future logging roads and skid trails.

### **1.3.6 Land use history and ownership**

The Swanton area has been influenced by human use for thousands of years. Rob Cuthrell's work at the Quiroste Valley, located 10 miles north of Swanton Pacific Ranch at Año Nuevo State park, has been very informative about the indigenous land management practices that were implemented in the Swanton region. Through an analysis of trace plant remains, he found strong evidence that indigenous burning of the vegetation was widespread and created many areas of grassland that have now undergone succession to coastal scrub or oak woodland (Evelt & Cuthrell, 2013). This archeological evidence is reinforced by historical accounts recorded by the 1769 Portola expedition that indicate grassland as the dominant vegetation in the region (Cuthrell, 2013). In addition to burning, native land use practices likely had other major impacts on the vegetation. Many tribes commonly harvested the bulbs or corms of local geophytes, which potentially increased the abundance of some populations due to the soil aeration and dispersal of bulblets. (Anderson & Rowney, 1999) They would also likely coppice shrubs such as *Corylus cornuta* Marshall *subsp. californica* (A. DC.) A.E. Murray (California hazelnut) in order to increase the fruit set, and would have tended beds of *Carex barbarae* Dewey (whiteroot sedge) for basketry (M. Kat Anderson, 2005)

When the Mission Padres arrived, the land use practices of the native peoples were drastically altered. The Padres forbade burning of the landscape and the Swanton valley was

included in a land grant that created the Agua Puercas Ranch. The Spaniards used the area primarily for grazing livestock on the abundant grasslands. This continued until 1866, when the original land grant was sold to James Archibald (Scaromozzio, 2015). From this period until 1950, the land was used for a variety of purposes. These included, timber, agriculture, and hydroelectric power. From 1850 to 1960 the area was logged extensively. All the old growth redwood and mixed conifer forest was clear cut and many tan bark oaks were harvested for their bark. Portions of the coastal prairies were tilled and used for row crops such as Brussel sprouts and artichokes, which likely contributes to the extreme variation in native species cover today (Kulmatiski et al., 2006). Flax was grown during the same period, the feral descendants of which are now a common nonnative member of the grassland community. Dams and miles of flume were built to run a hydroelectric power plant which provided electricity to Santa Cruz. The plant operated from 1899 to 1948 when the flume was burnt by a forest fire.

Archibald's holdings were split up over time, but much of the Swanton Valley came to be owned by the settling families. The Gianone family was one of these families, originally hired by Archibald to manage his dairy operations. James West is a direct descendent of these settlers. Born in 1946, he had the luxury of free rein in exploring the botanical treasures of the watershed from a very young age. The Gianone family along with other families sold parcels in the Swanton region to Al Smith from about 1940 to 1980. Smith had the goal of owning a large portion of the valley and keeping it from development. Smith experimented with different tenants and farming techniques and deepened his relationship with Cal Poly State University, San Luis Obispo, during the 1980s. In 1991 Smith gifted a 2 million dollar endowment and much of his ranch to Cal Poly to be used for experiential learning.

### 1.3.7 Wildlife

Scott Creek is the southernmost natal stream in North America for the endangered Coho Salmon (*Oncorhynchus kisutch*) and also hosts the endangered Pacific Steelhead (*Oncorhynchus mykiss*). Studies show that the Scott Creek Marsh estuary is important habitat for Steelhead smelts before they enter the ocean (S. A. Hayes et al., 2008). The Scott Creek Marsh is also habitat for the endangered Tidewater Goby (*Eucyclogobius newberryi*). This small benthic fish is particularly noted to inhabit enclosed lagoons near the mouth of coastal streams (Swenson & McCray, 1996). Moving inland the endangered California Red-Legged Frog (*Rana draytoni*) can be found in or near riparian corridors (Fellers & Kleeman, 2007). In addition to these endangered species, SPR is host to numerous other species of bird, reptile, amphibian, mammal and insect.

## 1.4 PREVIOUS DESCRIPTIONS OF THE FLORA

The Santa Cruz Mountains and Santa Cruz county have had a long history of botanical documentation. The first attempt to systematically catalogue the flora of Santa Cruz County was made in 1892 and resulted in the pamphlet “A Catalogue of Flowering Plants and Ferns of Santa Cruz County.” This work began with a contest posed by The Surf, one of Santa Cruz’s newspapers. The newspaper offered a prize for students in the county’s public schools who collected wildflower and fern specimens. Their collections were curated and added to by Dr. Charles Lewis Anderson to produce the catalogue, which claims to be the first published in the state. It lists 628 flowering plants, 17 ferns and 75 grasses (Clarke, 1890).

The next work that included the flora of Santa Cruz County was *A Flora of the Santa Cruz Mountains of California: A Manual of the Vascular Plants*. This was published by John Hunter Thompson in 1961. He documented about 1,800 species in the region of the Santa Cruz Mountains, encompassing San Francisco, San Mateo, and western Santa Clara County as well as



Santa Cruz County (Thomas, 1961). In Santa Cruz county, Thompson drew heavily on the collections amassed by Vesta Hesse in the Boulder Creek area in the 1940's and 50's. Swanton is listed as a locality in this work and Thompson made several series of collections on and around the ranch, totaling about 30 specimens. *A Flora of the Santa Cruz Mountains* remains the most comprehensive account of the large-scale floristic patterns observed in the county including discussions of the common vegetation types and geologic patterns.

In 2005, Randal Morgan and the rare plant committee of the Santa Cruz California Native Plant Society (CNPS) chapter authored the first edition of the "Annotated Checklist of Santa Cruz County." This was largely a result of efforts to establish a list of locally rare species in Santa Cruz county, and resulted in the most comprehensive and accurate inventory of species in the county at that time. The checklist established 13 floristic regions in the county of which Swanton/the Scott Creek Watershed is one (Morgan, 2005). In 2013 Dylan Neubauer published the second updated edition which includes 1,594 vascular plant taxa as well as many notes on differentiating closely related taxa, geographic information and rarity data (Neubauer, 2013). Neubauer's checklist was used extensively during this study as the most up to date field resource specific to the county. Jim West's essay "Traversing Swanton Road," which documents plant communities as well as taxonomic and ecological oddities that can be found as one walks Swanton Road, was also used extensively as a reference and primary record (James West, 2016).

## **1.5 MATERIALS AND METHODS**

To compile a preliminary species list for Swanton Pacific Ranch, we obtained previous records from the Consortium of California Herbaria through the old and new portals (CCH1:<https://ucjeps.berkeley.edu/consortium/> and CCH2: <http://cch2.org/portal/index.php>). We included all records that are georeferenced as occurring within 50 meters of SPR property, unless they could be verified using the site description as occurring off of SPR. We also included

specimens that were not georeferenced or were georeferenced as occurring off of SPR, but which had Swanton Pacific Ranch listed as the collection locality. This list was used primarily to guide collection efforts. Specimens that we did not personally collect or observe in the field but are included in the study as historically present, were reviewed at the Hoover (OBI) and UC Berkeley/Jepson herbaria (UC/JEPS). Some species are included in the study which are known only from the personal observations of the authors. These are noted as historically present and the source of the record is clearly stated.

Monika Richardson and Jim West spent 19 days collecting in 2017, collecting primarily within, but not limited to, SPR. They collected between July 2 and September 21, 2017. Reed Kenny and Jim West spent 44 days collecting in 2019. Collecting started March 2 and ended July 26, 2019. Specimens collected during those two periods were curated by Reed Kenny in 2019-2020 and are deposited at OBI.

In 2017, collection locations were recorded using the My GPS Coordinates app (My GPS Coordinates version 2.12, TappiApps) running on an iPhone 6. In 2019, collection locations were recorded using Arc GIS Collector (Arc GIS Collector version 20.1.0, Esri) running on an iPhone 8. Some label data was lost for Richardson collections made in 2017. Locality data for these specimens was assigned during curation in 2019 to the level of occurring on or off of SPR and, if possible, in which study regions specimens were found. All voucher specimens were deposited in the Hoover Herbarium (OBI) with duplicates sent to the Kenneth S. Norris Center for Natural History (UCSC) when possible.

The Jepson eFlora and Dylan Neubauer's "Annotated Checklist to the Vascular Plants of Santa Cruz County" were the primary resources used to identify specimens. Taxonomy generally follows the Jepson eFlora with the exception of some taxa recognized by CNPS as rare but not treated in the eFlora. Designations of species as locally rare were taken from Neubauer, who defines locally rare as having 5 or fewer extant populations in Santa Cruz county (see Neubauer

2013 pg. 10 for a full definition). Taxa with a CNPS rare plant rank are listed in Table 1 and have their rank included in the species notes. Occurrence information for all CNPS rare plants on SPR was submitted to the California Natural Diversity Database.

The goal of this project was to survey as much of SPR as possible. Collecting localities were targeted primarily for biodiversity and to represent all plant communities at SPR. Localities were also targeted where Jim West had listed plants in “Traversing Swanton Road” that were not yet collected from SPR. Many specimens were also collected opportunistically while walking to targeted localities.

We created study regions to divide SPR into floristically similar zones (see Fig 1.1). In July of 2019, each study region was surveyed, regardless of having been previously visited, and a species list was created. These were combined with all collections made within the study region to produce as complete a species list as possible for each region. During this process, most of the accessible portions of SPR were visited. Areas that were not visited were those with heavy cover of poison oak, impenetrable chaparral, and slopes that were not walkable.

## **1.6 PLANT ASSOCIATIONS**

Due to the focused and short-term nature of this study, vegetation stands were not surveyed with the detail required to delineate the current Manual of California Vegetation (MCV) alliance and association names. Indeed, the vegetation at SPR is highly complex, and merits further study. Here we present a summary of the vegetation types following Holland and Keil 1995 along with the MCV alliances that we believe are represented. The exception to this is the Scott Creek Marsh. An exceedingly thorough catalogue of the vegetation of the Scott Creek Marsh was compiled by students Thomas Buchloh, Sam Farrow and Celeste Dorion with supervision from the authors in 2018-19. For the Scott Creek Marsh, we will report the MCV

alliance names assigned using this quantitative data. All MCV alliances were identified using the Manual of California Vegetation online edition (California Native Plant Society, 2020).

### *Coastal Prairie*

This extremely diverse assemblage of plants is defined by the presence of several species of perennial grasses with a plethora of annual and perennial forbs and geophytes included. It is largely found in two regions of SPR. The majority of the coastal prairie is found on predominantly north and west facing slopes within 1.5 km (~ 1 mile) of the ocean. The dominant species are *Deschampsia cespitosa* (L.) P. Beauv., *Danthonia californica* Bol. and *Hordeum brachyantherum* Nevski. Notable forb species include *Hosackia gracilis* Benth., *Delphinium decorum* subsp. *decorum* Fisch. & C.A. Mey. and *Amsinckia lunaris* Macbr. These communities tend to be found in areas of increased moisture, or on slopes that are too steep for cattle to easily access. Additional smaller and floristically distinct prairies are found on the lower reaches of the Schoolhouse Ridge (Fig 1.1). Given the botanically and ecologically distinct nature of the ridge top prairie, we refer to this community in habitat descriptions as interior coastal prairie. It is distinguished floristically by a greater abundance of *Danthonia californica*, *Stipa pulchra* Hitchc., and *Elymus glaucus* Buckley and a relative lack of *Deschampsia cespitosa*. The forb community is also divergent, with *Clarkia rubicunda* (Lindl.) F.H. Lewis & M.E. Lewis, *Lomatium caruifolium* (Hook. & Arn.) Coult. & Rose, and *Brodiaea terrestris* Kellogg being much more common than in the more coastal communities. The interior coastal prairie is also distinct in that it lacks the vernal or perennially moist areas that seem to support large stands of perennial grasses on the coastal terraces. The MCV alliances that comprise these areas are the *Danthonia californica* alliance, *Hordeum brachyantherum* alliance and *Deschampsia cespitosa* alliance.

### *Freshwater Seeps*

Interdigitated with the coastal prairies on the west facing coastal slopes are numerous freshwater seep areas. These range in size from less than 100 square meters to several hundred square meters. The communities are dominated by *Carex* L. spp. and *Juncus* L. spp. with perennial herbs such as *Sisyrinchium bellum* S. Watson appearing frequently. These seeps are also found within large expanses of non-native annual grassland and can act as refuges of primarily native cover. *Trifolium repens* L. and *Holcus lanatus* L. are the two non-native species that seem to be able to effectively invade these areas. The typical dominant species are *Juncus phaeocephalus* Engelm., *Juncus balticus* Willd. subsp. *ater* (Rydb.) Snogerup, *Juncus patens* E. Mey., *Juncus hesperius* (Piper) Lint, *Carex densa* (L.H. Bailey) L.H. Bailey, *Carex subbracteata* Mack., *Carex harfordii* Mack., and various hybrids or unnamed taxa in *Carex*. The corresponding MCV alliances are *Juncus (oxymenis, xiphioides)* and *Juncus arcticus* (var. *balticus*, var. *mexicanus*).

### *Wildflower Fields*

There are several areas of nearly exposed mudstone, especially in the northern third of the Western Terrace (Fig1.1 study regions 7-13), where the thin soil and drought conditions keep the cover of non-native grasses low and allow large displays of native forbs to thrive. Though small in size, these areas are floristically distinct from the coastal prairies and deserve recognition. These areas can be most easily picked out during the flowering time of *Lasthenia gracilis* (DC.) Greene when they can be seen from Highway 1 as large patches of bright yellow. *Plantago erecta* E. Morris, *Microseris bigelovii* (A. Gray) Sch. Bip., and *Clarkia rubicunda* (Lindl.) F.H. Lewis & M.E. Lewis also form large components of these communities in different areas. Many of these areas also host an incredible diversity of native *Trifolium* L. spp. as well as the rare *Stebbinsoseris decipiens* (Chamb.) K.L. Chambers. Likely due to their shallow, drought

prone, soils, these areas share many of the forb species found in the interior coastal prairies. The MCV alliance that these areas fit into is the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* alliance.

#### *Non-native Grassland*

Large areas of the coastal terraces are dominated by non-native annual grasses, namely *Avena barbata* Pott ex Link, *Bromus hordeaceus* L. and *Hordeum murinum* L. These areas tend to be on low to moderate slopes and have deep loamy soils. They are more xeric than the coastal prairie zones and are highly productive, providing much of the forage for the ranch's cattle. From the northern to southern edge of the Western Terrace, aeolian sand deposits increase dramatically. As the sand content in the soil increases it appears that the cover of non-native forbs and grasses increases as well. Other prominent species in these areas include *Trifolium angustifolium* L., *Trifolium subterraneum* L., *Carduus pycnocephalus* subsp. *pycnocephalus* L. and *Silybum maritimum* (L.) Gaertn. These areas fit into the MCV *Avena* spp. – *Bromus* spp. alliance.

#### *Freshwater Marsh*

Freshwater marshes can be found at the head of many of the coastal gulches (Fig. 1 see Big Willow Gulch), where subsurface water emerges before flowing down through the gulch. These are generally dominated by *Juncus effusus* subsp. *pacificus* (Fernald & Wiegand) Piper & Beattie, *Juncus patens*, *Juncus hesperius*, and *Scirpus microcarpus* J. Presl & C. Presl, with some having an overstory of *Salix lasiolepis* Benth. or *Ribes divaricatum* Koehne. These often show signs of being significantly grazed, with prominent hoof punch and grazed tips on the *Juncus*. Despite, or perhaps because of this, these communities tend to be dominated by native species. Notable forbs include *Epilobium ciliatum* Raf., *Oenanthе sarmentosa* Presl ex DC., *Hypericum*

*anagalloides* Cham. & Schltdl., and the locally rare *Stachys chamissonis* Benth. These areas fit into the MCV *Juncus effusus* alliance and *Scirpus microcarpus* alliance.

### *Central Coastal Scrub*

Coastal scrub is found primarily on the coastal terraces. It is the dominant vegetation on the steep slopes that form the sides of the coastal gulches and large patches occur on the higher elevation grassland areas. The dominant species are *Artemisia californica* Less., *Toxicodendron diversilobum* (Torr. & A. Gray) Greene, and *Baccharis pilularis* D.C. They tend to form dense, impenetrable stands with a depauperate understory. However, in areas where there is more space between shrubs the forb understory can be quite diverse. *Berberis pinnata* Lag. and *Amelanchier utahensis* Koehne form small but notable additions to these communities in some areas. Higher elevation stands are dominated by *Baccharis pilularis* and *Toxicodendron diversilobum*. To prevent their encroaching on productive grasslands, these are periodically removed. Notable understory species include *Piperia michaelii* (Greene) Rydb., *Zeltnera davyi* (Jeps.) G. Mans., and *Angelica tomentosa* S. Wats. This community is composed of the MCV *Baccharis pilularis* alliance and *Artemisia californica* alliance.

### *Coastal Bluff Scrub*

Occurring on the relatively small portion of the ranch adjacent to ocean bluffs (Fig 1.1 study region 17), this scrub is floristically distinct from the inland coastal scrub. *Erigeron glaucus* Ker-Gawl., *Eriophyllum staechadifolium* Lag. and *Eriogonum latifolium* Sm. are co-dominant with *Artemisia californica* to a much greater extent than is found anywhere inland. The shrubs are shorter in stature than inland and spaced farther apart. This allows for a more robust understory which commonly includes *Cryptantha micromeres* (A. Gray) Greene, *Cryptantha clevelandii*

Greene var. *florosa* I.M. Johnst. and *Daucus pusillus* Michx. Additionally, intergrading with this is a forb and grass dominated coastal strand type community. This occurs in the sandiest and most eroded portions of the bluffs and is characterized by the presence of *Agrostis blasdalei* Hitchc., *Bromus maritimus* (Piper) Hitchc., *Fragaria chiloensis* (L.) Mill. and *Dudleya caespitosa* (Haw.) Britton & Rose. Many of the areas that would have historically hosted these vegetation types on and near SPR have been destroyed by agriculture. These communities fit within the *Artemisia californica* alliance, but we would suggest an *Artemisia californica* – *Eriophyllum staechadifolium* association.

### *Riparian Forest*

This community is primarily found within 100 meters (300 ft) of Scott Creek (Fig 1.1). In the lower reaches of Scott Creek *Alnus rubra* Bong. is the dominant overstory tree. This transitions into being co-dominant with *Acer macrophyllum* Pursh and *Acer negundo* L. in the upper reaches. Most areas have a robust mid story commonly composed of *Salix* spp. (*lasiolepis* Benth., *sitchensis* Sanson ex Bong., and *lasiandra* Benth.), *Sambucus nigra* L. subsp. *caerulea* (Raf.) R. Bolli, and *Rubus spectabilis* Pursh. The lower reaches, directly before the transition to *Salix* dominated marsh, have little to no mid story and instead have a thick flood plain understory dominated by *Carex obnupta* L.H. Bailey, *Persicaria punctata* (Elliott) Small, and *Cyperus eragrostis* Lam. *Aesculus californica* (Spach) Nutt. grows in thick groves at the lower ends of the larger coastal gulches. As these areas are at least seasonally riparian, we include this as a distinct riparian forest community. These communities fall into the MCV *Alnus rubra* alliance, the *Acer macrophylla* alliance and the *Aesculus californica* Forest & Woodland alliance.



### *Mixed Evergreen Forest*

This community occurs on most of the hill slopes in the interior half of SPR. *Pseudotsuga menziesii* (Mirb.) Franco is co-dominant with *Notholithocarpus densiflora* (Hook. & Arn.) Manos, Cannon & S.H. Oh, *Arbutus menziesii* Pursh, and *Quercus parvula* var. *shrevei* (C.H. Mull) Nixon. The mid story is generally open with scattered *Toxicodendron diversilobum*, *Heteromeles arbutifolia* (Lindl.) M. Roem. and *Frangula californica* (Eschsch.) A. Gray. The understory varies between being largely depauperate with a thick layer of leaf litter, to having a strong cover of ferns and forbs such as *Polypodium californicum* Kaulf., *Osmorhiza berteroi* D.C., and *Cynoglossum grande* Dougl. ex Lehm. Small stands of this community occur on some of the slopes of the coastal gulches. These are unique in having *Ligusticum apiifolium* S. Wats. as a component of the understory. Another unique member of this community, *Torreya californica* Torr., is co-dominant to dominant on the south-east facing slopes on the west side of the Scott Creek drainage. This community fits into the MCV *Pseudotsuga menziesii*-*Notholithocarpus densiflora* alliance.

### *Redwood Forest*

This community primarily occurs in the Little Creek watershed, and secondarily in some stands along Scott Creek and in the steep valleys which come off of the Schoolhouse ridge (Fig 1.1). The overstory is dominated by *Sequoia sempervirens* (Lamb. ex D. Don) Endl., the mid story is generally sparse with a composition similar to the mid story of mixed conifer forest. The understory is sparse to dense, with *Oxalis oregana* Nutt., *Polystichum munitum* (Kaulf.) C. Presl and *Maianthemum* spp. (*stellatum* (L.) Link and *racemosum* (L.) Link) dominating to varying degrees depending on the density of the canopy. These areas would fall under the MCV *Sequoia sempervirens* alliance.

## Chaparral

There are two distinct chaparral communities found at SPR. One is a softer chaparral composed almost entirely of *Ceanothus thyrsiflorus* and the other is a harder, *Adenostoma-Arctostaphylos* dominated, chaparral. The *Ceanothus* chaparral areas are almost entirely the result of post fire recruitment of *C. thyrsiflorus* in the areas that were burned in the 2009 Lockheed fire. These areas were previously mixed conifer forest with a sparse mid story and diverse understory. The heavy growth of *C. thyrsiflorus* has resulted in *Ceanothus* dominated communities where the burn severity was higher and much of the tree cover was lost. Where the burn was lower severity, open mixed conifer forest with a dense mid story of *Ceanothus* is found. The understory in both of these communities is quite depauperate as there is very little light that comes through the *Ceanothus*. Areas of the harder chaparral were also burned in the 2009 Lockheed fire, but the burn forming *Adenostoma fasciculata* Hook. & Arn. and *Arctostaphylos crustacea* Eastw. regenerated rapidly. This community is dominated by *Adenostoma fasciculata* and *Arctostaphylos crustacea* with *Dendromecon rigida* Benth. and *Eriodictyon californica* (Hook. & Arn.) Greene also occurring frequently. The understory is generally sparse and hosts forbs such as *Acmispon junceus* (Benth.) Brouillet, *Psilocarphus tenellus* Nutt., and notably *Senecio aphanactis* DC. The hard chaparral is found primarily on ridgetops in poor soil with very low moisture retention (see Fig 1.4). There are also isolated patches found on the steep south east facing slopes west of Scott Creek. These communities fall into the MCV *Ceanothus thyrsiflorus* alliance and the *Arctostaphylos crustacea* alliance.

## 1.7 SCOTT CREEK MARSH COMMUNITIES

The Scott Creek marsh and seasonally bar-closed lagoon is located at the far south-western corner of SPR (Fig 1.1). California Highway One bridges the outlet of the lagoon. This bridge is due to be replaced in the next decade, which will likely involve restoration of the lagoon

and salt marsh. To document baseline vegetation patterns in the marsh and facilitate future restoration efforts, Cal Poly students finely mapped the vegetation in the marsh using a combination of field surveys and drone imagery. This data was used to create fine scale distributions for each species in the marsh. Here we have used those species distributions to identify and map the relevant MCV alliances (Fig 1.7).

*Salix lasiolepis* alliance; provisional *Salix lasiolepis* – *Persicaria punctata* association

A large area between the marsh plain proper and the upstream alder forest is dominated by *Salix lasiolepis*, with an understory almost entirely dominated by *Persicaria punctata*. The soil is generally saturated and small ponds and pools are common. In drier areas, *Ribes divaricatum* and *Urtica dioica* form a dense midstory.

*Distichlis spicata* alliance; *Distichlis spicata* – *Salicornia pacifica* association

These areas are the highest elevations in the marsh plain. They are dominated by *Distichlis spicata* (L.) Greene, *Potentilla anserina* subsp. *pacifica* (Howell) Rousi, and *Salicornia pacifica* Standl. *Juncus lescurii* Bol. and *Schoenoplectus californicus* (C.A. Mey.) Soják are co-dominant in some areas.

*Typha* (*angustifolia*, *domingensis*, *latifolia*) alliance; *Typha* (*latifolia*, *angustifolia*) association.

This community occurs in the lowest elevation portions of the marsh, generally adjacent to channels and ponds. *Typha angustifolia* L. dominates in this community with *Typha latifolia* L. occurring in a few small pure stands.

### *Juncus lescurii* provisional alliance

The mid elevation transitional regions are largely dominated by *Juncus lescurii* with *Bolboschoenus fluviatilis* (Torr.) Soják and *Schoenoplectus californicus* dominating in some areas. It is possible that these areas should be divided up between the *Distichlis* and the *Typha* communities, but we find it worthwhile to note the significant floristic differences in this community.

## 1.8 FLORA

We documented 634 taxa at SPR. In total, 974 specimens were collected during this project, 405 specimens in 2017 and 569 in 2019. We reviewed 211 historic specimens. We vouchered 546 taxa between 2017 and 2019 and observed but did not collect 6 taxa. 53 taxa are represented from historic collections and were not relocated. There are 30 taxa listed as historically present from personal observations of the authors but without vouchers. Though these do not have the same value as a physical specimen, we believe that all information is valuable and have included them with a clear indication of the source of the record. There were 465 native and 169 non-native taxa documented in the study area. There were 93 families represented, with Asteraceae, Poaceae and Fabaceae being the top three most speciose respectively (Table 2). There were 83 taxa noted as locally rare following Neubauer, of these 16 taxa have a CNPS rank (Table 1).

### 1.8.1 History of Botanical Collection

The earliest collection that is recorded from SPR is of *Pinus radiata* (W. H. Rich s.n.) from April 1910 with the locality is listed as "Swanton." The collector was Willis Horton Rich, a student at Stanford who went on to become a professor in Zoology at the same institution. Rich

came back two years later and made a series of 56 collections between January and May of 1912. From the 1920's to the 1950's there were 59 collections made in the locality by various collectors. Beryl Schreiber, the botanist who coined the term "nascent inflorescences" in *Arctostaphylos* made a series of collections in 1939, presumably while she was employed by Albert E. Wieslander in mapping vegetation for the US Forest Service and UC Berkeley. John Hunter Thomas, author of *A Flora of the Santa Cruz Mountains*, was active in the area from 1950 to 1960 and several collections were made in that period by Vesta Hesse, Rimo Bacigalupi and Peter Raven. From 1960 to 1970 the young James (Jim) West was conducting his own botanical exploration of the watershed, which was largely owned by his family. In the early 1970's Jim connected with Randal Morgan and they began collecting in the area. These two men would be the driving force for documenting the flora of the Scott Creek watershed for the next half century. Randal Morgan, after graduating from UC Santa Cruz in the early 1970's, would go on to be a renowned ornithologist and entomologist as well as botanist and one of the principle proponents of protecting the rare sandhills habitat in Santa Cruz county. Randy and Jim went on to work extensively on the Orchidaceae and *Trifolium* spp. that are found in the Scott Creek watershed along with many of the other taxonomically challenging entities. In the 1980's another prolific collector arrived in the area. Roy Buck, a PhD student from UC Berkeley would go on with Jim West to make around 400 collections in the watershed in the early to mid 1980's. This represents the first big spike in collection effort for SPR. During the late 1980's Dave Keil and V.L. Holland made about 150 collections at SPR. This was during the time that the relationship between Al Smith and Cal Poly, San Luis Obispo was being cemented. This period was the first big increase in collection effort at SPR (Fig 1.6). Jim West has continued to diligently collect notable specimens from the watershed. Randy and Jim mentored several young botanists who came out of UCSC in the 1980's and 1990's and who would form the next cohort of very active botanists in the county and in the watershed. Among these were Grey Hayes and Dylan Neubauer. In the late 2010's, during and after Dylan Neubauer's publication of the second edition of "An Annotated

Checklist of Santa Cruz County,” Dylan made several series of collections and has remained active in the area. In 2017, Monica Richardson, an undergraduate student at Cal Poly, San Luis Obispo, began a season of collecting with Jim West under the direction of Drs. Matt Ritter and Jenn Yost. They amassed over 400 collections in the watershed which have been curated as part of this project.

### **1.8.2 Noteworthy collections**

We report one species new to Santa Cruz County. We collected the CNPS 2B.2 ranked *Senecio aphanactis* in two locations at SPR. One specimen was growing in the ridgetop chaparral in the upper reaches of the Schoolhouse ridge. The other was growing in the ridgetop chaparral on the northern ridge of the Little Creek watershed. The sites are ecologically similar, sharing a degraded mudstone substrate and dominated by *Arctostaphylos crustacea* and *Adenostoma fasciculata*. The closest record formerly was in Santa Clara County, in the eastern foothills of the Santa Cruz mountains. Our collection firmly establishes the presence of the species in the Santa Cruz mountains. Previously the Santa Cruz Mountains appeared to be a gap in the distribution of the species which is found from the Bay Area to central Baja California.

### **1.8.3 Endemic species**

One individual of *Hesperocyparis abramsiana* (C. B. Wolf) Bartel has been located on SPR. This state and federally endangered species is endemic to Santa Cruz County. The individual at SPR is outside of the four main populations in the county, which occur as large stands on poor sandstone or granitic derived soils in fire prone areas. The SPR tree is growing on a steep east facing slope with loamy soil in a mixed conifer forest community. The tree’s location at SPR is not included in any timber management plans and is unlikely to be affected by human

activities. Fire suppression is a threat to the species in general and the location where the individual is growing is unlikely to burn in the near future. If the area did burn, it would be interesting to observe the regeneration of the species in the area. The typical response in this genus is that adult trees are killed by fire but their serotinous cones open and generally seeds sprout vigorously (Adams & Bartel, 2009).

*Arctostaphylos glutinosa* B. was collected from the ranch in 1983 by Jim West and Roy Buck. This species is endemic to Santa Cruz County and has a CNPS rare plant rank of 1B.2 It occurs only on the extremely weathered siliceous mudstone that is exposed on the ridgetops east of SPR. The collection locality for the 1983 specimen was revisited and searched thoroughly but no individuals were found. The area was burned in the 2009 Lockheed fire and *A. glutinosa* does not re-sprout after fire. It may be that we missed a seedling in our search, or it has potentially been outcompeted by the re-sprouting shrubs common in the area.

#### **1.8.4 CNPS listed and locally rare species**

Six taxa found at SPR have a CNPS rare plant rank of 1B, which indicates that they are rare, threatened or endangered in California or elsewhere. One of these is *Arctostaphylos glutinosa* which was addressed above. Of the rest, three occur in the rare coastal prairie communities, and two occur generally in openings in mixed conifer forest. Here we present habitat information and approximate population counts but these are preliminary and in no way represent a full censusing of these species.

*Agrostis blasdalei* Hitchc. is a perennial grass that is found at SPR in perennially moist, or disturbed areas in the coastal grasslands. There are eight patches known from collections on at SPR, with the largest occurring on the tops of the coastal bluffs in highly eroded sandy soil (Fig 1.1 region 17). It is also commonly found in areas of more intact coastal prairie, often where there

is perennial moisture. It is threatened most by the encroachment of nonnative species, such as *Carduus pycnocephalus* and *Holcus lanatus*, into the coastal prairie community.

*Amsinckia lunaris* Macbr. is an annual herb that is found at SPR on one exposed, north facing slope in a mostly intact coastal prairie community. Cows access the area where it grows but the terrain is so steep that they do not seem to graze there. The patch consists of about 150 individuals.

*Collinsia multicolor* Lindl. & Paxton is an annual wildflower in that is found in three locations in the study area. All of these are roadcuts where a vertical surface of the mudstone parent material has been exposed. The patches vary from about 10 to about 50 individuals. Road maintenance is the most direct threat to these patches. If one of the patches were scraped with a tractor, the seed bank has a chance of being removed. One of the patches occurs on a quad trail where this is not a threat.

*Stebbinsoseris decipiens* (Chamb.) K.L. Chambers is an annual wildflower that occurs in three main patches or subpopulations at SPR. Each subpopulation has several elements that can be ephemeral year to year. Two smaller subpopulations are found on the Western Terrace and the largest is found on the interior coastal prairie on the lower portions of the Schoolhouse Ridge. The two smaller subpopulations consist of about 150-200 individuals each and the interior subpopulation population consists of maybe 500 individuals. Cattle grazing is currently the largest threat to these species. On the Western Terrace, the plants tend to occur in areas that cattle avoid due to poor forage or steep slopes. However, on the currently ungrazed interior coastal prairies, plants are found on less extreme slopes. If grazing was introduced to this area, it seems likely that the population would decline.

*Trifolium buckwestiorum* Isely is an annual clover that has been found in openings in mixed conifer forest at SPR. It was not found at SPR during this study, but it was collected in the watershed during the time the study was taking place. The most recent collection from SPR was



in 1982 on the lower Schoolhouse Ridge. It is possible that the habitat at SPR for this species was impacted by the 2009 Lockheed fire. Much of the mixed conifer forest with an open understory was burned and experienced heavy *Ceanothus* regeneration which closed off the understory.

Seven additional taxa occur at SPR that have a CNPS rare plant rank lower than 1B. All CNPS ranked plants are denoted with an <sup>RR</sup> in the checklist and habitat information can be found there as well. All CNPS ranked taxa are listed in Table 1. There are 67 taxa vouchered from SPR that do not have a CNPS rank but are listed as local rarities in Neubauer 2013. These are all denoted in the checklist with an <sup>R</sup>. In addition to the locally rare taxa, there are 14 taxa that are occurring at or near their range limits (Table 3). Documenting and monitoring these taxa at SPR could provide valuable information about the effects of climate change on the Central Coast. Ranch staff have already observed drought induced mortality in the *Alnus rubra* which border Scott Creek, a species that reaches its southern range limit in Monterey county.

#### **1.8.5 Non-native taxa**

Twenty six percent of the taxa recorded in this study are non-native. Most taxa are uncommon, but several are dominant in certain communities. In particular, large areas of the coastal and interior grasslands are dominated by European annual grasses such as *Avena barbata* and *Bromus diandrus*. These communities reached equilibrium long ago and are not a priority for management. However, there are several species that should be managed, either because they are newly arrived and at low levels or because they appear to be spreading. These species are listed below along with observations about their distribution and potential for management. All notes about potential management techniques are drawn from *Weed Control in Natural Areas in the Western United States*, unless otherwise cited (*Weed Control in Natural Areas in the Western United States*, 2013).

*Silybum marianum* (L.) Gaertn. (milk thistle)

This species is present in high density in localized areas of the Western Terrace. The most severe infestation is at the northern edge of the Western Terrace where the soils are deep and loamy (Fig 1.1 region 8). These areas tend to be more mesic than the southern portion of the Western Terrace and contain intact coastal prairie. Management is a priority for this species to prevent the degradation of more coastal prairie as well as to improve the forage quality in the rangelands. Mechanical treatment such as mowing is cited as the most effective management. Unfortunately, grazing is cited as relatively ineffective.

*Carduus pycnocephalus* L. (Italian thistle)

This species is found in high densities in the same northern extent of the Western Terrace as *Silybum marianum*. It poses many of the same risks but is potentially more manageable. Mowing and grazing can both be effective at limiting the spread and could be implemented at SPR. Measures such as targeted goat grazing could be especially effective.

*Rubus ulmifolius* Schott var. *anoplothysus* Sudre (thornless blackberry)

This species is found primarily in one large patch at SPR, growing just off of Old Schoolhouse Road. Though it is not known to be a common invasive in California, its relative *Rubus armeniacus* Focke can be highly invasive in some areas. Given that all the individuals at SPR could be removed in one day of mechanical treatment, it seems wise to prevent any possibility of further spread.

*Holcus lanatus* L. (velvet grass)

This perennial grass rapidly colonizes mesic grasslands. It is found in several places on the Western Terrace and perhaps poses the most extreme threat to the biodiversity of that area. Mesic areas on the Western Terrace tend to harbor a high diversity of native species. If these communities become highly invaded by *Holcus lanatus*, much of the biodiversity in the coastal prairies, including rare plants, could be lost (Hektner & Foin, 1977). This species is particularly problematic as it is difficult to reduce via grazing, requiring very intense levels to show any effect, and low levels of grazing may increase the spread. Additionally, it provides relatively poor forage and is known to invade both grazed and ungrazed grasslands (“*Holcus Lanatus* Plant Assessment Form,” 2017). It is extremely important that managers recognize the threat to native biodiversity at SPR that this species poses. A long-term study of different treatment regimens on the Western Terrace could be beneficial to both local ranchers and conservationists.

*Delaria odorata* Lem. (Cape ivy)

This species is present in high density in several localized patches in the Scott Creek riparian corridor, with the largest patch occurring on the west bank of Scott Creek just below the railroad bridge. On the Central Coast, this species is known to dominate riparian areas and successfully chokes out much of the understory (“*Delairea Odorata* Plant Assessment Form,” 2017). The potentially extreme impacts on the riparian corridor should justify control of this species. It also has the potential to be harmful to aquatic animals due to the presence of toxic compounds in the foliage that can leach into water. If the riparian corridor became extremely invaded, it could pose a threat to the endangered Salmonids and Red legged frogs that use this habitat (Robison & DiTomaso, 2010). Mechanical treatment can be effective but repeated treatment is necessary as the plant re-sprouts vigorously from roots and stem fragments. The limited extent of the infestation and the proximity to water make mechanical control the best

option for this species. Additionally, biocontrol agents are being developed. A leaf and stem mining moth (*Digitivalva delaireae*) has been approved for releases and a galling fly (*Parafreutreta regalis*) is close to being approved (Balciunas et al., 2010; Reddy & Mehelis, 2015). Cal Poly could collaborate with the institutions performing the releases to monitor the efficacy of the treatment.

*Oxalis pes-caprae* L. (Bermuda buttercup)

This species is invading the coastal bluff and exposed mudstone outcrop communities, which harbor many native species. Unfortunately, it is extremely difficult to manage and there may not currently be a viable strategy for management at SPR. Mechanical control requires painstaking removal of all bulblets to prevent re-sprouting and grazing is ineffective. Chemical control may be effective but may not be available as an option (*Weed Control in Natural Areas in the Western United States*, 2013). All efforts should be made to prevent the spread of the bulblets, the primary mechanism for distribution of this species.

*Euphorbia oblongata* Griseb. & *E. lathyris* L. (eggleaf spurge & caper spurge)

These species are present at low levels in disturbed areas at SPR. Large patches can be found on Old Schoolhouse road near the turnoff to the Al Smith House as well as on the quad trails above the Staub House. As they spread, they will begin to have larger impacts on the native vegetation and become significantly more difficult to control. A systematic mechanical control regime would likely prevent spread and could potentially eliminate these species from SPR.

*Genista monspessulana* (L.) L.A.S. Johnson (French broom)

This species is present at SPR in mostly localized patches concentrated around the Staub House and on the quad trails above Staub House, although scattered individuals can be found along access roads. This species should probably be the highest priority for management at SPR. It is known to form very dense stands, out compete native vegetation and can pose a major fire risk (Pauchard et al., 2008). The plants also create a long-lived seedbank, making eradication very difficult (Geerts et al., 2013). The longer the infestations go untreated, the longer it will take to eradicate the seed bank. Mechanical removal can be effective for this species and is likely the best option at SPR. Removal paired with effective mapping and attempts to avoid soil disturbance in infested or formerly infested areas would likely be effective controls on the population.

#### **1.8.6 Putative Hybridization**

Several taxa documented at SPR appear morphologically intermediate and may represent hybridization events. Here we present the morphological evidence observed and the relevant background literature.

*Juncus hesperius* × *patens* putative hybrids

Plants morphologically intermediate between *J. patens* and *J. hesperius* are somewhat common in wet or seasonally wet areas of the coastal prairies. These can be easily distinguished in the field as they lack the strongly blue grey culms of *J. patens* but the flowers have six stamens instead of three. Representative specimens are Reed Kenny 653, Monica Richardson 148, and Monica Richardson 257. This putative hybrid has also been documented by Peter Zika (Zika, 2013).

*Lupinus arboreus* × *latifolius* putative hybrids

Plants morphologically intermediate between *L. arboreus* and *L. latifolius* can be found primarily in the Little Creek watershed. These are notably less woody than *L. arboreus*, growing as a small shrub which becomes somewhat woody at the base but retains flexible and hollow stemmed branches. The flowers are consistently lilac in color. These plants may also be referable to *L. propinquus* (Greene) (not treated in the Jepson eflora, but noted as in need of study), though SPR specimens differ from this taxon in having hairs on the leaflets. Representative specimen, Reed Kenny 202.

*Carex* putative hybrids

Many unusual *Carex* individuals can be found on the Western Terrace. The oddities primarily seem to be intermediate between *C. harfordii* and *C. subbracteata* or *C. densa* and *C. subbracteata*. Many of these plants appear to be sterile, not forming plump perigynia, although they produce anthers and pollen which may be viable. These plants can have variable inflorescence structures but are united by their lack of fertile perigynia. Putative hybrids between *C. subbracteata* and *C. harfordii* fit this description and have been noted by Peter Zika. Other individuals have fertile perigynia but are intermediate between *C. densa* and *C. subbracteata* in having pistillate flowers above staminate flowers but also paniculate spikelets and minute teeth on the angles of their stems. Additionally, there are individuals that appear most similar to *C. harfordii* but have paniculate spikelets. In all cases the paniculate spikelets arise from one or two basal spikelets becoming branched. This is problematic in that Sect. *Ovales*, which contains *C. harfordii* and *C. subbracteata*, as it is currently circumscribed, specifies plants with racemose inflorescences. This led to the hypothesis of cross-sectional hybridization events between *Ovales* and *Multiflora* which introduced the paniculate spikelets. An alternative hypothesis is that inflorescence structure is not as strongly regulated as is currently assumed and perhaps occasional

branching of basal spikelets is not unusual. This is supported by individuals of another species also occurring at SPR, *C. bolanderi*, which also show branched basal spikelets outside of the accepted circumscription. Representative specimens are Reed Kenny 561, Reed Kenny 528, Reed Kenny 413, Reed Kenny 265, Reed Kenny 184, Reed Kenny 183 and Monica Richardson 149.

#### *Agrostis* hybrids

Five species of *Agrostis* occur on SPR. Putative hybrids have been observed between *A. exarata* and *A. densiflora*, *A. blasdalei* and *A. densiflora*, and *A. exarata* and *A. blasdalei*. Monica Richardson 93 is an example of a putative *A. exarata* × *densiflora*. The *A. blasdalei* × *densiflora* putative hybrids are noted in the Jepson eflora. This complex needs further study.

Many intermediates have also been observed between *A. hallii* and *A. pallens*. These usually have ligules which are in the 4-7 mm range which keys to *A. hallii* but anthers which are in the 0.7 to 1.8 mm range which indicates *A. pallens*. Reed Kenny 724 shows these characters.

#### **1.8.7 Taxonomic uncertainty**

Some taxa at SPR are potentially taxonomically interesting as unusual ecotypes or potential new species. Notes on these are included to encourage further botanical and evolutionary studies at SPR.

#### *Clarkia*

There are two distinct forms of what can be keyed to *Clarkia davyi* at SPR. One is decumbent to prostrate and fits the current circumscription for the taxon as described in the Jepson eflora. The other form is consistently erect and less robust than the prostrate form. The

two forms have been grown side by side in a common garden and retained their unique characteristics over several generations, suggesting that there may be some degree of reproductive isolation (pers comm. Randal Morgan). These forms could be an interesting study of incipient speciation. Representative specimens are Reed Kenny 518, Reed Kenny 654, Reed Kenny 660, Reed Kenny 666, Reed Kenny 671, Reed Kenny 699, Monica Richardson 110, Monica Richardson 399 and Monica Richardson 370.

### *Isolepis cernua*

There are two forms of *Isolepis cernua* present at SPR. One consists of very small statured annuals and the other consists of short-lived perennials that form dense clumps or mats. The latest monograph of the genus describes *I. cernua* as an annual too short-lived perennial, so the forms fit within the latest circumscription (Muasya & Simpson, 2002). However, the maintenance of two distinct forms that co-occur is of interest. Representative specimens are Reed Kenny 559 and Reed Kenny 530.

### *Sanicula crassicaulis* Poep. ex. D.C. var. *nudicaulis* Kenny & West

An unusual form of *Sanicula crassicaulis* has been collected and observed at SPR for decades. It is distinguishable from *S. crassicaulis* var. *crassicaulis* and var. *tripartita* by the relatively ungraduated nature of the prickles on the schizocarp and the much longer marginal leaf trichomes. It seems to have some ecological differentiation as well, being found much more frequently in riparian, moist or shaded areas. This form has been collected and observed from northern Santa Barbara county to the Bay Area. Upon further investigation we found that these plants had been collected and named in 1839 as *Sanicula nudicaulis* Hook & Arn. These plants are described as the new combination *Sanicula crassicaulis* var. *nudicaulis* in Chapter 2.



Representative specimens from SPR are Reed Kenny 187 and Reed Kenny 160. Unfortunately, the marginal trichomes are often lost on herbarium specimens.

Table 1.1. CNPS ranked species in the study area, currently and historically. Rank 1B indicates taxa that are threatened or endangered in California and elsewhere. Rank 2B indicates rare threatened or endangered in California but not elsewhere. Rank 3 indicates species about which more information is needed and Rank 4 indicates plants with limited distribution in California.

Scientific Name	CNPS List
<i>Agrostis blasdalei</i>	1B
<i>Amsinckia lunaris</i>	1B
<i>Arctostaphylos glutinosa</i>	1B
<i>Collinsia multicolor</i>	1B
<i>Elymus californicus</i>	4
<i>Hosackia gracilis</i>	4
<i>Micropus amphibolus</i>	3
<i>Microseris paludosa</i>	1B
<i>Perideridia gairdneri</i> subsp. <i>gairdneri</i>	4
<i>Piperia michaelii</i>	4
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	1B
<i>Sanicula hoffmannii</i>	4
<i>Stebbinsoseris decipiens</i>	1B
<i>Trifolium buckwestiorum</i>	1B
<i>Senecio aphanactis</i>	2B
<i>Hesperocyparis abramsiana</i>	State and Federally Endangered

Table 1.2. Numeric summary of the flora of Swanton Pacific Ranch

	Ferns	Gymnosperms	Magnolids	Monocots	Eudicots	Total
Families	7	2	2	15	67	93
Genera	11	2	2	65	279	359
Nonnative taxa	0	0	0	41	128	169
Special Status Taxa	2	0	0	18	63	83
Total Taxa	16	4	2	127	485	634

Table 1.3. Species at range limits found at SPR. The range extent indicates at which edge of the range the species is occurring at SPR.

Scientific Name	Range Extent	Population notes	Bio Regions
<i>Amsinckia lunaris</i>	Southern	One occurrence of about 200 plants was found on a steep north facing slope in coastal prairie.	21
<i>Alnus rubra</i>	Southern	Common within about 100m of Scott Creek. May have been impacted by recent drought conditions	2, 5, 24-26
<i>Anemone grayi</i>	Southern	One occurrence of about 100 plants was found on a steep north facing slope in mixed conifer forest understory	24
<i>Claytonia sibirica</i>	Southern	Locally abundant in the Little Creek watershed. Plants can be found on roadside in areas of redwood forest primarily	23, 25, 26
<i>Corylus cornuta</i> subsp. <i>californica</i>	Southern	Common in riparian forest and mixed conifer forest understory	1, 3, 5, 18, 23, 25, 32
<i>Delphinium decorum</i> subsp. <i>decorum</i>	Southern	Two occurrences of about 100 plants each were found on the north facing slope of a gullies in coastal prairie	21
<i>Festuca subuliflora</i>	Southern	Uncommon in riparian areas	5, 24, 25
<i>Melica subulata</i>	Southern	Occasional in mixed conifer forest	5, 23
<i>Montia parvifolia</i>	Southern	One occurrence of several hundred individuals found on one cliff face near riparian area in mixed conifer forest understory	5
<i>Ranunculus uncinatus</i>	Southern	Uncommon, scattered individuals found in wet areas in mixed conifer forest	5, 23, 25
<i>Rubus spectabilis</i>	Southern	Common in the Scott Creek riparian corridor	1, 5, 26

<i>Sanicula hoffmannii</i>	Northern	Uncommon in mixed conifer forest understory	5
<i>Silene verecunda</i> subsp. <i>verecunda</i>	Southern	Uncommon, occurs mostly on exposed mudstone outcrops in coastal prairie	7
<i>Struthiopteris spicant</i>	Southern	One occurrence growing on wet cliff face adjacent to waterfall in redwood forest	3
<i>Tellima grandiflora</i>	Southern	Uncommon, found in wet areas in mixed conifer forest	24
<i>Tiarella trifoliata</i> var. <i>unifoliata</i>	Southern	One occurrence found in mixed conifer forest understory within 30m of creek	24
<i>Torreya californica</i>	Southern	Mostly confined to one stand on steep south facing slope on N side of Scott Creek	5, 24, 25, 31
<i>Wyethia angustifolia</i>	Southern	Uncommon in coastal prairie	11, 28, 32

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Table 1.4. Numerical summary of the flora of the Swanton Pacific Ranch. The top ten most well represented families and genera are listed as well as the most common habits.

	Number of Taxa	Percent of total Flora
<b>Family</b>		
Asteraceae	89	14.2%
Poaceae	70	11.1%
Fabaceae	53	8.3%
Apiaceae	23	3.7%
Brassicaceae	23	3.7%
Rosaceae	21	3.3%
Boraginaceae	21	3.2%
Polygonaceae	18	2.9%
Cyperaceae	17	2.7%
Lamiaceae	16	2.5%
<b>Genus</b>		
<i>Trifolium</i>	22	3.5%
<i>Festuca</i>	11	1.8%
<i>Carex</i>	10	1.6%
<i>Juncus</i>	10	1.6%
<i>Rumex</i>	10	1.6%
<i>Erythranthe</i>	8	1.3%
<i>Acmispon</i>	8	1.1%
<i>Lupinus</i>	7	1.1%
<i>Ranunculus</i>	7	1.1%
<i>Vicia</i>	7	1.1%
<b>Life form</b>		
annual	206	32.6%
biennial	16	2.5%
caning shrub	2	0.3%
deciduous tree	4	0.6%

evergreen tree	12	1.9%
perennial	330	51.8%
Geophyte	14	2.2%
shrub	47	7.5%
subshrub	3	0.5%

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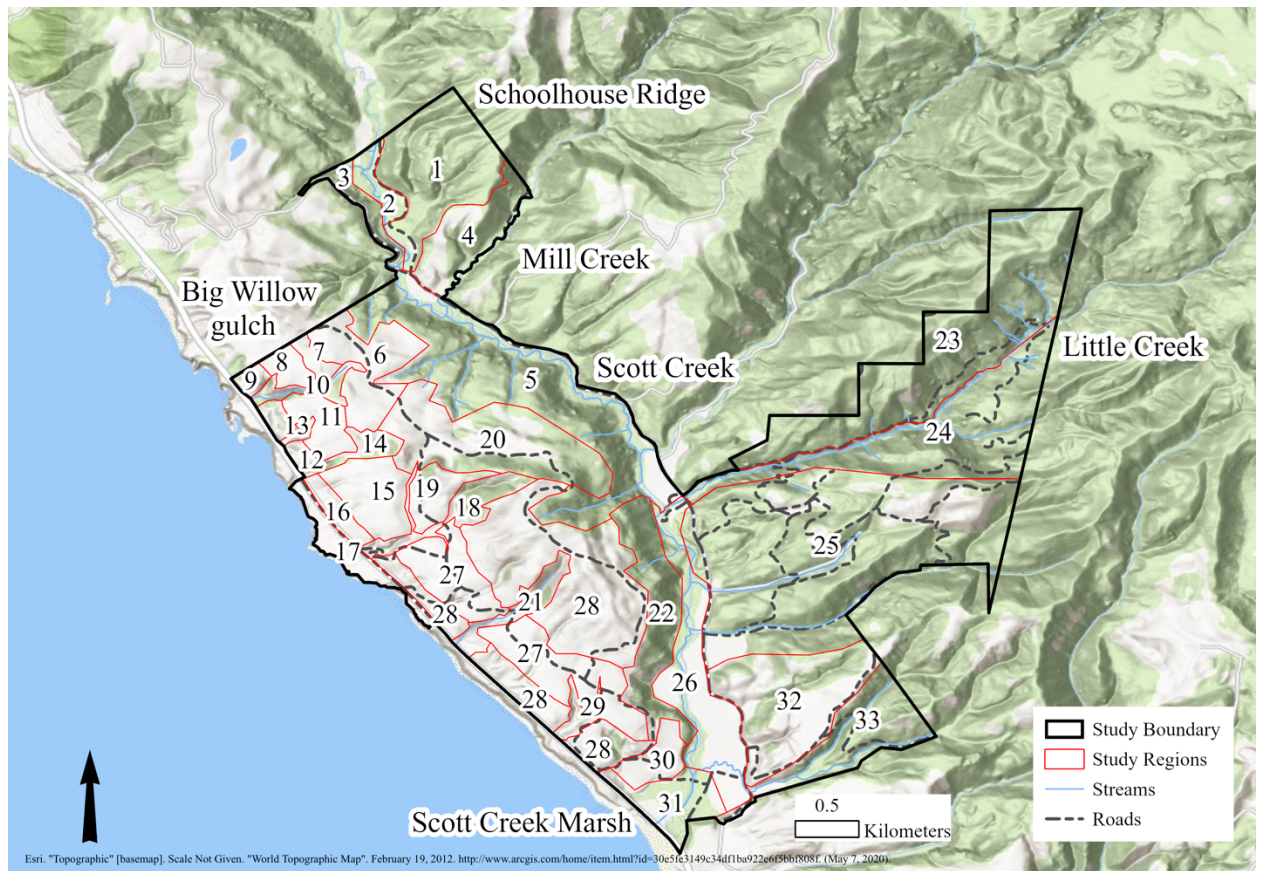


Fig 1.1. Pictured are the study boundaries, notable features, roads, and study regions.





Fig 1.2. Vegetation of the Scott Creek Marsh. View looking north to south.



Fig 1.3. The Western Terrace. The first and second coastal terraces can be seen as well as some of the distinctive gullies.



Fig 1.4. The top of Schoolhouse Ridge, showing the white “chalk” soil and hard chaparral community.

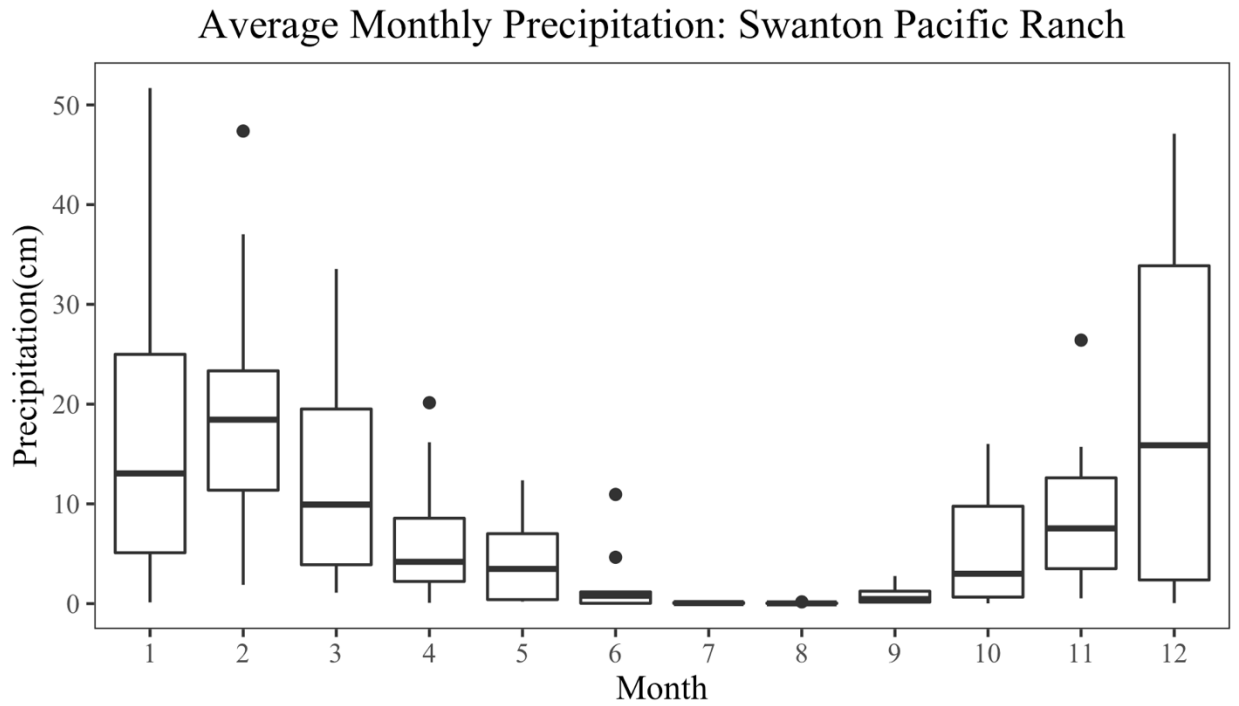


Fig 1.5. Average rainfall per month over the period from 2000-2015. Measurements are reported from rain gauges in the study area.

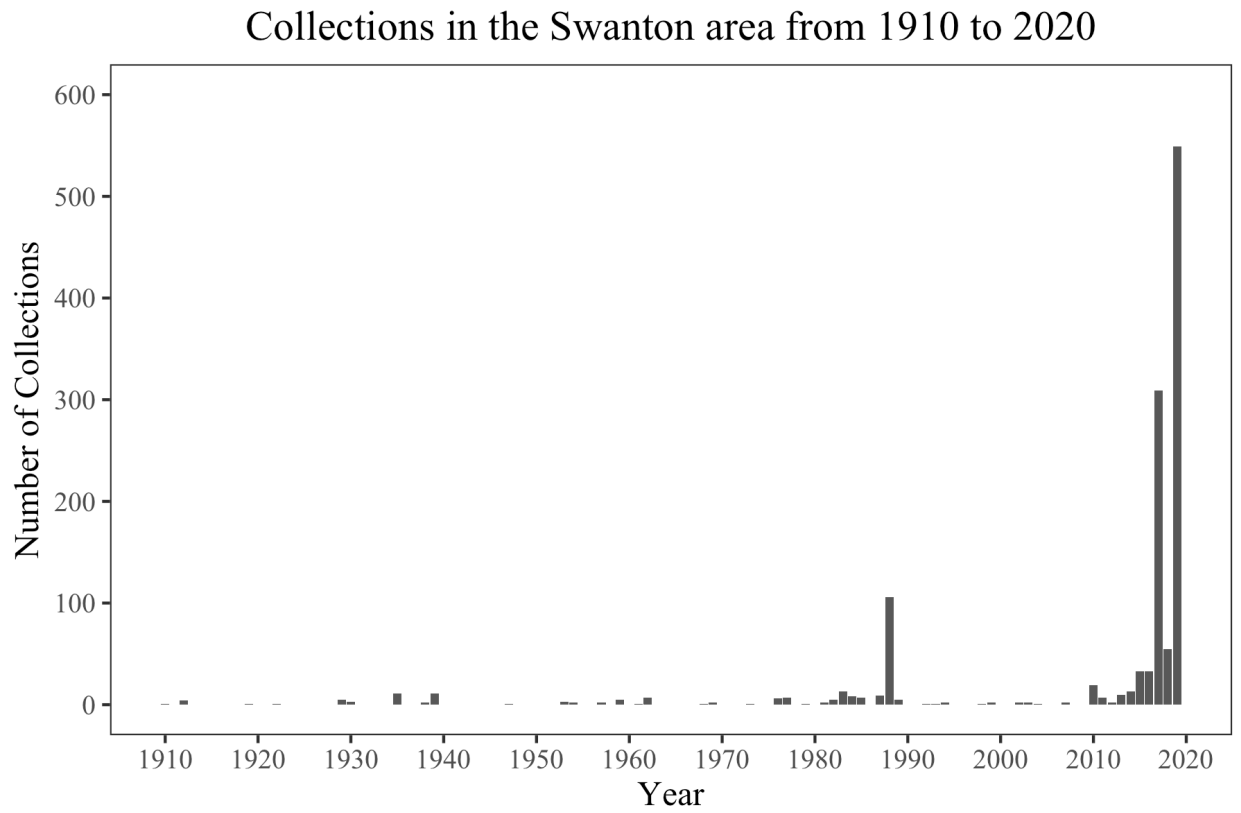


Fig 1.6. Collections per year from the period between 1910 and 2020.



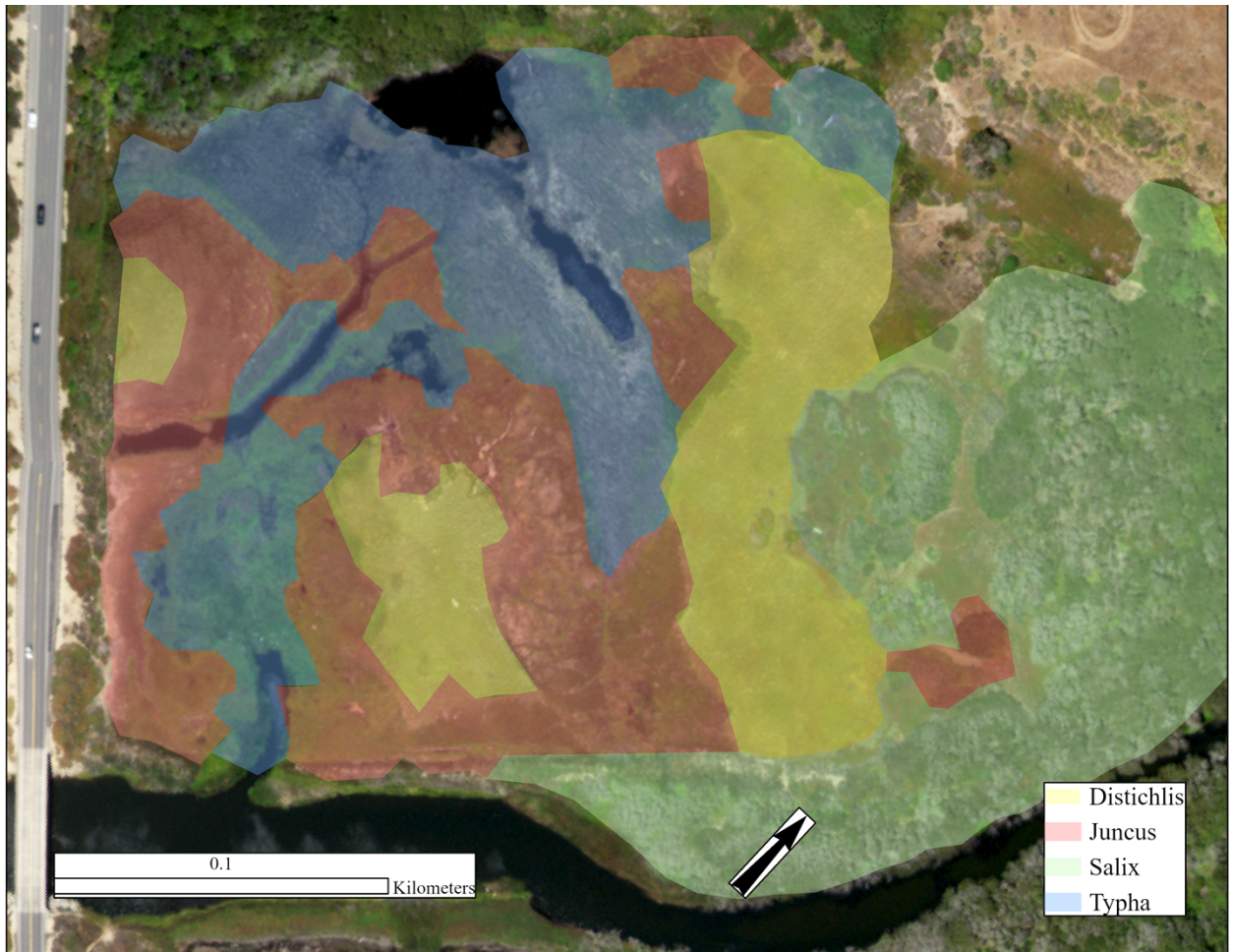


Fig 1.7. CNPS vegetation alliances and associations in the Scott Creek Marsh. Distichlis = *Distichlis spicata* alliance; *Distichlis spicata* – *Salicornia pacifica* association; Juncus = *Juncus lescurii* provisional alliance; Salix = *Salix lasiolepis* alliance; provisional *Salix lasiolepis* – *Persicaria punctata* association; Typha = *Typha* (*angustifolia*, *domingensis*, *latifolia*) alliance; *Typha* (*latifolia*, *angustifolia*) association.

## CHAPTER 2

### A NEW COMBINATION IN *SANICULA CRASSICAULIS* (APIACEAE), *SANICULA CRASSICAULIS* VAR. *NUDICAULIS*

#### 2.1 INTRODUCTION

*Sanicula crassicaulis* Poepp. ex D.C. is an herbaceous perennial species distributed throughout Western North America from Vancouver Island to northern Baja California and reappearing in central Chile. This species has long been recognized as morphologically highly variable and can be found in open grasslands, shrublands, woodlands, riparian corridors and mixed conifer forest. Here we argue that the taxon *S. nudicaulis* Hook. & Arn., formerly treated as a synonym of *S. crassicaulis* var. *crassicaulis*, should be recognized as a variety within *S. crassicaulis*.

The name *Sanicula crassicaulis*, was published in 1830 from specimens collected in Chile by Poeppig and therefore has taxonomic priority as the valid name for the species (Augustin Pyramus de Candolle, 1830). North American specimens, now treated as *S. crassicaulis*, were originally described as two separate species. The names *Sanicula menziesii* Hook. & Arn. and *Sanicula nudicaulis* Hook & Arn. were published in 1839 from specimens collected in California in 1827, during Captain Beechey's Voyage of 1825-1828 (Arnott et al., 1839). The name *S. menziesii* referred to plants that were largely indistinguishable from *S. crassicaulis* aside from their distribution. The name *S. nudicaulis* referred to plants with a caulescent stem, leaves cordate in three parts and setose leaf margins (Fig 2.1).

Willis Lynn Jepson treated *S. nudicaulis* as a variety of *S. menziesii* (*S. menziesii* Hook & Arn. var. *nudicaulis* Jeps.) in his 1911 Flora of Western Middle California (Jepson, 1911). In 1923, he published two new varieties of *S. menziesii* in Madroño: var. *foliosa* Jeps. and var.

*pedata* Jeps. Jepson separated the varieties in this way: plants with thin, only partly divided leaves and with leaf segments that are less lobed, fall into var. *nudicaulis*; stout plants with thicker leaves that are pedately divided into cuneate segments with serrate, bristle tipped margins fall into var. *pedata*; and low growing, leafy plants, with bracteal leaves that are notably larger fall into var. *foliacea* (Jepson, 1923). The types for all of these taxa were collected in California.

In 1913, Herman Wolff placed *S. menziesii* into *Sanicula crassicaulis* as a variety, resulting in the combination *S. crassicaulis* Poepp. ex. D.C. var. *menziesii* H. Wolff, based off of the fact that he could find no consistent morphological differences between North and South American plants. He listed *S. nudicaulis* Hook & Arn. as a synonym for this new combination (Wolff, 1913). In 1936, Mildred Mathias treated *S. menziesii* as a synonym to *S. crassicaulis*, stating, “these two entities and their various segregates represent a variable species.” This resulted in *S. nudicaulis*, *S. menziesii* var. *nudicaulis* and *S. crassicaulis* var. *menziesii* all being treated as synonyms for *S. crassicaulis* (Mathias, 1936). This taxonomy was largely followed by Shan and Constance in their 1951 monograph of the genus (Shan & Constance, 1951) and by Ritchie Bell in his 1954 study of polyploidy and putative hybridization in *S. crassicaulis* (Bell, 1954).

During a floristic study of the Cal Poly Swanton Pacific Ranch, near Davenport California, we encountered several populations of a distinct form of *Sanicula crassicaulis* with no evidence of intermediate forms. Upon further investigation, we found several populations of the distinct form, occurring between the San Francisco Bay Area and Santa Barbara county (Fig 2.2.) We reviewed many herbarium specimens as well as living material and have concluded that some plants in California share key characteristics with the type specimen of *S. nudicaulis* and are morphologically distinct from *S. crassicaulis* var. *crassicaulis*, deserving recognition as a variety of *S. crassicaulis*.



Previously, this taxon was distinguished by having caulescent stems and leaves that are somewhat less lobed, thinner, and with much longer, undulate, marginal trichomes than *Sanicula crassicaulis* var. *crassicaulis*. We found that the long, undulate marginal trichomes on fresh leaves can be used to reliably distinguish this taxon and agree with previous treatments that the leaves tend to be thinner, although we have not measured this trait. We have observed many different stem branching patterns in this taxon and so do not believe that this taxon has markedly caulescent stems. We have observed a pattern of leaves that are generally less divided, but we do not believe this is a character that can be used to readily separate this taxon from others. In addition to the leaf traits used to distinguish this taxon, we add two fruit characters, the angle of attachment of the prickles to the schizocarps and the difference in length between the most proximal and the most distal prickles. We choose to recognize this taxon as a variety, as there are already two existing varieties in *S. crassicaulis*, *S. crassicaulis* Poepp ex. D.C. var. *crassicaulis* and *S. crassicaulis* Poepp ex. D.C. var. *tripartita* H. Wolff.

## 2.2 TAXONOMIC TREATMENT

*Sanicula crassicaulis* Poepp. ex D.C. **var. nudicaulis** (Hook & Arn.) Kenny & West, **comb. nov.**

Basionym: *Sanicula nudicaulis* Hook & Arn. Bot. Beechey Voy. (1839)

Type: California. *David Douglas s.n.* (holotype: K000697304, isotype: E00369085)

Perennial, dying back to rosette in the winter. Plants stout, erect, 24-120 cm high, with a thin taproot. Stems solitary, fistulose, glabrous, generally erect, often many branched from base but occasionally more or less caulescent to moderately branched distally. Stems when crushed have an acrid scent. Leaves basal and cauline, generally palmate to palmate ternate, green; blade 3-12 cm, generally rounded-cordate, lobes 3-5, obovate, generally shallowly cut but can be +/- deeply cut, margins generally serrate to crenate, tipped with sinuate trichomes (2) 3-4 (7) mm in length.

Marginal trichomes are often deciduous on older leaves and tend to be missing on herbarium specimens. Central lobe of leaf generally greater than 10 mm wide at base, distal segment 4-20 mm wide. Basal leaves generally long petioled. Inflorescence: peduncle 0.7-8 cm; bracts +/- 5, 1-2 mm, < heads, narrowly lanceolate; pedicels short. Flower: bisexual 3-8, staminate 3-5; calyx lobes fused at base, 0.5-0.7 mm, +/- lanceolate, acute; corolla yellow; styles 2 x calyx lobes. Fruit: 2-5 mm, +/- round, generally stalked, with stout prickles hooked at the tips. Prickles only slightly longer (~1.2x) distally than proximally, but proximal prickles occasionally little developed. Angle of attachment of prickles +/- perpendicular. Seed: face grooved.

*Diagnosis:* Leaves of *Sanicula crassicaulis* var. *nudicaulis* are recognizable in having leaf marginal trichomes that are (2) 3-4 (7) mm long and sinuate, in contrast to those of var. *crassicaulis* which are 1-2(3) mm long and strait. The marginal trichomes are often deciduous in age in var. *nudicaulis*, where those of var. *crassicaulis* persist in age or become partly deciduous, forming mucronate tips on the leaf serrations. Additionally, the prickles on the schizocarps are attached more or less perpendicularly, about 80° versus about 60° in var. *crassicaulis*. The most distal rank of prickles in var. *nudicaulis* are about the same length on average as the most proximal (on avg. 1.2 x longer) whereas the most distal rank of prickles are almost twice as long on average (1.7 x longer) in var. *crassicaulis*.

*Paratypes.* United States, California, San Luis Obispo, Estero Bluffs State Park on west side of Hwy 1 upcoast from the town of Cayucos, [35.45425 -120.953117], Scattered under *Baccharis pilularis* stand at base of hill 1.13 road mi W of San Geronimo crk, 8 Mar 2010, *Michael Walgren* 85 (OBI); United States, California, San Luis Obispo, Nipomo Dunes Complex, Riparian corridor along northern base of Big Coreopsis Hill. Along SW fringes of riparian corridor. Plants 3-7 dm tall with yellow corollas. 23 May 1993, *Arthur W. Hazebrook* 228 (OBI); United States, California, San Luis Obispo, North of San Simeon along ridge just S of Arroyo de la Cruz [35.71083 -121.27889 +10000m], Windswept coastal hills with severely wind-pruned shrubby

vegetation; Occasional in sheltered area on wind-shallow slopes, Fls yellow. 11 Apr 1981, *David J. Keil 14367* (OBI,UCR) with *Rhonda Riggins, Dirk Walters, Malcolm McLeod, Melissa Luckow, et al.*; United States, California, San Luis Obispo, S of Oso Flaco in stabilized area of Nipomo Dunes [35.03 -120.6175 +-2000m. NAD83], Growing in protected place at inner border of the dunes, Herbaceous plant with taproot; fls yellow. 29 Mar 1972, *Robert J. Rodin 8621* (OBI); United States, California, San Luis Obispo, Nipomo Mesa. Big Coreopsis Hill S of Oso Flaco lake, at end of Oso Flaco lake Rd., 3.6 mi from jctn with state hwy 1 [35.03 -120.6175 +-2000m. NAD83] Locally common with *Populus trichocarpa*. 10 Mar 1984, *David J. Keil 18088* (OBI) with *K. Jones, S. Cochrane, M.G. McLeod, Bernard and Lela Burdette, Austin Griffiths*; United States, California, Santa Cruz, approx. 17 mi nw of Santa Cruz (between California 1 (Cabrillo Hwy) and Swanton Rd, se of Greyhound Rock, approx. 0.4 km e of old Seaside School. on sw side of Scott Creek); H-H Ranch, Scott Creek [37.083332, -122.25], in riparian hab. along horse trail; in decomposed Santa Cruz mudstone enriched w humus; along ....., lvs yellow-green, bristles whitish. Mar 6 1983, *Roy E. Buck, James A. West 144* (UCJEPS); United States, California, Santa Cruz, approx. 17 mi nw of Santa Cruz (between California 1 (Cabrillo Hwy) and Swanton Rd, se of Greyhound Rock, w and nw of old Seaside School. in "Magic Triangle"); H-H Ranch, "Magic Triangle [37.083332, -122.25], at n end of divide ridge; on nne-facing slope in n coastal scrub; in decomposed mudstone; among ..., leaves yellow-green; bristles whitish. Mar 6 1983, *Roy E. Buck, James A. West 149* (UCJEPS); United States, California, Santa Cruz, ca 17 mi. nw Santa Cruz (betw CA 1 (Cabrillo Hwy.) & Swanton Rd., se of Greyhound Rock & w & nw of Old Seaside School, Swanton, bottom of "Lasher Marsh Gulch" near mouth); H-H Ranch [37.083332, -122.25], in tall Rhamnus scrub; shade; soil from Santa Cruz mudstone enriched w/ humus, marginal bristles ... whitish; lvs. ... yellow-green. Apr 3 1983, *Roy E. Buck, James A. West 177* (UCJEPS); United States, California, Santa Cruz, approx. 17 mi nw of Santa Cruz (just n of Swanton Rd, 1.0 km nw of old Seaside School, Swanton, H-H Ranch); H-H Ranch [37.083332, -122.25], on upper se-facing slope of small gulch draining into main gulch; in shade

just inside forest; lvs yellow-green; bristles whitish. Mar 27 1983, *Roy E. Buck, James A. West 172* (UCJEPS); United States, California, Santa Cruz, approx. 17 mi nw of Santa Cruz (between California 1 (Cabrillo Hwy) and Swanton Rd, se of Greyhound Rock, w and nw of old Seaside School. mouth of Big Willow Gulch); H-H Ranch, Big Willow Gulch [37.083332, -122.25], growing in Aesculus cal. Grove. Jan 22 1985, *James A. West 298* (UCJEPS)

*Common Names.* We recommend Pacific fringed-snakeroot as the common name for *Sanicula crassicaulis* var. *nudicaulis*, referring to its characteristic fringed leaf margins. The common names Pacific sanicle, gambleweed and Pacific blacksnakeroot are in use for *Sanicula crassicaulis* var. *crassicaulis* and Pacific blacksnakeroot for *Sanicula crassicaulis* var. *tripartita* (eg. Calflora 2020, USDA Plants 2020), and here we recommend that they be restricted to vars. *crassicaulis* and *tripartita*.

## 2.3 METHODS

We measured a total of seventy-one accessions to examine variation in fruit morphological characters. Twenty-six of these were fruit accessions banked at the UCSC Arboretum seed bank, thirty-nine were herbarium specimens from the Davis Herbarium (DAV) and UC Berkeley and Jepson Herbaria (UC/JEPS), and four were fruit and herbarium collections collected by the authors and vouchered at the Hoover Herbarium (OBI). The geographic range of *S. crassicaulis* var. *crassicaulis* specimens measured covers most of the range in California. We measured *S. crassicaulis* var. *nudicaulis* specimens collected from the San Francisco Bay Area to Santa Barbara county. These covered the current known range of the taxon (Fig 2.2), although samples were concentrated from the Davenport area and from San Luis Obispo County.

We measured morphological variation in two fruit traits. These traits are 1) the angle of attachment of the prickles on the schizocarps as well as 2) the difference in length between the

most distal and the most proximal prickles. Up to ten schizocarps were measured per accession or herbarium specimen. Specimens and seed collections were included only if these traits could be measured. Specimens in strictly vegetative condition were excluded. Fruits were photographed using a Leica EZ4 dissecting scope with an integrated digital camera and imported into Image J (Rueden et al., 2017). Schizocarps were imaged with the adaxial face facing upward. The abaxial face was supported on a bed of Velcro so that the adaxial face was as close to perpendicular with the camera lens as possible. This allowed us to capture images where the first series of prickles are seen in true length (Fig 2.3 A&B). On each schizocarp, we measured the length and angle of attachment of the most distal, the most proximal, and one medial prickle closest to the adaxial face of the schizocarp. The angle of attachment was measured as the angle between the line running from the tip to the base of the prickle and the line tangent to the curve of the margin of the schizocarp (Fig 2.3B). Prickle graduation is the length of the most distal prickle divided by the most proximal. Per fruit, the angle of prickle attachment is the average of the angle of attachment of the three prickles measured. Reported means, ranges and standard deviations were taken from the calculated per fruit values for angle of attachment and prickle graduation.

We measured leaf marginal trichome length on 99 individuals: 32 *S. crassicaulis* var. *crassicaulis* and 67 *S. crassicaulis* var. *nudicaulis*. We photographed leaves in the field due to the fact that the leaf marginal trichomes are often lost on herbarium specimens. We photographed leaves alongside a ruler using a 10x macro lens (Moment macro lens V2, 25 mm) mounted on an iPhone 8 (Fig 2.4 A&B). All leaves measured were from plants occurring more or less sympatrically in a population at Montaña de Oro State Park, San Luis Obispo, CA. We photographed one leaf per plant, and we chose leaves with intact marginal trichomes to photograph. We used Image J to measure the length of the marginal trichomes in the leaf photos. One trichome was haphazardly chosen to measure for each leaf photograph. The trichome was measured from the leaf margin to the tip of the trichome (Fig 2.4 A). Sinuate or bent trichomes

were traced with the freehand line drawing tool in Image J (Fig 2.4 B). Reported means, ranges and standard deviations of leaf marginal trichome lengths represent the values measured for each variety.

## 2.4 TRAIT VALUES

On average, the most proximal prickles on the schizocarps of var. *crassicaulis* are 1.7 times longer than the most distal (mean = 1.7, SD = 0.6, min = 0.7, max = 4.0) and the most proximal prickles on var. *nudicaulis* are 1.2 times longer than the most distal (mean = 1.2, SD = 0.3, min = 0.6, max = 2.4). Variety *nudicaulis* has on average a prickle attachment angle of 77° (mean = 77°, SD = 13°, min = 33°, max = 131°), 17° degrees greater than var. *crassicaulis* (mean = 60°, SD = 13°, min = 16°, max = 113°). On average, var. *crassicaulis* has leaf marginal trichomes that are 1.2 mm long (mean = 1.2, SD = 0.5, min = 0.5, max = 2.1) and var. *nudicaulis* has leaf marginal trichomes that are 4.0 mm long (mean = 4.0, SD = 1.5, min = 0.9, max = 7.6).

## 2.5 ECOLOGY AND DISTRIBUTION

The majority of collections made of *Sanicula crassicaulis* var. *nudicaulis* are from shaded areas, often appearing more mesic than the surrounding areas. It is unclear how strong this pattern may be. More collections and observations of this plant will allow for a more accurate understanding of its ecology. Of interest is the fact that the authors have never observed var. *nudicaulis* growing more than about 100 meters away from var. *crassicaulis*. This supports the argument for designation of a unique variety in that we would expect to see intergradation where the two taxa are occurring so close together, but they remain morphologically distinct. Additionally, despite the fact that the two taxa are so commonly found close together, it is uncommon to find them actually growing side by side (but see Fig 2.5). This suggests that

perhaps there is some segregation between microclimates. Nevertheless, this is extreme sympatry for sister taxa. Crossing or genetic experiments would be valuable for determining the extent of reproductive isolation and the genetic basis for these two morphologies.

## 2.6 POLYPLOIDY

*Sanicula crassicaulis* is known to have populations of tetraploid, hexaploid, and octoploid individuals. Our initial hypothesis was that the distinct form we observed could represent diploid individuals, or a previously unknown morphological separation of ploidy levels. Ritchie Bell conducted an extensive project in 1954 to determine whether the ploidy levels in *S. crassicaulis* could be separated morphologically for the purpose of distinguishing separate taxa. He found no consistent morphological traits that could be used to determine the ploidy of an individual. In examining Bell's voucher specimens, we found one specimen (UC1714589) which appears to fall into var. *nudicaulis*. Bell marked on the label that it was tetraploid, leading us to conclude that this form is unlikely to represent any unique ploidy level in the species.

Bell recognized one variety, *S. crassicaulis* var. *tripartita*, in his publication (Bell, 1954). These plants are found primarily in Washington and are distinguished by their ternate leaves and purple-tinged flowers. All of these plants are octoploid and represent the only distinct polyploids that Bell found. However, there are octoploid individuals in California that do not fall into this taxon. This suggests that there is potential for differentiation within a ploidy level in the species. We believe this is one possibility to explain the distinct, putatively tetraploid, plants that we designate as var. *nudicaulis*.

Where vars. *crassicaulis* and *nudicaulis* might fall along the continuum of speciation is very difficult to say. We do not feel that we have evidence to designate these plants as separate species, but we feel that the rank of variety is useful and appropriate. We see two distinct stable

forms of *Sanicula crassicaulis* in California. Naming these as distinct taxa allows for further study of what might be incipient speciation, the result of introgression, or complex interactions within a polyploid genome. Without a taxonomic rank, these forms are very unlikely to receive further investigation. By documenting this diversity, we increase the potential for gaining further knowledge.

## 2.7 KEY TO THE VARIETIES OF *SANICULA CRASSICAULIS*

1. Leaf marginal trichomes 1-2(3) mm long and strait, angle of attachment of prickles on the schizocarps acute ( $\sim 60^\circ$ ), most distal rank of prickles +/- twice as long as most proximal.

2. Basal leaves +/- ternately lobed (the central lobe of the lower cauline and last formed basal leaves always elongated) with undulate margins, flowers showing varying amounts of purple pigmentation in the petals, plants of Oregon and Washington..... *S. crassicaulis* var. *tripartita*

2' Basal leaves variously lobed in 3-5 parts, but not so deeply cut to be ternate, with the central lobe rarely much elongated. Flowers consistently yellow..... *S. crassicaulis* var. *crassicaulis*

1' Leaf marginal trichomes (2) 3-4 (7) mm long and sinuate, prickles on the schizocarps attached more or less perpendicularly ( $\sim 80^\circ$ ), most distal rank of prickles +/- the same length on average as the most proximal..... *S. crassicaulis* var. *nudicaulis*





Fig 2.1. Type specimen of *Sanicula nudicaulis*. The inset shows 16 times magnification of the leaf marginal trichomes.



Fig 2.2. Known range of *Sanicula crassicaulis* var. *nudicaulis*. Points represent herbarium specimens or seed collections. Map datum is WGS84 and the coordinate system is UTM.

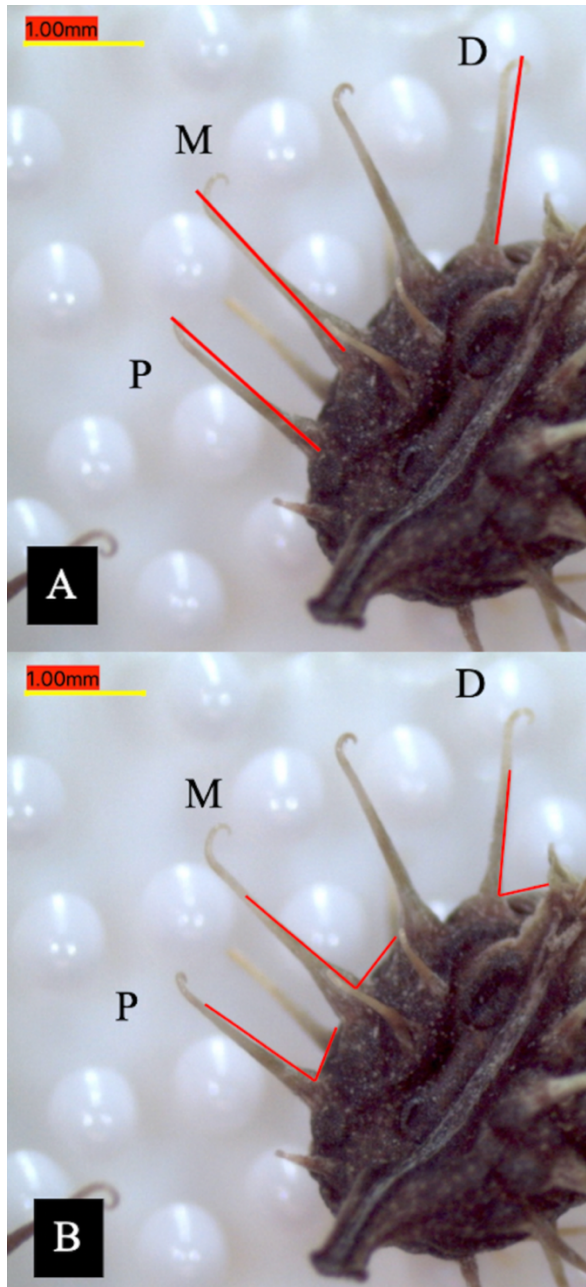


Fig 2.3. Methods for measuring prickle length and angle of attachment. In both image A and B, P denotes the most proximal prickle, D the most distal, and M a medial prickle. Image A shows our method for measuring the length of the prickles on the schizocarp. The red lines represent the straight-line distance from the base of the prickle to the tip which was measured in Image J. Image B shows the method for measuring the angle of attachment of the prickles. The angle formed by the red lines is the measured angle of attachment.



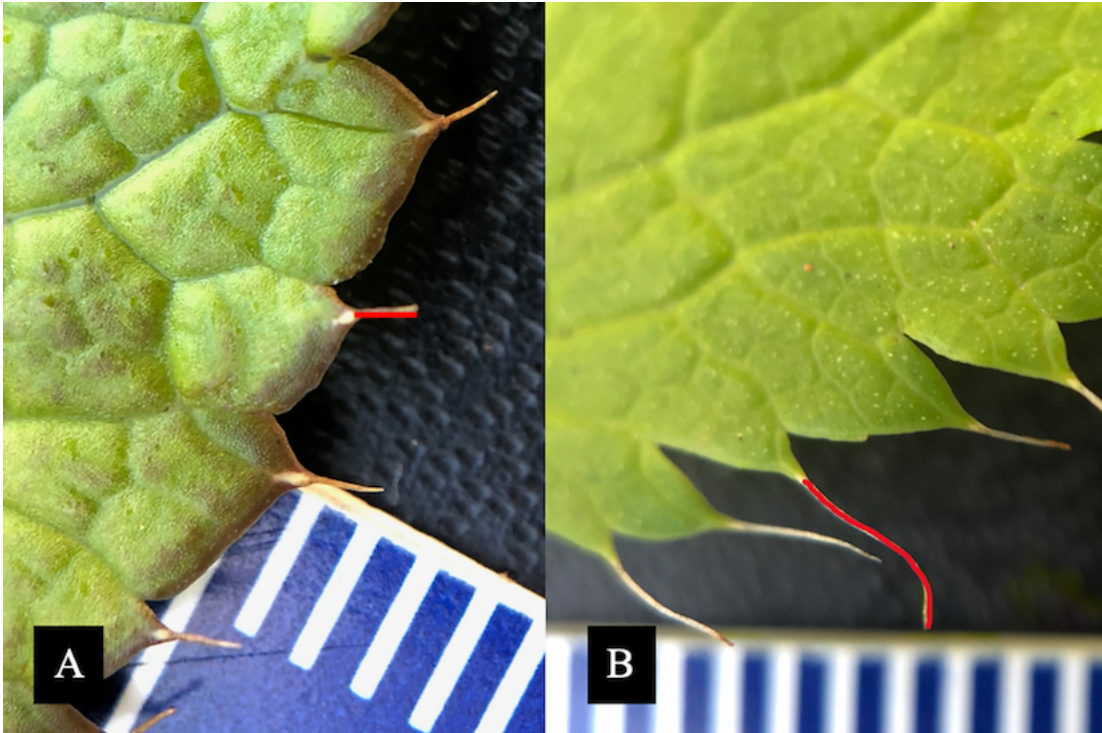


Fig 2.4. Methods for measuring leaf marginal trichomes. Image A shows an example of the method used to measure straight prickles as well as a close up of the marginal trichomes typical in var. *crassicaulis*. Image B shows the free hand method used to measure sinuate prickles as well as a close up of the marginal trichomes typical in var. *nudicaulis*.

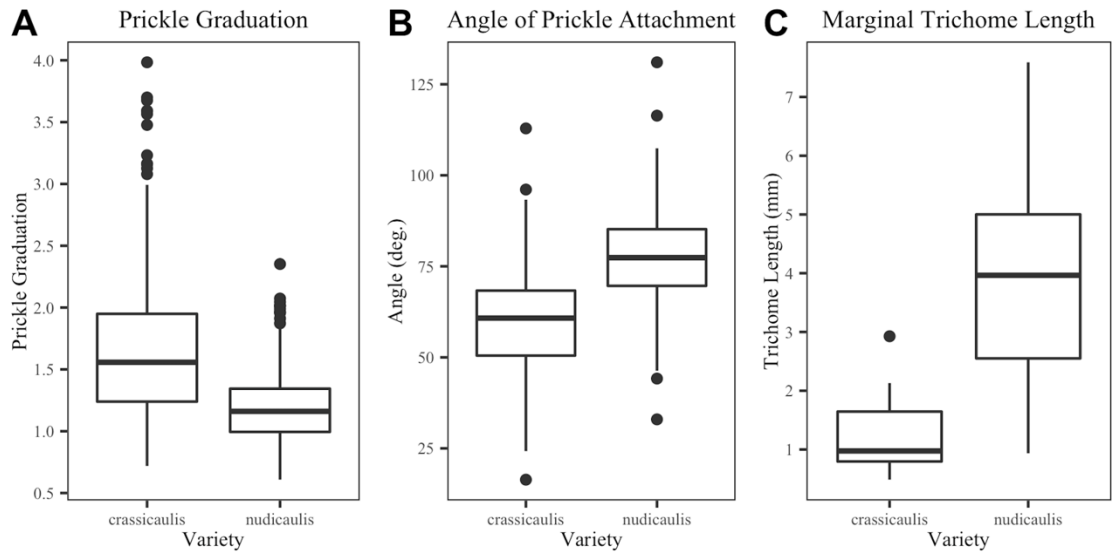


Fig 2.5. Measured trait value distributions for var. *crassicaulis* and var. *nudicaulis*. A. Prickle graduation. B. Angle of prickle attachment to the schizocarp. C. Leaf marginal trichome length. Angle of attachment of the prickle to the schizocarp is the average of 3 measured prickles per fruit (see Fig 2.3). Prickle graduation is calculated as the length of the most distal prickle divided by the length of the most proximal.



Fig 2.6. Vars. *crassicaulis* (left) and *nudicaulis* (right) occurring together at Jacks Peak, Monterey County, CA. Photo by Dylan Neubauer.





Fig 2.7. Var. *nudicaulis* occurring at Jacks Peak, Monterey County, CA. Photo by Dylan Neubauer.

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## APPENDIX: ANNOTATED SPECIES LIST FOR SWANTON PACIFIC RANCH

\* denotes non-native species

<sup>R</sup> denotes locally rare species

<sup>RR</sup> denotes CNPS ranked species

### Ferns and Allies

#### BLECHNACEAE

<sup>R</sup>*Struthiopteris spicant* (L.) Weiss (deer fern) – perennial herb, uncommon in riparian areas, growing on wet cliff face adjacent to waterfall in redwood forest, occurrences in the study area are at southern end of species distribution. Reed Kenny 898. Regions: 3

*Woodwardia fimbriata* Sm. (giant chain fern) – perennial herb, occasional in riparian areas, a patch of this species also occurs in the southern pond of the Scott Creek marsh growing out of the floating mass of *Typha latifolia* rhizomes. Monika Richardson 204. Regions: 10, 13, 21, 23, 26, 31

#### DENNSTAEDTIACEAE

*Pteridium aquilinum* (L.) Kuhn. Underw. var. *pubescens* (bracken fern) – perennial herb, common in coastal sage scrub, mixed conifer forest, riparian forest and coastal prairie. Monica Richardson 45. Regions: 1, 3, 5, 10, 12, 18, 20, 21, 23-26, 28

#### DRYOPTERIDACEAE

*Dryopteris arguta* (Kaulf.) Watt (coastal wood fern) – perennial herb, common in coastal sage scrub and mixed conifer forest understory. Monika Richardson 40. Regions: 1, 3, 5, 10, 12, 18, 20, 21, 23-26, 28

*Polystichum munitum* (Kaulf.) C. Presl (western sword fern) – perennial herb, common in mixed conifer forest understory. Monika Richardson 6. Regions: 1-3, 5, 10, 18, 20, 23-25, 28, 31

#### EQUISETACEAE

*Equisetum arvense* L. (common horsetail) – perennial herb, occasional in the Scott Creek riparian corridor. Reed Kenny 987. Regions: 5, 2

*Equisetum telmateia* Ehrh. subsp. *braunii* (J. Milde) Hauke (giant horsetail) – perennial herb, common in riparian areas. Monika Richardson 272. Regions: 2, 5, 10, 13, 17, 18, 21, 23-25, 27, 28, 30

#### POLYPODIACEAE

*Polypodium californicum* Kaulf. (California polypody) – perennial herb, occasional in mixed conifer forest. Reed Kenny 537. Regions: 1, 2, 5, 10, 13, 20, 23-25, 28

*Polypodium calirhiza* S.A. Whitmore & A.R. Sm. (nested polypody) – perennial herb, occasional in mixed conifer forest. Reed Kenny 985. Regions: 5, 25, 32

<sup>R</sup>*Polypodium scolieri* Hook. & Grev. (Leather-leaf fern) – perennial herb, uncommon in mixed conifer forest, historically present, not encountered during study. Randal Morgan 1978. Regions: NA

#### PTERIDACEAE

*Adiantum pedatum* L. (five-finger fern) – perennial herb, uncommon, found in redwood forest understory in riparian area. Monika Richardson 72. Regions: 5, 23

*Adiantum jordanii* C.H. Mull. (California maidenhair) – perennial herb, occasional in riparian areas in mixed conifer forest. Monica Richardson 74. Regions: 1, 5, 10, 21, 24-26, 28, 32

*Pellaea andromedifolia* (Kaulf.) Fée (coffee fern) – perennial herb, occasional in cliff areas in mixed conifer forest. Reed Kenny 394. Regions: 1, 10, 23

*Pellaea mucronata* (D.C. Eaton) D.C. Eaton var. *mucrota* (bird's foot fern) – perennial herb, uncommon in vertical openings in mixed conifer forest, historically present, not encountered during study. Roy E. Buck, James A. West 309. Regions: NA

*Pentagramma triangularis* (Kaulf.) Yatsk., Windham & E. Wollenw. (goldback fern) – perennial herb, common in coastal sage scrub and mixed conifer forest understory. Reed Kenny 317. Regions: 1, 5, 9, 13, 20, 23-25, 28, 32

#### WOODSIACEAE

*Athyrium filix-femina* (L.) Roth var. *cyclosorum* Rupr. (western lady fern) – perennial herb, common in riparian areas in mixed conifer forest. Reed Kenny 639. Regions: 2, 5, 10, 14, 18, 21, 26, 28

### Gymnosperms

#### CUPRESSACEAE

<sup>RR</sup>*Hesperocyparis abramsiana* (C. B. Wolf) Bartel (Santa Cruz cypress) – evergreen tree, one individual found on steep south facing slope above Scott Creek growing in area dominated by *Torreya californica*, state and federally endangered. Reed Kenny 196B. Regions: 5

*Sequoia sempervirens* (Lamb. ex D. Don) Endl. (coast redwood) – evergreen tree, occurs in pure stands as well as intermixed with other conifers and broadleaf trees, can be found from near sea level to poor soils on ridgetops where it takes on a stunted and yellow growth form. Reed Kenny 502. Regions: 2, 3, 5, 23-26

#### PINACEAE

*Pinus attenuata* Lemmon (knobcone pine) – evergreen tree, occasional in small stands in coastal headlands areas, many individuals appear intermediate between *P. radiata* and *P. attenuata*. Monica Richardson 261. Regions: 4, 24, 31

*Pinus radiata* D. Don (Monterey pine) – evergreen tree, occasional, many of the trees in the study areas are intermediate between *P. attenuata* and *P. radiata*, many individuals appear intermediate between *P. radiata* and *P. attenuata*. D. Keil, V. L. Holland, L. Kelly 20657. Regions: 4, 24, 31

*Pseudotsuga menziesii* (Mirb.) Franco var. *menziesii* (Douglas-fir) – evergreen tree, dominant tree in mixed conifer forest. D. Keil w/ V. L. Holland, L. Kelly 20565. Regions: 1-5, 10, 12, 13, 18-21, 24, 25, 31, 32

## TAXACEAE

*Torreya californica* Torr. (California-nutmeg) – evergreen tree, occasional in mixed conifer forest, there is a large stand on the south facing slope north of Scott Creek, Populations in the study area are near the southern extent of the species range on the coast. David J. Keil 20587. Regions: 5, 24, 25, 31

## Magnolids

## ARISTOLOCHIACEAE

*Asarum caudatum* Lindl. (wild ginger) – perennial herb, occasional in riparian forest understory. Reed Kenny 501. Regions: 2, 5, 23, 24

## LAURACEAE

*Umbellularia californica* (Hook. & Arn.) Nutt. (California bay laurel) – evergreen tree, found in riparian forest and mixed evergreen forest. Monika Richardson 279. Regions: 1-3, 6, 14, 25, 32

## Eudicots

## ACANTHACEAE

\**Acanthus mollis* L. (bear's breeches) – perennial herb, uncommon, found only near landscaped areas, not treated in TMJ2. Monica Richardson 318. Regions: 5

## ADOXACEAE

*Sambucus nigra* L. subsp. *caerulea* (Raf.) R. Bolli (blue elderberry) – shrub to small tree, common in mixed conifer understory and riparian forest. Monica Richardson 59. Regions: 3, 7, 20, 21, 24, 25, 33



***Sambucus racemosa*** L. var. ***racemosa*** (red elderberry) – shrub to small tree, common in mixed conifer understory and riparian forest. David J. Keil 20663. Regions: 1-3, 5, 10, 13, 14, 24-26, 33

#### AIZOACEAE

\****Carpobrotus edulis*** (L.) N.E. Br. (freeway iceplant) – perennial herb, common on coast in disturbed areas adjacent to roads. Monika Richardson 294. Regions: 17, 31

#### ANACARDIACEAE

***Toxicodendron diversilobum*** (Torr. & A. Gray) Greene (western poison oak) – shrub to liana, common throughout study area. Monica Richardson 396. Regions: 1-14, 17-21, 23-28, 30-33

#### APIACEAE

<sup>R</sup>***Angelica tomentosa*** S. Wats. (wooly angelica) – perennial herb, locally rare in the county, two individuals in study area occurring in coastal sage scrub. Reed Kenny 757. Regions: 33

\****Anthriscus caucalis*** M. Bieb. (bur-chervil) – annual herb, occasional in mixed conifer forest understory, historically present, not encountered during study. D. Keil w/ V. L. Holland, L. Kelly 20646. Regions: NA

<sup>R</sup>***Apiastrum angustifolium*** Nutt. (wild celery) – annual herb, locally rare in county, common in study area in coastal prairie and coastal sage scrub on bluffs and in coastal sage scrub on slopes of coastal gulches.. Reed Kenny 406. Regions: 17, 28

<sup>R</sup>***Bowlesia incana*** Ruiz & Pav. (hoary bowlesia) – annual herb, locally rare in county, occasional in study area in mixed conifer forest and chaparral understory. Reed Kenny 262. Regions: 20, 25

\****Bupleurum lancifolium*** Hornem. (lance-leaf thorow-wax) – annual herb, uncommon, found in Scott Creek riparian corridor, historically present, not encountered during study. Randall Morgan & J. West 3363. Regions: NA

***Cicuta douglasii*** (DC.) Coult. & Rose (Douglas' water hemlock) – perennial herb, occasional on stream banks. Reed Kenny 740. Regions: 5, 26

\**Conium maculatum* L. (poison hemlock) – perennial herb, common in moist, disturbed areas throughout study area. Monika Richardson 55. Regions: 1-3, 6-14, 18-21, 23-28, 30-33

*Daucus pusillus* Michx. (rattlesnake carrot) – annual herb, common on coastal bluffs and slopes of coastal gulches. Reed Kenny 677. Regions: 10, 12, 13, 17, 20, 21, 28

*Eryngium armatum* (S. Watson) J.M. Coult. & Rose (coyote thistle) – perennial herb, occasional in wet areas of coastal prairie, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

\**Foeniculum vulgare* Mill. (fennel) – perennial herb, occasional on roadsides. Reed Kenny 966. Regions: 5, 32

*Heracleum maximum* Bartr. (cow parsnip) – perennial herb, common in riparian forested understory, mixed conifer forest understory. Monika Richardson 13. Regions: 2, 3, 5, 9, 10, 17-19, 24, 26, 28

<sup>R</sup>*Ligusticum apiifolium* S. Wats. (celery-leaved licorice root) – perennial herb, uncommon in understory of mixed conifer forest on north facing slopes in coastal gulches, two occurrences in study region represent southernmost population in range. Reed Kenny 888. Regions: 18, 20, 26

<sup>R</sup>*Lomatium caruifolium* (Hook. & Arn.) Coult. & Rose var. *caruifolium* (caraway-leaved lomatium) – perennial herb, rare in the county, occasional in interior coastal prairies in study region. Reed Kenny 113. Regions: 4, 7

*Oenanthe sarmentosa* Presl ex DC. (pacific oenanthe) – perennial herb, common in riparian areas and freshwater marshes throughout the study area. Thomas Buchloh 23. Regions: 5, 10, 14, 17, 18, 20, 21, 28, 31

*Osmorhiza berteroi* DC. (mountain sweet cicely) – perennial herb, common in mixed conifer forest understory. Monika Richardson 355. Regions: 1, 5, 18, 23-25

<sup>RR</sup>*Perideridia gairdneri* (Hook. & Arn.) Mathias subsp. *gairdneri* (Gairdner's yampah) – perennial herb, one occurrence on coastal prairies in study area, CNPS list 4.2. Monika Richardson 104. Regions: 11

*Sanicula arctopoides* Hook. & Arn. (footsteps of spring) – perennial herb, common in coastal prairie. Reed Kenny 108. Regions: 9, 20, 27, 28

***Sanicula bipinnatifida*** Dougl. (purple sanicle) – perennial herb, occasional in interior coastal prairie. Reed Kenny 280. Regions: 4

***Sanicula crassicaulis*** Poepp. ex DC. (pacific sanicle) – perennial herb, common in forest understory and coastal sage scrub, individuals found in shaded and riparian areas appear to be distinct from individuals found in more xeric areas, shade plants have schizocarp prickles that are less graduated and leaf marginal trichomes that are longer and thinner than the xeric ecotype. David J. Keil 20629. Regions: 1, 5, 9, 10, 12, 17-21, 24, 25, 28, 31, 32

<sup>RR</sup>***Sanicula hoffmannii*** (Shan & Constance) Bell (Hoffmann's sanicle) – perennial herb, uncommon in mixed conifer forest understory, CNPS list 4.3, the occurrences in the study area are near the northern edge of the species range. Reed Kenny 196. Regions: 5

\****Torilis arvensis*** (Huds.) Link (tall sock-destroyer) – annual herb, uncommon in disturbed areas. Monika Richardson 67. Regions: 23, 25

\****Torilis nodosa*** (L.) Gaertner (short sock-destroyer) – annual herb, common in disturbed areas. Reed Kenny 955. Regions: 1-3, 5, 10, 17, 18, 20, 24, 33

<sup>R</sup>***Yabea microcarpa*** (Hook. & Arn.) Koso-Pol. (California hedge parsley) – annual herb, only found in the Scott Creek watershed in Santa Cruz county, in study area, occasional in coastal sage scrub and grasslands. Reed Kenny 489. Regions: 1, 21, 33

#### APOCYNACEAE

\****Vinca major*** L. (greater periwinkle) – perennial herb, occasional in mixed conifer understory in near historically disturbed areas. Monika Richardson 76. Regions: 5, 25

#### ASTERACEAE

***Achillea millefolium*** L. (yarrow) – perennial herb, common in coastal scrub and grasslands. David J. Keil 20566. Regions: 1, 4, 6, 7, 10, 12, 17-21, 24-28, 31, 32

***Adenocaulon bicolor*** Hook. (trail plant) – perennial herb, occasional in mixed conifer forest understory. Monika Richardson 134. Regions: 5

*Agoseris grandiflora* (Nutt.) Greene var. *grandiflora* (large flowered agoseris) – perennial herb, perennial herb, occasional in mixed conifer forest understory. Reed Kenny 463. Regions: 1, 2, 5, 18, 24, 26

*Agoseris heterophylla* (Nutt.) Greene var. *heterophylla* (annual agoseris) – annual herb, rare in the county but widespread throughout the state, in the study area uncommon in interior coastal prairie. Reed Kenny 448. Regions: 4

<sup>R</sup>*Ambrosia chamissonis* (Less.) Greene (beach bur-sage) – shrub, common in sandy areas around Scott Creek beach. Reed Kenny 874. Regions: 31

*Anaphalis margaritacea* NA (pearly everlasting) – perennial herb, common in coastal sage scrub. Reed Kenny 734. Regions: 10, 11, 13, 18, 20

*Anisocarpus madioides* Nutt. (woodland tarweed) – perennial herb, common in openings in mixed conifer forest. Monica Richardson 130. Regions: 1, 5, 20, 23-25

*Arnica discoidea* Benth. (rayless arnica) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 765. Regions: 24

*Artemisia californica* Less. (California sagebrush) – shrub, common in coastal sage scrub. Monica Richardson 43. Regions: 7, 9, 10, 12, 13, 17-19, 21, 26, 28, 30-32

*Artemisia douglasiana* Bess. (mugwort) – perennial herb, common in riparian forest, mixed conifer forest and coastal sage scrub. Reed Kenny 845. Regions: 2, 3, 9, 10, 12-14, 17-21, 25-28, 30, 31

*Baccharis glutinosa* Pers. (marsh baccharis) – caning shrub, occasional in freshwater marshes. Monica Richardson 264. Regions: 10, 13, 14, 30, 31

*Baccharis pilularis* D.C. subsp. *consanguinea* (DC.) C. B. Wolf (coyote brush) – shrub, common in coastal sage scrub. Monica Richardson 81. Regions: 33

\**Bellis perennis* L. (english daisy) – perennial herb, uncommon in disturbed areas. Reed Kenny 379. Regions: 1, 25

\**Carduus pycnocephalus* L. subsp. *pycnocephalus* (Italian thistle) – annual herb, common in disturbed coastal prairie. Monica Richardson 30. Regions: 1, 2, 5-8, 10-12, 14, 17-21, 23, 25, 27, 28, 30, 32

\**Centaurea melitensis* L. (tocalote) – annual herb, common in disturbed coastal prairie. Reed Kenny 954. Regions: 1, 9, 10, 12, 17, 19, 20, 25, 28, 32

\**Cichorium intybus* NA (chicory) – perennial herb, uncommon in disturbed areas. Monica Richardson 329. Regions: 5

*Cirsium brevistylum* Cronq. (Indian thistle) – perennial herb, occasional in disturbed areas in mixed conifer forest understory and coastal sage scrub. Reed Kenny 761. Regions: 3, 5, 9, 24, 25

*Cirsium quercetorum* (A. Gray) Jeps. (brownie thistle) – annual to perennial herb, uncommon in coastal prairie, historically present, not encountered during study, known from 1983 collection within 500m of study area (Roy E. Buck, James A. West 284), documented in Traversing Swanton as occurring in study region 21 as of 2010. s.n. Regions: NA

\**Cirsium vulgare* (Savi) Ten. (bull thistle) – biennial herb, common throughout study area. Thomas Buchloh 21. Regions: 1-8, 10, 11, 13, 14, 17-21, 23-28, 30-33

*Corethrogyne filaginifolia* (Hook. & Arn.) Nutt. (California aster) – perennial herb to subshrub, perennial herb to subshrub, common in grasslands and coastal sage scrub, prostrate plants occurring near the coast with stems bearing single large inflorescences have been assigned to *Corethrogyne filaginifolia* var. *californica* D.C.. Reed Kenny 681B. Regions: 4, 7, 9, 10, 12, 14, 19-21, 28, 31, 32

\**Cotula coronopifolia* L. (brass-buttons) – perennial herb, common on coastal bluffs in disturbed areas or exposed soil. Reed Kenny 560. Regions: 17, 19-21, 28

\**Crepis vesicaria* (Thuill.) Thell. subsp. *taraxacifolia* (weedy hawksbeard) – perennial herb, occasional in disturbed coastal prairies. Reed Kenny 827. Regions: 20, 23, 28

*Deinandra corymbosa* (DC.) B. G. Baldwin (coastal tarweed) – annual herb, occasional in coastal prairie and coastal sage scrub. Monica Richardson 298. Regions: 21, 25

\**Delairea odorata* Lem. (cape ivy) – perennial herb, occasional in riparian forest understory. Reed Kenny 970. Regions: 20, 26

*Ericameria arborescens* (A. Gray) Greene (golden-fleece) – shrub, uncommon on steep openings in mixed conifer forest, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Erigeron canadensis* L. (horseweed) – annual herb, common disturbed areas throughout study area. Thomas Buchloh 17. Regions: 5, 10, 18, 19, 21, 23, 25, 26, 30-32

*Erigeron foliosus* Nutt. var. *franciscensis* G.L. Nesom (leafy fleabane) – perennial herb, uncommon in interface of mixed conifer forest and coastal prairie, historically present, not encountered during study, observed in study region 20 (personal observation, Jim West). s.n. Regions: NA

*Erigeron glaucus* Ker-Gawl. (seaside daisy) – subshrub, common on coastal bluffs. Reed Kenny 266. Regions: 9, 10, 12, 17, 21, 28

*Eriophyllum confertiflorum* (DC.) A. Gray var. *confertiflorum* (golden-yarrow) – subshrub, occasional in openings in mixed conifer forest. Monica Richardson 21. Regions: 1, 23-25

*Eriophyllum staechadifolium* Lag. (seaside woolly sunflower) – subshrub, common in coastal sage scrub. Monica Richardson 79. Regions: 10, 12, 13, 17-19, 21, 25, 28, 30-33

*Eurybia radulina* (A. Gray) G.L. Nesom (broad-leaved aster) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 864. Regions: 3, 18, 23

*Euthamia occidentalis* Nutt. (western goldenrod) – perennial herb, common in upland portions of Scott Creek Marsh, uncommon in freshwater marshes throughout study area. Monika Richardson 250. Regions: 18, 30, 31

*Gamochaeta ustulata* (Nutt.) J. Holub (purple cudweed) – perennial herb, common in disturbed areas throughout the study area. Reed Kenny 625. Regions: 10, 12, 17, 19-21, 23, 24, 27, 28, 30, 31

\**Glebionis coronaria* (L.) Cass. ex Spach (crown daisy) – annual herb, uncommon, found in disturbed area in coastal prairie. Reed Kenny 977. Regions: 30

***Gnaphalium palustre*** Nutt. (lowland cudweed) – annual herb, uncommon in riparian areas and wet fields. Reed Kenny 251. Regions: 2, 25

***Grindelia hirsutula*** Hook. & Arn. (hirsute gumplant) – perennial herb, occasional in coastal prairie. Reed Kenny 892. Regions: 10, 18, 19

***Helenium puberulum*** DC. (sneezeweed rosilla) – perennial herb, common in riparian forest and mixed conifer forest understory. Thomas Buchloh 45. Regions: 5, 14, 17, 18, 23, 24, 31, 33

\****Helminthotheca echioides*** (L.) Holub (bristly ox-tongue) – perennial herb, common in anthropogenic grasslands. Monika Richardson 284. Regions: 17, 26, 28, 30, 31

<sup>R</sup>***Heterotheca sessiliflora*** (Nutt.) Shinnery subsp. ***bolanderi*** (A. Gray) Semple (Bolander's golden aster) – perennial herb, uncommon in coastal prairie and coastal bluffs, Guy Nesom annotated Monica Richardson 101 to *H. bolanderi* var. *bolanderi* in 2018, Santa Cruz county is more or less the southernmost extent of the range of this taxon, with one record from Monterey county, subspecies *bolanderi* and *echioides* both occur in the study area with subsp. *bolanderi* occurring in coastal prairie within 0.25 miles of the coast and subsp. *echioides* occurring in interior grasslands (see below), there are no apparent intergrades on the property. Reed Kenny 952. Regions: 25

***Heterotheca sessiliflora*** (Nutt.) Shinnery subsp. ***echioides*** (Benth.) Semple (bristly golden aster) – perennial herb, uncommon in interior grasslands, though occurrences in the study area are in the northern portion of the taxon range, it extends up through the Bay Area. Reed Kenny 264. Regions: 25

***Hieracium albiflorum*** Hook. (white hawkweed) – perennial herb, occasional in mixed conifer forest. Reed Kenny 758. Regions: 3, 23, 24

\****Hypochaeris glabra*** L. (smooth cat's-ear) – annual herb, common throughout grasslands and disturbed areas in study area. Reed Kenny 650. Regions: 1, 4, 6, 7, 9, 11, 12, 17, 19, 21, 28

\****Hypochaeris radicata*** L. (rough cat's-ear) – perennial herb, common throughout grasslands and disturbed areas in study area. Monica Richardson 56. Regions: 1-8, 10-12, 14, 17-21, 23-25, 27, 28, 30, 32, 33

***Jaumea carnosa*** (Less.) A. Gray (salt-marsh jaumea) – perennial herb, common in Scott Creek marsh. Thomas Buchloh 26. Regions: 31

\**Lactuca serriola* L. (prickly lettuce) – annual herb, common in disturbed areas of mixed conifer forest. Reed Kenny 953. Regions: 1, 4, 19, 23, 25, 26, 28, 31

\**Lapsana communis* NA (nipplewort) – annual herb, occasional in disturbed areas of mixed conifer and riparian forest. Reed Kenny 838. Regions: 5, 26

<sup>R</sup>*Lasthenia gracilis* (DC.) Greene (common goldfields) – annual herb, occasional on areas of thin soil in coastal prairie, habitat for this species has been heavily impacted and it can be used as an indicator species for botanical hotspots in the county (Neubauer 2013). Reed Kenny 417. Regions: 7, 9, 10

<sup>R</sup>*Layia gaillardii* Hook. & Arn. (woodland layia) – annual herb, uncommon in grassy openings in mixed conifer woodlands, not encountered during this study, likely most of the habitat in the study area was converted to Ceanothus chaparral post the 2009 Lockheed fire. David J. Keil 20612. Regions: 1, 4, 5, 25

*Layia hieracioides* (DC.) Hook. & Arn. (tall layia) – annual herb, occasional in coastal scrub and coastal prairie. Reed Kenny 460. Regions: 1, 12, 20, 28, 33

<sup>R</sup>*Layia platyglossa* (Fisch. & C. A. Mey.) A. Gray (tidy-tips) – annual herb, uncommon in county, occurring in study area on exposed mudstone in coastal scrub and coastal prairie. Reed Kenny 281. Regions: 7, 28, 32

\**Leontodon saxatilis* Lam. subsp. *saxatilis* (hairy hawkbit) – perennial herb, occasional in disturbed coastal prairies. Reed Kenny 444. Regions: 4, 25, 32

*Logfia filaginoides* (Hook. & Arn.) Morefield (California cottonrose) – annual herb, uncommon, found in open areas of coastal scrub, historically present, not encountered during study. Roy E. Buck, James A. West 513. Regions: NA

\**Logfia gallica* (L.) Coss. & Germ. (daggerleaf cottonrose) – annual herb, common in disturbed areas with exposed soil throughout study area. Thomas Buchloh 20. Regions: 7, 9-11, 13, 17, 19, 20, 28, 30-32

*Madia exigua* (Sm.) Greene (threadstem madia) – annual herb, uncommon in openings in mixed conifer forest. Reed Kenny 763. Regions: 24



\**Silybum marianum* (L.) Gaertn. (milk thistle) – annual to perennial herb, common in disturbed coastal prairie. Monika Richardson 278. Regions: 1, 4, 6, 7, 11, 14, 18-21, 25, 27, 28, 30, 32

*Solidago elongata* Nutt. (west coast canada goldenrod) – perennial herb, occasional in coastal sage scrub and disturbed areas in riparian forest. Reed Kenny 895. Regions: 5, 13, 14, 26, 28

*Solidago velutina* D.C. subsp. *californica* (Nutt.) Semple (California goldenrod) – perennial herb, uncommon in coastal prairie. Monika Richardson 152. Regions: 7

\**Soliva sessilis* Ruiz & Pav. (common soliva) – annual herb, occasional on roadsides. Reed Kenny 539. Regions: 25

\**Sonchus asper* (L.) Hill subsp. *asper* (prickly sow thistle) – annual herb, common in disturbed areas throughout study area. Monika Richardson 29. Regions: 24

\**Sonchus oleraceus* L. (common sow thistle) – annual herb, common in disturbed areas throughout study area. Reed Kenny 858. Regions: 3-5, 8, 17, 19-21, 25, 28, 31, 33

<sup>RR</sup>*Stebbinsoseris decipiens* (Chamb.) K.L. Chambers (Santa Cruz microseris) – annual herb, uncommon on thin soils in coastal prairie, CNPS 1B.2. The taxon is believed to be a hybrid of *Microseris bigelovii* and *Uropappus lindleyi* and is typically found with *Microseris bigelovii* in the study area. Reed Kenny 471. Regions: 1, 4, 5, 9, 18, 20

*Stephanomeria virgata* (Greene) Gottlieb subsp. *pleurocarpa* (virgate stephanomeria) – annual herb, uncommon in openings in mixed conifer forest, specimens are highly variable, but all examined lack the distinct longitudinal groove on the faces of the achene which puts them in *S. virgata* and the lack of reflexion of the outer phyllaries indicates *S. virgata* subsp. *pleurocarpa*, some individuals observed in the field show greater reflexion of the outermost phyllaries, a trait which is difficult to see on herbarium specimens, indicating potential hybridization with the tetraploid *S. elata* which has been noted to occur but produces non reproductive triploid individuals, caryotyping of several individuals might shed light on the taxonomic state of this interesting population. Reed Kenny 957. Regions: 1

*Symphotrichum chilense* (Nees) G.L. Nesom (California aster) – perennial herb, common in coastal sage scrub. Monika Richardson 187. Regions: 1, 6-8, 10, 13, 14, 17-19, 21, 23, 30-32

*Symphotrichum subspicatum* (Nees) G.L. Nesom (Douglas aster) – perennial herb, occasional in wet areas in coastal sage scrub. Reed Kenny 630. Regions: 26, 31

\**Taraxacum officinale* NA (common dandelion) – perennial herb, uncommon in disturbed areas near roads. Reed Kenny 274. Regions: 1, 5, 26

*Madia gracilis* (Sm.) Keck & J. Clausen ex Applegate (gumweed) – annual herb, occasional in opening in mixed conifer forest and brushy slopes. David J. Keil 20626. Regions: 3, 5, 20, 24

*Madia sativa* Molina (coast tarweed) – annual herb, common in coastal scrub, chaparral and grasslands. Thomas Buchloh 38. Regions: 1, 2, 7, 8, 10, 12, 19-21, 24-26, 28, 30, 31

<sup>R</sup>*Malacothrix floccifera* (DC.) S.F.Blake (wooly malacothrix) – annual herb, locally rare in county, limited to post burn areas or sandy soils and exposed cliffs. Uncommon in study area, found exclusively on cliff faces which create openings in mixed conifer forest. Reed Kenny 383. Regions: 1

*Matricaria discoidea* DC. (pineapple weed, rayless chamomile) – annual herb, uncommon in study area found in growing in gravel on road margins. Reed Kenny 199. Regions: 26, 27

<sup>RR</sup>*Micropus amphibolus* A. Gray (mount diablo cottonseed) – annual herb, uncommon in study area, found in thin soils in coastal prairie within 0.25 miles of coast. Areas regularly experience strong winds off of the ocean, CNPS list 3.2. Reed Kenny 521. Regions: 9

<sup>R</sup>*Micropus californicus* A. Gray var. *subvestitus* (green cottonweed) – annual herb, uncommon in openings in mixed conifer forest, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Microseris bigelovii* (A. Gray) Sch. Bip. (Bigelow's microseris) – annual herb, locally rare in county, occasional in study area occurring in coastal prairies close to coast as well as inland, two forms have been documented in the watershed which differ in size of head and fruit and require further investigation. Reed Kenny 399. Regions: 4, 14, 17, 20

<sup>RR</sup>*Microseris paludosa* J.T. Howell (marsh microseris) – perennial herb, uncommon in coastal prairie, observed in seasonally wet drainage, CNPS list 1B.2, historically present, not encountered during study, observed in 1970's habitat may have been impacted by grazing. s.n. Regions: NA

*Petasites frigidus* (Ait.) Cronq. var. *palmatus* (western sweet coltsfoot) – perennial herb, common in riparian areas. Reed Kenny 131. Regions: 2, 5, 25, 26

*Pseudognaphalium beneolens* (Davidson) Anderb. (fragrant everlasting) – annual to perennial herb, uncommon in mixed conifer forest, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Pseudognaphalium biolettii* A.A. Anderberg (Bioletti's cudweed) – perennial herb, occasional in coastal sage scrub. Reed Kenny 840. Regions: 8, 17, 20

*Pseudognaphalium californicum* (DC.) A.A. Anderberg (California cudweed) – perennial herb, occasional in openings in mixed conifer forest, coastal sage scrub, grasslands. Reed Kenny 936. Regions: 5, 11, 21, 24, 31

\**Pseudognaphalium luteoalbum* (L.) O.M. Hilliard & B.L. Burt (weedy cudweed) – annual herb, common in coastal sage scrub, chaparral and grasslands. Monika Richardson 291. Regions: 11, 19, 21, 26, 30, 31

*Pseudognaphalium ramosissimum* (Nutt.) A.A. Anderberg (pink everlasting) – perennial herb, occasional in mixed conifer forest and riparian forest. Monika Richardson 194. Regions: 5, 12, 23

*Pseudognaphalium stramineum* (Kunth) A.A. Anderberg (cotton-batting plant) – perennial herb, common in coastal sage scrub. Reed Kenny 902. Regions: 1, 2, 10-12, 17, 20, 26, 28, 31, 32

<sup>R</sup>*Psilocarphus tenellus* Nutt. (slender woolly-marbles) – annual herb, in study area, occasional in areas of bare soil in mixed conifer forest, chaparral and grasslands. Reed Kenny 255. Regions: 5, 23, 25, 28

*Rafinesquia californica* Nutt. (California chicory) – annual herb, uncommon on exposed mudstone cliffs. Reed Kenny 841. Regions: 5, 17, 23, 24

<sup>RR</sup>*Senecio aphanactis* DC. (chaparral ragwort) – annual herb, uncommon in the study area occurring in ridgetop chaparral, CNPS 2B.2, not in Neubaur 2013, specimen is the first collection in the county. Reed Kenny 483. Regions: 23

\**Senecio glomeratus* Desf. ex Poir. (cutleaf burnweed) – annual to perennial herb, uncommon in disturbed areas along roads. Reed Kenny 762. Regions: 8, 24, 25

\**Senecio jacobaea* L. (tansy ragwort) – perennial herb, uncommon in disturbed areas along road near Scott creek. Monika Richardson 275. Regions: 5

\**Senecio minimus* Poir. (coastal burnweed) – annual to perennial herb, occasional in disturbed areas along roads. Reed Kenny 934. Regions: 1, 5, 10, 24, 31

\**Senecio vulgaris* NA (common groundsel) – annual herb, uncommon in disturbed areas along roads. Reed Kenny 190. Regions: 26, 33

*Uropappus lindleyi* (D.C.) Nutt. (silverpuffs) – annual herb, uncommon in interior coastal prairie, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 1. s.n. Regions: NA

<sup>R</sup>*Wyethia angustifolia* (DC.) Nutt. (narrow-leaved mule's ears) – perennial herb, uncommon in coastal prairie, occurrences in the study area are near the southern edge of the species range on the coast. Reed Kenny 830. Regions: 11, 28, 32

#### BERBERIDACEAE

*Berberis pinnata* Lag. subsp. *pinta* (California barberry) – shrub, uncommon in the county, found growing in coastal scrub on north facing slope of gully in the study region. Reed Kenny 185A. Regions: 10, 11

#### BETULACEAE

*Alnus rubra* Bong. (red alder) – deciduous tree, common in riparian forest, population in the study area is near the southern limit of the distribution on the coast. Monica Richardson 7. Regions: 2, 5, 24-26

*Corylus cornuta* Marshall subsp. *californica* (A. DC.) A.E. Murray (California hazel) – shrub, common in riparian forest and mixed conifer forest understory, near the southern limit of the distribution on the coast. Reed Kenny 130. Regions: 1, 3, 5, 18, 23, 25, 32

#### BORAGINACEAE

*Amsinckia intermedia* Fisch. & Mey. (common fiddleneck) – annual herb, occasional in coastal grasslands. Reed Kenny 549. Regions: 2, 19, 28

<sup>RR</sup>*Amsinckia lunaris* Macbr. (bent-flowered fiddleneck) – annual herb, occurs in the study area in coastal prairie on steep, exposed slopes in the upper portion of coastal gullies, CNPS 1B.2, populations in the study area are in the southern portion of the species range. Reed Kenny 285. Regions: 21

*Amsinckia menziesii* (Lehm.) A. Nels. Macbr. (common fiddleneck, small-flowered fiddleneck) – annual herb, uncommon in coastal sage scrub. Monika Richardson 85. Regions: 1, 33

*Cryptantha clevelandii* Greene var. *florosa* I.M. Johnst. (coastal cryptantha) – annual herb, common in coastal sage scrub. Reed Kenny 456. Regions: 1, 4, 9, 12, 17

*Cryptantha micromeres* (A. Gray) Greene (minute-flowered cryptantha) – annual herb, common in coastal sage scrub and chaparral. Reed Kenny 453. Regions: 1, 9, 13, 20, 28

<sup>R</sup>*Cryptantha torreyana* (A. Gray) Greene (dwarf cryptantha) – annual herb, uncommon in chaparral, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 23. s.n. Regions: NA

*Cynoglossum grande* Dougl. ex Lehm. (grand hound's tongue) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 101. Regions: 5, 23-25

*Emmenanthe penduliflora* Benth. (whispering bells) – annual herb, uncommon in ridgetop chaparral, only observed briefly post 2009 Lockheed fire, historically present, not encountered during study, seeds deposited at UCSC Arboretum. s.n. Regions: NA

*Eriodictyon californicum* (Hook. & Arn.) Greene (California yerba santa) – shrub, uncommon, found in chaparral on ridgetops. Reed Kenny 459. Regions: 1, 20, 23, 25

\**Myosotis discolor* Pers. (changing forget-me-not) – annual herb, occasional in coastal sage scrub, disturbed grasslands and riparian areas. Reed Kenny 500. Regions: 9, 10, 14, 20

\**Myosotis latifolia* Poir. (broadleaved forget-me-not) – perennial herb, common in riparian areas and mixed conifer forest understory. Monika Richardson 9. Regions: 1-3, 5, 20, 23-26

<sup>R</sup>*Nemophila menziesii* Hook. & Arn. var. *menziesii* (baby blue-eyes) – annual herb, uncommon, found in openings on steep slopes in mixed conifer forest understory. Reed Kenny 124. Regions: 1, 2

*Nemophila parviflora* Dougl. ex Benth. (small-flowered nemophila) – annual herb, occasional in mixed conifer forest understory. Reed Kenny 475. Regions: 1, 3, 5, 23, 25

<sup>R</sup>*Nemophila pedunculata* Dougl. ex Benth. (meadow nemophila) – annual herb, uncommon, found in meadow area in redwood forest understory. Reed Kenny 469. Regions: 1, 5

<sup>R</sup>*Nemophila pulchella* Eastw. var. *fremontii* (Elmer) Constance (Fremont's nemophila) – annual herb, uncommon, found in meadow areas in redwood forest understory, collections in the study area are the only collections in Santa Cruz county. Reed Kenny 467B. Regions: 1, 19

*Phacelia californica* Cham. (California phacelia) – perennial herb, found in study area on steep south facing slope in redwood forest. Reed Kenny 624. Regions: 24, 25

*Phacelia distans* Benth. (common phacelia) – annual herb, uncommon, found in openings on steep slopes in mixed conifer forest understory. Reed Kenny 390. Regions: 1

*Phacelia malvifolia* Cham. var. *malvifolia* (stinging phacelia) – annual herb, common in coastal sage scrub and disturbed areas in mixed conifer forest. Reed Kenny 277. Regions: 3, 20, 21, 25, 26, 28, 31

<sup>R</sup>*Plagiobothrys bracteatus* (Howell) I. M. Johnst. (bracted popcornflower) – annual herb, occasional in seasonally wet areas, pond margins, seeps. Reed Kenny 467. Regions: 1, 2, 5, 6

*Plagiobothrys hispidulus* (Greene) I. M. Johnst. (harsh popcornflower) – annual herb, one collection from vernal wet area in mixed conifer forest understory, known in the county and in the study area only from a 1988 collection, the collection locality is currently out of the species range as reported by the Jepson eflora, the specimen keys to *P. hispidulus* and the collection may have recorded a long-distance dispersal event that did not establish a permanent population. D. Keil w/ V. L. Holland, Larry Kelly 20636. Regions: NA

<sup>RR</sup>*Plagiobothrys chorisianus* (Cham.) I.M. Johnst. var. *chorisianus* (Choris's popcornflower) – annual herb, found in small marshy area near Scott Creek, historically present, not encountered during study, personal observation by Jim West, CNPS 1B.2. s.n. Regions: NA

## BRASSICACEAE

<sup>R</sup>*Athysanus pusillus* (Hook.) Greene (dwarf athysanus) – annual herb, uncommon, found in opening in mixed conifer forest, historically present, not encountered during study. James A. West 54.1. Regions: NA

*Barbarea orthoceras* Ledeb. (American winter cress) – perennial herb, occasional in riparian forest. Reed Kenny 192. Regions: 26

\**Brassica nigra* (L.) W.D.J. Koch (black mustard) – annual herb, common in disturbed areas on roadsides and adjacent to agricultural fields. Reed Kenny 380. Regions: 1, 5, 19, 26, 28, 31, 33

\**Brassica rapa* L. (turnip, field mustard) – annual herb, occasional in disturbed areas and roadsides. Thomas Buchloh 56. Regions: 5, 31

\**Cakile edentula* (Bigelow) Hook. (California sea rocket) – annual herb, uncommon, occurring on burms bordering the Scott Creek marsh. Thomas Buchloh 31. Regions: 31

\**Cakile maritima* Scop. (European sea rocket) – annual herb, uncommon, occurring on burms bordering the Scott Creek marsh. Reed Kenny 875. Regions: 31

*Cardamine californica* (Nutt.) Greene (milk maids) – perennial herb, occasional in mixed conifer forest understory and disturbed areas of coastal sage scrub. Reed Kenny 409. Regions: 3, 5, 18, 20, 23, 25

\**Cardamine hirsuta* L. (hairy bitter cress) – annual herb, occasional in mixed conifer forest understory and moist disturbed areas, not listed in Neubaur 2013 but noted as potentially occurring, may be displacing the native *Cardamine oligosperma*, which was formerly common on the ranch but was not recorded in this study. Reed Kenny 191. Regions: 1, 23, 33

*Cardamine oligosperma* Nutt. (popweed) – annual herb, occasional in mixed conifer forest, historically present, not encountered during study. James A. West OBI100037. Regions: NA

*Caulanthus lasiophyllus* Payson (California mustard) – annual herb, uncommon in coastal prairie and coastal sage scrub, historically present, not encountered during study, known from 1912 collection in the Swanton area and documented as occurring in study region 10 as of 2006 in Jim West's Traversing Swanton. s.n. Regions: NA

\**Hirschfeldia incana* (L.) Lagr.-Foss. (summer mustard) – perennial herb, common in disturbed area throughout the study area. Monika Richardson 87. Regions: 19, 26-28, 30-33

\**Lepidium didymum* L. (lesser swine cress) – annual herb, occasional in vernal moist, disturbed areas. Thomas Buchloh 53. Regions: 25, 26, 31

*Lepidium nitidum* Nutt. (shining peppergrass) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 279. Regions: 28

*Lepidium virginicum* (DC.) Thell. subsp. *menziesii* (Virginia peppergrass) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 465. Regions: 27, 28

\**Lunaria annua* L. (monkey plant) – annual herb, uncommon, known only from historic collection, not recorded in this study, historically present, not encountered during study. David J. Keil 20640. Regions: NA

*Nasturtium officinale* W.T. Aiton (water cress) – perennial herb, common in riparian areas. Reed Kenny 658. Regions: 2, 5, 10, 14, 18, 20, 26, 28

\**Raphanus raphanistrum* L. (jointed charlock) – annual to perennial herb, occasional in disturbed areas near roads. Reed Kenny 946. Regions: 19, 26, 30, 31

\**Raphanus sativus* L. (radish) – annual to perennial herb, common in disturbed coastal prairie. Reed Kenny 945. Regions: 3, 19, 25, 26, 28, 30, 31

*Rorippa curvisiliqua* (Hook.) Bessey ex Britton (western yellow cress) – annual to perennial herb, occasional in Scott Creek. Reed Kenny 873. Regions: 5, 26, 31

\**Sisymbrium officinale* (L.) Scop. (hedge mustard) – annual herb, occasional in disturbed understory of mixed conifer forest. Reed Kenny 966. Regions: 6, 19, 32

*Thysanocarpus curvipes* Hook. subsp. *curvipes* (hairy fringe-pod) – annual herb, uncommon in mixed conifer forest openings. Reed Kenny 432. Regions: 1, 2, 5, 21



<sup>R</sup>*Thysanocarpus laciniatus* Nutt. (narrow leaved fringe pod) – annual herb, uncommon, occurring in openings in mixed conifer forest. Reed Kenny 393. Regions: 1

*Turritis glabra* L. (tower mustard) – annual herb, uncommon in steep mixed conifer forest with dense midstory, historically present, not encountered during study, seeds deposited at UCSC Arboretum. s.n. Regions: NA

#### CAMPANULACEAE

*Asyneuma prenanthoides* (Durand) McVaugh (California harebell) – perennial herb, occasional in mixed conifer forest understory. Monika Richardson 175. Regions: 23, 24

*Triodanis biflora* (Ruiz & Pav.) Greene (Venus's looking glass) – annual herb, uncommon in mixed conifer forest understory. Reed Kenny 395. Regions: 1

#### CAPRIFOLIACEAE

*Lonicera hispidula* (Lindl.) Dougl. ex Lindl. (hairy honeysuckle) – perennial vining herb, common in chaparral and mixed conifer forest understory. Monica Richardson 53. Regions: 1, 3, 5, 9, 10, 13, 17, 20, 23-25, 32

*Symphoricarpos albus* (L.) S.F. Blake var. *laevigatus* (Fern.) Blake (snowberry) – shrub, occasional in mixed conifer forest understory. Reed Kenny 962. Regions: 2

*Symphoricarpos mollis* Nutt. ex Torr. & Gray (creeping snowberry) – shrub, low statured shrub, occasional in mixed conifer forest understory. Reed Kenny 886. Regions: 18, 20, 24, 28

#### CARYOPHYLLACEAE

\**Herniaria hirsuta* (DC.) Loret & Barrandon var. *cinerea* (gray hernaria) – annual herb, uncommon in coastal prairie, historically present, not encountered during study, observed in 1990's. s.n. Regions: NA

*Minuartia douglasii* (Torr. & A. Gray) Mattf. (Douglas's sandwort) – annual herb, uncommon in vertical openings in mixed conifer forest, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

\**Polycarpon tetraphyllum* NA var. *tetraphyllum* (four-leaved allseed) – annual herb, occasional on coastal bluffs and coastal prairie, there is habitat in the study area for the native *P. depressum* but no individuals were found. Reed Kenny 856. Regions: 17, 19

\**Sagina apetala* Ard. (dwarf pearlwort) – annual herb, uncommon in wet, disturbed areas of coastal bluffs. Reed Kenny 689. Regions: 17

*Sagina decumbens* (S. Wats.) G.E. Crow subsp. *occidentalis* (western pearlwort) – annual herb, western pearlwort, uncommon in wet, disturbed areas on coastal bluffs. Reed Kenny 718. Regions: 17

*Silene antirrhina* L. (sleepy catchfly) – annual herb, uncommon, found in open coastal sage scrub, historically present, not encountered during study. Roy E. Buck, James A. West 517. Regions: NA

\**Silene gallica* L. (small-flower catchfly) – annual herb, common in disturbed coastal prairie. Reed Kenny 391. Regions: 1, 7, 9-12, 17, 19-21, 24, 27, 28, 30-32

*Silene verecunda* S. Watson subsp. *verecunda* (San Francisco campion) – perennial herb, uncommon, occurs mostly on exposed mudstone outcrops in coastal prairie, CNPS 1B.2, populations in the study area are in the southern portion of the species range, TMJ2 does not recognize any subspecies in their treatment. Monika Richardson 97. Regions: 7

\**Spergula arvensis* L. (stickwort) – annual herb, common in disturbed coastal prairie near roadsides. Reed Kenny 106. Regions: 7, 8, 17, 19, 27, 28

\**Spergularia bocconi* (Scheele) Graebn. (Boccone's sand spurrey) – annual herb, occasional in disturbed coastal prairie. Monica Richardson 297. Regions: 25

\**Spergularia rubra* (L.) J. Presl & C. Presl (red sand-spurrey) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 890. Regions: 17-19, 25, 26, 32

\**Stellaria media* (L.) Vill. (common chickweed) – annual herb, common in disturbed coastal prairies. Reed Kenny 129. Regions: 1, 5, 10, 11, 18, 20, 23, 25, 26, 28

#### CELASTRACEAE

*Euonymus occidentalis* Nutt. ex Torr. var. *occidentalis* (western burning bush) – shrub, uncommon in riparian forest understory. Reed Kenny 504. Regions: 5

#### CHENOPODIACEAE

\**Atriplex prostrata* Boucher ex DC. (fat-hen) – annual herb, occurs in the Distichlis and Salicornia dominated regions of Scott Creek marsh. Thomas Buchloh 43. Regions: 31

*Chenopodium californicum* (S. Watson) S. Watson (California goosefoot) – perennial herb, occasional in disturbed areas near coast. Reed Kenny 189. Regions: 13, 14, 26, 33

\**Chenopodium murale* L. (nettle leaf goosefoot) – annual herb, occasional in the Scott Creek Marsh. Reed Kenny 848. Regions: 31

\**Dysphania ambrosioides* (L.) Mosyakin & Clemants (Mexican tea) – perennial herb, occasional in riparian forest understory. Reed Kenny 835. Regions: 5, 26

*Salicornia pacifica* Standl. (pickleweed) – perennial herb, common in high elevation regions of Scott Creek marsh. Reed Kenny 868. Regions: 31

#### CISTACEAE

\**Cistus incanus* L. (rock-rose) – perennial herb, uncommon, one occurrence in ecotone of oak woodland and disturbed coastal prairie. Reed Kenny 828. Regions: 32

*Crocanthemum scoparium* Millsp. var. *vulgare* (peak rush-rose) – shrub, uncommon in chaparral. Reed Kenny 481. Regions: 1

#### CONVOLVULACEAE

*Calystegia purpurata* (Greene) Brummitt subsp. *purpurata* (western morning glory) – perennial vining herb, occasional in chaparral. Monika Richardson . Regions: 1, 25

\**Convolvulus arvensis* L. (bindweed) – perennial vining herb, common in disturbed coastal prairie. Monica Richardson 351. Regions: 2, 6, 8, 19-21, 25, 27, 32

#### CORNACEAE

*Cornus sericea* L. subsp. *sericea* (American dogwood) – shrub, common in riparian areas. Monika Richardson 2014. Regions: 2, 5, 10, 25, 26, 31

#### CRASSULACEAE

*Crassula aquatica* (L.) Schoenl. (water pygmy-weed) – annual herb, uncommon in vernal wet areas, historically present, not encountered during study. David J. Keil 20560. Regions: NA

*Crassula connata* (Ruiz & Pav.) A. Berger (pygmy-weed) – annual herb, occasional in coastal prairies. Reed Kenny 123. Regions: 1, 9, 17, 28

\**Crassula tillaea* Lester-Garl. (moss pygmy-weed) – annual herb, uncommon, found in moist gravel in parking lot. Reed Kenny 200. Regions: 26

*Dudleya caespitosa* (Haw.) Britton & Rose (sea lettuce) – perennial herb, common on coastal bluffs and on exposed mudstone faces, forms found on coast tend to be smaller, have more glaucous and red tinged leaves and are potentially more variable than inland populations. Monica Richardson 361. Regions: 7, 9, 10, 12, 13, 17, 20, 21, 23, 28, 32

#### CUCURBITACEAE

*Marah fabacea* (Naudin) Greene (California man-root) – perennial vining herb, common in coastal sage scrub and chaparral. Monica Richardson 323. Regions: 1-3, 5, 9, 10, 12, 13, 17-19, 21, 23-26, 28, 31, 33

#### DIPSACACEAE

\**Dipsacus fullonum* L. (wild teasel) – perennial herb, uncommon in wet, disturbed areas near roadsides. Reed Kenny 944. Regions: 5, 26

#### ERICACEAE

*Arbutus menziesii* Pursh (pacific madrone) – evergreen tree, common in mixed conifer broadleaf forest. Monika Richardson 301. Regions: 1, 4, 5, 17, 23-25, 32

*Arctostaphylos crustacea* Eastw. subsp. *crinita* (J.E. Adams ex McMinn) V.T. Parker, M.C. Vasey & J.E. Keeley (crinite manzanita) – shrub, uncommon, only occurring in areas of ridgetop chaparral. Reed Kenny 114. Regions: 4, 23

*Arctostaphylos crustacea* Eastw. subsp. *crustacea* V.T. Parker, M.C. Vasey & J.E. Keeley (brittle-leaved manzanita) – shrub, uncommon, only occurring in areas of ridgetop chaparral. Monika Richardson 112. Regions: 1

<sup>RR</sup>*Arctostaphylos glutinosa* B. (Scheiber's manzanita) – shrub, uncommon, found in chaparral on ridgetops, CNPS 1B.2, historically present, not encountered during study, plants were historically found near border of study area and appear not to have survived the 2009 Lockheed fire. Roy E. Buck, James A. West 152. Regions: NA

*Gaultheria shallon* Pursh (salal) – shrub, uncommon in mixed conifer forest and coastal sage scrub. Only one occurrence located in study area. Reed Kenny 767. Regions: 24

*Rhododendron occidentale* (Torr. & A. Gray) A. Gray (California azalea) – shrub, uncommon in mixed conifer forest. Only one occurrence located in study area. Reed Kenny 643. Regions: 5, 6

*Vaccinium ovatum* Pursh (California huckleberry) – shrub, occasional in mixed conifer forest and chaparral. Reed Kenny 480. Regions: 1, 5, 23, 24

## EUPHORBIACEAE

*Euphorbia crenulata* Engelm. (Chinese caps) – annual herb, uncommon on steep slopes in mixed conifer forest with dense midstory, historically present, not encountered during study, seeds deposited at UCSC Arboretum. s.n. Regions: NA

\**Euphorbia lathyris* L. (caper spurge) – perennial herb, occasional in disturbed areas and roadsides. Thomas Buchloh 18. Regions: 5, 18, 20, 30-32

\**Euphorbia oblongata* Griseb. (eggleaf spurge) – perennial herb, occasional on roadsides, populations appear to be spreading and as this plant is noted as one of the most invasive weeds in

the county in Dylan Neubauer's checklist, it should be a high priority for weed management.  
Monica Richardson 26. Regions: 24, 25

\**Euphorbia peplus* L. (petty spurge) – annual herb, common in disturbed areas in mixed conifer forest. Reed Kenny 967. Regions: 1, 3, 5, 17, 23, 25, 26, 31

*Euphorbia serpyllifolia* Pers. subsp. *serpyllifolia* (thyme leaved spurge) – annual to perennial herb, uncommon, found in weedy lawn. Reed Kenny 940. Regions: 26

*Euphorbia spathulata* Lam. (warty spurge) – annual herb, uncommon in mixed conifer forest. Reed Kenny 707. Regions: 4

## FABACEAE

*Acmispon americanus* (Nutt.) Rydb. var. *americanus* (Spanish trefoil) – annual herb, uncommon in chaparral. Reed Kenny 392. Regions: 1

*Acmispon glaber* (Vogel) Brouillet var. *glaber* (deerweed) – perennial herb, common in coastal sage scrub and chaparral. Monica Richardson 331. Regions: 1, 7, 10, 12, 17, 21, 23, 24, 28, 32

*Acmispon heermannii* (A. Gray) Brouillet var. *orbicularis* (Wooly trefoil) – perennial herb, observed on roadside in mixed conifer forest in the Little Creek watershed, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Acmispon junceus* (Benth.) Brouillet var. *junceus* (rush trefoil) – perennial herb, uncommon, found in open areas in ridgetop chaparral. Reed Kenny 613. Regions: 1, 23

<sup>R</sup>*Acmispon maritimus* (Nutt.) D.D. Sokoloff var. *maritimus* (coastal trefoil) – annual herb, found on the lower reaches of the Schoolhouse ridge, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Acmispon parviflorus* (Benth.) D.D. Sokoloff (small-flowered trefoil) – annual herb, occasional in openings in chaparral and coastal sage scrub. Reed Kenny 454. Regions: 1, 4, 8, 20, 23, 32

*Acmispon strigosus* (Nutt.) Brouillet (strigose trefoil) – annual herb, uncommon, one occurrence near trail in ridgetop chaparral. Reed Kenny 482. Regions: 1

*Acmispon wrangelianus* (Fisch. & C.A. Mey.) D.D. Sokoloff (Chilean trifoil) – annual herb, uncommon in coastal prairie. Reed Kenny 388. Regions: 1, 5, 9, 17, 25, 28

<sup>R</sup>*Astragalus gambelianus* E. Sheld. (gambel milkvetch, little blue loco) – annual herb, uncommon in areas of thin soil in coastal prairie. Reed Kenny 416. Regions: 7

\**Genista monspessulana* (L.) L.A.S. Johnson (French broom) – shrub, occasional in mixed conifer forest, Neubauer notes this as one of the most invasive weeds in the county, populations on the ranch are relatively small and should be managed to prevent spreading. Monika Richardson 54. Regions: 2, 3, 24, 25

<sup>RR</sup>*Hosackia gracilis* Benth. (harlequin lotus) – perennial herb, uncommon, occurring only in wet areas of intact coastal prairie, CNPS 4.2. Reed Kenny 414. Regions: 11

\**Lathyrus latifolius* L. (perennial sweet pea) – perennial vining herb, uncommon, found on roadsides. Reed Kenny 948. Regions: 3, 17, 33

<sup>R</sup>*Lathyrus vestitus* Nutt. var. *vestitus* (hillside pea) – perennial vining herb, occasional in mixed conifer forest understory. David J. Keil 20575. Regions: 5

\**Lotus corniculatus* L. (bird's-foot trefoil) – annual herb, occasional in disturbed areas and along roads. Thomas Buchloh 44. Regions: 14, 20, 31, 32

*Lupinus arboreus* Sims (yellow bush lupine) – shrub, common in coastal sage scrub and coastal prairie. Reed Kenny 729. Regions: 7, 10, 18-21, 25, 26, 28, 30-32

*Lupinus bicolor* Lindl. (miniature lupine) – annual herb, occasional in coastal prairie. David J. Keil 20625. Regions: 5, 6, 28

<sup>R</sup>*Lupinus formosus* Greene var. *formosus* (summer lupine) – perennial herb, uncommon in coastal prairies. Monika Richardson 109. Regions: 20

*Lupinus latifolius* J. Agardh var. *latifolius* (broad-leaved lupine) – perennial herb, uncommon, found growing in openings in mixed conifer forest. Reed Kenny 377. Regions: 1, 2, 4, 5, 23

***Lupinus nanus*** Douglas ex Benth. (sky lupine) – annual herb, occasional in coastal prairies. David J. Keil 20610. Regions: 1, 4-6, 20, 28

***Lupinus succulentus*** Douglas ex K. Koch (arroyo lupine) – annual herb, uncommon, found in coastal prairie. Reed Kenny 404. Regions: 11

***Lupinus variicolor*** Steud. (Lindley's varied lupine) – perennial herb, occasional in coastal prairie. Reed Kenny 647. Regions: 6, 7, 9, 11, 17, 19, 20, 27

\****Medicago arabica*** (L.) Huds. (burclover) – annual herb, uncommon, on roadside. Reed Kenny 963. Regions: 1, 2

\****Medicago lupulina*** L. (black medick) – annual herb, uncommon, on roadside. Reed Kenny 933. Regions: 1, 24

***Rupertia physodes*** (Douglas ex Hook.) J.W. Grimes (California tea) – perennial herb, uncommon in mixed conifer forest understory. Reed Kenny 859. Regions: 5

\****Trifolium angustifolium*** L. (narrow-leaved clover) – annual herb, common in disturbed coastal prairie. Monica Richardson 47. Regions: 1, 4, 6-12, 14, 17-21, 23, 25, 27, 28, 30-32

***Trifolium bifidum*** A. Gray var. ***decipiens*** Greene (pinole clover) – annual herb, occasional in openings in mixed conifer forest understory. Reed Kenny 553. Regions: 4, 20

<sup>RR</sup>***Trifolium buckwestiorum*** Isely (Santa Cruz clover) – perennial herb, uncommon, found in small swale in interior coastal prairie, CNPS 1B.1, historically present, not encountered during study. Roy E. Buck, James A. West, Tom Hawke, Connie Vigno 1. Regions: NA

\****Trifolium campestre*** Schreb. (hop clover) – annual herb, common in disturbed coastal prairie. Reed Kenny 620. Regions: 1, 4, 9, 20, 21, 23-25, 28, 30

***Trifolium ciliolatum*** Benth. (foothill clover) – annual herb, occasional in coastal prairie and openings in mixed conifer forest. Reed Kenny 431. Regions: 1, 3, 5, 25, 28

***Trifolium depauperatum*** (Greene) J.S. Martin ex Isely var. ***truncatum*** (dwarf sack clover) – annual herb, uncommon, found in area of thin soil in coastal prairie. Reed Kenny 402. Regions: 14, 20



\**Trifolium dubium* Sibth. (little hop clover) – annual herb, common in disturbed coastal prairie and on roadsides. Reed Kenny 619. Regions: 17, 23, 24, 28, 31, 32

\**Trifolium fragiferum* L. (strawberry clover) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 964. Regions: 21, 27, 28, 30, 32

\**Trifolium glomeratum* L. (clustered clover) – annual herb, uncommon in disturbed coastal prairie. Reed Kenny 499. Regions: 20, 28

*Trifolium gracilentum* Torr. & A. Gray (pinpoint clover) – annual herb, occasional in coastal prairie and on roadcut in redwood forest. Reed Kenny 443. Regions: 4, 17, 20, 28, 32

\**Trifolium hirtum* All. (rose clover) – annual herb, uncommon in disturbed coastal prairie. Reed Kenny 541. Regions: 25

*Trifolium macraei* Hook. & Arn. (Macrae's clover) – annual herb, uncommon in coastal prairie, and on roadside in mixed conifer forest, individuals with extremely small inflorescences primarily occurring directly adjacent to coastal bluffs have been proposed as a new taxon. Reed Kenny 538B. Regions: 4, 6, 9, 11, 14, 20, 21, 25

*Trifolium microcephalum* Pursh (small-head clover) – annual herb, occasional in coastal prairie and openings in mixed conifer forest. Reed Kenny 442. Regions: 1, 4, 9, 24, 26

*Trifolium microdon* Hook. & Arn. (thimble clover) – annual herb, uncommon in coastal prairies. Reed Kenny 554. Regions: 4, 20

<sup>R</sup>*Trifolium obtusiflorum* Hook. (clammy clover) – annual herb, uncommon, found in dense riparian forest, historically present, not encountered during study. Roy E. Buck, James A. West 415. Regions: NA

*Trifolium oliganthum* Steud. (few-flowered clover) – annual herb, historically collected from road margins in mixed conifer forest, historically present, not encountered during study.. D. Keil w/ V. L. Holland, L. Kelly 20637. Regions: NA

\**Trifolium repens* L. (white clover) – perennial herb, common in wet areas in coastal prairie. Reed Kenny 381. Regions: 1, 5, 19, 27, 30, 31

\**Trifolium striatum* L. (knotted clover) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 696. Regions: 1, 4, 19, 20, 25, 30

\**Trifolium subterraneum* L. (subterranean clover) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 259. Regions: 9, 25, 28

*Trifolium variegatum* Nutt. (variegated clover) – annual herb, uncommon, found in opening in mixed conifer forest. Reed Kenny 832. Regions: 2

*Trifolium willdenovii* Spreng. (tomcat clover) – annual herb, occasional in openings in mixed conifer forest. Reed Kenny 375. Regions: 1, 2, 5, 20, 24, 25

<sup>R</sup>*Trifolium wormskioldii* Lehm. (cow clover) – perennial herb, uncommon in wet areas in coastal prairie, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in a perennially moist swale in study region 27. s.n. Regions: NA

*Vicia americana* Muhl. ex Willd. subsp. *america* (American vetch) – perennial herb, occasional in wet openings in mixed conifer forest. Reed Kenny 253. Regions: 23, 25, 32

*Vicia gigantea* Hook. (giant vetch) – perennial herb, occasional in wet slopes in mixed conifer forest. Monica Richardson 193. Regions: 5, 10, 23-25, 28, 31

<sup>R</sup>*Vicia hassei* S. Watson (slender vetch) – annual herb, collected in matrix of woodlands and coastal prairie, historically present, not encountered during study. David J. Keil 30758. Regions: NA

\**Vicia hirsuta* (L.) Gray (hairy vetch) – annual herb, collected in matrix of woodlands and coastal prairie, historically present, not encountered during study. David J. Keil 30757. Regions: NA

\**Vicia lutea* L. (yellow vetch) – annual herb, uncommon, found on roadside. D. Keil w/ V. L. Holland, L. Kelly 20635. Regions: 1, 2, 5

\**Vicia sativa* (L.) Ehrh. subsp. *nigra* (narrow-leaved vetch) – annual herb, occasional on margins of openings in mixed conifer forest. Reed Kenny 261. Regions: 25

\**Vicia tetrasperma* (L.) Schreb. (sparrow vetch) – annual herb, common in disturbed areas throughout the study area. Reed Kenny 492. Regions: 2, 5, 7, 8, 10, 11, 13, 17, 24, 26, 30

## FAGACEAE

*Notholithocarpus densiflorus* (Hook. & Arn.) Manos, Cannon & S.H. Oh var. *densiflorus* (tanoak) – evergreen tree, some areas of almost pure stands and occasional in mixed evergreen forest. Monika Richardson 281. Regions: 2, 3, 5, 23-25

*Quercus agrifolia* Née var. *agrifolia* (coast live oak) – evergreen tree, common on south and west facing slopes forming open woodlands. David J. Keil, V. L. Holland, Larry Kelly 20658. Regions: 1, 5-7, 20, 23, 25, 30-32

*Quercus chrysolepis* Liebm. (canyon live oak) – evergreen tree, uncommon, occurring only in ridgetop chaparral. Reed Kenny 117. Regions: 1

*Quercus parvula* (C.H. Mull) Nixon var. *shrevei* (shreve oak) – evergreen tree, common, occurring as both part of mixed evergreen forest and in open woodlands. David J. Keil, V. L. Holland, L. Kelly 20641. Regions: 1, 3-5, 10, 13, 18-20, 26, 32

## FRANKENIACEAE

*Frankenia salina* (Molina) I.M. Johnst. (alkali heath) – perennial herb, common in the Scott Creek marsh. Thomas Buchloh 30. Regions: 31

## GENTIANACEAE

*Cicendia quadrangularis* (Lam.) Griseb. (timwort) – annual herb, uncommon, occurring on areas of bare soil outside of seeps. Reed Kenny 258. Regions: 25

*Zeltnera davyi* (Jeps.) G. Mans. (Davy's centaury) – annual herb, common in coastal prairie and coastal sage scrub. Reed Kenny 670. Regions: 10, 11, 13, 17, 19, 27, 31

*Zeltnera muehlenbergii* (Griseb.) G. Mans. (Monterey centaury) – annual herb, common in coastal prairie and coastal sage scrub, stigmas 2, wide, fan shaped, specimens have been mistaken for *Centaureum tenuiflorum*. Reed Kenny 773. Regions: 11, 17, 20, 21, 30

## GERANIACEAE

\**Erodium cicutarium* (L.) L'HÉR. ex Aiton (redstem filaree) – annual herb, common in disturbed coastal prairie. Reed Kenny 975. Regions: 6, 8, 9, 17, 19, 28

\**Erodium moschatum* (L.) L'HÉR. ex Aiton (greenstem filaree) – annual herb, common in disturbed coastal prairie. Reed Kenny 854. Regions: 1, 6, 7, 19, 21, 26, 27, 30, 32

\**Geranium core-core* Steud. (New Zealand geranium) – perennial herb, uncommon, found on roadside. Reed Kenny 743. Regions: 3

\**Geranium dissectum* L. (common cranesbill) – annual herb, common in disturbed regions throughout the study area. Thomas Buchloh 16. Regions: 2, 4, 6, 9, 10, 17, 20, 23, 25, 28, 30-32

\**Geranium molle* L. (soft cranesbill) – annual to perennial herb, uncommon, found on roadside. Reed Kenny 826. Regions: 25

\**Geranium robertianum* L. (herb robert) – annual herb, uncommon, found on roadside in redwood forest. Reed Kenny 825. Regions: 5, 25

\**Geranium rotundifolium* L. (round-leaved geranium) – annual herb, uncommon, found on train tracks in riparian forest. Reed Kenny 881. Regions: 25, 26

## GROSSULARIACEAE

*Ribes divaricatum* Koehne var. *pubiflorum* (straggle bush) – caning shrub, occasional in riparian and marshy areas. Reed Kenny 753. Regions: 2, 5, 10, 11, 13, 15

*Ribes menziesii* Pursh var. *menziesii* (canyon gooseberry) – shrub, occasional in mixed conifer forest understory. Reed Kenny 103. Regions: 5, 23-25, 31, 32

## HYPERICACEAE

*Hypericum anagalloides* Cham. & Schltdl. (tinker's penny) – annual to perennial herb, occasional in freshwater marsh areas. Reed Kenny 659. Regions: 9, 10

\**Hypericum perforatum* L. subsp. *perforatum* (klamathweed) – perennial herb, uncommon in disturbed coastal sage scrub. Monica Richardson 89. Regions: 26

## LAMIACEAE

*Clinopodium douglasii* (Benth.) Kuntze (yerba buena) – perennial herb, common in coastal sage scrub, chaparral, and mixed conifer forest. Monica Richardson 65. Regions: 5, 9, 10, 13, 17, 18, 20, 21, 23-25, 28, 30, 32

\**Glechoma hederacea* L. (ground ivy) – perennial herb, uncommon, found in riparian forest understory. Reed Kenny 837. Regions: 5

\**Lamium purpureum* L. (dead nettle) – annual herb, uncommon, found in disturbed areas of riparian forest. Reed Kenny 132. Regions: 2, 5, 25

*Lepechinia calycina* (Benth.) Epling (pitcher sage) – shrub, uncommon, found in ridgetop chaparral. Reed Kenny 455. Regions: 1

\**Melissa officinalis* L. (lemon balm) – perennial herb, found in disturbed riparian areas. Reed Kenny 983. Regions: 2, 3

\**Mentha NA* L. () – perennial herb, found in disturbed areas throughout the study area, likely a hybrid, does not key to a species. Reed Kenny 998. Regions: 25, 26

*Monardella villosa* Benth. subsp. *francisca* (Elmer) Jokerst (Franciscan coyote mint) – perennial herb, uncommon in coastal sage scrub near coast. Reed Kenny 903. Regions: 1, 4, 11, 12, 14, 17, 21, 33

*Monardella villosa* Benth. subsp. *villosa* (coyote-mint) – perennial herb, occasional in interior coastal sage scrub and chaparral. Monica Richardson 77. Regions: 1, 2, 5, 10, 23

<sup>R</sup>*Pogogyne serpyllifolia* (Torr.) A. Gray (thymeleaf beardstyle) – annual herb, uncommon, found in one vernal moist, sandy area in coastal prairie, historically present, not encountered during study. James A. West 139. Regions: NA

***Prunella vulgaris*** L. var. ***vulgaris*** (self-heal) – perennial herb, occasional in moist, disturbed areas. Monika Richardson 123. Regions: 2, 5, 26

***Salvia columbariae*** Benth. (chia) – annual herb, uncommon, occurring only on one south facing cliff in coastal gully. Reed Kenny 524. Regions: 9

***Scutellaria tuberosa*** Benth. (Dannie's skullcap) – perennial herb from tuber, uncommon, found in openings in mixed conifer forest. Reed Kenny 389. Regions: 1

***Stachys ajugoides*** Benth. (bugle hedge nettle) – perennial herb, uncommon, found in wet, marshy area of coastal prairie. Reed Kenny 531. Regions: 6

***Stachys bullata*** Benth. (hedge nettle) – perennial herb, common in coastal sage scrub, riparian forest, and mixed conifer forest. Monika Richardson 18. Regions: 1-3, 5, 7, 10, 11, 13, 17, 18, 20, 21, 23-26, 28, 31, 32

<sup>R</sup>***Stachys chamissonis*** Benth. (swamp stachys) – perennial herb, occurs in one marshy region in coastal prairies. Reed Kenny 950. Regions: 14

***Stachys rigida*** Nutt. ex Benth. var. ***quercetorum*** (rigid hedge nettle) – perennial herb, found in redwood forest understory. Reed Kenny 615. Regions: 23

## LINACEAE

<sup>\*</sup>***Linum bienne*** Mill. (narrow-leaved flax) – annual herb, common in coastal prairies, was cultivated on the property during the mid 20th century. Monica Richardson 44. Regions: 4-12, 14, 17, 19-21, 25, 27, 28, 30-32

## LYTHRACEAE

\**Lythrum hyssopifolia* L. (hyssop loosestrife) – annual to perennial herb, common in wet areas of coastal prairie. Thomas Buchloh 27. Regions: 6-8, 10, 11, 13, 14, 17-21, 25, 27, 28, 30, 31

#### MALVACEAE

\**Malva parviflora* L. (cheeseweed) – annual herb, found in disturbed lawn area. Reed Kenny 941. Regions: 26

\**Modiola caroliniana* (L.) G. Don (modiola) – perennial herb, found on roadside in oak woodland. Reed Kenny 506. Regions: 5

*Sidalcea malviflora* (DC.) A. Gray subsp. *malviflora* (checkerbloom) – perennial herb, occasional in coastal prairie. Reed Kenny 270. Regions: 9-12, 17, 21, 28

#### MONTIACEAE

*Calandrinia menziesii* (Hook.) Torrey & A. Gray (red maids) – annual herb, uncommon in coastal prairies. Reed Kenny 542. Regions: 17, 25

<sup>R</sup>*Claytonia exigua* Torr. & A. Gray subsp. *exigua* (little spring beauty) – annual herb, uncommon in areas of thin soil in coastal prairie, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 20 in 2013. s.n. Regions: NA

*Claytonia perfoliata* Donn ex Willd. (miner's lettuce) – annual herb, occasional in mixed conifer forest. Reed Kenny 887. Regions: 1, 3, 9, 18, 20, 23-25, 28

<sup>R</sup>*Claytonia sibirica* L. (candy flower) – perennial herb, occurs in the study area in redwood forest understory, uncommon in Santa Cruz county, population in study area is near the southernmost extent of the range. Reed Kenny 206. Regions: 23, 25, 26

*Montia parvifolia* (Moc. ex DC.) Greene (small-leaved montia) – perennial herb, uncommon, found on one cliff face near riparian area in mixed conifer forest understory, populations in the study area are near the southern extent of the species range. Reed Kenny 863. Regions: 5

#### MYRICACEAE

***Morella californica*** (Cham.) Wilbur (wax myrtle) – shrub, uncommon in wet areas in coastal prairie. Reed Kenny 656. Regions: 10, 13

#### MYRSINACEAE

\****Lysimachia arvensis*** NA (scarlet pimpernel) – annual herb, common in coastal prairie. Reed Kenny 437. Regions: 1, 2, 4-6, 8-12, 14, 17, 19-21, 23, 25, 27, 28, 30-32

***Lysimachia latifolia*** (Hook.) Cholewa (pacific starflower) – perennial herb, occasional in mixed conifer forest. Reed Kenny 477. Regions: 1, 23-25

***Lysimachia minima*** (L.) U.Manns & Anderb. (chaffweed) – annual herb, found in vernal wet, sandy area in coastal prairie. Reed Kenny 527. Regions: 6

#### OLEACEAE

\****Ligustrum lucidum*** W.T. Aiton (chinese privet) – shrub, uncommon, a few individuals naturalized in one drainage. Reed Kenny 989. Regions: 24

#### ONAGRACEAE

<sup>R</sup>***Clarkia dayyi*** (Jeps.) F.H. Lewis & M.E. Lewis (Davy's clarkia) – annual herb, uncommon in coastal prairie, occurrences tend to be in areas of thin soil or steep sides of coastal gullies, two distinct forms occur on the ranch, one strongly prostrate, one strongly erect.. Reed Kenny 699. Regions: 6, 9, 11, 19

***Clarkia purpurea*** (Douglas) F.H. Lewis & M.E. Lewis subsp. ***quadrivulnera*** (four-spot) – annual herb, uncommon in coastal prairie. Reed Kenny 704. Regions: 4

***Clarkia rubicunda*** (Lindl.) F.H. Lewis & M.E. Lewis (farewell-to-spring) – annual herb, common in coastal prairie. Reed Kenny 703. Regions: 1, 2, 4, 7, 10, 13, 19, 21, 24, 32, 33

***Epilobium brachycarpum*** C. Presl (panicled willow herb) – annual herb, occasional in disturbed areas. Reed Kenny 972. Regions: 26, 32



***Epilobium canum*** (Greene) P.H. Raven subsp. ***canum*** (california fuchsia) – perennial herb, occasional in coastal sage scrub and coastal prairie. Reed Kenny 976. Regions: 7, 10, 28, 30, 31

***Epilobium ciliatum*** Raf. subsp. ***ciliatum*** (common willow herb) – perennial herb, common in wet areas in coastal prairie. Reed Kenny 631. Regions: 1, 2, 5, 10, 13, 17, 20, 21, 24-26, 28, 31

***Epilobium ciliatum*** Raf. subsp. ***watsonii*** (Watson's willow herb) – perennial herb, uncommon in wet areas in coastal prairie. Monika Richardson 24. Regions: 18, 24

***Taraxia ovata*** (Nutt.) Small (sun cup) – perennial herb, occasional in coastal prairie. Reed Kenny 107. Regions: 4, 9, 27

#### OROBANCHACEAE

***Aphyllon fasciculatum*** (Nutt.) Torr. & A. Gray (clustered broomrape) – perennial herb, uncommon, found in coastal sage scrub. Reed Kenny 1000. Regions: 7

\****Bellardia trixago*** (L.) All. (mediterranean linseed) – annual herb, occasional in disturbed coastal prairie. Reed Kenny 721. Regions: 17, 32

***Castilleja affinis*** Hook. & Arn. subsp. ***affinis*** (Indian paintbrush) – perennial herb, uncommon in coastal sage scrub. Reed Kenny 517. Regions: 5, 9, 10, 12, 13, 17, 20, 21, 28, 33

<sup>R</sup>***Castilleja densiflora*** (Benth.) T.I. Chuang & Heckard subsp. ***densiflora*** (owl's clover) – annual herb, uncommon in coastal prairie, individuals in study area with cream bract tips fit into the former taxon *Orthocarpus densiflorus* Benth. var. *noctuina* (Eastw.) J.T. Howell, a form which is uncommon and might qualify for protected status if recognized as a separate taxon. Reed Kenny 458. Regions: 4, 19, 25

<sup>R</sup>***Castilleja exserta*** (A. Heller) T.I. Chuang & Heckard subsp. ***latifolia*** (S. Watson) T.I. Chuang & Heckard (purple owl's clover) – annual herb, uncommon, found in area of thin soil in coastal prairie, historically present, not encountered during study. James A. West 165. Regions: NA

\****Parentucellia viscosa*** (L.) Caruel (yellow parentucellia) – annual herb, uncommon in disturbed areas of coastal prairie. Reed Kenny 889. Regions: 18

***Triphysaria pusilla*** (Benth.) T.I. Chuang & Heckard (dwarf owl's clover) – annual herb, uncommon in coastal prairie. Reed Kenny 180. Regions: 20

***Triphysaria eriantha*** (A. Gray) T. I. Chuang & Heckard subsp. ***rosea*** (pelican flower) – annual herb, uncommon in coastal prairie, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 9. s.n. Regions: NA

## OXALIDACEAE

***Oxalis oregana*** Nutt. (redwood sorrel) – perennial herb, common in redwood forest understory. Monica Richardson 17. Regions: 2, 3, 5, 23, 24

\****Oxalis pes-caprae*** L. (bermuda buttercup) – perennial herb, common in disturbed areas of coastal prairie, can invade cliff faces and areas of this soil that often harbor rare natives, efforts should be made to contain the spread of this species in the study area. Reed Kenny 683. Regions: 17, 23, 28

***Oxalis pilosa*** Nutt. (hairy wood-sorrel) – perennial herb, common in disturbed areas in mixed conifer forest. Reed Kenny 188. Regions: 4, 5, 9, 19, 21, 23, 27, 32

\****Oxalis purpurea*** L. (purple wood-sorrel) – perennial herb, uncommon, found on roadside in redwood forest understory. Reed Kenny 994. Regions: 3

## PAPAVERACEAE

***Dendromecon rigida*** Benth. (bush poppy) – shrub, uncommon, found in ridgetop chaparral. Reed Kenny 116. Regions: 1, 23

***Dicentra formosa*** (Haw.) Walp. (pacific bleeding heart) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 497. Regions: 5, 25

***Eschscholzia californica*** Cham. (California poppy) – perennial herb, common in coastal prairie. Monica Richardson 51. Regions: 1, 2, 4, 6, 7, 10, 12, 17, 19-21, 25-28, 31-33

\****Fumaria capreolata*** L. (white ramping fumitory) – perennial herb, uncommon, found roadside in mixed conifer forest. Reed Kenny 370. Regions: 1

***Platystemon californicus*** Benth. (cream cups) – annual herb, uncommon, found in exposed mudstone surfaces in coastal prairie. Reed Kenny 278. Regions: 21, 25

## PHRYMACEAE

***Diplacus aurantiacus*** (Curtis) Jeps. (orange bush monkeyflower) – shrub, common in coastal sage scrub, individuals occurring on coastal bluffs appear intermediate with *D. longiflorus*, provenance unknown. Reed Kenny 839. Regions: 1, 3-5, 7, 8, 10, 12, 13, 17-21, 23-25, 28, 31, 32

***Erythranthe arvensis*** (Greene) G.L.Nesom (villous-bracted monkeyflower) – annual herb, uncommon, found in wet areas of mixed conifer forest understory and seeps in coastal prairie. Reed Kenny 701. Regions: 26

***Erythranthe cardinalis*** (Douglas ex Benth.) Spach (scarlet monkeyflower) – perennial herb, occasional in Scott Creek riparian corridor. Reed Kenny 896. Regions: 5, 26

***Erythranthe floribunda*** (Lindl.) G.L.Nesom (many-flowered monkeyflower) – annual herb, uncommon, found in gravel bar in Scott Creek riparian corridor. Reed Kenny 878. Regions: 5, 20, 25, 31

***Erythranthe arenicola*** (Pennell) G.L.Nesom (magnificent seep monkeyflower) – perennial herb, occasional in wet areas in coastal prairie. Reed Kenny 693. Regions: 13, 14, 17, 18

***Erythranthe guttata*** (Greene) G.L. Nesom (common monkeyflower) – perennial herb, uncommon, found in Scott Creek riparian corridor, plants stoloniferous with more or less glabrous leaves, but corolla exerted much more than 5 mm beyond calyx, specimens in the study area and in the county need more study to determine the status of these plants. Monica Richardson 140. Regions: 5

***Erythranthe microphylla*** (Benth.) G.L.Nesom (small-leaved monkeyflower) – annual herb, uncommon, found in wet areas in mixed conifer forest and growing in willows, not in Neubauer 2013. Reed Kenny 493. Regions: 26

***Erythranthe moschata*** (Douglas ex Lindl.) G.L.Nesom (musk monkeyflower) – annual herb, occasional in Scott Creek riparian corridor. Reed Kenny 879. Regions: 2, 5, 26

*Erythranthe nasuta* (Greene) G.L.Nesom (snout-nosed monkeyflower) – annual herb, uncommon, found in Scott Creek riparian corridor. Reed Kenny 880. Regions: 26

*Erythranthe ptilota* G.L. Nesom (wing-leaf monkeyflower) – perennial herb, uncommon, found in Scott Creek riparian corridor. Reed Kenny 834. Regions: 26

## PLANTAGINACEAE

*Antirrhinum kelloggii* Greene (twining snapdragon) – annual herb, uncommon, found on steep slope in opening in mixed conifer forest. Reed Kenny 385. Regions: 1, 8

*Callitriche heterophylla* Pursh var. *bolanderi* (Hegelm.) Fassett (Bolander's wooly starwort) – perennial herb, uncommon in stock ponds, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

*Callitriche marginata* Torr. (California water-starwort) – annual herb, occasional in ponds and marshy areas. Reed Kenny 466. Regions: 1, 7

*Collinsia heterophylla* Buist ex R. Grah. var. *heterophylla* (Chinese houses) – annual herb, uncommon, found on steep exposed mudstone slopes. Reed Kenny 831. Regions: 1-3, 26

<sup>RR</sup>*Collinsia multicolor* Lindl. & Paxton (San Francisco collinsia) – annual herb, one occurrence on exposed mudstone cliff face in mixed conifer forest, CNPS 1B.2. Reed Kenny 495. Regions: 1, 3, 5, 33

\**Cymbalaria muralis* G. Gaertn., B. Mey. & Scherb. (kenilworth ivy) – perennial herb, uncommon in disturbed areas in coastal prairie. Reed Kenny 711. Regions: 4

\**Kickxia elatine* (L.) Dumort. (sharp-leaved fluellin) – perennial herb, uncommon, found in disturbed meadows and coastal prairie. Reed Kenny 995. Regions: 1, 2

*Nuttallanthus texanus* (Scheele) D.A. Sutton (blue toadflax) – annual herb, uncommon, found on exposed mudstone slopes in openings in mixed conifer forest and coastal prairie. Reed Kenny 387. Regions: 1, 9

\**Plantago coronopus* L. (cut-leaved plantain) – perennial herb, common in disturbed coastal prairies. Reed Kenny 691. Regions: 1, 17, 19, 26-28, 30, 31

***Plantago erecta*** E. Morris (California plantain) – annual herb, found in coastal prairie, plants near the coast tend to be larger with more succulent leaves than plants inland. Reed Kenny 755. Regions: 12, 13, 28

\****Plantago lanceolata*** L. (english plantain) – perennial herb, common in coastal prairie. Monika Richardson 52. Regions: 1, 2, 4, 6-8, 10-12, 14, 18-21, 24, 25, 27, 28, 30-32

\****Plantago major*** L. (common plantain) – perennial herb, uncommon, found in wet, disturbed areas. Reed Kenny 687. Regions: 5, 26

***Plantago maritima*** L. (common seaside plantain) – perennial herb, found in sandy, eroding soil on bluffs. Reed Kenny 637. Regions: 17

***Plantago subnuda*** Pilg. (Mexican plantain) – perennial herb, occasional in wet areas in coastal prairie. Reed Kenny 937. Regions: 24, 27, 28

***Veronica americana*** Schwein. ex Benth. (american brooklime) – perennial herb, occasional in marshy and riparian areas. Reed Kenny 636. Regions: 2, 5, 10, 13, 14, 18, 20

***Veronica serpyllifolia*** L. (bright-blue speedwell) – perennial herb, found on SPR side of Mill Creek, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

## PLUMBAGINACEAE

***Armeria maritima*** (Mill.) Willd. subsp. ***californica*** (Boiss.) A.E. Porsild (sea pink) – perennial herb, uncommon, found only in northernmost coastal prairie. Reed Kenny 663. Regions: 5, 11

## POLEMONIACEAE

<sup>R</sup>***Allophyllum divaricatum*** (Nutt.) A.D. Grant & V.E. Grant (purple false gilia) – annual herb, uncommon, found on sandbank in Scott Creek, historically present, not encountered during study. Roy E. Buck, James A. West 108. Regions: NA

*Collomia heterophylla* Douglas ex Hook. (variable-leaf collomia) – annual herb, occasional in openings in mixed conifer forest. Reed Kenny 436. Regions: 1, 2, 23, 25

*Gilia achilleifolia* Benth. subsp. *achilleifolia* (California gilia) – annual herb, occasional in chaparral and openings in mixed conifer forest understory. Reed Kenny 386. Regions: 1, 2, 8, 25

<sup>R</sup>*Gilia achilleifolia* Benth. subsp. *multicaulis* (Benth.) V.E. Grant & A.D. Grant (many-stemmed gilia) – annual herb, uncommon in mixed conifer forest understory. Reed Kenny 717. Regions: 4, 25

<sup>R</sup>*Gilia clivorum* (Jeps.) V.E. Grant (grassland gilia) – annual herb, uncommon, found in area of thin soil in coastal prairie, historically present, not encountered during study. Roy E. Buck, James A. West 210. Regions: NA

*Leptosiphon androsaceus* Benth. (common leptosiphon) – annual herb, uncommon in mixed conifer forest openings. Reed Kenny 510. Regions: 1

*Navarretia squarrosa* (Eschsch.) Hook. & Arn. (skunkweed) – annual herb, common in coastal sage scrub. Monika Richardson 31. Regions: 1, 2, 10, 17, 19, 20, 23, 24, 28, 30-32

#### POLYGALACEAE

*Polygala californica* Nutt. (California milkwort) – perennial herb, occasional in mixed conifer forest. Reed Kenny 479. Regions: 1, 23, 24

#### POLYGONACEAE

*Eriogonum latifolium* Sm. (seaside wild buckwheat) – perennial herb, common in coastal sage scrub. Monika Richardson 95. Regions: 7, 9-12, 17, 20, 21, 28, 32

*Eriogonum nudum* Benth. var. *auriculatum* (Benth.) Jeps. (Naked stemmed buckwheat) – perennial herb, uncommon, found only on slide area in mixed conifer forest. Reed Kenny 958. Regions: 1

*Persicaria amphibia* (L.) Delarbre (water smartweed) – perennial herb, common in the Scott Creek marsh. Reed Kenny 866. Regions: 31

\**Persicaria capitata* (Buch.-Ham. ex D. Don) H. Gross (Himalayan smartweed) – perennial herb, uncommon, found in riparian forest understory, not in Neubaur 2013. Reed Kenny 971. Regions: 26

\**Persicaria maculosa* Gray (lady's thumb) – perennial herb, uncommon, found in riparian forest understory. Reed Kenny 969. Regions: 26

*Persicaria punctata* (Elliott) Small (water knotweed) – perennial herb, common in the Scott Creek riparian corridor. Monika Richardson 158. Regions: 5, 13, 14, 26, 31

\**Polygonum aviculare* L. subsp. *depressum* (Meisn.) Arcang. (common knotweed) – perennial herb, common disturbed areas on roadsides. Reed Kenny 942. Regions: 18, 19, 25-27, 31

*Pterostegia drymarioides* Fisch. & C.A. Mey. (woodland threadstem) – annual herb, uncommon in openings in mixed conifer forest. Reed Kenny 472. Regions: 1, 17, 28

\**Rumex acetosella* L. (sheep sorrel) – perennial herb, common in disturbed coastal prairie. Monika Richardson 57. Regions: 1, 2, 4, 6-14, 17, 19-21, 24, 25, 27, 28, 30-33

<sup>R</sup>*Rumex californicus* Rech. f. (California dock) – perennial herb, occasional in wet areas in coastal prairie and coastal sage scrub. Monika Richardson 82. Regions: 5, 25, 26, 33

\**Rumex conglomeratus* Murray (whorled dock) – perennial herb, common in disturbed areas in coastal prairies and on roadsides throughout the study area. Reed Kenny 982. Regions: 1-3, 5, 14, 18, 25, 31

*Rumex crassus* Rech. f. (leatherleaf dock) – perennial herb, uncommon, found on coastal bluffs and in the Scott Creek marsh. Reed Kenny 1003. Regions: 17, 31

\**Rumex crispus* L. (curly dock) – perennial herb, common in disturbed areas of coastal prairie. Thomas Buchloh 42. Regions: 1, 2, 7, 8, 11, 20, 21, 27, 28, 30, 31, 33

\**Rumex obtusifolius* L. (bitter dock) – perennial herb, uncommon in Scott Creek riparian corridor. Reed Kenny 986. Regions: 5

<sup>R</sup>*Rumex occidentalis* S. Watson (western dock) – perennial herb, uncommon, found on coastal bluffs, uncommon in Santa Cruz county, occurs in sensitive habitat. Reed Kenny 900. Regions: 2, 6, 17

\**Rumex pulcher* L. (fiddle dock) – perennial herb, common in disturbed areas of coastal prairie. Thomas Buchloh 37. Regions: 5, 6, 8, 11, 19-21, 25, 27, 28, 30-33

*Rumex salicifolius* Weinm. (willow-leaved dock) – perennial herb, occasional in wet areas of coastal prairie and coastal bluffs. Reed Kenny 745. Regions: 17, 26, 28, 31

<sup>R</sup>*Rumex transitorius* Rech. f. (willow dock) – perennial herb, occasional in riparian forest understory. Reed Kenny 725. Regions: 2, 4, 5, 8, 10, 26, 31, 33

#### PRIMULACEAE

*Primula clevelandii* (Greene) A.R. Mast & Reveal (Padre's shooting star) – perennial herb, uncommon, found in interior coastal prairie. Reed Kenny 115. Regions: 4

*Primula hendersonii* (A. Gray) Mast & Reveal (mosquito bills) – perennial herb, uncommon, found on eroded mudstone, historically present, not encountered during study. James A. West 347. Regions: NA

#### RANUNCULACEAE

*Actaea rubra* (Aiton) Willd. (baneberry) – perennial herb, occasional in riparian forest understory. Reed Kenny 498. Regions: 5, 25

*Anemone grayi* Behr & Kellogg (windflower) – perennial herb, uncommon, found in mixed conifer forest understory, populations in the study area are near the southern extent of the species range. Reed Kenny 766. Regions: 24

*Aquilegia formosa* Fisch. ex D.C. (western columbine) – perennial herb, uncommon, found in mixed conifer forest understory. Reed Kenny 204. Regions: 23

*Clematis lasiantha* Nutt. (chaparral clematis) – perennial herb, uncommon, found in mixed conifer forest understory. Reed Kenny 760. Regions: 24



<sup>R</sup>*Delphinium californicum* Torr. & A. Gray subsp. *californicum* (California larkspur) – perennial herb, uncommon, found on roadsides in oak woodland and coastal sage scrub. Reed Kenny 829. Regions: 26, 33

<sup>R</sup>*Delphinium decorum* Fisch. & C.A. Mey. subsp. *decorum* (coast larkspur) – perennial herb, uncommon, found in area of thin soil in coastal prairie, uncommon in Santa Cruz county, population in study area is the southernmost extent of the range. Reed Kenny 286. Regions: 21

*Delphinium patens* Benth. subsp. *patens* (woodland larkspur) – perennial herb, uncommon, found in slide area in mixed conifer forest understory. Reed Kenny 374. Regions: 1, 2

<sup>R</sup>*Myosurus minimus* L. (common mousetail) – annual herb, uncommon, found on banks of Scott Creek marsh. Reed Kenny 980. Regions: 24, 31

*Ranunculus aquatilis* L. var. *diffusus* With. (water buttercup) – perennial herb, uncommon, found in Scott Creek riparian corridor. Reed Kenny 667. Regions: 5

*Ranunculus californicus* Benth. var. *cuneatus* Greene (western buttercup) – perennial herb, uncommon in coastal prairie. Reed Kenny 288. Regions: 27

*Ranunculus hebecarpus* Hook. & Arn. (downy buttercup) – annual herb, uncommon, found in wet areas in mixed conifer forest. Reed Kenny 252. Regions: 4, 25

\**Ranunculus muricatus* L. (prickle-fruited buttercup) – annual to perennial herb, uncommon, found in wet disturbed soil in trail. Reed Kenny 439. Regions: 1, 23

*Ranunculus parviflorus* L. (few-flowered buttercup) – annual herb, uncommon on roadside in mixed conifer forest, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

\**Ranunculus repens* L. (crowfoot) – perennial herb, occasional in disturbed riparian areas. Reed Kenny 640. Regions: 2, 5, 26

<sup>R</sup>*Ranunculus uncinatus* D. Don ex G. Don (barbed buttercup) – perennial herb, uncommon, found in wet areas in mixed conifer forest, uncommon in Santa Cruz county, population in study area is the southernmost extent of the range on the coast. Reed Kenny 503. Regions: 5, 23, 25

*Thalictrum fendleri* Engelm. ex A. Gray var. ***polycarpum*** (meadow rue) – perennial herb, occasional in riparian forest. Reed Kenny 193. Regions: 5, 26

#### RHAMNACEAE

*Ceanothus thyrsiflorus* Eschsch. var. ***thyrsiflorus*** (blue blossom) – shrub, common in mixed conifer forest. Monika Richardson 34. Regions: 1, 3, 23-25, 32, 33

*Frangula californica* (Eschsch.) A. Gray subsp. ***californica*** (California coffee berry) – shrub, common in mixed conifer forest and coastal sage scrub. Monika Richardson 307. Regions: 1-3, 5, 10, 12, 18-21, 25, 27, 28, 32

#### ROSACEAE

*Acaena pinnatifida* Ruiz & Pav. var. ***californica*** (Bitter) Jeps. (California acaena) – perennial herb, uncommon in coastal prairie. Reed Kenny 672. Regions: 10, 11, 27

*Adenostoma fasciculatum* Hook. & Arn. var. ***fasciculatum*** (chamise) – shrub, uncommon in chaparral on ridgetops. Monika Richardson 340. Regions: 4

<sup>R</sup>*Amelanchier utahensis* Koehne (Utah service-berry) – shrub, uncommon, found on slopes of coastal gulch. Reed Kenny 682. Regions: 10, 21

*Aphanes occidentalis* (Nutt.) Rydb. (western lady's-mantle) – annual to perennial herb, occasional in coastal prairie and on roadsides. Reed Kenny 545. Regions: 20, 25, 28, 33

*Drymocallis wrangelliana* (Lindl.) Rydb var. ***glandulosa*** (Fisch. & Avé-Lall.) Ertter (sticky cinquefoil) – perennial herb, uncommon, found in riparian area in mixed conifer forest understory. Monika Richardson 174. Regions: 23

*Fragaria chiloensis* (L.) Mill. (beach strawberry) – perennial herb, common on coastal bluffs and coastal sage scrub. Reed Kenny 268. Regions: 5, 17, 32

*Fragaria vesca* L. (wood strawberry) – perennial herb, common in mixed conifer forest. Reed Kenny 371. Regions: 1, 4, 5, 10, 13, 18, 20, 21, 23-25, 32

***Heteromeles arbutifolia*** (Lindl.) M. Roem. (toyon) – shrub, occasional in mixed conifer forest. Monica Richardson 28. Regions: 3, 23-25

***Holodiscus discolor*** (Pursh) Maxim. (oceanspray) – shrub, occasional in mixed conifer forest openings. Monica Richardson 190. Regions: 1, 5, 13, 20, 23-25, 28

***Horkelia cuneata*** Lindl. var. ***cuneata*** (wedge-leaved horkelia) – perennial herb, occasional in coastal prairie. Reed Kenny 526. Regions: 10, 11, 19

***Oemleria cerasiformis*** (Torr. & A. Gray ex Hook. & Arn.) J.W. Landon (oso berry) – shrub, occasional in coastal sage scrub. Reed Kenny 505. Regions: 1-5, 10, 12, 18, 20, 21, 25, 26, 28

***Potentilla anserina*** (Howell) Rousi subsp. ***pacifica*** (pacific silverweed) – perennial herb, common in the Scott Creek marsh. Monica Richardson 245. Regions: 31

<sup>R</sup>***Prunus emarginata*** (Douglas) Eaton (bitter cherry) – shrub, uncommon in coastal sage scrub. Reed Kenny 488. Regions: 33

***Rosa californica*** Cham. & Schltdl. (California rose) – shrub, occasional in mixed conifer forest and riparian areas in coastal prairie. Monica Richardson 102. Regions: 8, 10, 31, 32

***Rosa gymnocarpa*** Nutt. var. ***gymnocarpa*** (wood rose) – shrub, occasional in mixed conifer forest. Monica Richardson 179. Regions: 10, 17, 18, 23, 24

***Rosa spithamea*** S. Watson (coast ground rose) – shrub, occasional in mixed conifer forest. Monica Richardson 327. Regions: 3, 5, 23

***Rubus leucodermis*** Douglas ex Torr. & A. Gray (whitebark raspberry) – perennial herb, occasional in mixed conifer forest. Reed Kenny 616. Regions: 23, 24

***Rubus parviflorus*** Nutt. (thimbleberry) – perennial herb, common in riparian forest. Monica Richardson 10. Regions: 2, 3, 5, 25, 26

<sup>R</sup>*Rubus spectabilis* Pursh (salmonberry) – shrub, common in the Scott Creek riparian corridor, Uncommon in Santa Cruz county, population in study area is the southernmost extent of the range. Reed Kenny 664. Regions: 1, 5, 26

\**Rubus ulmifolius* Schott var. *anoplothysus* Sudre (thornless blackberry) – perennial herb, uncommon in on roadside in mixed conifer forest. Reed Kenny 771. Regions: 25

*Rubus ursinus* Cham. & Schltdl. (California blackberry) – perennial herb, common in mixed conifer forest and coastal sage scrub. Monica Richardson 63. Regions: 1-14, 17-21, 23-28, 30-33

## RUBIACEAE

*Galium aparine* L. (goose grass) – annual herb, common in mixed conifer forest and coastal sage scrub. Reed Kenny 706. Regions: 1-5, 9, 10, 13, 18, 20, 23-25, 28

*Galium californicum* Hook. & Arn. subsp. *californicum* (California bedstraw) – perennial herb, common in mixed conifer forest. Reed Kenny 452. Regions: 1, 5, 10, 18, 20, 23-25

*Galium porrigens* Dempster var. *porrigens* (climbing bedstraw) – perennial herb, common in coastal sage scrub and mixed conifer forest understory. Monica Richardson 78. Regions: 1, 5, 12, 19, 21, 23-25, 31-34

*Galium triflorum* Michx. (sweet-scented bedstraw) – perennial herb, occasional in mixed conifer forest. Reed Kenny 478. Regions: 1, 5, 23-25

\**Sherardia arvensis* L. (field madder) – annual herb, common in disturbed coastal prairie. Reed Kenny 373. Regions: 1, 4, 7, 9, 17, 20, 21

## SALICACEAE

*Salix lasiandra* Benth. var. *lasiandra* (Pacific willow) – shrub, common in riparian areas. David J. Keil 20662. Regions: 2, 5, 10, 13, 26

*Salix lasiolepis* Benth. (arroyo willow) – shrub, common in riparian areas. Reed Kenny 844. Regions: 2, 5, 10, 11, 13, 14, 17, 19, 21, 26-28, 30-33

***Salix sitchensis*** Sanson ex Bong. (sitka willow) – shrub, occasional in riparian areas. Monika Richardson 165. Regions: 5, 25, 26

#### SAPINDACEAE

***Acer macrophyllum*** Pursh (big-leaf maple) – deciduous tree, common in riparian forest. David J. Keil 20585. Regions: 3, 5, 24-26

***Acer negundo*** L. (box elder) – deciduous tree, occasional in riparian forest. David J. Keil 20659. Regions: 2, 5, 25, 26, 31

***Aesculus californica*** (Spach) Nutt. (California buckeye) – deciduous tree, occasional in riparian forest and in gulch bottoms. D. Keil w/ V. L. Holland, L. Kelly 20633. Regions: 1-3, 5, 10, 13, 14, 20, 25, 26, 31, 32

#### SAXIFRAGACEAE

***Heuchera micrantha*** Douglas ex Lindl. (small-flowered alum-root) – perennial herb, occasional in mixed conifer forest. Reed Kenny 372. Regions: 1-3, 5, 24, 25

***Lithophragma affine*** A. Gray (woodland star) – perennial herb, uncommon in mixed conifer forest. Reed Kenny 490. Regions: 5

***Lithophragma heterophyllum*** (Hook. & Arn.) Hook. & Arn. (hill star) – perennial herb, uncommon in mixed conifer forest. Reed Kenny 430. Regions: 3

***Micranthes californica*** (Greene) Small (California saxifrage) – perennial herb, uncommon, found on cliff area in mixed conifer forest. Reed Kenny 111. Regions: 1

***Tellima grandiflora*** (Pursh) Douglas ex Lindl. (fringe cups) – perennial herb, uncommon, found in wet areas in mixed conifer forest, Populations in the study area are near the southern extent of the species range. Reed Kenny 626. Regions: 24

***Tiarella trifoliata*** (Hook.) Kurtz var. ***unifoliata*** (sugar-scoop) – perennial herb, uncommon, found in mixed conifer forest understory, Populations in the study area are near the southern extent of the species range. Reed Kenny 938. Regions: 24

## SCROPHULARIACEAE

***Scrophularia californica*** Cham. & Schltdl. (California figwort) – perennial herb, common in coastal sage scrub. Reed Kenny 947. Regions: 1-5, 7, 9-13, 17-21, 23-26, 28, 31, 32

## SOLANACEAE

***Solanum douglasii*** Dunal (Douglas's nightshade) – perennial herb, common in coastal sage scrub and mixed conifer forest. Reed Kenny 100. Regions: 2, 3, 5, 11, 23-26

***Solanum umbelliferum*** Eschsch. (blue witch) – perennial herb, common in coastal sage scrub and mixed conifer forest. Reed Kenny 112. Regions: 1, 4, 5, 20, 23, 24, 27

## TROPAEOLACEAE

\****Tropaeolum majus*** L. (garden nasturtium) – perennial herb, uncommon, growing near buildings. Reed Kenny 997. Regions: 26

## URTICACEAE

***Hesperocnide tenella*** Torr. (western nettle) – annual herb, occasional on cliff faces in mixed conifer forest. Reed Kenny 474. Regions: 1, 3, 5, 18, 20, 24, 25, 32

\****Parietaria judaica*** L. (asthma-weed pellitory) – perennial herb, occasional on roadsides. Reed Kenny 894. Regions: 5, 18

***Urtica dioica*** L. (hoary nettle) – perennial herb, occasional in riparian areas. Monica Richardson 358. Regions: 2, 3, 5, 10, 14, 18, 20, 24-26, 28, 31, 33

## VALERIANACEAE

***Plectritis ciliosa*** (Greene) Jeps. (long-spurred plectritis) – annual herb, uncommon on roadside in riparian forest, Historically present, not encountered during study. Seeds deposited at UCSC Arboretum. s.n. Regions: NA

*Plectritis congesta* (Lindl.) DC. subsp. *brachystemon* (Fisch. & C.A. Mey.) Morey (pale plectritis) – annual herb, occasional in coastal prairie and openings in mixed conifer forest. Reed Kenny 181B. Regions: 1, 4, 13, 20

#### VERBENACEAE

*Verbena lasiostachys* Link var. *lasiostachys* (California vervain) – perennial herb, common in mixed conifer forest. Monika Richardson 33. Regions: 2, 10, 17, 19, 21, 24, 25, 28, 30

#### VIOLACEAE

*Viola ocellata* Torr. & A. Gray (western heart's ease) – perennial herb, uncommon in mixed conifer forest. Reed Kenny 610. Regions: 23

\**Viola odorata* L. (English violet) – perennial herb, uncommon in mixed conifer forest. Reed Kenny 988. Regions: 5

*Viola pedunculata* Torr. & A. Gray (johnny-jump-up) – perennial herb, occasional in coastal prairie. Reed Kenny 451. Regions: 4, 19

*Viola sempervirens* Greene (evergreen violet) – perennial herb, occasional in redwood forest understory. Reed Kenny 104. Regions: 23

#### VITACEAE

\**Parthenocissus inserta* (A. Kern.) Fritsch (woodbine) – perennial herb, found growing on *Salix lasiolepis* near Scott Creek, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

### Monocots

#### AGAVACEAE

***Chlorogalum pomeridianum*** (DC.) Kunth var. ***divaricatum*** (Lindl.) Hoover (divaricate soap plant) – perennial herb from bulb, occasional in coastal prairie, plants occurring on coastal grasslands w. inflorescences not exceeding 40cm, infl. branches spreading from base, var. *pomeridianum* occurs in study region inland in chaparral understory and grasslands. Reed Kenny 685. Regions: 10

***Chlorogalum pomeridianum*** (DC.) Kunth var. ***pomeridianum*** (soap plant) – perennial herb from bulb, occasional in coastal sage scrub, chaparral, observed in 2019 but not collected. s.n. Regions: 4, 9, 10, 12, 13, 17, 18, 20, 21, 23, 28, 32, 33

#### ALLIACEAE

\****Allium triquetrum*** L. (three-angled onion) – perennial herb from bulb, one patch on Scott Creek in riparian forest understory. Reed Kenny 990. Regions: 5

***Allium unifolium*** Kellogg (single-leaved onion) – perennial herb from bulb, occurs in perched marsh above Big Willow gulch in generally saturated soils. Reed Kenny 732B. Regions: 10

#### AMARYLLIDACEAE

\****Amaryllis belladonna*** L. (naked ladies) – perennial herb from bulb, uncommon in disturbed areas in coastal prairie, potentially waifs from historic plantings. Reed Kenny 1002. Regions: 18

\****Leucojum aestivus*** L. (snowflake) – perennial herb from bulb, waif, observed in 2019 but not collected. s.n. Regions: NA

\****Narcissus tazetta*** L. (paper white) – perennial herb from bulb, waif, observed in 2019 but not collected. s.n. Regions: NA

#### ARACEAE

\****Arum italicum*** Mill. (Italian arum) – perennial herb, occasional in coastal scrub and grasslands. Reed Kenny 275. Regions: 26, 28, 30, 31

\****Arum palaestinum*** Boiss. (black calla, solomon's lily) – perennial herb, uncommon in mixed evergreen forest near roadsides, historically present, not encountered during study.. David J. Keil 30753. Regions: NA



***Lemna minor*** L. (smaller duckweed) – perennial herb, occasional in riparian areas, observed in 2019 but not collected. s.n. Regions: NA

***Lemna minuta*** Kunth (least duckweed) – perennial herb, occasional in riparian areas, observed in 2019 but not collected. s.n. Regions: NA

\****Zantedeschia aethiopica*** L. (Callalilly) – perennial herb, occasional in wet areas and as a waif. Thomas Buchloh 40. Regions: 26

#### ARALIACEAE

***Aralia californica*** S.Watson (elk clover) – perennial herb, common in riparian forest understory. Monika Richardson 173. Regions: 2, 5, 23

\****Hedera helix*** L. (English ivy) – perennial herb to liana, uncommon on roadside in mixed conifer forest. Reed Kenny 850. Regions: 5, 25

***Hydrocotyle ranunculoides*** L. fil. (floating marsh pennywort) – perennial herb, uncommon in ponds. Reed Kenny 753. Regions: 5, 20

#### COMMELINACEAE

\****Tradescantia fluminensis*** Vell. (small leaf spiderwort) – perennial herb, occasional along Scott Creek. Reed Kenny 984. Regions: 5

#### CYPERACEAE

<sup>R</sup>***Bolboschoenus fluviatilis*** (Torr.) Soják (river bulrush) – perennial herb, several dense patches occur in Scott Creek Marsh, only known in county outside of study area from one 1909 collection from the Pajaro river. Reed Kenny 872. Regions: 31

***Carex amplifolia*** Boott (big-leaf sedge) – perennial herb, common in riparian areas. Reed Kenny 836. Regions: 2, 5, 26

***Carex barbarae*** Dewey (whiteroot) – perennial herb, occurs in freshwater portions of the Scott Creek marsh as well as in a perched freshwater marsh upslope from the main marsh. Reed Kenny 904. Regions: 30, 31, 33

***Carex bolanderi*** Olney (Bolander's sedge) – perennial herb, occasional along the Scott Creek riparian corridor, some individuals collected have compound spikelets which is outside of the current species circumscription and merits further study. Reed Kenny 770. Regions: 2, 5, 11, 24, 26

***Carex brevicaulis*** Mack. (short-stemmed sedge) – perennial herb, occasional in coastal prairie. Reed Kenny 842. Regions: 6, 12, 17, 32

***Carex densa*** (L.H. Bailey) L.H. Bailey (dense sedge) – perennial herb, occasional in wet areas in coastal prairie. Reed Kenny 289. Regions: 5, 6, 8, 17, 27, 28

***Carex glareosa*** Schkuhr ex Wahlenb. (round-fruited sedge) – perennial herb, occasional in mixed conifer forest understory. Monika Richardson 178. Regions: 5, 23

<sup>R</sup>***Carex gracilior*** Mack. (slender sedge) – perennial herb, uncommon in the study area, occurring in coastal prairies, populations in the region of the study area are the only occurrences in the county for this species. Reed Kenny 933. Regions: 2, 3, 17

***Carex harfordii*** Mack. (Harford's sedge) – perennial herb, common in coastal prairies, may hybridize with *Carex subbracteata*. Monica Richardson 126. Regions: 5, 6, 8, 10-12, 17, 18, 21, 23, 24, 32

***Carex obnupta*** L.H. Bailey (slough sedge) – perennial herb, common in riparian areas. Reed Kenny 684. Regions: 6, 10, 13, 14, 17, 26, 31

***Carex subbracteata*** Mack. (small-bracted sedge) – perennial herb, common in coastal prairie, may hybridize with *Carex harfordii*. Reed Kenny 185B. Regions: 6-21, 27-30

***Carex tumulicola*** Mack. (foothill sedge) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 470. Regions: 1, 2, 6, 11, 17, 23

***Cyperus eragrostis*** Lam. (umbrella sedge) – perennial herb, common in riparian areas. Monika Richardson 66. Regions: 2, 5, 10, 13, 17-21, 24, 26-28, 30-32

*Isolepis carinata* Hook. & Arn. ex Torr. (dwarf club rush) – annual herb, occasional in wet areas of coastal prairie. Reed Kenny 415. Regions: 11

*Isolepis cernua* (Vahl) Roem. & Schult. (low club rush) – annual to perennial herb, common in wet areas of coastal prairie. Reed Kenny 559. Regions: 6, 11, 13, 17, 19, 21, 27, 28

*Schoenoplectus americanus* (Pers.) Volkart ex Schinz & R. Keller (Olney's three-square bulrush) – perennial herb, common in the Scott Creek Marsh. Thomas Buchloh 25. Regions: 31

*Schoenoplectus californicus* (C.A. Mey.) Soják (southern bulrush) – perennial herb, common in the Scott Creek Marsh. Thomas Buchloh 33. Regions: 26, 31

*Scirpus microcarpus* J. Presl & C. Presl (small-fruited bulrush) – perennial herb, common in riparian areas. Monika Richardson 251. Regions: 5, 13, 14, 23, 26, 31

#### IRIDACEAE

*Iris douglasiana* Herb. (Douglas's iris) – perennial herb, occasional in mixed conifer forest understory. Monica Richardson 378. Regions: 1, 3, 5, 24, 25, 32

*Iris fernaldii* R.C.Foster (Fernald's iris) – perennial herb, occasional in mixed conifer forest understory. Reed Kenny 205. Regions: 23

\**Romulea rosea* (L.) Eckl. var. *australis* (Ewart) M.P. de Vos (rosy sand crocus) – perennial herb, occasional in coastal prairie, observed in 2019 but not collected. s.n. Regions: NA

*Sisyrinchium bellum* S.Watson (western blue-eyed-grass) – perennial herb, common in coastal prairie. Reed Kenny 260. Regions: 4, 9-11, 17, 19, 21, 25, 27, 28, 32

#### JUNCACEAE

<sup>R</sup>*Juncus acuminatus* Michx. (sharp fruited rush) – perennial herb, uncommon, found on sandbank in Scott Creek, historically present, not encountered during study. James A. West 2016-08-23. Regions: NA

***Juncus balticus*** Willd. subsp. ***ater*** (Rydb.) Snogerup (baltic rush) – perennial herb, common in wet areas in coastal prairie. Monika Richardson 105. Regions: 11, 17

***Juncus bufonius*** F.J. Herm. var. ***occidentalis*** (western toad rush) – annual herb, common in wet areas in coastal prairies, additional surveys needed to establish distribution. Monika Richardson 100. Regions: 8, 10, 11, 17, 19-21, 25, 27, 28, 31

***Juncus effusus*** (Fernald & Wiegand) Piper & Beattie subsp. ***pacificus*** (pacific rush) – perennial herb, occasional in freshwater marsh regions in coastal prairie. Reed Kenny 865. Regions: 3, 17, 24, 26, 31

***Juncus hesperius*** (Piper) Lint (coast rush) – perennial herb, common in wet areas in coastal prairie. Reed Kenny 861. Regions: 5, 6, 8, 10, 13, 18, 20, 21, 24, 26-28, 30

***Juncus lescurii*** Bol. (San Francisco rush) – perennial herb, occasional in wet areas of coastal prairie, common in the Scott Creek marsh. Reed Kenny 688. Regions: 13, 17, 30, 31

***Juncus occidentalis*** Wiegand (western rush) – perennial herb, common in coastal prairie and in wet openings in mixed conifer forest. Monika Richardson 98. Regions: 4, 6-8, 10, 11, 19-21, 32

***Juncus patens*** E. Mey. (spreading rush) – perennial herb, common in wet areas of coastal prairie. Celeste Doiron 2. Regions: 1, 2, 4-12, 14, 17-21, 23-28, 30-32

***Juncus phaeocephalus*** Engelm. (brown-headed rush) – perennial herb, common in wet areas of coastal prairie. Reed Kenny 645. Regions: 6, 8, 10, 11, 19-21, 27, 28, 30

***Juncus xiphioides*** E. Mey. (iris-leaved rush) – perennial herb, uncommon, found in Scott Creek riparian corridor. Reed Kenny 936. Regions: 5, 26

<sup>R</sup>***Luzula subsessilis*** (S. Watson) Buchenau (short-stalked wood rush) – perennial herb, uncommon, found in mixed conifer forest understory. Reed Kenny 438. Regions: 1, 3, 5, 9, 10, 20, 25

## JUNCAGINACEAE

***Triglochin scilloides*** (Poir.) Mering & Kadereit (flowering-quillwort) – perennial herb, uncommon, found in wet depression in coastal prairie. Reed Kenny 644. Regions: 6

## LILIACEAE

***Calochortus albus*** (Benth.) Douglas ex Benth. (fairy-lantern) – perennial herb from bulb, found in mixed conifer forest understory and on cliff faces in coastal prairie. Reed Kenny 611. Regions: 10, 12, 23

***Clintonia andrewsiana*** Torr. (red clintonia) – perennial herb, found in redwood forest understory. Monika Richardson 60. Regions: 3, 24, 25

***Fritillaria affinis*** (Schult. & Schult.f.) Sealy (checker lily) – perennial herb from bulb, occasional in redwood forest understory. Reed Kenny 105. Regions: 18, 23, 24, 33

***Prosartes hookeri*** Torr. (Hooker's fairy bells) – perennial herb, occasional in redwood forest understory. Monica Richardson 377. Regions: 3, 5, 24, 25

***Scoliopus bigelovii*** Torr. (fetid adder's tongue) – perennial herb, uncommon in redwood forest. Reed Kenny 768. Regions: 24

## MELANTHIACEAE

***Toxicoscordion fremontii*** (Torr.) Rydb. (Fremont's star lily) – perennial herb from bulb, uncommon in openings in mixed conifer forest. Reed Kenny 122. Regions: 1, 23

***Trillium chloropetalum*** (Torr.) Howell (giant trillium) – perennial herb, occasional in Scott Creek riparian corridor, three floral morphs are found on the ranch, each with a distinct scent.. Kjirsten A. Wayman 301. Regions: 26

***Trillium ovatum*** Pursh (western trillium) – perennial herb, occasional in mixed conifer forest. Reed Kenny 128. Regions: 1, 3, 5, 23, 25

<sup>R</sup>*Trillium albidum* J.D. Freeman (white trillium) – perennial herb, found in coastal scrub overlooking Big Willow gulch, historically present found in early 1980's, personal observation by Jim West. s.n. Regions: NA

## ORCHIDACEAE

*Corallorhiza maculata* (Lindl.) Ames var. *occidentalis* (unspotted coralroot) – perennial herb, uncommon in mixed conifer forest understory. Reed Kenny 893. Regions: 5, 18

*Corallorhiza striata* Lindl. (striped coralroot) – perennial herb, uncommon in mixed conifer forest, historically present, not encountered during study, flavistic form has also been observed in study area. Roy E. Buck, James A. West 228. Regions: NA

\**Epipactis helleborine* (L.) Crantz (broad-leaved helleborine) – perennial herb, common in mixed conifer forest. Monica Richardson 382. Regions: 1, 2, 5, 10, 23, 25

*Piperia elegans* (Lindl.) Rydb. subsp. *elegans* (coast piperia) – perennial herb, uncommon, historically present, not encountered during study. Randal Morgan 925. Regions: NA

*Piperia elongata* Rydb. (chaparral orchid) – perennial herb, uncommon in mixed conifer forest. Several individuals found in one opening in mixed conifer forest on steep slope. Reed Kenny 961. Regions: 1

<sup>RR</sup>*Piperia michaelii* (Greene) Rydb. (Michael's rein-orchid) – perennial herb, uncommon found in coastal sage scrub, CNPS list 4.2. Reed Kenny 973. Regions: 26, 32

*Piperia transversa* Suksd. (flat spurred piperia) – perennial herb, uncommon in mixed conifer forest. Reed Kenny 956. Regions: 1, 3, 5

*Spiranthes romanzoffiana* Cham. (hooded lady's tresses) – perennial herb, uncommon in mixed conifer forest coastal prairie interface, historically present, not encountered during study. Dylan Neubauer 97a. Regions: NA

<sup>R</sup>*Piperia unalascensis* (Spreng.) Rydb. (Alaska rein orchid) – perennial herb, found sporadically on the Western terrace, historically present, not encountered during study, personal observation by Jim West. Specimens similar to Morgan 0439-P collected on coast near SPR, more similar to the type specimen than to specimens found elsewhere in California.. s.n. Regions: NA

## POACEAE

<sup>RR</sup>*Agrostis blasdalei* Hitchc. (Blasdale's bent grass) – perennial grass, occasional in coastal prairie in study area, occurring in sandy disturbed soils on bluffs and in wet depressions in coastal prairie, CNPS 1B.2. Reed Kenny 750. Regions: 6, 7, 11, 14, 17, 19, 20, 27

<sup>R</sup>*Agrostis densiflora* Vasey (California bent grass) – perennial grass, occurs primarily on coast in habitat that is commonly degraded. Reed Kenny 751. Regions: 9, 11, 14, 17

*Agrostis exarata* Trin. (spike bent grass) – perennial grass, occasional in coastal prairies in sandy soil on bluffs or vernal wet depressions, a variant that has been recognized in the past as *A. exarata* var. *exarata* is found just outside of the study area and is locally rare. Reed Kenny 891. Regions: 3, 18

*Agrostis hallii* Vasey (Hall's bent grass) – perennial grass, occasional in coastal prairies and openings in mixed conifer forest, often appears intermediate between *A. hallii* and *A. pallens*. Reed Kenny 939. Regions: 3, 10, 23, 24, 26, 32, 33

*Agrostis pallens* Trin. (dune bent grass) – perennial grass, occasional in coastal prairies and openings in mixed conifer forest. Reed Kenny 935. Regions: 2, 20, 24, 32

\**Agrostis stolonifera* L. (creeping bent) – perennial grass, uncommon, found in the Scott Creek riparian corridor, occurrence has been visited several times by James West but reproductive material has never been collected. Reed Kenny 996. Regions: 26

\**Aira caryophyllea* L. (silver hair grass) – annual grass, common in disturbed areas in coastal prairies and on roadsides throughout the study area. Reed Kenny 511. Regions: 1, 5-7, 9-11, 13, 17, 19-21, 23-25, 27, 30, 32

\**Alopecurus pratensis* L. (meadow foxtail) – perennial grass, locally abundant in one disturbed meadow, potentially seeded. Reed Kenny 901. Regions: 2, 5

*Anthoxanthum occidentale* (Buckley) Veldkamp (California sweet grass) – perennial grass, occasional in redwood forest understory. Reed Kenny 102. Regions: 23, 24

\**Avena barbata* Pott ex Link (slender wild oat) – annual grass, common in disturbed areas of coastal prairie. David J. Keil 20600. Regions: 1, 2, 6-12, 14, 17-21, 23, 25-28, 30-32

\**Brachypodium distachyon* (L.) P. Beauv. (purple false brome) – annual to perennial grass, common in disturbed area throughout the study area. Reed Kenny 681. Regions: 2, 6, 7, 10-12, 14, 17, 19-21, 24, 26-28, 30, 32

\**Briza maxima* L. (rattlesnake grass) – annual grass, common in disturbed areas in coastal prairies and on roadsides throughout the study area. Reed Kenny 849. Regions: 1, 3, 8-12, 17, 19, 23, 25, 28

\**Briza minor* L. (annual quaking grass) – annual grass, common in disturbed coastal prairie. Reed Kenny 737. Regions: 4, 7-12, 17-21, 25, 27, 28, 30, 32

\**Bromus diandrus* Roth (ripgut grass) – annual grass, common in disturbed area throughout the study area. David J. Keil 20599. Regions: 1, 2, 4, 6, 9, 11, 12, 17, 19-21, 24, 25, 27, 28, 30

\**Bromus hordeaceus* L. (soft chess) – annual grass, common in disturbed areas in coastal prairies and on roadsides throughout the study area. David J. Keil 20605-1. Regions: 2, 4, 6, 7, 9-11, 17, 19-21, 23, 25, 27, 28, 30, 32

\**Bromus madritensis* L. (foxtail chess) – annual grass, uncommon in disturbed areas near roads. David J. Keil 20595. Regions: 25

<sup>R</sup>*Bromus maritimus* (Piper) Hitchc. (maritime brome) – perennial grass, uncommon in sandy soils on bluffs. Reed Kenny 269. Regions: 17

*Bromus sitchensis* Trin. var. *caritus* (Hook. & Arn.) R.E. Brainerd & Otting (California brome) – perennial grass, occasional in mixed conifer forest. Reed Kenny 758. Regions: 2-6, 18-21, 23-26, 28, 30, 32, 33

*Bromus vulgaris* (Hook.) Shear (Columbia brome) – perennial grass, occasional in mixed conifer forest and oak woodland. Monika Richardson 186. Regions: 1, 3, 5, 23, 24

<sup>R</sup>*Calamagrostis nutkaensis* (J. Presl) Steud. (pacific reed grass) – perennial grass, uncommon in wet areas in coastal prairie. Reed Kenny 657. Regions: 10, 13, 14



*Calamagrostis rubescens* Buckley (pine reed grass) – perennial grass, occasional in mixed conifer forest understory. Monika Richardson 303. Regions: 1, 5, 9, 23-25

\**Cortaderia jubata* (Lemoine) Stapf (jubata grass) – perennial grass, uncommon in disturbed areas on coastal bluffs. Reed Kenny 855. Regions: 1, 10, 12, 17, 23, 24, 31

\**Cynodon dactylon* (L.) Pers. (bermuda grass) – perennial grass, uncommon on roadsides. Reed Kenny 974. Regions: 32

\**Cynosurus echinatus* L. (bristly dogtail grass) – perennial grass, common in disturbed areas throughout study area. Reed Kenny 714. Regions: 1-4, 6, 7, 10, 11, 18-21, 24, 25, 27, 32

\**Dactylis glomerata* L. (orchard grass) – perennial grass, occasional in disturbed coastal prairie and roadsides. Reed Kenny 852. Regions: 5, 19, 25

*Danthonia californica* Bol. (California oat grass) – perennial grass, common in coastal prairie. Reed Kenny 754. Regions: 4, 6, 7, 9-11, 17, 19, 20, 27, 28, 32

<sup>R</sup>*Deschampsia cespitosa* (L.) P. Beauv. subsp. *cespitosa* (tufted hair grass) – perennial grass, common in coastal prairie. Reed Kenny 655. Regions: 1, 7, 8, 10, 17

<sup>R</sup>*Deschampsia cespitosa* (L.) P. Beauv. subsp. *holciformis* (J. Presl) W.E. Lawr. (California hair grass) – perennial grass, common in coastal prairie. Reed Kenny 648. Regions: 1, 6, 7

*Deschampsia elongata* (Hook.) Munro (slender hair grass) – perennial grass, occasional in mixed conifer forest. Monika Richardson 163. Regions: 5, 11, 18, 24-26

*Distichlis spicata* (L.) Greene (salt grass) – perennial grass, common in the Scott Creek marsh. Monika Richardson 247. Regions: 31

\**Ehrharta erecta* Lam. (panic veldt grass) – perennial grass, occasional along roadsides. Reed Kenny 857. Regions: 3, 5, 23, 25, 26, 33

<sup>RR</sup>*Elymus californicus* (Boland. ex Thurb.) Gould (California bottle-brush grass) – perennial grass, uncommon, found in Scott Creek riparian corridor, CNPS 4.3. Monika Richardson 132. Regions: 5, 20

*Elymus glaucus* Buckley subsp. *glaucus* (blue or western wild-rye) – perennial grass, occasional in mixed conifer forest and coastal prairie. Reed Kenny 992. Regions: 2, 4-6, 8, 10, 11, 18, 20, 24, 26, 32, 33

*Elymus glaucus* (Piper) Gould subsp. *virescens* (Virginia wild rye) – perennial grass, uncommon in coastal prairie. Monica Richardson 146. Regions: 9

\**Festuca arundinacea* Schreb. (tall fescue) – perennial grass, uncommon, found on coastal bluffs. Reed Kenny 720. Regions: 17

\**Festuca bromoides* L. (brome fescue) – annual grass, occasional, found in disturbed areas of coastal prairie and coastal sage scrub. David J. Keil 20602-1. Regions: 33

*Festuca californica* Vasey (California fescue) – perennial grass, occasional in mixed conifer forest. Reed Kenny 491. Regions: 1, 18, 23, 33

<sup>R</sup>*Festuca elmeri* Scribn. & Merr. (Elmer's fescue) – perennial grass, occasional in mixed conifer forest. Monica Richardson 188. Regions: 5, 23, 24

<sup>R</sup>*Festuca idahoensis* Elmer (Idaho fescue) – perennial grass, uncommon, found on coastal bluffs. Reed Kenny 979. Regions: 17

<sup>R</sup>*Festuca microstachys* (Scribn. ex Beal) Leonard & Gould (hair fescue) – annual grass, uncommon in coastal sage scrub and openings in mixed conifer forest, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 1. s.n. Regions: NA

\**Festuca myuros* L. (rattail sixweeks grass) – annual grass, common in disturbed areas in coastal prairies and on roadsides throughout the study area. Reed Kenny 851. Regions: 1, 4, 6, 7, 9, 10, 12, 17, 19-21, 25, 27, 28, 30, 32

*Festuca occidentalis* Hook. (western fescue) – perennial grass, occasional in mixed conifer forest. Reed Kenny 614. Regions: 5, 23, 24

\**Festuca perennis* (L.) Columbus & J.P.Sm. (rye grass) – perennial grass, common in disturbed areas of coastal prairie. Monica Richardson 75. Regions: 1, 2, 4-8, 10, 11, 14, 17-21, 25-28, 30-32

<sup>R</sup>*Festuca subulata* Trin. (bearded fescue) – perennial grass, uncommon, found in mixed conifer forest understory, population is extreme disjunct from the rest of the species range. Reed Kenny 641. Regions: 5

<sup>R</sup>*Festuca subuliflora* Scribn. (crinkle-awn fescue) – perennial grass, uncommon, found in mixed conifer forest understory, populations in the study area are near the southern extent of the species range. Reed Kenny 862. Regions: 5, 24, 25

\**Gastridium phleoides* (Nees & Meyen) C.E. Hubb. (nit grass) – annual grass, common in disturbed areas throughout study area. Reed Kenny 712. Regions: 4, 11, 19, 24, 28, 32

*Glyceria declinata* Bréb. (fowl manna grass) – perennial grass, occasional, found in margins of stock ponds in coastal prairie. Reed Kenny 548. Regions: 10, 20, 27, 28

\**Holcus lanatus* L. (common velvet grass) – perennial grass, common in moist, disturbed areas of coastal prairie. Monika Richardson 280. Regions: 1-8, 10, 11, 14, 18-21, 24-28, 30, 31, 33

*Hordeum brachyantherum* Nevski subsp. *brachyanthemum* (northern barley) – perennial grass, occasional in coastal prairie. Reed Kenny 529. Regions: 6, 8, 10, 11, 17-19, 21, 27

\**Hordeum marinum* Huds. subsp. *gussoneanum* (Parl.) Thell. (mediterranean barley) – annual grass, common in disturbed coastal prairie. Reed Kenny 853. Regions: 6-8, 10, 11, 18-21, 27, 28, 30, 32

\**Hordeum murinum* L. (wall barley) – annual grass, common in disturbed coastal prairie. Monica Richardson 39. Regions: 1, 5, 6, 10, 11, 17-21, 23, 25-28, 30-32

*Koeleria macrantha* (Ledeb.) Schult. (june grass) – perennial grass, uncommon, found in disturbed area in coastal prairie. Reed Kenny 673. Regions: 9

*Melica californica* Scribn. (California melic) – perennial grass, occasional in mixed conifer forest and coastal sage scrub. Reed Kenny 449. Regions: 4, 26

*Melica harfordii* Boland. (Harford's melic) – perennial herb, uncommon in chaparral margins, historically present, not encountered during study, documented in Jim West's Traversing Swanton as occurring in study region 23. s.n. Regions: NA

***Melica imperfecta*** Trin. (little California melica) – perennial grass, occasional in mixed conifer forest and coastal sage scrub. Reed Kenny 618. Regions: 1, 20, 23, 24, 28, 32

***Melica subulata*** (Griseb.) Scribn. (Alaskan oniongrass) – perennial grass, occasional in mixed conifer forest, populations in the study area are near the southern extent of the species range. Monika Richardson 127. Regions: 5, 23

***Melica torreyana*** Scribn. (torrey's melic) – perennial grass, occasional in mixed conifer forest. Reed Kenny 290. Regions: 1, 3-5, 18, 23-25, 28

\****Parapholis incurva*** (L.) C.E. Hubb. (sickle grass) – annual grass, uncommon in coastal prairie, historically present, not encountered during study, personal observation by Jim West. s.n. Regions: NA

\****Pennisetum clandestinum*** Hochst. ex Chiov. (kikuyu grass) – perennial grass, uncommon, found growing in dirt roads. Reed Kenny 943. Regions: 31, 32

\****Phalaris aquatica*** L. (harding grass) – perennial grass, occasional in disturbed riparian areas in coastal prairie. Monika Richardson 68. Regions: 18, 24, 27

***Phalaris californica*** Hook. & Arn. (California canary grass) – perennial grass, occasional in wet areas in coastal prairie and coastal sage scrub. Reed Kenny 522. Regions: 5, 9, 10, 13, 25, 26, 31

\****Poa annua*** L. (annual blue grass) – annual grass, occasional in disturbed areas along roads. Reed Kenny 646. Regions: 6, 25, 28

***Poa howellii*** Vasey & Scribn. (Howell's bluegrass) – perennial grass, uncommon, found on roadcut in mixed conifer forest. Reed Kenny 462. Regions: 3

\****Poa pratensis*** L. subsp. ***pratensis*** (Kentucky blue grass) – perennial grass, uncommon, found on roadside. David J. Keil 20627. Regions: 5

***Poa secunda*** J. Presl subsp. ***secunda*** (Nevada blue grass) – perennial grass, occasional in mixed conifer forest. Reed Kenny 433. Regions: 1, 12, 17

*Poa unilateralis* Scribn. ex Vasey subsp. *unilateralis* (San Francisco blue grass) – perennial grass, uncommon in areas of thin soil in coastal prairie. Reed Kenny 401. Regions: 9, 14, 32

\**Polypogon monspeliensis* (L.) Desf. (rabbitfoot grass) – annual grass, common in disturbed areas throughout study area. Reed Kenny 981. Regions: 2, 5, 8, 10, 11, 18, 20, 21, 24, 26, 28, 30, 31

*Stipa lepida* Hitchc. (foothill needle grass) – perennial grass, uncommon in coastal prairie. Reed Kenny 486. Regions: 26, 32

*Stipa pulchra* Hitchc. (purple needle grass) – perennial grass, common in coastal prairie. David J. Keil 20621. Regions: 4-6, 9, 11, 12, 17-20, 25, 27, 28, 32

*Trisetum canescens* Buckley (tall false oat) – perennial grass, uncommon in mixed conifer forest. Reed Kenny 769. Regions: 23, 24

#### RUSCACEAE

*Maianthemum racemosum* (L.) Link (false Solomon's seal) – perennial herb, common in mixed conifer forest. Monica Richardson 379. Regions: 1, 5, 24, 25

*Maianthemum stellatum* (L.) Link (slim Solomon's seal) – perennial herb, common in mixed conifer forest. Reed Kenny 194. Regions: 2, 5, 24

#### THEMIDACEAE

*Brodiaea terrestris* Kellogg subsp. *terrestris* (dwarf brodiaea) – perennial herb from corm, uncommon in coastal prairie. Reed Kenny 441. Regions: 4, 9, 25, 27, 32

*Dipterostemon capitatus* (Benth.) Rydb. (blue dicks) – perennial herb from corm, occasional in coastal prairie. Reed Kenny 434. Regions: 1, 9, 18, 20, 23, 25, 28

*Triteleia laxa* Benth. (Ithuriel's spear) – perennial herb from corm, occasional in coastal prairie and coastal sage scrub. Reed Kenny 649. Regions: 7, 27, 28, 32

#### TYPHACEAE

\**Typha angustifolia* L. (narrow-leaved cattail) – perennial herb, common in the Scott Creek marsh. Reed Kenny 877. Regions: 31

*Typha latifolia* L. (broad-leaved cattail) – perennial herb, common in the Scott Creek marsh. Reed Kenny 999. Regions: 24, 26, 31