11-14-2011

**Traversing Swanton Road, 6th ed.**

James A. West

Follow this and additional works at: [https://digitalcommons.calpoly.edu/spr_assocres](https://digitalcommons.calpoly.edu/spr_assocres)

Part of the Biodiversity Commons, Biology Commons, and the Botany Commons

**Recommended Citation**
November 14, 2011.

This Report is brought to you for free and open access by the Swanton Pacific Ranch at DigitalCommons@CalPoly. It has been accepted for inclusion in Academic, Government & Associated Organizational Research Resources by an authorized administrator of DigitalCommons@CalPoly. For more information, please contact digitalcommons@calpoly.edu.
Traversing Swanton Road  
(revised 11/14/2011)  

By James A. West

Abstract: Situated at the northwest end of Santa Cruz County and occupying circa 30 square miles of sharply contrasted terrain, the **Scotts Creek Watershed** concentrates within its geomorphological boundaries, at least 10-12% of California’s flora, both native and introduced. **Incorporated within this botanical overview but technically not part of the watershed sensu strictu, are the adjacent environs, ranging from the coastal strand up through the Western Terrace to the ocean draining ridge tops... with the Arroyo de las Trancas/Last Chance Ridge defining the western/northwestern boundary and the Molino Creek divide, the southern demarcation.** Paradoxically, the use/abuse that the watershed has sustained over the past 140+ years, has not necessarily diminished the biodiversity and perhaps parallels the **naturally disruptive but biologically energizing processes** (fire, flooding, landslides and erosion), which have also been historically documented for the area. With such a comprehensive and diverse assemblage of floristic elements present, this topographically complex but relatively accessible watershed warrants utilization as a living laboratory, offering major taxonomic challenges within the **Agrostis, Arctostaphylos, Carex, Castilleja, Clarkia, Juncus, Mimulus, Pinus, Quercus, Sanicula and Trillium** genera (to name but a few), plus ample opportunities to study the significant role of landslides (both historical and contemporary) with the corresponding habitat adaptations/modifications and the resulting impact on population dynamics. Of paramount importance, is the distinct possibility of a paradigm being developed from said studies, which underscores the seeming contradiction of **human activity and biodiversity within the same environment as not being mutually exclusive** and understanding/clarifying the range of choices available in the planning of future land use activities, both within and outside of Swanton.

Although synthetic in origin, Swanton Road, like its fluid counterpart Scotts Creek, traverses a substantial part of the watershed and reveals an informative cross-section of the region’s flora. Without leaving the tarmac, one can journey the entire length of “Old Highway One” and observe/study some of Santa Cruz County’s rarest, most horticulturally desirable, and just plain overlooked plant life! The Scotts Creek Watershed and its environs, is more than an aggregation of **600+ native species (subspecies, varieties and forms), representing 282+ genera and 90+ families:** it is that rare occurrence, a living window into California’s evolutionary past, still relatively undeveloped by human activity and spared the habitat degradation that has befallen
much of the coastal ecology elsewhere in our state.

Momentarily putting aside the nostalgic and visually arresting aspect of the watershed, it is paradoxical that an area logged, rangeland/grazed and farmed for the past 130+ years, could still yield species new to science and sustain habitats that serve as refugia for taxa rare elsewhere in the state. Because there is such a high percentage of the Golden State’s native flora, at least (10-12%) and still counting, concentrated within 30 square miles, this area is perhaps the ideal primer for students investigating, for example: (1) the underlying evolutionary mechanisms, which from an ecological perspective, define the interrelationships between four taxa within one genus (Stachys) sharing the same watershed, ranging from site specific, (a) Stachys chamissonis/hydrologically active year round habitat/China Ladder Marsh, (b) Stachys ajugoides/seasonally wet, often poorly drained depressions, (c) Stachys rigida var. quercetorum/mesic to xeric (edge of chaparral) habitats and (d) Stachys bullata, highly adaptive, ranging from coastal marshes, coniferous/oak woodlands, riparian corridor and occasionally extending up to chaparral..... (2) reproductive isolating mechanisms and native [Bombus sp] versus introduced [Apis sp] species of Hymenoptera, comparing their overall versatility as pollinating vectors and the potential consequences of population collapse due to disease, parasites and/or pesticides of the introduced species relative to habitat loss thru agricultural conversion and/or urbanization of the native species. What percentage of our native plant species are flexible enough in their basic floral structures, to allow for indigenous replacement vectors with albeit less effective capacities for pollen transference to offset the possible loss of the primary pollinator and what are the long term implications, for speciation in a changing environment?..... (3) the roles of mammals, birds and insects, intentional or otherwise, as dispersers of seeds and the co-evolutionary mechanisms involved..... (4) chemical signatures (foliage and/or floral scents) as taxonomic markers, used in conjunction with other morphological features, to differentiate locally problematic species of Castilleja (densiflora aff. Orthocarpus noctunius Eastw.), Layia, Madia, Mimulus (guttatus complex), Monardella (villosa complex), Pseudognaphalium (gianonei, pro.sp.nov.), Sanicula (gianonei, pro.sp.nov. and pseudolaciniata, pro.sp.nov.), Trillium (chloropetalum complex) and Stachys..... (5) creating a digital library/herbarium documenting the watershed’s flora at all stages of development (e.g., cotyledon configuration, seed structure and patterning), note: CalPoly/Swanton Pacific Ranch has implemented this concept and its ongoing development can be viewed on the Ranch’s website..... (6) habitat stability versus human induced disruptions and the resulting increase/decrease in patterns of biodiversity..... (7) palynological (pollen) studies involving core samplings taken throughout the watershed to ascertain historic changes within the local species composition..... specifically, from a hydrological, palynological and ecological perspective, do a comparative study of the benched/perched marshes at the sw edge of the Western Terrace aka coastal prairie, between the Cowboy Shack Gulch and Lasher Marsh Gulch drainages: (a) to determine, if possible, the age(s) of the marshes which act as “islands of biological diversity”, (b) differences between current and pre-european occupancy native species composition, (c) doing an inventory of shared and marsh specific taxa, (d) role, if any, the underlying syncline plays in water storage/distribution patterns within this section of the Western Terrace, (e) what influence, has the eolian sand deposits played in shaping the vegetational mosaics throughout this portion of the coastal prairie, (f) the cumulative impact of agriculture, both grazing and row crops, have played in modifying/fragmenting the "native vegetation", its persistence along the non-cultivated margins and the repository capacity of Juncus tussocks to act as mini-refugia and (g) the ecological importance from a biodiversity perspective, of the east/west alignment of the lower portions of the marsh draining gulches between the coastal
prairie and highway 1, having mesic and xeric biotic profiles mirroring each other..... (8) the geomorphic origins of the “vertical grasslands” and their value as refugia for rare taxa and holding succession in abeyance..... (9) slope orientation and the resulting changes in vegetation patterns within the same drainage system and **one of the underlying mechanisms needed** to establish localized biodiversity..... (10) the importance of cyclical riparian scouring to reinvigorate the established, long-lived vegetation and increase species diversity by uncovering seeds deposited and buried decades before in sandbars and adjacent stream banks **paralleling the co-evolutional value of fire within the chaparral ecosystem**..... (11) study gene flow patterns between a given species, e.g., coyote mint (**Monardella villosa**, sensu lato), which ranges elevationally from the coastal bluffs up to the chaparral and is represented in the watershed, by **two well defined subspecies**..... (a) map the distribution patterns of **subsp. villosa** and **subsp. franciscana** and the areas where their populations overlap, (b) what are the underlying ecological conditions that allow the two subspecies to maintain their distinctive phenotypes and where their ranges overlap, is there a breakdown in those distinctions (c) in terms of speciation, is **subsp. franciscana** more recently derived, and are there any mechanical or genetic barriers evolving or in place, save physical proximity, to prevent the exchange of genetic material between the two taxa?..... (12) the flowers of **Clarkia purpurea** subsp. **purpurea** and subsp. **quadriovulnera** vary both within and between populations as to contrasting pigment patterns and their placement/dimensions: in **terms of uv radiation absorbed or reflected and the ability of members of the Hymenoptera to perceive this part of the spectrum, is one pattern preferred over another by the prospective pollinators and how does this affect both the variability within and sustainability of the populations as a whole in a changing environment**..... (13) undertake a study (a) documenting the primary hybrids locally of **Lupinus arboresus** with **Lupinus formosus** and **Lupinus varicolor** and the relationship of the stabilized taxon tentatively designated **Lupinus propinquus** to both **Lupinus arboresus** and **Lupinus latifolius**, (b) what role, if any, have the primary hybrids played in the variability of the contributing parents through backcrossing and (c) what evolutionary advantages/disadvantages are conferred where sympatric interfertile taxa are both perennial, but either evergreen or seasonal above ground and shrub-like versus decumbent in mode of growth?..... (14) the role of bryophytes: in (a) providing a favorable microhabitat for seed germination, (b) creating a buffer zone between exposed rock formations with their potentially less than optimal pH and (c) through their hygroscopic capabilities, capturing atmospheric moisture, particularly between dusk and dawn..... (15) the comparative value of dissimilar types of recent and accumulated leaf litter (e.g., **Lithocarpus densiflorus var. densiflorus** = **Notholithocarpus densiflorus var. densiflorus**, **Arbutus menziesii**, **Sequoia sempervirens**) in **mitigating the erosive power of heavy and often prolonged rainfall in unstable areas**..... (16) the cumulative capacity of seasonally shed foliage from deciduous streamside trees and shrubs (e.g., **Alnus rubra**, **Sambucus racemosa**, **Salix lasiandra var. lasiandra**, **Rubus spectabilis**, **Acer negundo var. californicum**) in conjunction with exposed rocky debris, to influence flow patterns and act as catchbasins for particles in suspension..... (17) what isolating mechanisms, if any, allow two closely related species of **Collinsia**..... namely **C. heterophylla** and **C. multicolor**, to co-exist proximal to each other, along Swanton and Purdy Roads, without producing apparent hybrids even though visited by at least two shared pollinating vectors, both members of the genus **Bombus**, and what co-evolutionary factors are in play, causing the **C. heterophylla** populations to be **overwhelmingly pale-flowered**, while sister species **C. multicolor**, remains basically uniform in coloration throughout its range? The distributional pattern of the **Collinsia multicolor** populations offers valuable research potential in the **study of inter/intra-population gene flow** with the following considerations worth investigating: (a) with virtually all flowering **Collinsia multicolor** plants producing viable seed, which when fully mature, is **dispersed within the**
current season’s population and from personal observation over the past 30+ years, seeing neither loss of vigor nor reduction in population size, are these *inbreeding populations* or is there some *gene flow from one or more of the other isolated/localized populations*, via the shared pollinating vectors aka the two species of Bombus?, (b) of all the populations studied within the watershed and its environs, **only one has produced any significant color variants**..... this one down road from Mountain Lion Gulch, comprising 150+ plants and over the course of 30+ years, **producing just two alba individuals [clear cell sap, flowers fading tan without any trace of anthocyanins] and one intensely concolorous form**, (c) are these now disjunct populations of *Collinsia multicolor* scattered along Swanton Road, once part of much larger ones which have been broken up into smaller physically isolated subsets, due to the ongoing slope failures that define much of their current habitat ..... **and do these disruptive events initiate or curtail population expansion?, (d) As to the breeding patterns of the watershed’s San Francisco collinsia, are they obligate outcrossers or is selfing also possible** and are all the current populations documented for the Scotts Creek Watershed and its environs, genetically identical or have some undergone changes on a molecular level that could through continued isolation, lead to the formation of cryptic or micro species?, (e) How do the the local *Collinsia multicolor* populations compare genetically, with the remaining viable ones in San Mateo, San Francisco, Monterey, San Luis Obispo and Santa Barbara Counties, DNA extracted from historical documentation for Central California and **where growing on serpentine** [Santa Clara and possibly San Mateo Counties], **are there significant differences, both on a molecular and physiological level?**..... (18) do long-lived fire responsive taxa, such as burl-forming members of the genus *Arctostaphylos*, maintain the integrity of their genome or does each episode of physiological trauma (fire), give rise to new growth, some/all of which display subtle modifications on a chromosomal level?..... (19) examine the evolutionary values conferred upon both native (*Taraxia ovata, Sanicula arctopoides*) and introduced (*Plantago lanceolata, Hypochaeris radicata*) taxa, where emerging foliage forms horizontally aligned rosettes initiated from fleshy, water-retaining root stocks, in a post-fire but pre-rainy season scenario.... with an emphasis on the rosette pattern: (a) securing valuable surface space from competition, (b) maximizing photosynthesis capabilities and (c) mitigating subsurface loss of moisture and the fleshy taproots: (d) having ample dormant buds to offset damage from the effects of fire plus potential for subsequent herbivory and (e) possessing sufficient stored water to bridge temporal gap until beginning of Fall rains..... (20) compare the net genetic gain/loss from a heterozygous/homozygous perspective, in a long-lived native grass (*Calamagrostis rubescens*), **whose basic mode of reproduction is asexual/vegetive** (from extensive clonal colonies growing within mixed conifer/oak woodlands) and typically produces inflorescences, only when disturbed by fire, landslides or through canopy removal (with the corresponding change in the light/temperature regimen) and when inflorescences are produced, **how successful is seed set and to what extent, with the colonies being principally clonal, is new genetic material being introduced into the existing gene pool?**..... (21) do a comparative analysis of the watershed’s oracle oaks (*Quercus x morehus*): focusing on (a) ecological (parental association, habitat preferences and role of disturbance in the broaching of reproductive isolating mechanisms), (b) morphological (bark topography, underlying vascular and epidermal patterns in foliage), (c) physiological (metabolism and growth rate behavior), (d) molecular (chromosome numbers, mutation rates at specific gene loci, putative gene flow patterns and degree of pollen fertility and whether selfing, outcrossing and/or backcrossing are possible and historically can partially account for variability within the local forest live-oak (*Quercus punzula var. shrevei*) populations) and (e) being non-F1 hybrids (see pages 50-51, 94, 98-99, 150 and 152 of this essay in reference to the thesis that the Scotts Creek Watershed oracle oaks are the product of ancient hybridization
between Quercus kelloggii and what is now called Quercus parvula var. shrevei, with the locally occurring hybrid taxon being the result of two forest live-oaks each carrying the hybrid gene(s) which are necessary [double recessive] for the infrequent occurrence of the scattered/clustered Quercus x morehus juveniles, which always appear proximal to a Quercus parvula var. shrevei adult and are wholly removed from any current physical contact with the black oak)...... (22) An extensive, in depth investigation of the variable taxon, Douglas's nightshade (Solanum douglasii), needs to be undertaken, sampling a wide range of habitats..... from the coastal bluffs up to the chaparral..... to determine, if all the forms in the watershed and its environs are indeed Solanum douglasii, and do those plants with lilac suffused corollas found on the immediate coast, represent past hybridization with the sympatric Solanum umbelliferum or is the distinctive anthocyanic pigmentation found on stem, foliage and flowers, a physiological response to the stressful, unshaded headland habitat?.... (23) in a post-fire scenario, where weathered (both consolidated and in places fragmented) Santa Cruz Mudstone (the "Chalks") is the principal substrate and organic material (duff) is minimal at best..... (a) what is the viability status of the mature fruit (drupes and stones) in the non-burl forming Schreiber's manzanita (Arctostaphylos glutinosa) populations when compared with its burl-forming relative, Arctostaphylos crastacea sensu lato, which by occupying the lower ridge tops and interfacing with the oak/conifer woodlands, has accumulated several centimeters of protective leaf litter?..... (b) when the temporal length between fires exceeds 60+ years and the seasonal deposition of manzanita "fruits" encased within the duff can be profiled vertically, have the "oldest" stones via the action of humic acid been rendered inviable..... are the most recently deposited mature fruits, lacking the insulatory protection afforded by the deeper layers of organic material destroyed by the "sustained" intensity of the fire, thereby leaving the "middle" layers of stones, the opportunity to germinate in a seedbed of ash-converted duff?..... (c) where the duff layer, as in the "Chalks", is sparse or absent and the triggering effects of smoke for germination not or minimally present, can the cracks/fissures in the mudstone act as refugia for replacement seedlings and are the presence of light, sustained moisture and mineral soil, sufficient to initiate germination and facilitate growth?..... (24) do an in depth analysis, between those sub-populations of Pinus radiata (coastal bluffs/headlands) outside of the direct influence of Pinus attenuata (via wind referenced pollen) and the sympatric sub-populations dominating the conifer/oak woodland interface with the chaparral..... focusing on (a) bark topography, branch alignment and overall growth structure, (b) leaf morphology, coloration, stomatal distribution, (c) cone structure..... color, size, profile/angle of attachment to branch, with particular emphasis on apophysis and umbo gestalt..... the mucro points back down towards the base (point of attachment) of the ovulate cones in Pinus radiata, is dominant in hybrid, miniscule in stature and after a few seasons reduced to a basal scar thru weathering, while in Pinus attenuata, the mucro is orientated apically, claw-like, long persisting and recessive in the hybrid, (d) seed and wing morphology, (e) postulate the potential role of outlying individuals representing a hybrid population, removed from parental influence thru isolation, creating new resegregates via selfing and thru time, establishing a highly reticulate pattern of heterozygosity and (f) during the early stages of seasonal growth in seedling/juvenile trees, needles are often 4-5 per fascicle..... is this reflective of a shared ancestry with the 5-needle taxa of Mexico and Central America and represent a currently derived foliar morphology thru reduction?..... (25) do a comparative analysis of the two coastal forms of Triteleia laxa..... form #1 with laterally symmetrical stamens, whitish anthers and filaments of unequal length and form #2 with radially symmetrical stamens, darker and narrower flowers, short, equal filaments and blue anthers that turn brown..... to determine if there are two different breeding systems at play, with the regionally wide spread form #1 representing an outbreeding strategy while the immediate coastal headland form #2,
in response to prevailing wind patterns, has developed an inbreeding, and consequently less variable from a morphological standpoint, reproductive system..... (26) examine Corallorhiza maculata forma immaculata from an ecological, morphological and molecular perspective, to determine whether local forma immaculata, warrants variety, subspecies or species status and is referable to var. occidentalis..... (27) from a reproductive isolating mechanism perspective, study the following (often) sympatric pairs of related species found within the watershed and determine, (a) if gene flow (uni- or bi-directional) is possible and (b) if ecologically disruptive events (fire, mass wasting, cyclical flooding) can broach, otherwise well-established barriers to gene exchange: Baccharis douglasii = Baccharis glutinosa and Baccharis pilularis..... Stachys bullata and Stachys rigida var. quercetorum..... Eriophyllum confertiflorum and Eriophyllum staechadifolium..... Epilobium ciliatum and Epilobium hallianum..... Trillium chloropetalum and Trillium ovatum..... Smilacina racemosa = Maianthemum racemosum and Smilacina stellata = Maianthemum stellatum..... Festuca elmeri and Festuca occidentalis..... Cryptantha clevelandii and Cryptantha micromera..... (28) with a substantial representation of both native (Agoseris, Hieracium, Malacothrix, Microseris, Rafinesquia, Stebbinsoseris, Stephanomeria and Uropappus) and introduced (Crepis, Hedypnois, Hypochaeris, Lactuca, Lapsana, Leontodon, Picris, Sonchus and Taraxacum) members of the Asteraceae, subfamily Cichorioideae occurring within the area covered by this essay: do a comparative study/analysis (a) from a structural/engineering perspective of the wind dispersed (anemochory) cypselae via pappus, (b) the efficiency of the native versus introduced species dispersal strategies, (c) the effect of disturbance (fire, mass wasting, cyclical flooding patterns, agricultural practices) in maximizing these delivery systems/strategies and (d) map within area of discussion, the native versus introduced taxa populations and ecological behavior (persistent versus ephemeral) over time..... (29) staying within the Asteraceae but this time the subfamily Carduoideae, focusing on the genus Cirsium: compare the behavior (population demographics and habitat preferences/response to disturbance and competition/genetic variability between populations) of Indian thistle (Cirsium brevistylium), Venus thistle (Cirsium occidentale var. venustum) and brownie thistle (Cirsium quercetorum), all native taxa, with the introduced bull thistle (Cirsium vulgare)..... (30) do an in depth study of the genus Quercus, subgenus Erythrobalanus, as it progresses up the Schoolhouse Ridge complex from the riparian corridor to the top of the watershed and determine: (a) where coast live-oak (Quercus agrifolia var. agrifolia) and forest live-oak (Quercus parvula var. shrevei) are sympatric, is the foliar variability of both taxa due, in part, to past hybridization, (b) is there any reduction in fertility for those trees which show some degree of intermediacy between the parental types, (c) in those areas where both taxa are growing intermixed, is there any evidence on a molecular level that shows inheritance of hybrid genes, even though from a morphological perspective, traits specific to one parent but not the other (stellate pubescence in abaxial vein-axils, number and alignment of foliar venation) are not apparent, (d) where forest live-oak (Quercus parvula var. shrevei) enters the chaparral and undergoes both a reduction in stature and change in foliar morphology, is this still the same taxon exhibiting an ecotypic response to a pronounced xeric environment or related chaparral live-oak (Quercus wislizeni var. frutescens) and (e) are there intergrades where these two related taxa meet and if so, is the gene flow uni- or bidirectional?..... (31) with five native species of Pseudognaphalium and one putative natural hybrid..... fragrant everlasting (Pseudognaphalium benoelns), Bioletti’s cudweed (Pseudognaphalimum bioletti), California cudweed (Pseudognaphalium californicum), Gianone’s everlasting (Pseudognaphalium x gianonei, pro.sp. nov.), pink everlasting (Pseudognaphalium ramosissimum) and cotton batting plant (Pseudognaphalium stramineum)..... residing within the watershed and in varying combinations, sharing the same habitat, often to the extent that they are growing intermixed: (a) with P. x gianonei (P. californicum x P. stramineum)
being the most obvious (sharing an intermediacy in overall morphology and chemical signature) fertile hybrid combination observed, study this taxon’s gene flow potential (selfing, sib-crossing and backcrossing to either/or both parents), habitat preference/adaptability for colonizing new environments and is this “new” taxon, a successful chance occurrence or where the parental species ranges overlap, sporadic?, (b) since *P. californicum* and *P. ramosissimum* are often found growing together and blooming concurrently, are the occasional plants of *P. californicum* with pinkish-tinged phyllaries, the result of hybridization or natural variation within the species? and (c) since the native *Pseudognaphalium* species, have distinct chemical signatures besides differences in foliar and floral morphology, do these species specific “scents” (when warmed by the sun and begin to vaporize) act like pheromones and aid in attracting pollinating vectors and effectively allowing sympatrically related taxa to maintain their genetic integrity? ..... (32) Where populations of introduced bull thistle (*Cirsium vulgare*) and native coast tarweed (*Madia sativa*) grow sympatrically: (a) what role does the glandular/viscid stems and herbage of the tarweed play in trapping (like flypaper) the airborne cypselae of the thistle and concentrating an otherwise wind-dispersed taxon within a localized area and thereby increasing the invasive potential/recruitment for future generations?, (b) study the post-fire ecological impacts of this native/exotic species interaction, where the ash-enhanced growth resulted in both taxa achieving heighths/biomass in the 1.5-2(+) meters range and forming, on the *Madia sativa*, pappus cloaked barriers (visually akin to walls of down)..... (33) Do an in depth study of the California nutmeg (*Torreya californica*) found within the watershed (circa 2,000+ all age catagory individuals): (a) map and profile population sizes, habitat preferences, associate species and age/stature, (b) document recruitment patterns throughout watershed, (c) from an evolutionary and ecological perspective, analyze the post 2009 fire ecological impacts of this native/exotic species...... (34) Distribution patterns and ecological constraints: (a) Why does crinkle-awn fescue (*Festuca subuliflora*) follow the coast redwood (*Sequoia sempervirens*) downstream of the Scotts Creek Bridge (albeit sporadically), while associate species further upstream..... red clintonia (*Clintonia andrewsiana*), slick pod (*Scoliopus bigelovii*), brook foam (*Boykinia occidentalis*), sugar-scoop (*Tiarella trifoliata* var. *unifoliata*), vanilla grass (*Hierochloe occidentalis* = *Anthoxanthum occidentale*), two-eyed violet (*Viola ocellata*), redwood violet (*Viola sempervirens*), yerba de selva (*Whipplea modesta*) and deer fern (*Blechnum spicant*)..... have not expanded their ranges downstream, eventhough in varying combinations, this native species combo also occurs in the other sub-watersheds feeding into Scotts Creek proper?, (b) going from the moist and semi-shaded riparian corridor to the decidedly xeric chaparral and coastal scrub..... what ecological preferences confine the bird’s-foot fern (*Pellaea mucronata* var. *mucronata*) to the upper reaches of
the watershed (principally the "Chalks") while sister species, coffee fern (*Pellaea andromedifolia*), extends its range all the way down to the coastal headlands?..... (35) Using GIS, LIDAR and other related mapping tools, see if there is a correlation between topography, geomorphology and biodiversity, using the following areas within the Scotts Creek Watershed and the in situ documentation for those areas found within this essay...... area #1: Schoolhouse Ridge complex, between Scotts and Mill Creeks, extending from Swanton Road up to the "Chalks", area #2: Old Schoolhouse Road, between Little and Winters Creek drainages, from Swanton Road to top of ridge/Cemex property boundary, area #3: Laird Gulch complex, from Last Chance Road down to entrance into Scotts Creek, area #4: Magic Triangle Ridge/Synform drainage complex and the attendant 7+ "gulchlets" which coalesce into one narrow stem that enters Scotts Creek just below the Scotts Creek Bridge, area #5: the e/ne oriented drainage system, beginning near the Mt. Cook area and entering into Scotts Creek, between the confluentes of Big and Little Creeks..... also contains isolated chaparral disjunct, worthy of a study unto itself!, area #6: the complex series of landslide derived, hydrologically active, benched marshes, beginning with "Beaver Flat" and stepwise, descending southward down to the "Marti’s Park Marsh", area #7: the west facing, descending grassland/chaparral mosaic..... beginning at the top of the Seymore Hill and flanked by Calf Gulch to the south and Bettencourt Gulch on the northwest, including the "bowl area" and basally demarcated by Purdy Road and areas #8 and #9: the bifurcate drainage system, which includes Cookhouse gulch as one contributor and the adjacent(south-east flanking) benched, incised and possibly rotated gulch complex, home to two uncommon native grass species, California bottlebrush grass (*Elymus californicus*) and crinkle-awn fescue (*Festuca subuliflora*)..... (36) Study the isolated populations of locally uncommon summer lupine (*Lupinus formosus var. formosus*) and (a) note the extreme variability in seed coat patterning within a given population..... is this the result, from an evolutionary perspective, of generating multiple series of seed coats varying in their surface coloration, allowing some seeds to blend into the surrounding dry grasses, exposed rocky debris, etc., and by cryptis (camouflage), offsetting predation for at least some of the season’s mature seeds?, (b) compare the recruitment success between more or less uniformly patterned yellow bush lupine (*Lupinus arboreus*) seeds with those of the sympatric summer lupine (*Lupinus formosus*), both locally and elsewhere, succeed best in grasslands where the textural variability of the surrounding vegetation can be correlated with seasonal rainfall and consequent changes in frequency/timing from year to year?..... (37) Using the two visually distinctive Lair Gulch populations as a base line, do an in depth study comparing the riparian corridor and chaparral populations of the coast redwood (*Sequoia sempervirens*), to determine: (a) if there are genetic differences between the two ecotypes, (b) if so, are there physiological and metabolic differences correlative to their mesic versus xeric habitats, (c) are the differences in stature and foliar pigmentation genetically fixed and transmittable via seed, (d) are there temporal differences in achieving reproductive maturity and any measurable deviations in ovulate cone size, quantity and size of seed produced and fertility..... both as to pollen and seed, (e) using chloroplast DNA and other genetic markers (as per differences in mutation rates), is there any correlation from a geomorphological perspective, between uplift and downcutting thru erosive action, which theoretically over time, could have separated what originally was one population into two? and (f) do an comparative study with the chaparral ecotype growing on the "chalks", between Bettencourt Gulch and the Seymore Hill..... (38) Along Swanton Road, between Scotts and Big Creek Bridges, several native taxa can be observed during the Fall season, producing ripe fruit, which in varying degrees, is both fleshy (baccate) and/or in the red to orange color range..... approaching this subject from a co-evolutionary viewpoint, (a) is fruit color falling within the red to orange end of the spectrum vector specific relating to dispersal?
(b) can color and the ability of the epidermal surface of the ripe fruit to refract or reflect light, act both as an enticement and/or warning,..... hairy honeysuckle (Lonicera hispidula) with intensely colored but not lustrous fruits versus baneberry (Actaea rubra) with nitid, as if varnished, fruits which contain a glycoside, ranunculin?, (c) with pendant, semi-glossy oblate-spheroid reddish-orange fruits looking like reduced-in-scale cherry tomatoes, Hooker's fairy bells (Prosartes hookeri) presents an interesting contradiction..... the habitat for this monocot is usually the mixed conifer/hardwood semi-shaded understory and the ripe fruits as well as the preceeding the greenish-white flowers, are pendant and for the most part, hidden from aerial viewing..... even though the over-arching foliage of this species is deciduous, what role does color play in fruit dispersal when it is so cryptically displayed and is there an olfactory component involved?, (d) also possessing pendant flowers and fruits but this time suspended by hair thin peduncles and having the exposed seed enclosed in a reddish-orange aril, the seasonally deciduous 2-4 meters in heigth shrub, western burning bush (Euonymus occidentalis var. occidentalis), presents yet another question of fruit/seed dispersal, (e) two related and often sympatric growing species with fruits an aggregate of orange/red/pink colored druplets, thimbleberry (Rubus parviflorus) and salmonberry (Rubus spectabilis) margin both the roadside and adjacent stream banks, (f) horticulturally desirable California wild rose (Rosa californica), with fleshy reddish-orange "hips" aka ripened flower-tubes was observed 10/29/10 growing with both hairy honeysuckle and blue elderberry, their fleshy fruits a study in contrasting colors, (g) staying within the Rosaceae and adding visual warmth during the advent of the winter season, with scarlet pomes on terminal corymbose panicles, the toyon (Heteromeles arbutifolia) offers birdlife nourishment during the bleakest time of the year, (h) another related species duo, fat Solomon's seal (Smilacina racemosa) and slim Solomon's seal (Smilacina stellata), both sport succulent berries colored reddish-orange thru reddish-purple..... red being the operative word, (i) accenting the wooded slopes overlooking the riparian corridor, Pacific madrone (Arbutus menziesii) gives the toyon competition, with an the end-of-season display of panicles laden with berries the color of blood oranges, (j) still staying within the warm end of the visible light spectrum, the cymose panicles of the red elderberry (Sambucus racemosa var. racemosa) present a visual feast for end-of-season avians and is this a generalist banquet or are certain bird species targeted?, and (k) if the co-evolutionary value of color coded/vector dispersed fruits, is the establishing of new populations which are not competitive with the seed producing parent and thereby insuring outbreeding and the potential for increased genetic diversity, how successful within the Scotts Creek Watershed is this strategy, particularly when several of the taxa involved are also long lived and expand their biomass, asexually, through rhizomes?..... along this relatively short section of Swanton Road, are several other plant species with fruting bodies possessing varying degress of succulence and coloration: can a pattern of coevolution be established, based on fruit color and secondarily, odor, for these taxa and are the dispersal vectors, species specific or generalist in nature? Here is a partial listing, which ultimately could be extended to cover the entire watershed, of native taxa to study for their seed dispersal strategies and to what extent, coevolution is a key component..... (1) fruit baccate and translucent, California bedstraw (Galium californicum subsp. californicum), (2) fruit a drupe and dark purplish-brown, California coffeeberry (Frangula californica subsp. californica), (3) fruit a drupe, blackish coated with a glaucous bloom, blue elderberry (Sambucus nigra subsp. canadensis), (4) fruit a berry, purplish densely covered with stiff hairs some of which are gland-tipped, canyon gooseberry (Ribes menziesii), (5) fruit a drupe, greenish suffused with purple turning milky-white at maturity, creek dogwood (Cornus sericea subsp. sericea), (6) fruit a drupe, blue-glaucous, oso berry (Oenothera gravisformis), (7) fruit an aggregate of blackish-purple druplets, California blackberry (Rubus ursinus) and (8) the watershed's two native nightshades, Douglas's nightshade
(Solanum douglasii) with black berries and blue witch (Solanum umbelliferum), with ripe fruits colored an off-white with basal portion greenish. (39) Does a coating of dust (mudstone, in part, reduced to powder) on the adaxial foliar surface of Agrostis hallii and related species, act as a barrier, to the establishment/development of fungal pathogens (e.g., rusts) during the summer months, as observed along the upper section of dirt road which enters into and parallels Little Creek? Study the various taxa within a given area, where the fungal pathogens are known to occur and analyze, from a foliar topography perspective, what conditions have to be met, in order for the fungal spores to become attached and subsequently germinate. (a) are foliar surfaces with recessed stomatal pits, impressed veinal patterns and various trichome modifications, more susceptible than leaves with stomata only on the abaxial surface, adaxial surfaces which are plane and/or coated with a waxy bloom or thickened cuticle?, (b) what role does exposure to the elements (sunlight, wind and moisture laden riparian air movement patterns) as opposed to tree trunk/canopy induced shade and the concomitant light reduction/air flow restriction play, in conjunction with the aforementioned physical conditions defining the foliar surfaces? (40) Study the local populations of Fritillaria affinis, from both an ecological and molecular angle, and (a) are the immediate coastal bluff populations, with their larger in size, thicker in texture and darker in coloration flowers, distinct from the watershed/riparian corridor populations, both as to genetic makeup and pollinating vector/reproductive behavior?, (b) are the “intermediate phases”, found where the Western Terrace is bisected by the lower section of Big Willow Gulch, a subspecies in the making (with the gene flow isolation being complete in the coastal bluff population(s) and (c) can one make a determination, from both morphological and molecular studies, the transition from an outbreeding series of overlapping populations within the Scotts Creek Watershed proper (forma typica) through the distinctive/isolated coastal bluff taxon and what is its relationship with the analogous north coast subspecies tristulis? (41) Do a botanical distributional analysis of the Scotts Creek Watershed and its environs, showing familial representation broken down by genera and species (e.g., APIACEAE, Sanicula, Sanicula hoffmannii) and (a) using this relatively small (30 square mi) but species rich (10-12%+ of California’s flora) coastal watershed as a base line, do a comparative profile of the watersheds to the north and south, (b) within the Scotts creek Watershed, is there any correlation between species distribution and habitat specificity, (c) examine the human footprint within the watershed where there is a known timeline (e.g., coastal prairie/Western Terrace), and determine what is the ratio of native to introduced taxa and can any trends be observed, such as (1) native taxa peripheral to areas formerly under cultivation recolonizing the fallow fields, (2) other native taxa, being marginalized/isolated by newly introduced and more aggressive species and (3) sympatric related taxa which may or may not be genetically compatible (e.g., Agrostis, Carex) having their reproductive isolating mechanisms broached by the disturbance regimes (punctuated equilibrium) and new “hybrids” or genetically “enriched” species emerging. (42) Analyze from morphological, molecular, reproductive, ecological and biogeographical frames of reference, the distinctive open-paniculate “form” of Juncus occidentalis, which occurs in Beaver Flat and has been observed in situ for the past 30+ years, as well as documented by herbarium pressings (UC Berkeley/Jepson Herbarium) and is represented by living material and seeds at the UCSC Arboretum. (1) since the forma typica for Juncus occidentalis, in Beaver Flat and the rest of the Scotts Creek Watershed, has a loose to densely capitate inflorescence, is the open-paniculate “form” (simulating the sympatric Juncus bufonius) an extreme variation of the type or is it indicative of a shared lineage with Juncus tenuis?. (2) What accounts for the persistant/localized occurrence of the open-paniculate “form” in Beaver Flat but not elsewhere in the watershed and could this be due to isolation/inbreeding of a population referencing Juncus tenuis genes?, (3) is the open-paniculate “form” reproductively isolated from the sympatric forma typica of Juncus.
occidentalis and if selfed or sib-crossed, would the F1 offspring be uniformly the open-paniculate "form" or reflect the overall Beaver Flat population in the ratio of plants with open-paniculate to closed(capitate) inflorescences? and (4) is there an efficiency differential, in terms of successful pollination/fertilization, between the open-paniculate and congested(capitate) inflorescence plants?..... note: Paralleling the open and densely congested inflorescence dimorphism of Juncus occidentalis is another Juncaceae constituent and Scotts Creek Watershed botanical component, Luzula comosa. Do a study to ascertain if the underlying mechanisms determining both taxa's inflorescences are shared or independently derived from different environmental pressures..... (43) With numerous self-perpetuating micro-populations of Claytonia perfoliata subsp. perfoliata found throughout the watershed and when growing sympatrically, still maintain their distinctive calyx coloring/patterning: study..... (a) the reproductive isolating mechanisms [obligate selfer versus outbreeder], (b) gene/genes controlling pedicel, calyx and corolla pigmentation [one or multiple, recessive/dominant], (c) what, if any, pollinating vectors are involved and (d) categorize the various color patterns as to (1) frequency of occurrence, (2) variability within a given population, (3) habitat correlation with specific pattern, (4) heterozygous or homozygous for color/pattern when artificially selfed and (5) when artificially crossed, do these variants act as microspecies?..... (44) With several components of the Mimulus guttatus complex represented within the Scotts Creek Watershed and its environs [see pages 22-24 of this essay], initiate a study which includes field observation, controlled garden studies and laboratory analysis, to determine: (a) the role of pollinating vectors in maintaining genetic integrity of sympatric related taxa, (b) importance of corolla morphology, lip patterning and scent in attraction/facilitation of potential pollinating vectors, (c) the genetic versus environmental basis for annual/perennial growth patterns and the related hydrological implications of cleistogamous/out-breeding reproductive systems, (d) are there structural/morphological differences within the various subsets of the Mimulus guttatus complex, such as seed gestalt, that are consistent enough to warrant form or varietal status, (e) study the relationship between the nanistic, self-pollinating taxa found growing on moss covered mudstone [upper Calf Gulch and coastal gulches abutting Highway 1] and the often robust forms of [var. gracilis = Mimulus nasutus] growing on sandbars within the Scotts Creek riparian corridor, (f) do controlled artificial breeding studies with the various members of the Mimulus guttatus complex locally, to determine intra-specific compatibility, uni-directional versus bi-directional gene flow, foreign pollen inducing facultative apomixis, and if sufficient moisture is present, can cleistogamy be replaced temporarily with a modified out-breeding system?..... (45) With more than 150 examples of Carex "imperfecta" documented for the coastal prairie, between Lasher and Scotts Creek Marshes, investigate this putative hybrid link between the Multiflorae and Ovales sections, from the following angles: (a) pollen production and fertility..... do all or only some "imperfectas" produce pollen and does fertility vary from plant to plant?, (b) formulate scenarios for origin of the "imperfectas"..... are all the Carex "imperfectas" F1 crosses or the result of selfings and/or backcrossings of the fertile Carex "nitidicarpa" (densa x subbracteata) onto either parent?, (c) longevity and fertility..... does fertility change thru time and does age of plant and amount of accrued biomass, have any influence?, (d) vertical versus horizontal (ecto-ascending/prostrate) alignment of flowering culms..... potential differences in windborn pollination efficiency, (e) solitary versus clustered distribution of "imperfectas" and potential for maximizing unidirectional "hybrid" gene flow back into sympatric parental gene pool, (f) study the role of natural/man made disturbance patterns and the broaching of reproductive isolating mechanisms in both the formation of primary and complex crosses and the role non-Mendelian genetics (gene fragments from centromeric fission/fusion) play in the Carex gianonei/imperfecta/nitidicarpa syngameon, (g)
map the occurrences of Carex "imperfecta", with regard to both previous land use activity and presence/absence of either or both parental species, (h) chart the transformation of C. subbracteata to C. nitidicarpa, by examining thickness, angularity, marginal scabridity and resistance to tearing of mature flowering culms (influence of Carex densa), presence of compound-congested lower 1-5(+) spikelets (reduced panicle branches derived from Carex densa), changes in arrangement of staminate and pistillate flowers (gynaecandrous/androgynous/mixed) and overall morphological variability plus intrapopulational fertility, (i) are the Carex gianonei (Carex harfordii matrix) populations, older in origin than the local Carex "imperfecta"/Carex nitidicarpa representatives and chart the distribution patterns for both, within and outside of the Scotts Creek Watershed, to determine if the (non-functioning pistillate) Carex "imperfecta" and (fertile) Carex nitidicarpa can occur in the absence of either/but both Carex densa and Carex subbracteata, (j) do a comparative analysis between the coastal prairie and interior (Beaver Flat, West's Spring Marsh, Marti's Park Marsh, Laguna de las Trancas drainage) occurrences of Carex "imperfecta" and catalog the similarities/differences from an ecological perspective..... (46) As with the Carex "imperfecta" hybrids, the Juncus hesperius x Juncus patens hybrids can possibly offer valuable insights into evolutionary theory and speciation, with some of the following issues needing to be addressed: (a) determine if the hybrid is self-fertile and if so, how does this play in the hybrid genes potentially referencing back into either parental species?, (b) with very low to non-existant viable seeds often being produced, is pollen fertility equally low or possibly higher, which could offset the poor seed production?, (c) with parents having 3[J. hesperius] and 6[J. patens] stamens respectively, is the fertility of the hybrids variable on an individual stamen level?, (d) does longevity and increase in biomass, bring about changes in the hybrid's fertility or is this an immutable condition?, (e) with both parents displaying "natural" variability as to overall gestalt, could some of this morphological plasticity be due to backcrossing from the hybrid offspring?, (f) what is the trigger mechanism that allows the hybrids to occur, natural or anthropogenic disturbance and is the gene flow uni- or bi-directional between the parents?, (g) do the F2 offspring, if they occur "naturally", display heterosis [hybrid vigor] or are they inherently weaker and prone to shorter life spans and total sterility?..... (47) Expanding on and relevant to the aforementioned discussion of Juncus hesperius x Juncus patens hybrids, is the following post-anthesis behavior of Juncus patens..... unlike the other 10 species of Juncus [J. acuminatus, J. breueri, J. bufonius, J. effusus var. pacificus, J. hesperius, J. mexicanus, J. lescurii, J. occidentalis, J. phaeocephalus and J. xiphioides] occupying the watershed and its environs, the mature/opened capsules of Juncus patens when exposed to moisture, envelop the seeds in a gelatinous encasement analogous to a cluster of microscopic frog eggs. This distinctive characteristic is not made mention of in the principal literature dealing with California floristics [Abrams, Hoover, Howell, old and new Jepson, Mason, Munz and Keck or older floras dealing with the section genuini, such as Britton and Brown, the recent Flora of North America or family overviews, Heywood]. Is the gelatinous material [a] derived from the seed coat or the interior wall of the capsule?, [b] from a co-evolutionary perspective..... does it facilitate seed dispersal, either as an adhesive or when dry, act as a visual attractant to disperse the concentrated seeds in easily fractured glassine packets?, [c] what is the chemical makeup of the mucilaginous secretion which the seeds are embedded in..... does it act as a fungicide and/or have pathogen inhibiting properties?..... (48) In some ways paralleling the Monardella villosa subspecies [subsp. villosa and subsp. franciscana], the two varieties of Chlorogalum pomeridianum locally [var. pomeridianum and var. divaricatum] present opportunities to study the underlying mechanics of intraspecific variation within a biogeographically defined environment. Some questions to be asking, are as follows: (a) is habitat preference, exposed edges of grassland covered terraces versus sheltered
understory of mixed hardwood/coniferous woodland, in part genetically determined, and how adaptable would seedlings of both varieties be, when raised ex situ, then transplanted to their varietal counterpart's habitat?, (b) are both varieties outbreeders and does the vespertine blooming time aid the exposed var. divaricatum with a respite from the often daily westerly wind patterns?, (c) with the inflorescences reduced in stature and branching patterns often at right angles to the main axis in var. divaricatum, do other vectors besides moths play a role in pollination?, (d) are there measurable physiological and metabolical differences between the two varieties, considering the differing ecological conditions that both are exposed to..... such as [1] bulb size , shape and storage capacity, [2] seed size, numbers produced and differences in their nutritional reserves, recruitment success and growth rate/maturation times between the two varieties under controlled conditions?, (e) are there any differences on a chromosomal level between the two varieties, that would prevent successful fertilization and the establishment of intraspecific hybrids, should populations of var. pomeridianum and var. divaricatum overlap and relevant to this question, have the two varieties in question, been isolated long enough from each other, to have any genetically set differences that would preclude the successful exchange of genetic material?..... (49) Do an in depth study of the Bromus carinatus complex found within the Scotts Creek Watershed and directly outside on the Santa Cruz and Western Terraces, to determine which populations, are obligate selfers and which are outbreeders through anemophily [wind pollination] and how these reproductive strategies relate to each population's overall gross morphology and genetic variability. Does the continued presence of atmospheric moisture [fog or nocturnal condensation] such as found in habitats with a close proximity to the ocean play a co-evolutionary role in the developement of a closed breeding system? Several distinctive "forms" of Bromus carinatus repeatedly occur throughout the Swanton area, one of which warrants closer examination..... what separates this component of the Bromus carinatus complex from the numerous other local variants, are the following characters: [1] heigth 1.5-2 meters, [2] leaf width 2.5cm or more, often shallowly plicate [3] inflorescences large and intricately branched, with lower branches conspicuously retrose in alignment. Do these observable "morphologies" have corresponding underpinnings on a molecular level, which when coupled with the frequency of occurrence, could lead to the taxon being given varietal status? On the Santa Cruz and Western Terraces, between Waddell and Scotts Creek Beaches, another distinctive phase of Bromus carinatus occurs, showing affinity and possibly conspecific with Bromus maritimus..... the distinguishing attributes of this native brome being the lowest glume is 3-veined, the second glume has 5-7 veins with the branches of the inflorescence appressed-ascending to arcuate, equal to or shorter than the spikelets and at maturity, becoming prostrate or nearly so..... (50) Toxicodendron diversilobum aka poison oak has two basic growth patterns within the watershed: a free standing and a low growing to sub-arboreal shrub and a tree supported woody vine, which can exceed 20m in heigth and have a stem diameter, six feet above ground level, exceeding 13cm. Do the free standing and tree supported forms of poison oak exhibit physiological, metabolic and structural (cambium layer production, vascular transport systems) differences based on the contrasting distances between root systems and photosynthesizing foliage? Is there a dropoff in successful pollination/fertilization and corresponding fruit set, when the liana-like form of Toxicodendron diversilobum reaches a specific heigth threshold and the vector attracting floral scent is more apt to be impacted by air movement, temperature and density of host tree canopy? Can any poison oak seedling, given the opportunity, develope one or the other growth patterns or is this behavior genetically determined and environmentally reinforced? Are there differences in the root systems and food storage capacities of the two growth forms and have the ligneous aerial stems of the support dependent variant, developed supplemental storage zones due to the greater vertical differences between
roots and foliage? With the some of the largest, both in terms of stem diameter and heigh
tached, examples of the vine form of poison oak found growing on the long-lived *Sequoia
sempervirens*, is there a life-span difference between the two growth forms or does longevity
reside within the root system’s regenerative capacity? Do the woody stems of the vine form act
like vertical rhizomes, attaching themselves to the bark with modified root systems and is any
part of the exposed surface of the attached stems capable of photosynthesis?

With the distribution patterns of the coast redwood (*Sequoia sempervirens*) limited principally
to tributaries and the upper/central portion of the Scotts Creek riparian corridor and not
presently found proximal to the Scotts Creek Marsh environs, what factors can be marshalled
to explain this conspicuous absence? Excluding human activity, one possible scenario involves
the mycorrhizal associations between fungi, roots and seed germination. With shallow fungi-
hosting root systems that can extend for a hundred or more feet from the tree base and the
capability of even relatively young trees producing thousands of seeds, there may be an
advantage for the parent trees to establish outbreeding satellite colonies which are sympatric
with but not directly competitive for light and subsistence, while retaining the ability to
produce asexually, clonal facsimilies. The success of establishing satellite colonies may be
offset by the increased seed production and corresponding over-utilization of fungal reserves
in the sub-surface root systems, leading to cyclic periods of poor germination and subsequent
production of weak, unhealthy seedlings. In the lower portion of the watershed (flood plain
area), seasonal/cyclical periods of flooding may upset the balance between beneficial and
pathogenic fungi, thereby creating a hostile environment for the long-term establishment of
redwood colonies!

Before beginning our traversal, here are some background statistics relating to the flora of
Swanton and its environs:

Of the 1,448 species (native and introduced) listed in the recently published *An Annotated
Checklist of the Vascular Plants of Santa Cruz County, California* by Randall Morgan, et al
(2005), in excess of 55% occur within the area defined by our traversal! With reference to those
native taxa designated as locally rare, 123+ are known to have occurred or currently reside within
the watershed and its surroundings.

Since much of the published literature dealing with the taxa discussed within this text does
not reflect the most recent nomenclatural changes made due to ongoing molecular work, both
the superceded and current names are used throughout this botanical overview of the Scotts
Creek Watershed and its immediate environs.

Representing the “Dicots”, the Asteraceae (a family undergoing extensive nomenclatural
changes due to recent and ongoing molecular studies) scores big with 43+ genera containing
species native to the area (Achillea, Adenocaulon, Agoseris, Ambrosia, Anaphalis, Arnica, Artemisia,
Aster*, Baccharis, Cirsium, Conyza, Eriogonum, Eriophyllum, Euthamia, Filago*, Gnaphalium*,
Grindelia, Helianthus, Hemizonia*, Heterotheca, Hieracium, Jasmiea, Lasthenia, Layia, Lessingia*, Madia*,
Malacothrix, Micropus, Microseris, Pentachaeta, Petasites, Psilocarphus, Rafinesquia, Senecio, Solidago*,
Stebbinsoseris*, Stephanomeria, Symphyotrichum, Uropappus, Wyethia and Xanthium).
*Aster chilense = Symphyotrichum chilense
*Aster subspicatus = Symphyotrichum subspicatum
*Aster radulinus = Eurybia radulina
*Filago californica = Logfia filaginoides
*Gnaphalium bicolor = Pseudognaphalium bialetti
*Gnaphalium californicum = Pseudognaphalium californicum
*Gnaphalium canescens ssp. beneolens = Pseudognaphalium beneolens
*Gnaphalium gianonei, pro.sp.nov. = Pseudognaphalium gianonei, pro.sp.nov.
*Gnaphalium ramosissimum = Pseudognaphalium ramosissimum
*Gnaphalium stramineum = Pseudognaphalium stramineum
*Gnaphalium purpureum = Gamochaeta ustulata
*Hemizonia corymbosa = Deinandra corymbosa
*Lessingia filaginifolia var. californica = Corethrogyne filaginifolia
*Microseris decipiens = Stebbinsoseris decipiens
*Madia madioides = Anisocarpus madioides
*Solidago californica = Solidago velutina subsp. californica
*Solidago canadensis subsp. elongata = Solidago elongata

Representing the “Monocots”, the Poaceae comes in with 19 genera containing species native to the area (Agrostis, Bromus, Calamagrostis, Danthonia, Deschampsia, Distichlis, Elymus, Festuca, Hierochloe*, Hordeum, Koeleria, Leymus*, Melica, Nassella*, Panicum, Phalaris, Poa, Trisetum and Vulpia) and the Liliaceae (sensu lato) following up with an additional 15 genera (Allium*, Brodiaea*, Calochortus, Chlorogalum*, Clintonia, Dichelostemma* Disporum*, Fritillaria, Lilium, Scoliopus, Smilacina*, Trillium*, Triteleia*, Xerophyllum* and Zigadenus*). With a combined total of 34 genera, the two largest “Monocot” families contributing to the area’s biodiversity are still outnumbered by the “Dicots” largest contributor, the Asteraceae, even with the removal of the cosmopolitan genus Xanthium, which has populations showing founder effects. Reflecting the recent changes taking place, both within genera and families due to studies based on molecular data, the above statistical assessments no longer hold true!!

*Disporum hookeri = Prosartes hookeri
*Zigadenus fremontii = Toxicoscordion fremontii

*Allium placed in Alliaceae
*Brodiaea, *Dichelostemma and *Triteleia placed in Thelimidaceae
*Chlorogalum placed in Agavaceae
*Prosartes (Disporum) placed in Colchicaceae
*Smilacina moved to Maianthemum and placed in Rusaceae
*Toxicoscordion (Zigadenus), *Trillium and *Xerophyllum placed in Melanthiaceae

*Hierochloe occidentalis = Anthoxantum occidentale
*Leymus triticioides = Elymus triticioides subsp. triticioides
*Leymus xvancouverensis = Elymus xvancouverensis
*Nassella lepida = Stipa lepida
*Nassella pulchra = Stipa pulchra
Lemna placed in the Araceae
Sparganium placed in the Typhaceae


*Hydrocotyle now placed in the family Araliaceae


*Potentilla glandulosa = Drymocallis glandulosa var. glandulosa


*The following taxa, formerly placed in the genus Lotus, are now called Acmispon: Lotus benthamii = Acmispon cytisoides, Lotus heermannii var. orbicularis = Acmispon heermannii var. orbicularis, Lotus humistratus = Acmispon brachycarpus, Lotus junceus var. junceus and var. bioletii = Acmispon junceus var. junceus and var. bioletii, Lotus micranthus = Acmispon purpureiflorus, Lotus purshianus var. purshianus = Acmispon americanus var. americanus, Lotus salsuginosus var. salsuginosus = Acmispon maritimus var. maritimus, Lotus scoparius var. scoparius = Acmispon glaber var. glaber, Lotus strigosus = Acmispon strigosus and Lotus wrangelianus = Acmispon wrangelianus.

*The following taxa, formerly placed in the genus Lotus, are now called Hosackia: Lotus formosissimus = Hosackia gracilis, Lotus oblongifolius var. oblongifolius = Hosackia oblongifolia (according to J.H. Thomas: Flora of the Santa Cruz Mountains, Lotus oblongifolius var. nevadensis occurred in Swanton), Lotus stipularis var. stipularis = Hosackia stipularis var. stipularis (note: the isolated populations found on the Laird Gulch Ridge, having foliage and inflorescences covered with balasmic scented glands, fall within the circumscription of Hosackia balsamifera Kell.).


*Antirrhinum, Collinsia, Keckiella, Linaria and Veronica now placed in family Plantaginaceae, along with locally rare mare's tail (Hippuris vulgaris)
*Castilleja, Pedicularis and Triphysaria now placed in family Orobanchaceae
*Mimulus now placed in family Phrymaceae

The Brassicaceae contributes 9 genera: Arabis = Turritis, Athysanus, Barbarea, Cardamine, Caulanthus, Erysimum, Lepidium, Rorippa and Thysanocarpus.

The Boraginaceae (acquires additional genera from the Hydrophyllaceae due to recent molecular investigations and contributes 9 genera: Amsinckia, Cryptantha, Cynoglossum, Emmenanthia, Eriddictyon, Heliotropium, Nemophila, Phacelia and Plagiobothrys.
The Lamiaceae contributes 8 genera: Lepechinia, Monardella, Pogogyne, Prunella, Salvia, Satureja*, Scutellaria and Stachys.

*Satureja douglasii = Clinopodium douglasii

The Ranunculaceae contributes 7 genera: Actaea, Anemone, Aquilegia, Clematis, Delphinium, Ranunculus and Thalictrum.


*Linaria canadensis = Nuttallanthus texanus

The Caryophyllaceae contributes 6 genera: Cardionema, Minuartia, Sagina, Silene, Spargularia and Stellaria.

*Linaria canadensis = Nuttallanthus texanus

The Saxifragaceae contributes 6 genera: Boykinia, Heuchera, Lithophragma, Saxifraga*, Tellima and Tiarella

*Saxifraga californica = Micranthes californica

The Ericaceae contributes 5 genera: Arbutus, Arctostaphylos, Gaultheria, Rhododendron and Vaccinium.

The Polemoniaceae contributes 5 genera: Allophyllum, Collomia, Gilia, Linanthus* and Navarretia.

*Linanthus androsaceus = Leptosiphon androsaceus
*Linanthus bicolor = Leptosiphon bicolor

Five of the ten described species for the orchid genus *Piperia* occur within the area under discussion, coast rein orchid (*Piperia elegans* = *Piperia elegans subsp. elegans*), dense-flowered rein orchid (*Piperia elongata*), Michael’s rein orchid (*Piperia michaelii*), royal rein orchid (*Piperia transversa*), including a coastal form of Alaska rein orchid (*Piperia unalascensis*), which matches only the type collection from Unalaska Island!

Scattered throughout the watershed, four representatives of the Willow Family (Salicaceae) occur, three often growing intermixed but in the case of Scouler’s willow (*Salix scoulerianna*), usually preferring its own company: the three considerably more gregarious family members are, arroyo willow (*Salix lasiolepis*), yellow willow (*Salix lucida subsp. lasiandra = Salix lasiandra var. lasiandra*) and velvet willow (*Salix sitchensis*). Since willows are dioecious, finding a large old specimen of arroyo willow in the upper portion of “Cookhouse Gulch” some thirty years ago producing several bisexual catkins (aments), definitely raised questions about the evolutionary scenario which gave rise to the dioecy of this globally widespread genus!

Since the early 1970’s, two “new to science” clovers (genus *Trifolium*) have been discovered and documented for the Swanton area. One species, Santa Cruz clover (*Trifolium buckwestiorum*), has already been published and is listed FSC/1B while the second taxon, headland clover (*Trifolium aff. physanthum*?)*, is as yet, unpublished. Staying with the Legume Family (Fabaceae), there are 18+ native species of Clover (genus *Trifolium*), 13+ native species of
Trefoil (genus *Lotus*, now divided between *Acmispon* and *Hosackia*) and 11+ native species of Lupine (genus *Lupinus*) calling the Swanton area home.

*Note: Due to the misapplication of the name *Trifolium physanthum* to a taxon originally given the working name of *Trifolium “pseudo-barbigerum”* and documented from the coastal prairie of the Old H-H Ranch circa 25 years ago, a different name will have to be proposed before this new and valid species is published! From a biogeographical perspective, this taxon has also been documented from the lower portion of Whitehouse Canyon in southern San Mateo County.

Two endemic manzanitas, Schreiber’s manzanita (*Arctostaphylos glutinosa* Schreiber) and a recently described and published taxon (*Arctostaphylos ohloneana* M.C.Vasey & V.T.Parker), possibly related to *Arctostaphylos manzanita* subsp. *laevigata* on Mt. Diablo, are not known to occur outside of the Scotts Creek Watershed!

**Note:** An insular disjunct, *Arctostaphylos crustacea* subsp. *subcordata*, occurs in one isolated population on the Schoolhouse Ridge and has been documented by herbarium pressings (UC Berkeley/Jepson), digital images and cuttings deposited with the UCSC Arboretum for propagation.

Here is a *condensed listing* of native taxa, found within the Swanton area, that due to rarity, uncertain taxonomic status and/or horticultural value, merit study: mare’s tail (*Hippuris vulgaris*)**, beargrass (*Xerophyllum tenax*)**, oracle oak (*Quercus x morehus*), *Carex gianonei*, *pro. sp. nov.* / *Carex nitidicarpa*, *pro. sp. nov. complexes*, Kellogg’s horkelia (*Horkelia cuneata* subsp. *sericea*), San Francisco collinsia (*Collinsia multicolor*), California lace fern (*Aspidotis californica*), California sword fern (*Polystichum californicum*), Schreiber’s manzanita (*Arctostaphylos glutinosa*), bent-flowered fiddleneck (*Amsinckia lunaris*), purple godetia (*Clarkia purpurea* subsp. *purpurea*), *Gianone’s everlasting* (*Gnaphalium gianonei*, *pro. sp. nov. = Pseudognaphalium gianonei*, *pro. sp. nov.*), marsh microseris (*Microseris paludosa*), lovage (*Ligusticum apiifolium*), bitter cherry (*Prunus emarginata*), Alaska rein orchid (*Piperia unalascensis*), service berry (*Amelanchier utahensis*), spotted coralroot (*Corallorhiza maculata* and forma *immaculata*), Santa Cruz microseris (*Stebbinsoseris decipiens*), Blasdale’s bent grass (*Agrostis blasdalei*), banded owl’s clover (*Castilleja exserta* subsp. *latifolia*), owl’s clover (*Castilleja densiflora* subsp. “?”/*Orthocarpus nootuinus* Eastw. analog), purple-beaked owl’s clover (*Triphysaria micrantha*), San Francisco popcorn-flower (*Plagiobothrys diffusus/reticulatus = Plagiobothrys diffusus*), San Francisco wallflower (*Erysimum franciscanum*), bouquet clover (*Trifolium grayi*), Santa Cruz clover (*Trifolium buckwestiorum*), *headland clover* (*Trifolium “pseudo-barbigerum”/Trifolium physanthum*), Hoffman’s sanicle (*Sanicula hoffmannii*), *Gianone’s sanicle* (*Sanicula gianonei*, *pro. sp. nov.*), green cottonweed (*Micropus californicus* var. *subvestitus*), harvest brodiaea (*Brodiaea elegans* subsp. *elegans*), Hall’s willow herb (*Epilobium hallianum*), and Fremont’s nemophila (*Nemophila pulchella* var. *fremontii*).

**Note:** As of 2007, curitorial action by R.B.Kelley, has reinstated the original diagnosis for Scotts Creek Watershed herbarium specimens tentatively labeled as the rare San Francisco popcorn-flower (*Plagiobothrys diffusus*) but interpreted by some students of the genus, more broadly..... including it within the circumscription of the *Plagiobothrys reticulatus* complex.

**Note:** Much work remains yet to be done in the way of documenting the flora and
fauna, both native and exotic, within the Scotts Creek Watershed and its surrounding environs. During the early 1980s, herbarium pressings numbering in the high hundreds, were made of key elements of the area’s flora, specifically those taxa which were (a) putatively “new to science”, (b) rare throughout their documented range, (c) represented disjuncts and/or potentially misdiagnosed components of wide ranging or highly localized taxa and (d) offered frames of reference towards the clarification of taxonomic problems found locally within “difficult” genera such as Agoseris, Agrostis, Arctostaphylos, Bromus, Carex, Castilleja, Clarkia, Claytonia, Dudleya, Festuca, Grindelia, Juncus, Melica, Microseris, Mimulus, Monardella, Nemophila, Pinus, Piperia, Pseudognaphalium, Quercus, Sanicula, Trifolium and Trillium. Between 2007 and 2009, in excess of 1,000 envelopes of in situ collected seed plus several hundred living collections (cuttings, divisions and entire plants) from the watershed, were deposited at the USCS Arboretum, with the ultimate goal: (1) to stock the newly expanded section featuring native taxa representing the biodiversity of the Central Coastal California ecosystem and (2) provide a comprehensive living data base for pursuing physiological, biochemical and genetic analyses, complementing the extensive herbarium documentation. Also noteworthy, are the ongoing photo-documentation projects, begun in the 1970’s by the late Mike Perkins (the localized and possibly extinct coastal populations of Piperia unalascensis survive via his 35mm slides), greatly expanded by Dylan Neubauer and more recently, Brett Hall, and culminating with an ongoing digital library, set up by the CalPoly/Swanton Pacific Ranch (one of the few digital images of a local Lupinus arboreus x Lupinus formosus hybrid, taken in situ, resides in their collection). In the above condensed listing of native taxa, those species followed by an asterisk have been documented by pressings deposited in the Jepson Herbarium at UC Berkeley: the species with two asterisks following their Latin names have been validated by in situ study but need to be pressed and consigned to major herbaria; and finally, the taxa in boldface represent either new species or hybrid complexes yet to be published but given comprehensive documentation in the form of herbarium pressings which now reside in the Jepson Herbarium, UC Berkeley and/or living material being raised for long term study at the UCSC Arboretum. During the course of the past three decades, beginning with the early 1970s, three first class scientists/naturalists, all past or present associates with and products of the UC educational system, have added immeasurably to the understanding of what defines the Scotts Creek Watershed and its place relative to the other ecological “hot spots” within California. Randall Morgan/research associate with the California Academy of Sciences, Roy Buck, Ph.D./botanist and Grey Hayes, Ph.D./ecologist, with combined expertise in botany, ecology, taxonomy, entomology and ornithology, have synergistically created a base line that allows future students clearly defined directions of research to pursue. Equally important in the ongoing clarification of the watershed’s natural history, have been the contributions of five established scientists/teachers with broadbase research backgrounds, namely Roberta Smith, Ph.D./geologist (the geomorphology of the watershed), John Bulger, Ph.D./biologist (amphibians and birds, endangered or otherwise), Walter Mark, Ph.D./dendrologist (plant pathology and silviculture), Brian Dietterick, Ph.D./hydrology (watershed infrastructure) and Sean Hayes, Ph.D./biologist (the endangered salmonids). Those of us who reside within the watershed and take pleasure from its unique biological and aesthetic attributes, owe a profound debt of gratitude to the aforementioned scholars/scientists and by extension, the parade of notables made aware through their researches, who also have visited the area and unanimously validated its worth.

By just traversing the Scotts Creek Watershed via Swanton Road, in excess of 267 native plant taxa have been visually documented,
conservatively accounting for more than one third of the total native flora validated for the entire watershed to date!

The North Entrance to Last Chance Road

Between the north entrance to Swanton Road and its contact point with Last Chance Road, the following high-profile “rarities”, “uncommoners” and “fascinating juxtapositions”, can be found growing specifically (1) on exposed, often fractured, bedding planes, (2) in the localized grasslands above them, or (3) along the moist ditches at their bases and their often drier mirror-imaged counterparts framing the outside edge of the roadbed:

Welcoming eager students/explorers of things botanical, red maids (Calandrinia ciliata) adorns the north entrance to Swanton Road with prostrate plants displaying satiny reddish-pink flowers circa 15-20 mm. across, while further along our route, half-hidden within a brush covered south-facing slope, minute-flowered cryptantha (Cryptantha micromeres) presents in contrary fashion, self-pollinating white flowers with corollas 0.5-1 mm. wide, these ultimately developing into a quartet of microscopic nutlets, three with backs fine-tubercled and the fourth larger in size and smooth surfaced! Sharing the same habitat and often growing cheek by jowl, Cleveland’s cryptantha (Cryptantha clevelandii var. florosa), displays corollas 1.5-2.5+ mm. wide with 2-4 flat backed, smooth, mottled, gray brown nutlets. Joining the cryptantha duo and representing the Bellflower Family (Campanulaceae), Venus’s looking-glass (Triodanus biflora) merges with the surrounding greenery, its cleistogamous flowers virtually indistinguishable from the subtending leaves, with only the terminal blue-violet flowers visible. Giving contrast with prostrate mats of cinereous foliage, which carpet the roadside edge, Heerman’s trefoil (Lotus heermannii var. orbicularis = Acmispon heermannii var. orbicularis), offers the aesthetically motivated landscaper a choice perennial to incorporate into the native rockery. Half-hidden within the roadside grasses and widespread throughout the watershed, Ithuriel’s spear (Triteleia laxa) displays considerable variation both as to stature and flower color. Two distinct forms occur within the watershed: form (a) with laterally symmetrical stamens, whitish anthers and filaments of unequal length while form (b) has radially symmetrical stamens, darker and narrower flowers with short, equal filaments and blue anthers aging brown. Imparting, both color and seductive fragrance, California wild rose (Rosa californica), less refractory than its horticulturally manipulated relatives, offers the native gardener a diverse series of variants from just within the Swanton area..... while further along, a solitary specimen of Michael’s rein orchid (Piperia michaelii), introduces to the biogeographer and jaded orchid fancier, the first of three native species of Piperia to be encountered as our journey unfolds.

Note: To underscore the botanical diversity one can encounter moments after entering the north end of Swanton Road, here is a listing of “native” taxa principally growing on the inner roadbank, drainage ditch and outer shoulder, within the first 600-800 feet of leaving Highway 1 (up to the hairpin turn overlooking Harry Wain’s Arroyo) and documented more or less in the order viewed (done on 01/27/2011 and updated on 06/25/2011)..... *Helenium puberulum, Quercus agrifolia var. agrifolia, Pinus radiata, Baccharis pilularis subsp. consanguinea, Calystegia purpurata subsp. purpurata, Phacelia malvifolia, Rubus ursinus, Scrophularia californica, Artemisia californica, Corethrogynae filaginifolia (var. californica), Stachys rigida var. quercetorum, Stipa lepida, Toxicodendron diversilobum, Heteromeles arbutifolia, Ceanothus thyrsiflorus var. thyrsiflorus, Bromus carinatus, Artemisia douglasiana,*
Eriophyllum staechadifolium, Fragaria vesca, Frangula californica subsp. californica, Claytonia perfoliata subsp. perfoliata, Mimulus aurantiacus, Stachys bullata, Drymocallis glandulosa var. glandulosa, Castilleja affinis subsp. affinis, Pteridium aquilinum var. pubescens, Symphyotrichum chilense, Heracleum maximum, Solanum douglasii, Dryopteris arguta, Rosa californica, Agrostis exarata (var. pacifica, lemmas awned), Juncus hesperius, Juncus patens, Pentagramma triangularis subsp. triangularis, Elymus glaucus subsp. glaucus, Iris douglasiana, Sambucus nigra subsp. caerulea, Adiantum jordanii, Ranunculus hebecarpus, Sanicula crassicaulis, Luzula comosa, Piperia michaelii, Galium porrigenus var. porrigenus, Clinopodium douglasii, Galium californicum subsp. californicum, Polystichum munitum, Vicia americana subsp. americana, Melica torreyana, Solidago velutina subsp. californica, Pseudotsuga menziesii var. menziesii, Chlorogalum pomeridianum var. pomeridianum, Marah fabaceus, Carex gianonei complex, Juncus occidentalis, Dudleya caespitosa, Eschscholzia californica, Eriogonum latifolium (closer to coastal bluff form than more inland Eriogonum nudum phase), Pseudognaphalium bioletii, Carex brevicaulis, Acmispon glaber var. glaber (along this section of Swanton Road, some plants definitely prostrate in mode of growth, would in past taxonomic treatments be referred to as Lotus scoparius var. prostratus), Fragaria chiloensis, Agrostis hallii/pallens intergrades, Monardella villosa sensu lato, Eriophyllum confertiflorum var. confertiflorum, Pseudognaphalium gianonei, pro. sp. nov., Phalaris californica, Salix lasiandra var. lasiandra, Salix lasioplepis (both species of Salix growing side by side where Washout Turn Gulch goes under Swanton Road), Polygodium calthiflora (lowermost pinna shorter than succeeding ones), Delphinium decorum subsp. decorum, Festuca roemeri var. klamathensis (one cespitose tussock perched at edge of grassland/road bank interface, overlooking Swanton Road), Triteleia laxa, Mimulus guttatus (aff. var. arvensis).....annual, truncate calyces, open corolla with suppressed folds/ridges in throat, inodorus), Pterostegia drymarioides, Silene verecunda (subsp. verecunda), Stebbinosseris decipiens (due to road work.....extensive grading in preparation for resurfacing, only one spent plant was observed for the 2011 season), Sidalcea malviflora subsp. malviflora, Danthonia californica and Cardionema ramosissimum.

Note: A section of the original Highway 1, above and west of the “Washout Turn”, persists as near vertical banks of exposed siliceous mudstone margining a horizontal roadbed of the same material. Growing along and within this historically significant curved segment of a long abandoned roadway, are several native species of uncommon occurrence: California coast plantain (Plantago elongata.....isolated population growing sympatrically but not intermixed with ubiquitous sister species, Plantago erecta), grassland gilia (Gilia clivorum.....a localized population, growing on a narrowly defined mudstone outcropping with a southern exposure and apparently not colonizing beyond this site-specific area, although found growing sporadically under similar conditions, between Harry Wain’s Arroyo and the Scotts Creek Marsh), San Francisco campion (Silene verecunda subsp. verecunda.....like its Gilia compatriot, site specific and having its perennial rootstocks deeply embedded within the fractured substrate, Davy’s century (Zeltnera davyi.....shocking pink flowers on diminutive plants 5-9 cm in height and when observed on 07/10/2011, creating a aesthetically satisfying counterpoint to the surrounding desiccated grasses), and common monkeyflower (Mimulus guttatus aff. var. arvensis.....distinctive annual form found growing on moist mudstone banks, with calyces subtruncate and glabrous, corollas inodorus and compressed along a dorsal/ventral axis and when growing proximal to Mimulus guttatus var. grandis, no intermediates found).
Finishing the overview for the north end of Swanton Road, on 06/26/2011, the following "native" species were observed, beginning with the hairpin turn overlooking Harry Wain’s Arroyo and terminating at the juncture of Last Chance Road with Swanton Road. Previously encountered species reoccur while new ones make their presence known, adding to the often missed "botanical richness" of an area, more traveled within the confines of a vehicle than leisurely surveyed on foot! The "natives", growing roadside and on the adjacent banks, are listed as they occur along this stretch of tarmac. 

plant growing proximal to later flowering *Symphyotrichum chilense* population, *Monardella villosa* subsp. *franciscana*, *Melica californica*, *Phacelia malvifolia*, *Deinandra corymbosa*, *Salix lasiandra* var. *lasiandra*, *Horkelia californica* var. *californica* and *Carex tumulicola*.

Further gilding the lily as per "natives" documented while traversing this section of Swanton Road, the following species have also been previously observed but were not seen during the 01/27/2011 and 06/25/2011 explorations..... *Calandrinia ciliata*, *Cryptantha clevelandii* var. *florosa*, *Cryptantha micromeres*, *Triodanus biflora*, *Acmispon heermannii* var. *orbicularis*, *Arctostaphylos crustacea* sensu lato, *Uropappus lindleyi*, *Verbena lasiostachys* var. *lasiostachys*, *Montia fontana*, *Trifolium depauperatum* var. *truncatum*, *Trifolium gracilentum*, *Trifolium macraei*, *Trifolium microcephalum*, *Acmispon parviflorus*, *Acmispon wrangelianus* and *Crassula connata* (4-merous flowers).

While many of these species are included within the Traversing Swanton Road narrative, extracting them from that text and presenting them in the context of native species diversity within an area with defined boundaries and a longterm documented history of human activities, validates the underlying premise of this botanical overview..... that human presence and biodiversity are NOT mutually exclusive!!!

- Rare statewide, San Francisco campion (*Silene verecunda* subsp. *verecunda*) and Santa Cruz microseris (*Stebbinsoseris decipiens*), both FSC/1B agency-listed taxa, bookend the frozen stream of asphalt. The Santa Cruz microseris, is an allo-tetraploid species derived from coast microseris (*Microseris bigelovii*) and silver puffs (*Uropappus lindleyi*), and exists in at least twenty reproductively isolated populations within the watershed, each exhibiting different recombinations of parental traits, making an ideal living laboratory for the study of species formation and the dynamics of population biology. Also along this stretch of road, a small population of coast microseris (*Microseris bigelovii*), one half of the diploid team responsible for parenting the Santa Cruz microseris, occupies a narrow and exposed 1-2 meter long slice of road bank, vulnerable like its rare offspring, to potential traffic abuse. More generously distributed, silver puffs (*Uropappus lindleyi*), the other diploid component in the hybrid equation, not only shares the occupancy of its celebrated offspring’s precarious niche but also resides more securely on the grassy slopes overlooking the diploid/tetraploid intrigues.

(A) Since *Stebbinsoseris decipiens* is an allo-tetraploid (2n=36), derived from two diploid species, *Microseris bigelovii* (2n=18) x *Uropappus lindleyi* (2n=18), is the gene flow between the diploid species uni- or bi-directional? Can *S. decipiens* arise equally from *M. bigelovii* x *U. lindleyi* and *U. lindleyi* x *M. bigelovii* combinations?

(B) What is the pollinating vector and do all pollinations result in successful fertilizations and subsequent production of allo-tetraploid *S. decipiens* or is this a rare occurrence?
(C) Are there diploid *S. decipiens* and if so, are they interfertile with either of their diploid parents?

(D) Can backcrosses between allo-tetraploid *S. decipiens* and either of its diploid parents occur and do these, if possible, result in sterile triploids?

(E) When *Uropappus* consisted of two species (Jepson Manual, 1925), *U. linearifolia* with blackish achenes/deciduous silvery pappus and *U. lindleyi* with tannish achenes/persistant dull brown pappus, was *U. linearifolia* the true species and *U. lindleyi* (in part) what is now considered *S. decipiens* or is there still an unnamed taxon out there?

(F) Since *Stebbinsoseris decipiens* and its half-sister species *S. heterocarpa* are both allo-tetraploids, sharing *U. lindleyi* as a common parent, are they interfertile should their populations overlap?

(G) With at least **20 documented populations** of *Stebbinsoseris decipiens* found in the watershed and its surrounding environs..... (a) is there gene flow between sympatric populations, (b) are the more isolated populations thru inbreeding, diverging from the common genotype in response to localized ecological pressures, (c) do larger populations, comprising 200+ individuals dispersed over a topographically diverse area, display more heterozygosity than smaller, concentrated ones and (d) what survival strategies has this allo-tetraploid taxon developed, **in response to prolonged drought, sucessional behavior of surrounding vegetation, herbivory and infrequent but often devastating fires**..... how many seasons, once the mature cypselae have been dispersed, can they persist in the surrounding environment before they start losing their viability and is substrate low in organic content versus one rich in accumulated duff, a significant factor influencing the long-term survival of a given population?

The recently described *Festuca roemeri var. klamathensis*, densely caespitose and basally circumscribed by vole runs, shares the tilted grassland with a perversely erect clarkia, **aff. Clarkia davyi**, displaying bicolored flowers and gray-encrusted seeds, which may prove to be a normally erect “new” species and along with blue toadflax (*Linaria canadensis = Nuttallanthus texanus*), junegrass (*Koeleria macrantha*), footsteps-of-spring (*Sanicula arctopoides*) and saw-toothed spurge (*Euphorbia spathulata*), can be viewed with 20/20 vision or a pair of binoculars, overlooking the road cut. One of five native species of violets found within the watershed, Johnny jump-up (*Viola pedunculata*), with deep-seated rootstocks and pumpkin colored flowers circa 3-3.5 cm. across, can easily hold its own against the extensively hybridized European violets (Pansies) while coast larkspur (*Delphinium decorum* subsp. *decorum*), sharing the same botanically diverse environment with a small colony of white globe lily (*Calochortus albus*), spills down the bank, yielding up flowers colored a vibrant bluish-purple. Beginning and ending our botanical quest as subsp. *franciscana*, with thick, sub-orbicular, tomentose leaves, coyote mint (*Monardella villosa*) between Scotts Creek and Big Creek Bridges, undergoes a nomenclatural change, becoming subsp. *villosa*, with thin, sparsely pubescent ovate leaves and a different chemical signature. Growing on exposed slopes throughout the length of our survey and acting as an important soil stabilizer, Torrey’s melic (*Melica torreyana*), varies considerably as to length and openness of inflorescence, one isolated population overlooking the lower portion of Schoolhouse Gulch averaging 35-40 centimeters between lowest flowering branch and apex. **This grass species displays numerous forms throughout the watershed and with so much material available, warrants an in depth investigation into: (1) which forms are genetically fixed regardless of habitat as opposed to**
those forms, whose overall gestalt are the result of environmental vagaries (light/shade conditions, vertical/horizontal orientation, presence/absence of continual moisture, competing vegetation pressures, etc.), (2) are there different breeding systems in play, obligate selfing versus outbreeding patterns which correlate with inflorescence configurations, (3) how do any/all of these forms behave when raised under uniform controlled conditions and in a broader sense, do any of these local forms appear, with some consistency, elsewhere within the known range of the species.

The Davy’s clarkia (Clarkia davyi) and prostrate clarkia (Clarkia prostrata) issue stills remains unresolved taxonomically, at least as far as the north end of Santa Cruz County (the Swanton area) is concerned. Within the purview of our traversal, what appears to be prostrate clarkia (Clarkia prostrata) favors a prostrate to ascending mode of growth, generally prefers siliceous terrace deposits on the coastal prairie, displays concolored flowers, distinctly pedicellate mature capsules and dark brown unadorned seeds; the defiantly erect Davy’s clarkia (Clarkia davyi), overlooking the north end of Swanton Road is found growing in grasslands whose underpinnings are derived from mudstone, exhibits a consistently erect mode of growth, flaunts bicolored flowers which when successfully fertilized, yield capsules, sub sessile through pedicellate, housing distinctly gray-encrusted seeds. These two, decidedly uncommon species of Clarkia, are rarely found growing sympatrically but when they occasionally overlap in habitat preferences, no intermediates have been found. When raised together in an open breeding situation, again no hybrids and each “species” as per flower color/seed type, consistently perpetuates itself. The type specimens for both Davy’s clarkia (Clarkia davyi) and prostrate clarkia (Clarkia prostrata) need to be studied and compared with our local taxa and chromosome determinations made. With three disjunct viable populations of rare purple godetia (Clarkia purpurea subsp. purpurea) occurring in the Swanton area, a biogeographical investigation into the evolutionary origins of this horticulturally desirable and amenable to cultivation taxon should be undertaken. Are the Swanton populations related genetically to those documented for the Great Central Valley or are they independently derived, an evolutionary response to the prevailing coastal wind patterns and competition from the surrounding grassland vegetation, resulting in reduced stems and inflorescence axes with corresponding density of flower heads and enlargement of floral parts (reduction/augmentation)? Do a comparative analysis between the three local populations with emphasis on edaphic/habitat preferences, sympatry (if any) with related four-spotted godetia (Clarkia purpurea subsp. quadririvulera) examining the potential for/direction of interspecific gene flow, and specificity of pollinating vector(s), differences in stature, variability in floral coloration/patterning, capsule and seed size, ect., between coastal Lasher Marsh and inland Seymore Hill populations.

Two distinct components of the Mimulus guttatus complex occupy moist zones above and below the southeast-facing hairpin turn overlooking Harry Wain’s Arroyo. First, is a reduced, inodorus form of var. arvensis, with truncate calyces and a deep, open throat with supressed longitudinal folds that can be found growing on seasonally moist rock faces. Second, is a rare, immaculate variant of var. grandis, with corollas wholly lacking the maroon spotting immortalized in its species name; it grows intermixed with the honey-scented forma typica, amongst Pacific bog-rush (Juncus effusus var. pacificus) and brown bog-rush (Juncus effusus var. bruneus = Juncus hesperius) tussocks. Vegetatively resembling a blue-eyed grass (Sisyrinchium bellum), which is found growing roadside further along on our journey, brown-headed rush (Juncus phaeocephalus var. phaeocephalus), rhizomatously weaves its way through the densely packed culms of its towering relatives, lost to all but the discerning eye. Sharing this already bursting-at-the-seams micro-
marsh, is tinker’s penny (*Hypericum anagalloides*), living up to its name, by mimicking the foliage of the scarlet pimpernel (*Anagallis arvensis*), water smartweed (*Polygonum punctatum* = *Persicaria punctata*), a native member of the Buckwheat Family (*Polygonaceae*), herbage stippled with transparent glands redolent of freshly cut green apples and a blue-flowered cousin of the aforementioned common monkeyflower, American brooklime (*Veronica americana*), putting out roots whenever its reddish-purple stems come in contact with moisture. Growing between asphalt and periphery of the drainage channel, California vervain (*Verbena lasiostachys* var. *lasiostachys*), lacking the visual impact of its domesticated relatives from the Midwest, redeems itself by being both long lived and resistant to all kinds of maltreatment while Mexican plantain (*Plantago subnuda*), a stately native with conspicuously ribbed leaves and virgate inflorescences, barely hangs on to its razor-thin perch. Found in a few isolated areas within the Swanton area, moisture loving blinks (*Montia fontana*), superficially resembles a prostrate chickweed and tends to be overlooked or ignored because of this hastily arrived at assumption, but as to familial affinities, was once a member in good standing of the Purslane Family (*Portulacaceae*) and now has joined its cousins (members of the genus *Claytonia*), in the family *Montiaceae*!

The *Mimulus guttatus* complex presents manifold challenges for the taxonomist, not the least being, whether it is prudent to follow the “lumper” or “splitter” path and justifying the rationale behind making that decision. Within the boundaries of our traversal, there are several reoccurring phases found, that when growing sympatrically, display no evidence of gene exchange. Such is the case with var. *arvensis* and var. *grandis*, one appearing scentless while the other, in bright light, emitting a melliferous odor. Other local members of this complex are:

(a) *Mimulus nasutus*: formerly considered a valid species and alternately called *Mimulus guttatus* var. *gracilis*, usually found growing on sandbars along the riparian corridor and distinguished by calyces with upper middle lobe + 3-times as long and forward pointing, the lower lip of corolla with a distinctive, centrally located, red-brown blotch and deeply lacerate leaves with velvety patches, adaxially. May be obligate selfer in spite of open flowers, as no intermediates found when growing sympatrically on sandbars with out-breeding common monkeyflower (*Mimulus guttatus* sensu lato). A concentrated population, with the majority of plants exceeding a meter in height, was observed post-Lockheed 2009 Fire (05/2010), margining the moisture saturated banks of a near-vertical gulchlet draining down into Little Creek.

(b) *Mimulus*, aff. *nasutus*: a nanistic ecotype, restricted to seasonally wet, exposed bedding planes, growing out of patches of moss, both on the immediate coast and inland (upper portion of Calf Gulch). Flowers cleistogamous, corollas not opening and expelled from calyces as pale-yellow sausage casings. Quadrate stems can be clothed with short trichomes or be glabrous, but not in the same population. Plants raised from seed in a controlled environment with a continuous supply of water, upon reaching anthesis, transition from cleistogamous stage to one in which flowers open, showing lower lip with centrally positioned maroon blotch, but still appear to be self-pollinating.

(c) *Mimulus*, *guttatus* complex: an isolated population growing in a permanently wet seep, lower Seymore Field, under a redwood (*Sequoia sempervirens*) grove along with scattered plants of floriferous monkeyflower (*Mimulus floribundus*). Possible affinities with *M. nasutus*, (1) lower leaves widely rounded, shallowly dentate to irregularly lacerate/lobed, particularly near base, unmarked and uniformly green on adaxial surface with distinctive erect trichomes looking like hypodermic syringes with attenuate apices (result of aging?), (2) pedicels with short gland-tipped trichomes near base, bases of upper subtending leaves viniferous or not, this coloration also extending in varying degrees to
petioles, plicate ribs of calyces and their apices, with/without scattering of like-colored inter-costal dots, (3) observed flowers, 10/13/06, cleistogamous, corollas not opening and expelled from calyces as pale-yellow sausage casings (correlation with late-in-season flowering?), (4) sharing habitat with these late-flowering cleistogamous plants, were spent remnants of the current season’s earliest bloomers and a new generation of recently germinated seedlings of this annual component of the *Mimulus guttatus* complex!

(d) *Mimulus*, aff. *guttatus* complex: a distinctive taxon with + glaucous stems and leaves, upper leaves connate-perfoliate and flowers pale yellow and scentless, was discovered more than two decades ago growing on a sandbar in the upper Scotts Creek Watershed, indicating a possible affinity with *Mimulus glaucescens*.

(e) *Mimulus guttatus*, aff. var. *arvensis*: a distinctive component of this variety grows vertically on the moist bedding planes of the Western Terrace overlooking Highway 1, between Lasher Marsh Gulch and Big Willow Gulch. In Gulch #1 (next gulch southeast of Lasher Marsh Gulch), three phases of the *Mimulus guttatus* complex were observed and studied in the early 1980s..... growing under the coastal scrub, in seasonally moist areas, was (1) a low in stature form with truncate calyces, widely opened corollas, scentless and without stolons, while on the waterfall face, (2) the honey-scented stoloniferous/mat-forming var. *grandis* occurred and in the lower potion of the gulch, on moss covered exposed mudstone, (3) a cleistogamous form (greatly reduced in stature and showing affinities with *Mimulus nasutus = Mimulus guttatus* var. *gracilis*) was producing tubular, unopened corollas in calyces with upper calyx-tooth conspicuously exceeding the others and having the adaxial foliar surface variously decorated with puberulent patches, pigmented areas and margins conspicuously laciniate-serrate. The inodorous open flowered type with the truncate calyces, also occurs along the north end of Swanton Road (and an isolated portion of the original Highway 1 above it), restricted to seasonally moist roadbanks and behaving like an annual.

Several years ago, while studying the behavior and breeding potential of *Mimulus guttatus* var. *grandis*, I decided to see how my emasculated plants would react when pollen from sticky monkeyflower (*Mimulus aurantiacus*), scarlet monkeyflower (*Mimulus cardinalis*), floriferous monkeyflower (*Mimulus floribundus*) and musk monkeyflower (*Mimulus moschatus*) was placed on their receptive stigmas. To my surprise, rather than reject the foreign pollen and dry up, all of the pollinated flowers started to initiate swollen ovaries, these ultimately developing into capsules filled with viable seed. Equally surprising, was the result of the several flats sown, all the seedlings ultimately turned out to be perfect replicas of their *Mimulus guttatus* var. *grandis* parent. Apparently the placement of foreign pollen on the stigmas of my *Mimulus guttatus* var. *grandis* plants induced facultative apomixis, or in the vernacular, having your cake and eating it too. If not an isolated and aberrational event, then a fascinating evolutionary strategy: when your genetic integrity is inadvertently or otherwise challenged, overwhelm the potential threat with numerous replicas of yourself!

As our journey of botanical discovery unfolds, it is of paramount importance to realize that outside of the constraints imposed by being restricted to the road proper, areas with a complex assemblage of “rare and unusual” taxa abound, within view but not physically accessible! Two such “hot zones”, comprising the headlands overlooking/bookending the north-west and south-east edges of Greyhound Rock State Beach in orientation, concentrate a multitude of rare and site-specific species into relatively narrow strips of coastal habitat, squeezed between Highway 1
and a vertical drop in excess of 80 feet. Looking up, we see the near-vertical, perpetually exfoliating cliffs, with their seasonal waterfalls and perennial seeps..... here common monkeyflower (Mimulus guttatus) cloaks the weathered face of the dampened mudstone, displaying sun drenched corollas redolent of honey. Vying for attention on the precarious wind-buffed exposures and held hostage by the ever-changing hydrology, Watson’s willow herb (Epilobium ciliatum subsp. watsonii) in a reduced stature, shows off intensely pigmented cerise flowers looking like miniature pin-wheels. Sharing this specialized habitat, are distinctive micro-populations of small-leaved bentgrass (Agrostis microphylla), needing to be analyzed and carefully compared with the type..... from both a taxonomic and ecological perspective, two questions need aswering: (1) since the taxon in question possesses a palea and the overall description for Agrostis microphylla states palea wanting/none, what taxonomic value can be assigned to the presence/absence of such an organ? and (2) what breeding systems are in play within these isolated populations..... are these obligate selfers, creating in effect, a constellation of micro-species, occupying proximal but separate vertical niches? A momentary detour to a unique habitat between the cliff bases and primary dunes yields several species losing ground along the immediate coast: fragrant cousin of the horticulturally manipulated bougainvillaea, yellow sandverbena (Abronia latifolia) survives the punishing winter storms by anchoring itself with extensive, cord-like root systems, as does sympatric beach morning glory (Calystegia soldanella), Vancouver’s rye grass (Leymus x vancouverensis = Elymus x vancouverensis), and sand-dune bluegrass (Poa douglasii). In the seasonally moist depressions behind the dunes, another “native” plantain luxuriates, this inconspicuous annual species, the decidedly uncommon California coast plantain (Plantago elongata), superficially looking like its omnipresent relative California plantain (Plantago erecta). Sharing this seasonally reconfigured environment, are beach bur (Ambrosia chamissonis), mock heather (Ericameria ericoides), California sagebrush (Artemisia californica), deerweed (Lotus scoparius var. scoparius = Acmispon glaber var. glaber), stephanomeria (Stephanomeria aff. virgata subsp. pleurocarpa..... in light of recent molecular based taxonomic work on this and related species of Stephanomeria, a revisiting and thorough exploration of this maritime population’s habitat should be undertaken, since a major landslide buried the originally observed colony and as of 08/10/2010, no trace of this taxon was found) with outer phyllaries appressed, achene clavate, tannish, 5-sided with each facet lined from top to bottom with two rows of slightly raised verrucosities, pappus white and plumose throughout, leatherleaf dock (Rumex salicifolius var. crassus = Rumex crassus), coast buckwheat (Eriogonum latifolium), yarrow (Achillea millefolium), coyote brush (Baccharis pilularis), morning glory (Calystegia purpurata subsp. purpurata), sticky monkeyflower (Mimulus aurantiacus), yellow bush lupine (Lupinus arboreus), California figwort (Scrophularia californica), California cudweed (Pseudognaphalium californicum), pink everlasting (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum), beach evening primrose (Camissonia cheiranthifolia subsp. cheiranthifolia = Camissoniopsis cheiranthifolia subsp. cheiranthifolia), beach saltbush (Atriplex leucophylla) and marsh gumplant (Grindelia aff. stricta var. angustifolia). Growing within the embrace of arroyo willows (Salix lasiopilos), California blackberries (Rubus ursinus), lizard tail (Eriophyllum staechadifolium) and poison oak (Toxicodendron diversilobum), scattered representatives of the Carex gianonei, pro. sp. nov. complex thrive, sending their keiki-laden aerial stems up through the surrounding scrubb, the origins of this taxonomic conundrum most likely the marshes, which back/margin gulches draining the coastal prairie via seasonal waterfalls. While revisiting this section of maritime habitat on 08/10/2010, these additional "natives" were accounted for: saltgrass (Distichlis spicata var. stolonifera), Torrey’s melic (Melica torreyana..... a reduced in stature form with abbreviate inflorescences), Indian thistle (Cirsium brevistylum), coast tarweed (Madia sativa), rattlesnake weed (Daucus pusillus), cow-parsnip (Heracleum maximum), sea lettuce (Dudleya caespitosa), oso
berry (*Oenothera cerasiformis*), bracken (*Pteridium aquilinum* var. *pubescens*), Cleveland’s cryptantha (*Cryptantha clevelandii*) and Monterey pine (*Pinus radiata*).

In spite of human activity, encompassing both vehicular and foot traffic, numerous microhabitats, featuring concentrated species diversity can still be found within this unique environment, where earth, sky and sea meet! Segueing from the coastal strand up to the edge of the Santa Cruz Terrace, half hidden within the wind sculpted shrubbery, purple-suffused California broomrape (*Orobanche californica* subsp. *californica*), a species complex unresolved taxonomically, parasites Pacific gumplant (*Grindelia stricta* var. *platyphylla*), ironically belonging to another genus with poorly defined elements locally. Sharing this exposed-to-the-elements perch, eight members of the Sunflower Family (Asteraceae), when not in flower, would leave most observers hard pressed to see the familial connection: the octet being mock heather (*Ericameria ericoides*), coast sagewort (*Artemisia pycnocephala*), western goldenrod (*Euthamia occidentalis*), coyote brush (*Baccharis pilularis*, sensu lato), seaside daisy (*Erigeron glaucus*), brownie thistle (*Cirsium quercetorum*), cotton batting plant (*Pseudognaphalium stramineum*) and Eastwood’s dandelion (*Agoseris apargioides* var. *eastwoodiae* = *Agoseris apargioides* var. *apargioides*). Drawing from the Grass Family (Poaceae), diversity also prevails, with the following quintet of species persisting despite the unrelenting exposure to sun and westerly winds: wild rye (*Elymus glaucus* subsp. *virescens*), meadow barley (*Hordeum brachyantherum* subsp. *brachyantherum*), seaside brome (*Bromus carinatus* var. *maritimus*), Torrey’s melic (*Melica torreyana*) and an isolated reduced-in-size variant of tall trisetum (*Trisetum canescens*). Sheltered within a few brush-cloaked depressions and meriting horticultural consideration, is the rare local form of San Francisco wallflower (*Erysimum franciscanum* var. *crassifolium*), suffrutescent in mode of growth, with fleshy leaves and intensely fragrant yellowish flowers. Other species adding to this texturally diverse assemblage of uncommon forms of widespread taxa and unexpected juxtapositions, are hill morning glory (*Calystegia subacaulis* subsp. *subacaulis*), a visually arresting and eminently-worth-of-cultivation form of checker lily (*Fritillaria affinis*, aff. var. *tristulis*), displaying outsized pendant flowers simulating Tiffany lampshades colored an opalescent maroon, the ubiquitous California plantain (*Plantago erecta*), *represented by a particularly robust ecotype looking more like a “new” species*, while offering competition in the olfactory arena, a member of the Rosaceae with foliage saturating the surrounding environment with an unforgettable pungency, wedge-leaved horkelia (*Horkelia cuneata* var. *cuneata*) sharing a low-to-the-ground status and also with aromatic herbage but this time clothed with a silky indument topped with contrasting inflorescences of gold, Bolander’s golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*). Given structural support by the extensive colonies of poison oak (*Toxicodendron diversilobum*) and associated interdigitating shrubbery, mainly California sagebrush (*Artemisia californica*) and coyote brush (*Baccharis pilularis* subsp. *consanguinea*), two native species of nightshade, Douglas’s nightshade (*Solanum douglasii*) and blue witch (*Solanum umbelliferum*) afford the observant sleuth contrast in floral gestalt, color and presence/absence of scent.

The botanically rich coastal scrub overlooking the south end of Greyhound Rock, has *an* ecological analog ….. on a section of headland looking westward towards Post Rock, where sufficient moisture is present, western dock (*Rumex occidentalis*), a visually arresting taxon reaching 2+ meters in heighth, displays mature stems and inflorescences pigmented a luminous reddish-pink and sports a hefty chromosome count of 2n=140, 200! A small drainage depression perched high on the bluffs and part of a fragmented marsh of unknown age, no more than 10 meters square and buffered from unwarranted human intrusion by an acre or so of poison oak (*Toxicodendron diversilobum*), is home to Blasdale’s bent grass (*Agrostis blasdalei*), one of
California’s rarest grasses and Michael’s rein orchid (Piperia michaelii), an orchid of uncommon occurrence. Unexpectedly, two more frequently encountered relatives of the aforementioned duo also occur within this “pocket of diversity”, namely California bent grass (Agrostis densiflora) and coast rein orchid (Piperia elegans subsp. elegans). This juxtaposing of rare and common members of the same genus occurs throughout the Scotts Creek Watershed and the areas bordering it, providing an abundance of material to predicate an ecological inquiry into the mechanics of reproductive barriers and their effectiveness. Surrounding and nestled within this “congregation of rarities” are one-leaved onion (Allium unifolium), a descriptive name at odds with this species actual foliar status, Wight’s paintbrush (Castilleja wightii), reduced in stature with pale yellow flowers and crowded glandular-puberulent stems, Mexican plantain (Plantago subnuda), a stately native representative of a genus known principally for its weedy and invasive members, plus selfheal (Prunella vulgaris var. lanceolata), an inodorous member of the Lamiaceae with lilac-purple flowers simulating a terrestrial orchid species, artist’s popcorn-flower (Plagiobothrys chorisianus), favoring moist depressions and often hidden within the undergrowth, low club rush (Scirpus cernuus = Isolepis cernua), behaving as a perennial in spite of references in literature to the contrary, harlequin lotus (Lotus formosissimus = Hosackia gracilis), a perennial pea with flowers colored yellow and cerise, possessing a fragrance rivaling the best French perfumes, California canary grass (Phalaris californica), with stems and leaves mimicking the stylized bamboo of the classic Chinese landscapes, large-flowered sand-spurrey (Spergularia macrotheca var. macrotheca), an ideal candidate for miniature rock gardens, bugle hedge-nettle (Stachys ajugoides var. ajugoides), with pale pink flowers and sweetly scented herbage and marsh microseris (Microseris paludosa), a rarely seen relative of the dandelion and culinary lettuce.

Reconnecting with our asphalt underpinnings, allows one to visually note that sharing the “hairpin turn” locale but growing on exposed mudstone and siliceous terrace deposits, a diverse assemblage of “natives” can be tallied up: a nod to the Rose Family (Rosaceae) yields sticky cinquefoil (Potentilla glandulosa subsp. glandulosa = Drymocallis glandulosa var. glandulosa), wedge-leaved horkelia (Horkelia cuneata var. cuneata) and sinuously weaving a gauntlet of formidable thorns, California wild rose (Rosa californica) co-exists in both in adjacent moist drainage ditches and seemingly arid embankments; a cursory survey for representatives of the Legume Family (Fabaceae) produces purple sack clover (Trifolium depauperatum var. truncatum), pin-point clover (Trifolium gracilentum), double-headed clover (Trifolium macraei), maiden clover (Trifolium microcephalum), tomcat clover (Trifolium willdenovii), deerweed (Lotus scoparius var. scoparius = Acmispon glaber var. glaber), small-flowered trefoil (Lotus micranthus = Acmispon parviflorus), Chilean trefoil (Lotus arwangelianus = Acmispon arwangelianus), Lindley’s varied lupine (Lupinus varicolor), and sky lupine (Lupinus nanus); dueling members of the Stonecrop Family (Crassulaceae), literally on opposite sides of the roadbed, are sea lettuce (Dudleya caespitosa), whose extreme foliar variability makes it an ideal candidate for the rock garden, and pygmyweed (Crassula connata), a micro-miniature (with 4-merous flowers) which when mature looks like a carpet of reddish-orange moss. Staying with the diminutive, California plantain (Plantago erecta), when scrutinized with a hand-lens, reveals fascinating structural details of foliage and flowers, missed when casually viewed from above; shifting the focus to the olfactory, Biolett’s cudweed (Pseudognaphalium biolettii), with its unexpected and hauntingly distinctive chemical signature and glandular indument, and pink everlasting (Pseudognaphalium ramosissimum), different in gestalt and scent but no less enjoyable, brings into focus the realization that to fully appreciate the natural world around us, full utilization of our sensory resources is demanded.
Within the Swanton area, occurring throughout the coastal prairie/headlands to the top of the Seymore Hill, golden aster (*Heterotheca sessiliflora*) manifests a complex assemblage of forms: variable as to foliar color and shape, type of indument/trichomes, glandulosity and chemical signatures and ranging in gestalt, from Bolander’s golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*) thru bristly golden aster (*Heterotheca sessiliflora* subsp. *echioides*), with some of the higher elevation populations possessing a distinct odor of camphor. To what extent has intraspecific hybridization influenced the readily observable variability between/within each of the local populations and has periodic habitat disruptions, both natural and man-made, played key roles? Can the chemical signatures be linked to specific genotypes and utilized to determine where subspecies variability ends and gene exchange between sympatric populations begins? With numerous populations readily available and occupying, both edaphically and elevationally, a wide range of habitats, a living laboratory to study species formation, reproductive isolating mechanisms and the value of periodic gene exchange in maintaining population adaptability, is available to the student of ecology and population biology.

Adding visual spice to the *Juncus* mix are a pair of ubiquitous species, both densely caespitose, with leafless cylindrical culms—bog rush (*Juncus effusus*), with culms various shades of green, formerly represented by two varieties often sharing the same permanently moist habitat, var. *brunneus* (= *Juncus hesperius*) acting like an anorexic version of var. *pacificus* and recently given a taxonomic divorce with an accompanying name change! Superficially resembling *Juncus effusus* is common rush (*Juncus patens*), with culms a bluish cast and mature inflorescences displaying pinkish-tan sub-globose capsules, these when opened and exposed to moisture, producing a mucilaginous mass, which encases the seeds, creating a visual effect not unlike a misplaced cluster of minuscule frog eggs. Common rush (*Juncus patens*), is the only representative of this genus in the watershed which behaves in this fashion, and going even further to establish its reputation as an iconoclast, forms sexual alliances with brown bog rush (*Juncus effusus* var. *brunneus* = *Juncus hesperius*), the skinny one, producing offspring* of dubious fertility but unchallenged longevity, giving validation to the adage hope springs eternal!

*Note: Superficially simulating brown bog rush (*Juncus effusus* var. *brunneus* = *Juncus hesperius*) but culms often with a bluish cast, inflorescences compact to open with elongate branches, number of stamens 3-6, and the capsules, while + quadrate, having apices partially attached rather than opening fully and conspicuously exceeded by mature perianth parts. Fertile seed occasionally is produced, and varies from plant to plant, often seasonally, but is statistically very low per individual. Second generation hybrids have been raised under controlled circumstances, opening up a frame of reference to further study the potential role of periodic interspecific hybridization as a component in the adaptive evolution of taxa in a changing environment or one subject to ongoing patterns of disruption, either due to natural or human induced causation. When fertile seed is produced, morphologically it can range from one parental extreme to the other!*
Swanton Road are two native species of strawberry that usually occupy markedly different habitats: forming horizontal mats on the ocean side of the roadway is beach strawberry (*Fragaria chiloensis*), often dioecious, with dark green nitid foliage and contrasting reddish stolons, while perched on a near-vertical bank with a southerly orientation is wood strawberry (*Fragaria vesca*), leaflets thin in texture and due to adaxial surface trichomes, dull in appearance. By presenting 4-merous yellow flowers on what appears to be elongate peduncles, sun cups (*Camissonia ovata* = *Taraxia ovata*) plays a visual joke on the unaware observer—the circa 3–18 cm. long structures supporting the solitary flowers are technically the sterile tips of the ovaries, which upon closer examination, are found buried deep within the basal rosette of leaves!

Tenaciously clinging to a highly unstable bank and observed for more than a decade, an isolated burl-forming manzanita (*Arctostaphylos crustacea*, sensu lato) was regrettably done in, not by old age or slope failure, but overzealous road maintenance. Recently, during the course of walking Swanton Road in preparation for this essay, a second specimen of hairy manzanita was located, growing roadside circa 1/8 mile before Big Creek Bridge (sharing edge of bank with a specimen of oracle oak aka *Quercus x morehus*), and either seeded originally from coyote scat or representing the end result of successional processes. Articulating a plausible scenario for the current evolutionary status of the burl-forming manzanitas found within the watershed, is to enter into a scientific debate of gladiatorial proportions---but signposts, even flawed ones, are a navigational necessity in this ecological arena! The origins of the *Arctostaphylos crustacea* complex may be polyphyletic: its burl putatively derived from ancient hybridization between a horizontally aligned, nodal-rooting diploid species (aff. *A. uva-ursi*) and a vertically aligned, auriculate-leaved diploid species (aff. *A. andersonii*). Subsequent reduction and coalescence of the node-rooting axis may have occurred through selective evolutionary pressures imposed by seasonal fires and the concurrent/succeeding assimilation of genetic material from sympatric species, ultimately producing an exceedingly long-lived fire-regenerative “genetic sponge”. Based on an in depth study of the “extreme” variability displayed by the thousands of specimens located within the watershed’s well-defined chaparral, this a biologically sound theory and one worth investigating on molecular (DNA sites), morphological (establish a linkage between specific foliar and floral traits and isolate/identify, if possible, their ancestral contributors), ecological (specificity of fungal associates) and structural (examination of misplaced burls = epicormic burls, the possible results of incomplete dominance) grounds.

Occasionally, two related but physically dissimilar taxa share the same habitat, the differences so manifest that without knowledge of the systematics of the family in question, one would not link the two. Such is the case with creeping hearts (*Pterostegia drymarioides*), an annual prostrate herb with bilobed leaves looking as if they had escaped from a Calder mobile, which upon reaching maturity turn an incandescent reddish-pink, and coast buckwheat (*Eriogonum latifolium*), a suffrutescent perennial, clothed with a white felt-like indument that when viewed from afar, gives the impression of a recent dusting of snow. As members in good standing of the Buckwheat Family (Polygonaceae), their shared heritage is demonstrated by the production of trigonous achenes.

Presenting taxonomic problems yet to be fully resolved, California aster (*Symphyotrichum chilense*) shadows the observer from one end of Swanton Road to the other, happily ensconced on road-banks, in drainage ditches and peering out from the impenetrable margins of the coastal scrub. Although extremely variable as to phenology, overall stature, foliar morphology, and flower color, the real problem resides in what value to assign the extremes found within the
involucral bract (phyllaries) configuration and orientation: these ranging from strongly graduate (formerly Aster chilensis) to foliaceous, sub-equal and acute (Aster subspicatus). Should Aster subspicatus be resurrected from synonymy, if indeed it ever existed in the State, and treated along with California aster (Symphyotrichum chilense) as co-participant in the production of a polymorphic hybrid complex or is California aster (Symphyotrichum chilense) an ecologically adaptive species with several phenotypes? Are the foliaceous phyllaries independently derived or do they reflect a possible ancestral connection with Aster eatonii, since Aster subspicatus is now regarded as not occurring in California? The stem leaves while variable, tend to have expanded bases, these somewhat auriculate and clasping, with the marginal trichomes scabrous-ciliolate and decurrent down the stem as whitish lines, akin to those found on common chickweed (Stellaria media).

Note: Aster subspicatus = Symphyotrichum subspicatum, has been retrieved from synonymy under Symphyotrichum chilense by John Strother, 2009 and one documented specimen (residing in the Jepson Herbarium, UC Berkeley) for the Swanton area, originally collected from the Allium Marsh (on Western Terrace, southeast of the Lasher Marsh)..... JEPS 83107/JAMES A. WEST, 351, JUN 11 1983

Growing in sandy soil along and spilling down the west facing edge of the Monterey pine (Pinus radiata) grove, which mirrors in part, the “hairpin turn,” a diffuse, loosely rhizomatous phase of red fescue (Festuca rubra) creates a visual effect akin to a vaporous green gas hovering over the weathered pine needles. Sharing this acidic environment and sheltered within the irregular drifts of pine needles, coast rein orchid (Piperia elegans), one of five species of this genus found within the watershed, seasonally rewards the respectful observer with dozens of fragrant inflorescences, which in their early stages of development, look like stalks of asparagus ready to harvest. Staying with the Orchid Family (Orchidaceae), one of the three documented occurrences for the watershed of calypso orchid (Calypso bulbosa), was within this pine grove, while directly across the road, hooded lady’s tresses (Spiranthes romanzoffiana) graced a seasonally wet depression flanked by wind buffering common rush (Juncus patens) tufts. In the 1970’s, several small isolated patches of holly-leaved navarretia (Navarretia atractyloides) were discovered, growing in undisturbed habitat, which was being encroached upon by ever-expanding populations of poison oak (Toxicodendron diversilobum) and coyote brush (Baccharis pilularis subsp. consanguinea). Passing a roadside meadow abounding in rain stimulated vegetative growth, one’s attention is immediately drawn to the yellow-petaled flowers glistening in the sun as if lacquered and appearing to be suspended in a sea of chlorophyll: California buttercup (Ranunculus californicus), although common in status and numerically plentiful, never fails to deliver visual magic heralding the arrival of Spring.

Either growing separately or cheek-to-jowl, lizard tail (Eriophyllum staechadifolium) and golden yarrow (Eriophyllum confertiflorum var. confertiflorum) secure the roadside banks from one end of Swanton Road to the other. Where they grow together, particularly in those areas that are periodically disturbed, a broader range of foliar variation occurs, either underscoring each species’ inherent plasticity or warranting investigation into sympatry and interspecific hybridization, with an emphasis on examining the chemical signatures of each species and the variants appearing within the shared habitats. Staying within the Sunflower Family (Asteraceae) and the probable results of interspecific hybridization (both current and ancestral) coupled with selfing, backcrossing, and outcrossing patterns, the Gianone everlasting complex
*(Pseudognaphaliwm gianonei, pro. sp. nov.)* is the putative result of hybridization between California cudweed *(Pseudognaphaliwm californicum)* and cotton batting plant *(Pseudognaphaliwm stramineum).* The primary crosses possess chemical signatures intermediate between the parents, but subsequent backcrossing often results in populations closer in scent to the California cudweed parent but displaying stem and foliar indument of the cotton batting plant parent! Suffice to say, this delightful mess also occurs throughout our biological excursion, often in association with the previously mentioned *Eriophyllum* duo.

Found within this section of our traversal and representing a genus notorious for taxonomic problems are five generally well-behaved species and a polyphyletic hybrid complex of sedges: Taking the straightforward first, slough sedge (*Carex obnupta*) favors and often outlines seasonally wet drainage areas, short-stemmed sedge (*Carex brevicaulis*) prefers the edges of grasslands and coastal prairies, dense sedge (*Carex densa*) with some pistillate scales conspicuously awned but perigynia ovate in outline, one small patch located along a seasonally moist edge of drainage ditch, small-bracted sedge (*Carex subbracteata*), some specimens tending towards *Carex nitidicarpa, pro. sp. nov.,* scattered along the roadside edge, while foothill sedge (*Carex tumulicola*) can be found growing on brushy slopes. The problem child within this sextet is *Carex gianonei, pro. sp. nov.,* a taxon putatively derived from at least three different sections of the genus and so fluid in distinguishing characters that five concurrently flowering culms on the same plant, when separately pressed, could be viewed as five separate species, closely related or not! To make matters worse, it can be found in all the aforementioned habitats varying seasonally which key traits it would like to display. With a basic gestalt mirroring Harford’s sedge (*Carex harfordii*), *Carex gianonei, pro. sp. nov.* differs radically from its analog by having inflorescences: (a) with the lower 1-5+ spikelets being compound-congested and androgynous, gynecandrous or mixed, (b) the terminal spikelet, being androgyrous or gynecandrous, occasionally with a pronounced clavate base, (c) the lowermost spikelets proximal or conspicuously distant, and on some specimens, subtended/enfolded by foliaceous bracts up to 30 cm in length, (d) producing spikelets, usually 1-2, occasionally 3 or 4, on elongate, filiform stalks (reduced panicle branches?) from near the base of the principal flowering culms, partially fused or free, the lower portion often enclosed in a tubular hyaline sheath, (e) perigynia extremely variable, dull, + thin walled, inner face flat, with/without conspicuous venation and outer convex and distinctly veined, orbicular to broadly lanceolate and rounded basally, winged, becoming pruned below beak*, (f) producing “keikis”, asexual nodal proliferations, from both spent flowering-culms and non-flowering innovations. This singular mode of asexual reproduction does not occur with either *Carex nitidicarpa, pro. sp. nov.* or the *Carex “imperfecta”* phase and most likely evolved in response to extended periods of soil aridity coupled with elevated levels of atmospheric moisture. *Carex gianonei, pro. sp. nov.* is often found growing up through the coastal scrub, particularly coyote brush (*Baccharis pilularis*), and is associated with another nodally proliferous monocot and putative hybrid complex, namely the Hall’s bent grass (*Agrostis hallii*)/leafy bent grass (*Agrostis pallens*) intergradations!

*Note: The perigynia of *Carex gianonei, pro. sp. nov.,* are often variable to an extreme degree (REGARDLESS OF EARLY OR LATE FLOWERING), not only within a defined population but also on individual specimens, in all probability, reflecting the polyphyletic origins of this “difficult” taxon! An in depth analysis should be undertaken, defining the various perigynia morphologies which occur within a given population of *Carex gianonei, pro. sp. nov.* and then comparing them with perigynia of *Carex tumulicola* (sect. Bracteosae), *Carex brevicaulis* (sect. Montaneae) and *Carex densa* (sect. Multiflorae), representing, in varying
degrees, the putative ancestors of the Gianone’s sedge complex.

**Note:** The *Carex gianonei, pro. sp. nov./Carex nitidicarpa, pro. sp. nov.** complexes, can produce inflorescences, at any time during the blooming season but more often than not as the season is winding down, that: (1) have only the terminal spikelet functional, it being either gynecandrous or androgynous, the remaining spikelets suppressed, replaced by their subtending bractlets clothing the rachis, (2) have all or some of the lower spikelets functional, with the terminal one either sterile and reduced to a bractlet clothed rachis or producing exserted stamens apically, (3) have the inflorescence reduced to a non-functional bractlet clothed rachis, (4) have all spikelets functional, tightly clustered but not on same plane and subtended by conspicuous acicular bracts, unequal in length, simulating a western rush (*Juncus occidentalis*) inflorescence and (5) have lowermost spikelets of principal inflorescence, discreet-distant, compound-congested or simple, **stalked**, terminating in a sterile or functionally staminate spikelet and subtended by a foliaceous bract. As with the highly variable perigynia, a comprehensive analysis of all the inflorescence permutations should be undertaken and see what correlations can be made relative to (a) intersectional hybridization, (b) currently existing sympatric species exhibiting analogous traits and (c) how these species specific characteristics sort out under controlled breeding experiments. The gynecandrous/androgynous and functional/sterile spikelet patterns that these inter-related hybrid complexes display, appear to represent varying degrees of incompatibility, derived from both ancestral and current intersectional hybridization, and can **exist concurrently on the same plant!**

An examination of the specimens found growing within this section of our floral sleuthing, could initiate an investigation into the polyphyletic origins of the *Carex gianonei/Carex nitidicarpa complex*, with emphasis on intersectional gene flow, both ancient and current, and the attendant non-mendelian resegregation of key characters. **Since the Carex gianonei/Carex nitidicarpa complex is basically Harford’s sedge (Carex harfordii) and small-bracted sedge (Carex subbracteata) matrices, both section Ovales, exhibiting traits specific to other sections, isolate and define these discordant elements.**

(1) Traits, which suggest a hybrid connection with *Carex brevicaulis*, section Montanae:

(a) Basal spikelets on elongate, filiform stalks, with the lower portion often enclosed in a hyaline tubular sheath.

(b) Foliaceous bracts 20-25+ cm. in length, enclosing/sheathing lower spikelets, which are often discrete-distant.

(c) Occasional terminal spikelet linear in gestalt, staminate or imperfect and rachis aligned off-center.

(2) Traits, which suggest a hybrid connection with *Carex densa*, section Multiflorae:

(a) Lower 1-5+ spikelets compound-congested, these can be androgynous, gynaeandrous and/or mixed with pistillate flower bracts occasionally awned.

(b) Opaque part of leaf sheaths transversely rugulose.

(c) Flowering culms sharply triangular, marginally scabrous, prostrate thru erect-ascending in alignment, with rachis often elongate.

(d) While flowering culms of *Carex subbracteata* are pliable at any stage of development and can be readily torn in half, the mature, post-anthesis culms of *Carex nitidicarpa*
tend to inherit, from *Carex densa*, fibrous culms that resist manual tearing.

(3) Traits, which suggest a hybrid connection with *Carex tumulicola*, section Bracteosae:

(a) Inflorescences with lower portion of rachis often bending abruptly at right angle above 1<sup>st</sup> spikelet, the presentation of spikelets + fractiflex and moniliform, some inflorescences with terminal spikelets tending towards androgyny.
(b) Perigynia stipitate and cymbidiform, with margins often infolding, attenuate beaks occasionally displaying modified bifid apices.
(c) Leaves narrow, 1.5-3.0 mm. wide, with flowering culms + filiform and conspicuously elongate with age.

**Note:** Examples repeatedly occur within this highly reticulate hybrid complex that superficially resemble members of the section Stellulatae, with lower spikelets separate and upper approximate, the terminal spikelet distinctly clavate, perigynia often spreading at maturity, somewhat spongy-thickened basally.

While variable in overall gestalt, specimens of *Carex nitidicarpa*, pro. sp. nov., are quite consistent throughout their studied range in several features: (a) the flowering culms, which start out in an ascending trajectory, soon become arcuate in mode of growth, assuming a prostrate status at maturity, (b) some inflorescences, whether on first-blooming seedlings or mature plants, with axis bent circa 80-90 degrees above subtending foliaceous bract, (c) the perigynia thick-walled, often ± cymbiform and varnished in appearance, (d) asexual nodal proliferations, “keikis”, never produced, even with plants found growing under/up through coastal scrub.

When originally studied and documented by herbarium pressings in the 1970’s, this complex hybrid taxon was given the working name of *Carex “super-subbracteata”* with the subsequent proposed name, *Carex nitidicarpa*, pro. sp. nov., referring to the shiny, varnished status of the mature perigynia.

**Study the influence/effect of light versus deep shade on the expression and/or suppression of non-ovales derived traits.**

**Note:** Plants observed for several seasons growing in shaded canyon bottoms, which morphologically fit the *Carex harfordii* profile, when placed in a private botanical garden and grown in full sun, over the course of 2-3 years, started exhibiting non-ovales traits, such as inflorescences with androgynous compound-congested lower spikelets and basal spikelets on elongate filiform stalks!

Examine the ecological role of **habitat disturbance** in the broaching of reproductive isolating mechanisms between sympatric *Carex* species from different sections of the genus.

**Note:** Examine the foliar epidermis, its underlying cellular structure and veining, of short-stemmed sedge (*Carex brevicaulis*), dense sedge (*Carex densa*) and foothill sedge (*Carex tumulicola*), to determine if there are recognizable differences, which are section specific, and that occur within the *Carex gianonei*, pro. sp. nov. and *Carex nitidicarpa*, pro. sp. nov. complexes, independent of traits attributable only to the section Ovales.
Note: Are the non-Ovales traits (e.g., androgynous spikelets, compound-congested lower spikelets, basal (1-4) spikelets on elongated stalks which are often sheathed with a tubular hyaline prophyll) the result of gene fragments (from centromeric fission/fusion), which do not behave in a Mendelian fashion but still reflect (and are transmitted sexually), in an Ovales gestalt, inter-sectional hybridization?

Note: Some thirty years ago, a Carex "imperfecta" was discovered in the upper portion of China Ladder Marsh, which had all of the perigynia scales distinctly awned..... a trait along with the first 1-5 spikelets being compound-congested plus displaying androgynous, gynaeandrous and/or mixed tendencies, could be attributed to sympatric Carex densa. A pressing was made of this taxon and deposited with the Jepson Herbarium.

Carex "imperfecta" appears to be the evolutionary “Rosetta Stone”, linking section Ovales to both the Multiflorae and Montanae sections in this reticulate patterned hybrid syngameon. This scattered and locally not uncommon taxon, often found in habitat of recent disturbance (past 50-60 years), suggests that Carex “imperfecta” is the product of current intersectional hybridization. Gene flow appears to be uni-directional, some plants with pollen producing anthers but with pistils non-functional. Lower 1-5+ spikelets compound-congested, the inflorescences infrequently dense and abbreviated but usually displaying a conspicuously elongate rachis, with the occasional presence of 1-2 basal spikelets on filiform stalks as per Carex gianonei, pro. sp. nov., and Carex nitidicarpa, pro. sp. nov., either free to base or some fused, in varying degrees, to the main inflorescence culm.

Note: Since Carex "imperfecta" usually produces stamens that discharge pollen (of unknown fertility) and has abortive pistillate flowers, the concentrated and morphologically variable populations..... found growing on the eastern side of the Pumpkin Field Marsh (120+ plants) and the s-facing slope overlooking the coastal prairie between China Ladder Marsh and Morehus Arroyo (60+ plants)..... present an interesting challenge in formulating a scenario that can explain the clustering of a dozen or more taxa physically incapable of reproducing via fruit (achenes). Often growing sympatrically with the “micro-colonies” of Carex “imperfecta”, are Carex densa, Carex nitidicarpa and Carex subbracteata..... Carex “imperfecta” appears to be an aneuploid, pistillately non-functional analog of Carex nitidicarpa, which itself behaves as a fertile hybrid derived from Carex densa x Carex subbracteata. The question is..... are the Carex “imperfecta” taxa F1 hybrids, the chance crossings of Carex densa with Carex subbracteata, or taxa secondarily derived from the fertile Carex nitidicarpa backcrossing on to either of its putative parents with the possibility of selfings entering into the equation, forming a highly reticulate gene flow pattern aka a syngameon?

(a) Stain pollen for viability and see if it varies from plant to plant.
(b) Unlike with Carex gianonei/Carex nitidicarpa, the pistillate flower bracts of Carex “imperfecta” occasionally are conspicuously awned, showing a key trait derived from Carex densa/Carex dudleyi, section Multiflorae. Why is this distinctive trait, present in Carex “imperfecta” but not found in any Carex gianonei/Carex nitidicarpa plants studied to date, considering all three taxa share a putative Carex densa/Carex dudleyi heritage?
(c) To determine if Carex “imperfecta” is indeed an aneuploid derivative of intersectional hybridization, with the non-functional pistillate flowers a byproduct of chromosomal incompatibility, do an in depth analysis of Carex “imperfecta” from...

37
morphological, chromosomal and habitat/ecological perspectives.

(d) What role has Carex “imperfecta” played in the formation of the Carex gianonei/Carex nitidicarpa complex, and does the fertility of Carex “imperfecta” pollen vary from plant to plant and also with seasonal conditions, age/biomass of plant and the stability of the ecosystem in which it resides?

Note: While visiting the UCSC Arboretum on 04/01/2011 and observing the established collection of Carex “imperfecta” taken from various sites within the Scotts Creek Watershed, at least 30% of the flowering specimens WERE PRODUCING INFLORESCENCES, WHEN SQUEEZED/SHAKEN, WITH ANTHERS RELEASING POLLEN!!!

Large mature plants of Carex gianonei, pro. sp. nov., often display concurrent flowering culms that are markedly dissimilar to each other in gestalt, often to such an extent, that 5-6 of these “inflos” could be pressed on separate herbarium sheets and when shown to knowledgeable observers, convince them that they are looking at 5-6 different species, some closely related others not! ARE THESE OBSERVABLE DISSIMILARITIES LIMITED TO JUST FOLIAR AND FLORAL MORPHOLOGIES OR DO THEY EXTEND TO POLLEN AND OVULES AS WELL? IS EACH CONCURRENT FLOWERING CULM AN INDEPENDENT NON-MENDELIAN RESHUFFLING OF THE POLYPHYTEIC CAREX GIANONEI GENOME AND IF VIEWED IN TOTO, DO THESE STRUCTURALLY DIFFERING INFLORESCENCES REPRESENT A POTENTIAL POPULATION PASSING FOR AN INDIVIDUAL TAXON?

Within the Scotts Creek Watershed, other notable anomalies within the genus Carex also occur:

(1) Populations of Bolander’s sedge (Carex bolanderi), sect. Deweyanae, produce inflos with the lower 1-5+ spikelets compound-congested, any or all of the spikelets being androgynous, gynaecandrous and/or mixed. Basal spikelets can also be produced, with the opaque part of the leaf sheaths, on occasion, transversely rugulose.

(2) Plants of foothill sedge (Carex tumulicolora), sect. Bracteosae, were observed with flwng-culms producing 1-2 basal spikelets on elongate, filiform stalks. Pressings were made and deposited with the Jepson Herbarium, U.C. Berkeley.

(3) On the coastal prairies flanking the central portion of “Big Willow Gulch”, several specimens of dense sedge (Carex densa), sect. Multiflorae, were found producing flwng-culms with 1-2 basal spikelets on elongate stalks, these not filiform but markedly thinner than the principal flwng-culms. Pressings were made and deposited with the Jepson Herbarium, U.C. Berkeley.

(4) One specimen of Carex gianonei, pro. sp. nov. found growing up through coastal scrub overlooking “Lasher Marsh”, produced flwng-culms, which displayed 1-2 basal spikelets on elongate stalks, but in two instances, 3 & 4!

Extremes in habitat preferences also characterize the Carex within the watershed proper: finding “wet feet” abhorrent, round-fruited sedge (Carex globosa) resides on well-drained, dry summer/fall, wooded slopes while torrent sedge (Carex nudata), prefers stream beds and succeeds where few other species can, firmly anchored by tenacious rhizomes in mid-stream rock crevices!

Another family with members that either drive the literal-minded to the brink of frustration or give unalloyed joy to the discriminating pursuer of variety is the Grass Family (Poaceae). Looking down into Harry Wain’s Arroyo, a large isolated population of Pacific reed grass (Calamagrostis nutkaensis) thrives, sharing habitat with a rare form of western bent grass (Agrostis
exarata), 1-2 meters in height with awnless spikelets condensed in glomerate verticils, these conspicuously separate. Farther along on our ascending tour, an extensive, long persisting colony of Hall’s bent grass (Agrostis hallii), perhaps tainted with genetic material contributed long ago by leafy bent grass (Agrostis pullens), shares a roadbank, this time flanking Harry Wain’s driveway, with a singularly robust form of California wild rye (Elymus glaucus subsp. glaucus), some inflorescences seasonally paniculate (a certain percentage of this form appears consistently in hand sown populations raised from locally collected native material, establishing a genetic basis for the elongate flowering branches on inflorescences), sporting leaves 26+ cm. in length and 2.5+ cm. in width and overpowering scattered specimens of native meadow barley (Hordeum brachyantherum subsp. brachyantherum). For many years, scattered populations of western bent grass (Agrostis exarata var. exarata) were established along this and other sections of Swanton Road but recently, due to the habitat encroaching non-native panic veldt grass (Ehrharta erecta), velvet grass (Holcus lanatus) and Italian rye grass (Lolium multiflorum), this less common awnless variety is becoming scarce. Mimicking a perennial caespitose Grass Family (Poaceae) constituent, western rush (Juncus occidentalis) cryptically resides amongst the bona fide grasses, daring a savvy viewer to unmask this consummate poseur. Rigid hedge-nettle (Stachys ajugoides var. rigida = Stachys rigida var. quercetorum), one of two native members of this aromatic genus occurring within this section of our botanical sleuthing, can be readily distinguished by its chemical signature, lower corolla lip alignment and strongly oblique ring of hairs distending lower part of the corolla tube. Occupying an unstable slope across the current replacement for the original Swanton Road/Highway 1, whose outline can still be discerned some thirty feet below, a scattered population of American vetch (Vicia americana subsp. americana) blends in with and is vastly outnumbered by the European introduction, narrow-leaved vetch (Vicia sativa subsp. nigra).

Looking downward in a southerly direction, the coastal prairie comes into view: an ecological continuum that parallels Highway 1 (including the Gulch #1-5 complexes), from the north end of Swanton Road (where it becomes fragmented) with its isolated populations of Kellogg’s horkelia (Horkelia cuneata var. sericea) and purple godetia (Clarkia purpurea var. margined terrace edge overlooking Scotts Creek Marsh proper. Providing habitat for a diverse aggregation of rare and unusual plant species, this horizontal ribbon of terrain, is punctuated with seeps, perennially watered micro-marshes, “vertical” grasslands bounded by coastal scrub and bisected by transverse gulches terminating in varying series of waterfalls before entering the ocean. A substantial part of this ecologically complex series of interrupted grasslands is defined by a triad of monocot families, namely the Sedge Family (Cyperaceae), the Rush Family (Juncaceae) and the Grass Family (Poaceae) and was extensively documented by herbarium pressings during the early 1980’s. Of particular interest were the disjunct populations of Blasdale’s bent grass (Agrostis blasdalei), a rare FSC/1B listed taxon previously known from a narrow coastal zone north of the Golden Gate, and displaying a wide range of growth patterns and inflorescence configurations locally. It would be of considerable interest, both ecologically and biogeographically, to determine on a molecular level, if the Santa Cruz County populations and the populations of Marin County are of the same age and if the documented examples of hybridization with sympatric California bent grass (Agrostis densiflora) and western bent grass (Agrostis exarata) locally, have played a role in this taxon’s polymorphism? One member of the Primrose Family (Primulaceae) plus three members of the Gentian Family (Gentianaceae) find suitable habitat in the prairie, both in areas that remain damp after seasonal rainfall and in the drier transitional zones defined by the coastal scrub: favoring the scattered, poorly drained quasi vernal pool patches are Centunculus minimus =
Anagallis minima, an inconspicuous sister species of the introduced scarlet pimpernel (Anagallis arvensis), timwort (Cicendia quadrangularis), often barely 2 cm. in height with solitary butter-yellow cruciform corollas markedly contrasting with its less picky and more ruderal relative, Monterey centaury (Centaurium muehlenbergii = Zeltnera mühlenbergii), exceeding 30 cm. in height, inflorescences dense, flat-topped with pink corollas and greatly expanding its local range over the past two decades and in some places actually becoming weedy and finishing up with Davy’s centaury (Centaurium davyi) or Zeltnera davyi according to the most recent nomenclatural changes, a worthy addition to any wildflower garden, often found growing half-hidden under California sagebrush (Artemisia californica), with flowers pink or white, and occasionally “hybrids” between those two polarities which are an unusual tannish-lilac in coloration!

California gilia (Gilia achilleifolia) and grassland gilia (Gilia clivorum) occupy quasi-vertical niches, ranging from shaded slopes to exposed cliff faces throughout the watershed and varying considerably as to inflorescence configuration, hairiness, glandulosity and flower coloration.

Growing within the confines of “Allium Marsh”, so named because it contained scattered plants of one-leaved onion (Allium unifolium), a disjunct population of locally rare Hall’s willow herb (Epilobium hallianum) was documented during the early 1980s. Ensnared in the lower portion of the marsh before it transitions into “Gulch 2” and decidedly uncommon in the Swanton area, cow clover (Trifolium wormskiioldii) is a rarity amongst our local native clovers, in being perennial, while nearby overlooking the mouth of “Gulch 1”, the more frequently encountered strigose trefoil (Acmispon strigosus), is annual and proud of it! Occasionally gracing the moist vertical banks adjacent to the seasonal waterfalls draining the prairie, are scattered colonies of western pearlwort (Sagina decumbens subsp. occidentalis), deftly camouflaged from all but the most diligent of observers and paralleling its relative, shining chickweed (Stellaria nitens), in the art of concealment.

Note: An overview (05/2011) of the native taxa growing within and circumscribing the Allium Marsh area and grouped by families, is as follows..... Monterey pine (Pinus radiata)..... forest live-oak (Quercus parvula var. shrevei)..... wax myrtle (Morella californica)..... California coffeeberry (Frangula californica subsp. californica)..... Pacific reed grass (Calamagrostis nutkaensis), California hairgrass (Deschampsia cespitosa subsp. holciformis), California wild rye (Elymus glaucus subsp. glaucus), meadow barley (Hordeum brachyantherum subsp. brachyantherum), foothill needlegrass (Stipa lepida)..... dense sedge (Carex densa), Carex gianonei complex (Carex harfordii matrix, some plants with inflorescences displaying lower 1-5 spikelets, compound-congested), “imperfect” sedge (Carex imperfecta..... a hybrid link, connecting the Ovales and Multiflorae sections, some plants displaying functional stamens producing pollen but none observed to date, manifesting pistillate flowers capable of maturing into viable achenes), slough sedge (Carex obovata), foothill sedge (Carex tumulicolata)..... salt rush complex (aff. Juncus brevirei, flowering culms tortile, laterally compressed, dark green and lacking leaf-blades with variable, open to compact, inflorescences), toad rush (Juncus bufonius), Pacific bog-rush (Juncus effusus var. pacificus), common rush (Juncus patens), brown-headed rush (Juncus phaeochepalus var. phaeochepalus)..... coyote brush (Baccharis pilularis subsp. consanguinea), Canada goldenrod (Solidago elongata), California aster (Symphyotrichum chilense)..... harlequin lotus (Lotus formosissimus = Hosackia gracilis), Lindley’s varied lupine (Lupinus varicolor)..... sun cup (Taraxia ovata)..... wood strawberry (Fragaria vesca), wedge-leaved horkelia (Horkelia cuneata var. cuneata), Pacific cinquefoil (Potentilla anserina subsp. pacifica), California blackberry (Rubus ursinus)..... dwarf brodiaea (Brodiaea terrestris subsp. terrestris)..... cow-parsnip (Heracleum maximum), Gairdner’s yampah (Perideridia gairdneri subsp. gairdneri)..... California vervain (Verbena lasiostachys var.
lasiostachys) ..... rigid hedge-nettle (*Stachys rigid a var. quercetorum* ..... growing in and peripheral to the marsh proper, with leaf bases truncate to cordate, scent of crushed leaves sweeter than often pungent chaparral ecotype of this taxon and perhaps referencing *Stachys ajugoides* genes) ..... sticky monkeyflower (*Mimulus aurantiacus*) ..... two blooming plants of one-leaved onion (*Allium unifolium*), namesake for this palustrine zone which defines the upper watershed for Gulch #2.

Note: While usually found in a drier, more mesic to xeric environment locally, the moisture retentive but rapidly draining slopes defining the Allium Marsh habitat occupied by *Stachys rigid a var. quercetorum*, differ markedly from the inner prairie/upper Big Willow Gulch Watershed, home to sister species *Stachys ajugoides*, with its horizontally aligned and standing water scenario, simulating an expansive vernal pool.

Bounded on all sides by the Western Terrace and moving in a southwardly direction, one enters the botanically diverse interface between the edge of the coastal prairie and the deeply incised drainage system of Gulch # 3. Just within this narrowly defined area, several native taxa which are rare or uncommon within the county, can be observed ..... Bolander's golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*), narrow-leaved mule ears (*Wyethia angustifolia*), checkerbloom (*Sidalcea malvaeflora* subsp. *malvaeflora*), California hairgrass (*Deschampsia cespitosa* subsp. *holciformis*) and wedge-leaved/Kellogg's horkelia (*Horkelia cuneata* ..... population variable with elements of both *var. cuneata* and var. *sericea* present). Playing a supporting role in defining the native species diversity within this localized subset of the coastal prairie, the following taxa (arranged by families), are noted: toad rush (*Juncus bufonius*), brown bog-rush (*Juncus hesperius*), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*) ..... dense sedge (*Carex densa*), Gianone sedge complex (*Carex gianonei, pro.sp.nov.*), imperfect sedge (*Carex ”imperfecta”), slough sedge (*Carex obtusa*), small-bracted sedge (*Carex subbracteata*), foothill sedge (*Carex tumulicola*) ..... California water starwort (*Callitriche marginata* ..... with pedicellate fruit pushed into moist substrate) ..... seaside brome (*Bromus aff. maritimus*), California oat grass (*Danthonia californica*), California wild rye (*Elymus glaucus* subsp. *glaucus*), meadow barley (*Hordeum brachyantherum* subsp. *brachyantherum*), purple needlegrass (*Stipa pulchra*) ..... sea pink (*Armeria maritima* subsp. *californica*). ..... Monterey pine (*Pinus radiata*). ..... California vervain (*Verbena lasiostachys* var. *lasiostachys*) ..... yarrow (*Achillea millefolium*), California sagebrush (*Artemisia californica*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), lizard tail (*Eriophyllum stachadifolium*), purple cudweed (*Gamochaeta ustulata*), California aster (*Symphyotrichum chilense*) ..... poison oak (*Toxicodendron diversilobum*) ..... sticky monkeyflower (*Mimulus aurantiacus*) ..... hairy wood sorrel (*Oxalis pilosa*) ..... coast nettle (*Urtica dioica* subsp. *gracilis*). ..... California man root (*Marah fabaeus*) ..... miner’s lettuce (*Claytonia perfoliata* subsp. *perfoliata*) ..... cow-parsnip (*Heracleum maximum*), gambleweed (*Sanicula crassicaulis*). ..... yerba buena (*Clinopodium douglasii*). ..... California hedge nettle (*Stachys bullata*). ..... blue-eyed grass (*Sisyrinchium bellum*). ..... soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*). ..... California blackberry (*Rubus ursinus*). ..... California buttercup (*Ranunculus californicus* var. *californicus*). ..... California figwort (*Scrophularia californica*). ..... bracken (*Pteridium aquilinum* var. *pubescens*).

Note: The coastal prairie aka Western Terrace, between Lasher Marsh Gulch and China Ladder Marsh Gulch, contains several taxa of special interest and in the case of the
Carex gianonei complex/syngameon, affords significant insights into species formation..... with one of the putative causal agents (broaching of the reproductive isolating mechanisms) being various types of disturbance patterns. The carices occupying this portion of the Western Terrace, tend to favor seasonally saturated areas that are analogous to vernal pools but with more subsurface than standing water present and also margin/occupy the various marsh-like habitats that act as catch-basins for run-off from the synform derived slopes overlooking the prairie. Within this relatively horizontal environment, the following species (building blocks) pertinent to the Carex gianonei/imperfecta/nitidicarpa intersectional non-mendelian derived hybrids occur..... Carex brevicaulis, Carex densa, Carex aff. harfordii, Carex subbracteata and Carex tumulicola. The short-stemmed sedge (Carex brevicaulis) is less tolerant of extended periods of "wet feet" and usually prefers the drier and more exposed edges of the Western Terrace but can be found within the prairie grassland as well. Carex gianonei forma typica, displaying elongate to densely capitulate inflorescences having the first 1-5(+) spikelets compound-congested (reduced panicle branch), can appear as homozygous sub-populations or intermixed with taxa displaying the "standard" Carex harfordii gestalt. Where large semi-prostrate patches of Carex densa and Carex subbracteata interdigitate, Carex nitidicarpa is often found..... referencing a more robust Carex subbracteata demeanor but with flowering culms possessing angular, retrorsely-scapabridulous margins and inflorescences with lower 1-5(+) spikelets compound-congested and occasionally androgy nous. The most obvious connecting bridge in this breakdown of sectional integrity, is Carex imperfecta..... variable as to stature and inflorescence configuration but consistent in its non-functioning pistillate flowers and in the majority of plants, staminate flowers with pollen producing anthers. While scattered throughout the area under discussion, two recently (05/14/2011) studied habitats are worth a brief discussion..... (1) overlooking the Sandy-bottom Reservoir, a moisture retentive zone (circa 12' x 30') dominated by carices, rushes and perennial grasses, contained at least 20 long-established examples of Carex imperfecta..... these growing either singly or in groups, sympatric with Carex densa, Carex gianonei, Carex harfordii analogs and Carex subbracteata; (2) below the Sandy-bottom Reservoir and scattered throughout the south-eastern half of the Pumpkin Field Marsh, 85(+) mature specimens of Carex imperfecta were examined, some of these growing out of Juncus patens tussocks, and sharing this part of the Western Terrace with Carex densa, Carex gianonei, Carex harfordii analogs, Carex nitidicarpa, Carex subbracteata and Carex tumulicola. This pattern of Carex species/hybrid interface continues unabated along the "coastal prairie" down to China Ladder Marsh, and in a more fragmented/interrupted version, extends down to the Scotts Creek Marsh. The principal non-related native species associated with each of these Carex dominated habitats are as follows..... Danthonia californica, Deschampsia cespitosa subsp. holciformis, Hordeum brachyantherum subsp. brachyantherum, for the Poaceae and Juncus bufonius, Juncus hesperius, Juncus occidentalis, Juncus patens, Juncus phaeocephalus var. phaeocephalus for the Juncaceae. With a nod to literally overlooked relatives of the star performers in this taxonomic drama, the Carex, two diminutive native members of the Cyperaceae, often growing sympatrically, are dwarf club rush (Isolepis carinata) and low club rush (Isolepis cernua).

Artificially sculpted and overlooking the Pumpkin Field Marsh, the Sandy-bottom Reservoir, for its diminutive stature, has been a repository for several rare and unique taxa. The following native species and putative hybrids have been documented as occurring in this micro-refugium, either by in situ study (over the past 35+ years), herbarium pressings, divisions of living plants and/or seed collections: water pygmyweed (Crassula aquatica), thyme-leaved pogogyne (Pogogyne serpylloides), Davy's centaury (Zeltnera davyi), Blasdale's bent grass (Agrostis
(Callitriche heterophylla var. bolanderi), displaying its foliar rosettes on the water’s surface while flowers and sessile fruits are sequestered in the aqueous depths, shares its fluid habitat with common spikerush (Eleocharis macrostachya) cleverly mimicking sympatric Mexican rush (Juncus mexicanus) with rhizomatous, tortile-compressed culms and is joined by another lookalike (at least from a distance), growing quillwort (Lilaea scilloides = Triglochin scilloides); scattered forest live-oaks (Quercus parvula var. shrevei), representing shrub through arboreal status categories, ecologically enrich the central portion of this complex watershed with their evergreen status while blue elderberry (Sambucus mexicana = Sambucus nigra subsp. canadensis) and red elderberry (Sambucus racemosa var. racemosa) shed their seasonal foliage in the fall, allowing needed light to penetrate the deeper recesses of the gulch and enriching the soil with their copious leaf litter; held hostage by poison oak (Toxicodendron diversilobum) and apparently the lone representative of its kind in this all inclusive “mini-hotspot”, Pacific madrone (Arbutus menziesii) stands out in its singularity, a welcome byproduct of some adventurous coyote or flock of robins.

Note: Circumscribed by a soil profile defined in part by eolian sand deposits, impacted by the prevailing westerly winds and modified by anthropogenic agricultural practices (all of which have created a distinctly xeric environment in spite of seasonal rains and the influence of coastal fog), one encounters an ecologically distinct “refugium” (w/nw of Frog Pond), composed of California hairgrass (Deschampsia cespitosa subsp. holciformis), brown-headed rush (Juncus phaeocephalus var. phaeocephalus), western rush (Juncus occidentalis), toad rush (Juncus bufonius var. bufonius), common rush (Juncus patens), brown bog-rush (Juncus effusus var. brunnneus = Juncus hesperius), dwarf club rush (Isolepis carinata), low club rush (Isolepis cernua), chaffweed (Anagallis minima), California brome (Bromus carinatus var. carinatus), California oat grass (Danthonia californica sensu lato), narrow-leaved mule ears (Wyethia angustifolia), harlequin lotus (Lotus formosissimus = Hosackia gracilis), purple cudweed (Gamochaeta ustulata) and tinker’s penny (Hypericum anagalloides), plus one of the two isolated populations of Gairdner’s yampah (Perideridia gairdnerii subsp. gairdneri) found within this “repository of biodiversity”, which is structurally distinguished from sister species, Kellogg’s yampah (Perideridia kelloggii), by possessing a flowering stem readily detachable from the fleshy tuberous root and a concave mature inflorescence..... on 07/20/2011, 6+ plants observed in various stages of floral development with two in anthesis. Sharing this hydrologically intriguing zone are coyote brush (Baccharis pilularis subsp. consanguinea), California coffeeberry (Frangula californica subsp. californica), poison oak (Toxicodendron diversilobum), California blackberry (Rubus ursinus), blue-eyed grass (Sisyrinchium bellum), bugle hedge-nettle (Stachys ajugoides..... with cuneate leaf bases), purple needlegrass (Stipa pulchra), dense sedge (Carex densa), Gianone sedge complex (Carex gianonei, pro sp. nov.), nitid sedge (Carex nitidicarpa, pro sp. nov.) and small-bracted sedge (Carex subbracteata).

Growing out of the weathered lichenous mudstone and overlooking the central portion of Big Willow Gulch as it crosses the prairie proper, California fuchsia (Epilobium canum) and California aster (Corethrogynne filaginifolia) soften the harshness of their exposed surroundings with shared canescent herbage but as to flowers, contrasting muted lilac daisy facsimiles with 3-4 cm long glowing red-orange salverform hummingbird enticements..... of particular note, the taxon referred to as California aster, is of the type formerly given the appellation Corethrogynne californica, with large solitary heads and five “alba” flowered individuals were recently discovered, anchored firmly to the fractured shale and spilling down the bifurcate gulch complex’s western flank (cuttings and cypselae are now being raised at the UCSC Arboretum);
the color blue, is often absent or rarely manifests itself in many plant families..... fortunately, the Ranunculaceae as represented by the genus Delphinium locally, has generously given the watershed two species with the rarest of this duo, coast larkspur (Delphinium decorum subsp. decorum), vibrantly standing out against the surrounding verdancy; scattered colonies of California wild rose (Rosa californica), unlike many of its domesticated relatives, thriving in moist habitats and perfuming the surrounding area with flowers the size of silver dollars arrayed on complex cymes displaying up to 40 flowers; two morphologically dissimilar species of Baccharis, coyote brush (Baccharis pilularis), with woody stems and branches, and marsh baccharis (Baccharis douglasii = Baccharis glutinosa), herbaceous with glutinous herbage, share a mesic niche along the prairie’s edge, while directly below on perpetually moistened bedding planes, common monkeyflower (Mimulus guttatus) defies gravity and mortality with rope-like stolons; seemingly out-of-place tan-oaks (Lithocarpus densiflorus var. densiflorus = Notholithocarpus densiflorus var. densiflorus) co-mingle with California sagebrush (Artemisia californica), while on the opposite side of the gulch, wind-sculpted Douglas-firs (Pseudotsuga menziesii var. menziesii) cling precariously near the edge of vertical slopes overlooking colonies of thimbleberry (Rubus parviflorus) and fraternize with nearly everlasting (Anaphalis margaritacea), hazelnut (Corylus cornuta subsp. californica), California goldenrod (Solidago californica = Solidago velutina subsp. californica) and sea lettuce (Dudleya caespitosa), the latter a xeriscaper’s dream plant with vibrant red stems and contrasting yellow-orange flowers; an ornamental striking form of giant trillium (Trillium chloropetalum) was collected from this area thirty years ago, with texturally thick, broadly obovate cream-colored petals and like-colored anthers, the flowers exuding a distinct lemony scent. This taxon was also observed in the Gazos Creek Watershed in southern San Mateo County and perhaps should be nomenclaturally referred to white trillium (Trillium albidum); isolated colonies of leathery-leaved salal (Gaultheria shallon) and coast barberry (Berberis pinnata subsp. pinnata) are a stone’s throw from a brightly colored large-flowered variant of checker lily (Fritillaria affinis), sea pink (Armeria maritima subsp. californica), Monterey pine (Pinus radiata), California acaena (Acaena pinnatifida var. californica), short-stemmed sedge (Carex brevicaulis), prostrate clarkia (Clarkia prostrata), with concolored flowers producing dark brown unadorned seeds, scattered patches of Bolander’s golden aster (Heterotheca sessiliflora subsp. bolanderi) variable both as to color and scent of foliage, and further along with its rootstocks deeply embedded in the mudstone fractures, San Francisco campion (Silene virecunda subsp. virecunda = Silene virecunda?); sheltered within the protective embrace of the coastal scrub, an isolated population of California mustard (Caulanthus lasiophyllus) was documented for this “watershed within a watershed” three decades ago and recently rediscovered (10/18/06) growing in the gulch bottom along the edge of a seasonal watercourse, the nearly spent plants a meter in height with conspicuously reflexed siliques; perhaps the only surviving colony of banded owl’s clover (Castilleja exserta subsp. latifolia) in the county, with its cobwebby indument, sharing the same exposed grass-contoured terrace with the vanilla scented cream-colored form of owl’s clover (Castilleja densiflora, aff. Orthocarpus noctuninus) and the myriad polychromatic forms of Indian paint-brush (Castilleja affinis subsp. affinis), red alder (Alnus rubra), creek dogwood (Cornus sericea subsp. sericea). California buckeye (Aesculus californica) which from an aerial perspective gives the impression of verdant brain coral, so coalesced are the individual crowns; wax myrtle (Myrica californica = Morella californica) and Utah service-berry (Amelanchier utahensis), oversee ancient clumps of giant chain fern (Woodwardia fimbriata), tussocks of California fescue (Festuca californica), Franciscan coyote mint (Monardella villosa subsp. franciscana) at its most diverse morphologically, a localized nanistic race of white globe lily (Calochortus albus), California huckleberry (Vaccinium ovatum), variable populations of wedge-leaved horkelia (Horkelia cuneata var. cuneata)..... the adaxial foliar surface ranging from a glandular coated grass green to a cinerous indument possibly representing subsp. sericea
influence; a pair of caespitose members of the Poaceae, junegrass (Koeleria macrantha) and ocean-bluff bluegrass (Poa unilateralis) with common woodrush (Luzula comosa) often favoring moisture retentive pockets on the west-facing slopes, while high above this botanical fray, one of the five documented populations for the county of chia (Salvia columbariae) co-exists in a parched abode of fractured mudstone with the uncommon Mt. Diablo cottonweed (Micropus amphibolus), the rare Santa Cruz microseris (Stebbinsoseris decipiens) sharing habitat with co-parent Microseris bigelovii, California filago (Filago californica = Logfia filaginoides) and slender goldfields (Lasthenia californica).

Note: Within the Big Willow Gulch drainage system, slender goldfields (Lasthenia californica) exists in two forms..... growing on an exposed fractured mudstone slope which drops down towards Highway 1, is a population with cypselae lacking pappus, while in an analogous environment, higher up in elevation and overlooking the coastal prairie between the east end of the Pumpkin Field and the Frog Pond, is a remnant colony producing pappus-crowned cypselae. Both of these populations have been documented with "achene" collections, these deposited at the UCSC Arboretum for future study. It is possible that Lasthenia gracilis may occur within this area and one or more of these populations, upon further study, may be included within the circumscription for that taxon.

Note: Franciscan coyote mint (Monardella villosa subsp. franciscana), just within Big Willow Gulch, constitutes a complex array of forms, with variations in foliar morphology and indument, differing chemical signatures of individual plants and inflorescence configurations: concerning the latter, a specific trait that occurs with some frequency throughout this population and elsewhere in the adjacent coastal gulches, is the production of sessile whorls within the existing flower heads and do these constitute condensed verticals or reduced branches?

Note: Scattered throughout the prairie’s edge and ocean facing coastal scrub are representatives of the genus Grindelia (Family Asteraceae), problematic in their taxonomy and behaving as intergrades between what were formerly designated Grindelia hirsutula subsp. rubricaulis and Grindelia stricta subsp. venulosa. Standing on the east-facing synform and looking west towards Greyhound Rock State Beach where Grindelia stricta var. angustifolia resides behind the primary dunes, moving up to the benched tops of the seabluffs viewing what purports to be Grindelia stricta var. platyphylla hugging the ground with prostrate stems radiating out from a central woody caudex, then glancing northwest towards Last Chance Road and Laguna de las Trancas, home to what is now called Gridelia hirsutula var. hirsutula = Grindelia hirsutula and without inducing vertigo, focusing upwards in an northeasterly direction to the Seymour Hill, colonized by a subglabrous stramineous form of Grindelia hirsutula simulating Grindelia camporum var. camporum and one has a perfect living laboratory to study on both a macro and micro level, the evolution of this ubiquitous yet imperfectly understood genus!

As an addendum to the previously discussed overview documenting the botanical diversity of Big Willow Gulch and its surrounding watershed, here is a partial but substantial listing of other native taxa, both locally rare and common species plus two diagnostically challenging hybrid complexes, which help to define this area of special interest. The Carex gianonei/nitidicarpa/imperfecta syngameon and the Agrostis hallii/pallens intergrades are amply represented, sharing habitat with some of the following “locals”: toyon (Heteromeles arbutifolia), western lady’s mantle (Aphanes occidentalis), California coffeeberry (Frangula californica subsp. californica), cow-parsnip (Heracleum maximum), straggly gooseberry (Ribes divaricatum var.
creeping hearts **parviflora** (yerba buena **ajugoides**, California saxifrage **pulchra**, cotton batting plant **(hebecarpus umbelliferum)**, Pacific bog-rush **(juncus effusus var. pacificus = juncus effusus subsp. pacificus)**, California man root (Marah fabaceus), California horkelia (Horkelia californica var. californica), Johnny jump-up (Viola pedunculata), purple cudweed (Gamochaeta ustulata), footsteps-of-spring (Sanicula arctopoides), caraway-leaved lomatium (Lomatium caruifolium var. caruifolium), rattlesnake weed (Daucus pusillus), Chinese houses (Collinsia heterophylla), sticky monkeyflower (**Mimulus aurantiacus**), California hedge-parsley (Yaba microcarpa), American winter cress (Barbarea orthoceras), watercress (Nasturtium officinale), stinging phacelia (Phacelia malvifolia), California plantain (Plantago erecta), pelican flower (Triphysaria eriantha subsp. rosea, flower color off-white thru pale yellow), blue-eyed grass (Sisyrinchium bellum), snowberry (Symphoricarpos albus var. laevigatus), hairy wood sorrel (Oxalis corniculata, **Oxalis pilosa**), sweet cicely (Osmorhiza hetero), shining peppergrass (Lepidium nitidium, Watson’s willow herb (Epilobium ciliatum subsp. watsonii), giant horsetail (**Equisetum telmateia subsp. braunii**), oso berry (Oenothera erasiformis), sneezeweed (Helenium puberulum), yarrow (Achillea millefolium), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), lizard tail (Eriophyllum stachadidifolium), California maidenhair (Adiantum jordanii), coffee fern (Pellaea andromedifolia), California polypody (Polypodium californicum var. kauffussii), goldback fern (**Pentaguria triangularis subsp. triangularis**), wood fern (Dryopteris arguta), western sword fern (**Polystichum munitum**), lady fern (**Athyrium felix-femina var. cyclorosum**), bracken (**Pteridium aquilinum var. pubescens**), Davy’s clarkia (aff. Clarkia davyi, erect mode of growth, flowers bicolored, seeds gray-encrusted, transition zone between Pumpkin Field Marsh and Frog Pond, farewell-to-spring (**Clarkia rubicunda**), thyme-leaved pogygyne (Pogogyne serpyloides), checkerbloom (**Sidalcea malvaeflora subsp. malvaeflora**), blue witch (**Solium umbelliferum**), California buttercup (**Ranunculus californicus**), downy buttercup (**Ranunculus hebecarpus**), Gianone’s sanicle (**Sanicula gianonei, pro. sp. nov.**), Gianone’s gnaphalium (**Pseudognaphalium gianonei, pro. sp. nov.**), California cudweed (**Pseudognaphalium californicum**), cotton batting plant (**Pseudognaphalium stramineum**), pink everlasting (**Pseudognaphalium ramosissimum**), Bioletti’s cudweed (**Pseudognaphalium biottii**), red fescue (**Festuca rubra**), California canary grass (**Phalaris californica**), Pacific reed grass (**Calamagrostis nutkaensis**), slender hairgrass (**Deschampsia elongata**), meadow barley (**Hordeum brachyantherum subsp. brachyantherum**), foothill needlegrass (**Nassella lepida = Stipa lepida**), purple needlegrass (**Nassella pulchra = Stipa pulchra**), California wild rye (**Elymus glaucus subsp. glaucus**), California melic (**Melica californica**), California saxifrage (**Saxifraga californica = Micranthes californica**), rigid hedge-nettle (**Stachys ajugoides var. rigida = Stachys rigida var. quercetorum**), California hedge-nettle (**Stachys bullata**), yerba buena (**Satureja douglasii = Clinopodium douglasii**), slender miner’s lettuce (**Claytonia parviflora subsp. parviflora**), miner’s lettuce (**Claytonia perfoliata subsp. perfoliata**), California poppy (**Eschscholzia californica**), slim Solomon’s seal (**Smilacina stellata = Maianthemum stellatum**), American brooklime (**Veronica americana**), red maids (**Calandrinia ciliata**), climbing bedstraw (**Galium porrigens var. porrigens**), blue dicks (**Dichelostemma capitatum subsp. capitatum**), soap plant (**Chlorogalum pomeridianum var. pomeridianum and var. divaricatum**), Indian thistle (**Cirsium brevislidiun**, wood strawberry (**Fragaria vesca**), sticky cinquefoil (**Potentilla glandulosa subsp. glandulosa = Drymocallis glandulosa var. glandulosa**), coast buckwheat (**Eriogonum latifolium**), creeping hearts (**Pterostegia drymarioide**, small-flowered trefoil (**Lotus micranthus = Acmispon parviflorus**), deerweed (**Lotus scoparius var. scoparius = Acmispon glaber var. glaber**,... some
plants prostrate and referable to var. prostratus), Chilean trefoil (Lotus wrangelianus = Acmispon wrangelianus), American vetch (Vicia americana subsp. americana), sky lupine (Lupinus nanus), Lindley’s varied lupine (Lupinus varicolor), woolly marbles (Psilocarphus tenellus var. tenellus), western nettle (Hesperocnide tenella), coast nettle (Urtica dioica subsp. gracilis), sun cup (Camissonia ovata = Taraxia ovata), California milkwort (Polygonum californica) and California figwort (Scrophularia californica).

Further along in a southerly direction one encounters Morehus Arroyo, named for the juvenile oracle oak (Quercus x morehus) found growing there circa 30 years ago. As with other edge-of-terrace perennial seeps that punctuate the coastal prairie from Lasher’s Marsh (overlooking Greyhound Rock State Beach) to China Ladder Marsh and beyond, shared species abound: but some native taxa are marsh and/or drainage area specific and highly localized even within these sub-watersheds, making each one of the superficially akin permanent seeps, proximal to the ocean with its attendant influence on localized atmospheric moisture, unique and valuable biological resources! The drainage system defining Morehus Arroyo is more reticulate that linear (except where it crosses the Western Terrace..... and even there, it drains a fan shaped complex of gently sloped seasonal wetlands..... marshlike in all but name), with the primary source originating, as a spring, midway up the coastal scrub covered face of the eastward dipping synform. From a hydrological perspective, the lower portion of the arroyo (as it leaves the coastal prairie) is equally complex, with a permanently draining benched marsh to the west and a seasonally draining gulchlet to the east, which is topped by a hydrologically active seep and before the cumulative water course dives under Highway 1, it is bookended by two more drainages, with origins proximal to China Ladder Gulch on the southeast flank and Big Willow Gulch in a northwesterly direction. The upper half..... of this perpendicular to Highway 1 self-contained watershed..... from the tilted slopes with their marshy vegetative skins down on to the Western Terrace with its mosaic of Juncus islands juxtaposed with coyote brush scrub, is well represented by all phases of the Carex gianonei/imperfecta/nittidicarpa complexes, perhaps underscoring the concept that disruptive events, both natural and manmade, can result in the broaching of reproductive isolating mechanisms that usually prevent the exchange of genetic material between sympatric taxa, closely related or not. While arroyo willow (Salix lasiolepis) defines the Big Willow and China Ladder watersheds, Morehus Arroyo midway between the two, also plays host to several examples of shining willow (Salix lucida subsp. lasiandra = Salix lasiandra var. lasiandra), these concentrated around the principal edge-of-prairie waterfall, with one old reclining furrowed-bark example dominating the landscape and possessing leaves unusually thick in texture and leathery to the touch! Where the prairie bounds the willow dominated edge of the terrace and during the rainy season, water often pools in depressions before draining into the gulch proper, specialized micro-habitats occur, acting as repositories for uncommon species locally. A specific example, of these physically enduring but ephemeral as to water content sites, is as follows: within a rectilinear depression circa 3 meters wide x 6 meters long, containing concentrated populations of California oat grass (Danthonia californica), California hairgrass (Deschampsia cespitosa subsp. holciformis), western rush (Juncus occidentalis) and brown-headed rush (Juncus phaeocephalus var. phaeocephalus), an isolated population of perennial harlequin lotus (Lotus formosissimus = Hosackia gracilis) was discovered in the early 1970s and has persisted for many years. Although the drainage area between the coastal prairie and the terminus of the Morehus Arroyo is relatively short, it receives multiple feeds, at least three continually active hydrologically and two only seasonal at best, making for a botanically diverse complex of near vertical habitats. Where water, to some degree is continually present, indicator species such as common monkeyflower (Mimulus guttatus), hugging the moist
gound and forming intricate mats of stolons tinted a reddish-purple, the ubiquitous duo of Pacific bog-rush (*Juncus effusus* var. *pacificus*) and brown bog rush (*Juncus hesperius*), one appearing to be a reduced facsimilie of the other, panicked bulrush (*Scirpus microcarpus*) and wax myrtle (*Myrica californica = Morella californica*) create verdant backdrops of varying heights and profiles, while their mesic counterparts, poison oak (*Toxicodendron diversilobum*) and coast barberry (*Berberis pinnata* subsp. *pinnata*) offer the viewer fall tapesities threaded with varied patches of red, orange and purple. Giving muted contrast, with subtle shadings of gray and silver, California sagebrush (*Artemisia californica*) and California fescue (*Festuca californica*) define the west facing, species rich slopes where biodiversity runs rampant. A crossection of taxa inhabiting this wind-sculpted environment includes, near its summit, reduced in stature colonies of farewell-to-spring (*Clarkia rubicunda*), with thick stems and intermediates internodes, basically hugging the terrain and covered with large flowers in shades of pink (whether this mode of growth is wholly environmental in response to the prevailing wind patterns or there is a genetic component involved is a project worth exploring); also sharing this exposed-to-the-elements abode are Franciscan coyote mint (*Monardella villosa* subsp. *franciscana*), seaside daisy (*Erigeron glaucus*), coastal rein orchid (*Piperia elegans*), Lindley’s varied lupine (*Lupinus varicolor*), two sanicles, gambleweed (*Sanicula crassicaulis*) and footstools-of-spring (*Sanicula arctopoides*), California plantain (*Plantago erecta*), tomcat clover (*Trifolium willdenowii*), Indian paintbrush (*Castilleja affinis* subsp. *affinis*), rattlesnake weed (*Daucus pusillus*), white globe lily (*Calochortus albus*), California aster (*Lessingia filaginifolia var. *californica = Corethrogyne filaginifolia*), Gianone’s cudweed (*Pseudognaphalium gianonei, pro. sp. nov.*), hairy honeysuckle (*Lonicera hispidula*), deerweed (*Acmispon glaber*), prostrate coastal headlands form aka *var. prostratus*), ocean-bluff bluegrass (*Poa unilateralis*), sea lettuce (*Dudleya caespitosa*), oso berry (*Oemleria cerasiformis*), coyote brush (*Baccharis pilularis*, with subsp. *pilularis* and *consanguinea* both represented plus intergrades between the two) and cow parsnip (*Heracleum maximum*). Deep within the arroyo bottom, rich in alluvium and not far from where it drains under Highway 1, a small colony of giant trillium (*Trillium chloropetalum*) was discovered in the late 1970s, displaying two distinct sympatric forms: *form (a)* had unsullied white petals, thin in texture while *form (b)* had rose-pink petals, also thin in texture, both types emitting a spicy scent reminiscent of cinnamon. This same combo was also found growing in the lower Gazos Creek riparian corridor (San Mateo County) along with the lemon-scented “*albidum*” taxon of Big Willow Gulch, but in true contrarian fashion, showing an ecological preference for the moist recesses above the dirt road, happily ensconced within a colony of bleeding heart (*Dicentra formosa*). Clinical studies need to be done, testing the connections between flower color, scent, pollinating vectors, sympathy and reproductive isolating mechanisms within the genus *Trillium*, and with perhaps more forms present within the Scotts Creek Watershed than any place else in Santa Cruz County, Swanton would be a good place to start!

**Note:** Grouped by families, the following list supplements the previously discussed native taxa, which have been documented/studied within the area defining the Morehus Arroyo watershed..... California coffeeberry (*Frangula californica* subsp. *california*). ..... Monterey pine (*Pinus radiata*). ..... forest live-oak (*Quercus parvula* var. *shrevei*). ..... bracken (*Pleridium aquilinum* var. *pubescens*). ..... California maidenhair (*Adiantum jordanii*). ..... goldback fern (*Pentagramma triangularis* subsp. *triangularis*). ..... wood fern (*Dryopteris arguta*). ..... giant chain fern (*Woodwardia fimbriata*). ..... lady fern (*Athryum filix-femina* var. *cyclosorum*). ..... giant horsetail (*Equisetum telmateia* subsp. *braunii*). ..... California saxifrage (*Micranthes californica*). ..... Blasdale’s bent grass (*Agrostis blasdalei*). ..... western bent grass (*Agrostis exarata* var. *monolepis*). ..... Hall’s and leafy bent grass intergrades (*Agrostis hallii/Agrostis pallens*). ..... Pacific reed grass (*Calamagrostis nutkaensis*). California wild rye
(Elymus glaucus subsp. glaucus), red fescue (Festuca rubra), foothill needlegrass (Nassella lepida), California canary grass (Phalaris californica), yarrow (Achillea millefolium), mugwort (Artemisia douglasiana), marsh baccharis (Baccharis glutinosa), lizard tail (Eriophyllum staechadifolium), hirsute gumplant (Grindelia hirsutula sensu lato), sneezeweed (Helenium puberulum), slender goldfields (Lasthenia aff. californica), Mt. Diablo cottonweed (Microps amphibolus), Bowie's cudweed (Pseudognaphalium bioletti), California cudweed (Pseudognaphalium californicum), pink everlasting (Pseudognaphalium ramosissimum), woolly marbles (Psilocarphus tenellus), Canada goldenrod (Solidago elongata), California aster (Symphyotrichum chilense), sticky cinquefoil (Drymocallis glandulosa var. glandulosa), wood strawberry (Fragaria vesca), California blackberry (Rubus ursinus), toad rush (Juncus bufonius), variable as to stature and inflorescence gestalt.

Mexican rush (Juncus mexicanus sensu lato), several populations occur within this drainage system as well as neighboring ones, differing in stature, culm color and diameter, open or compact inflorescences, pale or dark perianth parts, length of mature perianth from base to apex but all having, in varying degrees, tortile and laterally compressed culms but without upper sheaths bearing blades, common rush (Juncus patens), common wood rush (Luzula comosa), Davy's centaury (Zeltnera davyi), dense sedge (Carex densa), slough sedge (Carex obnupta), foothill sedge (Carex tumulicola), straggly gooseberry (Ribes divaricatum var. pubiflorum), sticky monkeyflower (Mimulus aurantiacus), California poppy (Eschscholzia californica), minute-flowered cryptantha (Cryptantha micromeres), willow herb (Epiobium ciliatum sensu lato), within the area under discussion, forms with condensed inflorescences and upper stem leaves little reduced = subsp. watsonii and open inflorescences with reduced upper stem leaves = subsp. ciliatum, both occur, sun cup (Taraxia ovata), California figwort (Scrophularia californica), hairy wood sorrel (Oxalis pilosa), yerba buena (Satureja douglasii = Clinopodium douglasii), California hedge-nettle (Stachys bullata), checkerbloom (Sidalcea malviflora subsp. malviflora), California buttercup (Ranunculus californicus), soap plant (Chlorogalum pomeridianum var. pomeridianum), stinging phacelia (Phacelia malvifolia), morning glory (Calystegia purpurata subsp. purpurata), yellow bush lupine (Lupinus arboreus), giant vetch (Vicia gigantea), common milkmaids (Cardamine californica), popweed (Cardamine oligosperma), climbing bedstraw (Gailium porrigenus var. porrigenus), checker lily (Fritillaria affinis), coast buckwheat (Eriogonum latifolium), California goosefoot (Chenopodium californicum), California man root (Marah fabaceus), San Francisco campion (Silene vernalis subsp. verecunda), California vervain (Verbena lasiostachys var. lasiostachys), coast nettle (Urtica dioica subsp. gracilis), blue witch (Solanus umbelliferum).

Upon entering China Ladder Marsh, although relatively small in stature, definitely home to several species warranting consideration, both taxonomically and for potential horticultural merit. Often reaching 2+ meters in height and towering over the supporting vegetation, swamp hedge-nettle (Stachys chamissonis) with its cerise, 2-3 cm. long pendent tubular corollas, would provide a visually arresting accent to the wild garden, edging a seep or small stream. In this particular instance, an ideal companion and visual foil is also found growing within the marsh, namely Pacific reed grass (Calamagrostis nutkaensis), a long-lived stately native, nearing the southernmost edge of its range and offering multiple uses in the landscaper's arsenal, including visual screening and erosion abatement. Two other attention getting "native" inhabitants of this isolated ecosystem perched on the ocean-facing edge of the prairie are Canada goldenrod (Solidago canadensis subsp. elongata = Solidago elongata) and the titan of docks, western dock (Rumex occidentalis), when seen growing together never failing to elicit a sense of awe, the golden plumes of the Solidago creating the perfect chromatic counterpart to the physically imposing, circa 2+ meters in height, Rumex, with mature stems and inflorescences pigmented an intense
psychedelic reddish-pink. Growing either as a monoculture or intermixed with the other botanical denizens of the marsh such as tussocks of slough sedge (Carex obnupta) with foliar margins emulating a newly minted bread knife and variable inflorescences exceeding 2 meters in height with spikelets either pendant or stiffly erect, giant chain fern (Woodwardia fimbriata) bringing a primeval element to the proceedings, salt rush (Juncus lesueurii) stands apart from its sympatric cespitose relatives, flaunting a rhizomatous growth habit and tortile, laterally compressed culms circa 1-2 meters in height..... within the marsh proper and the surrounding prairie, this taxon is represented by several phases, ranging from 30cm in height to 2m as found within the marsh itself and all forms have tortile, laterally compressed grass to dark green culms, some of which can exceed 6mm in diameter and generally lack leaf blades, with the inflorescences ranging from compact to open and multi-branched, perianth segments 4-6(+)*mm in length ..... this variable taxon appears to combine aspects of Juncus brevleri, Juncus lesueurii and Juncus mexicanus and warrants a study unto itself. Representing the cespitose contingent of the genus, both Pacific bog-rush (Juncus effusus var. pacificus) and brown bog-rush (Juncus hesperius) offer a verdant counterpoint to the autumnal shadings of reds and maroons which defines the scandent presence of the California blackberry (Rubus ursinus). Deep down within the human scale barrier of seemingly impenetrable marsh vegetation and out of view to the indifferent passer-by, colonies of low club rush (Scirpus cernuus = Isolepis cernua), standing 5-8 centimeters tall in comparison with their gargantuan cousin slough sedge (Carex obnupta), margin the edges of the invisible watercourse that threads its way through the gauntlet of rhizomes..... also sharing the moist crannies of this lilliputian world and sporting bilaterally symmetrical flowers, vibrant yellow in coloring and exuding a fragrance reminiscent of honey, is the common monkeyflower (Mimulus guttatus var. grandis). Securing the ocean facing edge of the marsh and forming a wind break from the everpresent northwesterlies, the intermeshing canopies of the arroyo willows (Salix lasiolepis), create an understory environment dictated by the dappled light and moisture retentive shaded zones margining the streamlets draining the marsh proper..... in this restrictive habitat, the light seeking stems of the Stachys chamissonis population can exceed 2.5 meters and share habitat with straggly gooseberry (Ribes divaricatum var. pubiflorum), marsh baccharis (Baccharis glutinosa), lady fern (Athyrium filix-femina var. cyclosum), water smartweed (Persicaria punctata), slender hairgrass (Deschampsia elongata) and Pacific oenanthe (Oenanthe sarmentosa). The northern portion of China Ladder Marsh experienced a major disturbance during the 2005 season, opening up this hitherto relatively unmolested and highly specialized environment to a reshuffling of native versus “introduced” components with some unforeseen and intriguing consequences: a species usually occurring as scattered individuals within a larger aggregation of moisture loving taxa, sneezeweed (Helenium obnupta), forming pure stands on the disturbed ground, showing an aesthetic potential for this overlooked and undervalued annual/biennial member of the Sunflower Family (Asteraceae), with upright posture, strongly decurrent leaves and well-presented globose, many-flowered heads. Also benefiting from and thriving in this scenario of disruption, two phases of western bent grass (Agrostis exarata), vigorous colonies of the awned form historically known as var. monolepis, co-existing and not forming intermediates with the locally uncommon awnless form, aff. var. exarata, presenting spikelets condensed into glomerate verticals, these decidedly separate, clearly showing off the main axis (rachis) of the inflorescence.

Note: The watershed defining China Ladder Gulch, of which China Ladder Marsh is a central component, contains a diverse assemblage of native plant life, some quite rare and in the case of the Carex gianonei complex, offering much material of interest in the study of this polyphyletic syngameon reflecting non-mendelian genetics (note: several decades ago, an
"imperfecta" was discovered and documented by an herbarium pressing, which besides having the compound-congested lower spikelets also displayed conspicuously awned perigynia scales... derived, in all likelihood, from Carex densa and recessive by nature).... here is an overview of the native taxa, grouped by familial alliances, that populate this drainage system, including its oceanside terminus: oracle oak (Quercus x morehus).... one sub-shrub, circa 30cm in height, growing on grassy knoll overlooking China Ladder Marsh, discovered 25 years ago and stature has remained constant, semi-deciduous), forest live-oak (Quercus parvula var. shrevei).... Monterey pine (Pinus radiata).... satellite population derived from ancient hybrid swarm between Pinus attenuata x Pinus radiata), Douglas-fir (Pseudotsuga menziesii var. menziesii).... red elderberry (Sambucus racemosa).... California coffeeberry (Frangula californica subsp. californica).... tinker’s penny (Hypericum anagalloides).... sticky monkeyflower (Mimulus aurantiacus).... poison oak (Toxicodendron diversilobum).... hoary nettle (Urtica dioica subsp. holosericea).... populations within China Ladder drainage system variable, with some displaying predominately stinging hairs on both stems and foliage = subsp. gracilis and others with soft, non-stinging hairs particularly on abaxial foliar surfaces = subsp. holosericea).... California bay laurel (Umbellularia californica).... yarrow (Achillea millefolium).... California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis subsp. consanguinea), California aster (Corethrogynus filaginifolia var. californica), lizard tail (Eriophyllum stachadifolium), purple cudweed (Gomophyta ustulata), Bioletti’s cudweed (Pseudognaphalium bieletii), California cudweed (Pseudognaphalium californicum), Gianone everlasting (Pseudognaphalium gianonei, pro.sp.nov.), woolly marbles (Psilocarpus tenellus), California aster (Symphyotrichum chilense).... bent grass (Agrostis hallii/pallens) intergrades), California oat grass (Danthonia californica sensu lato), California wild rye (Elymus glaucus).... specimens growing on exposed bluffs overlooking Highway 1, compact with shorter awns and tending towards subsp. virescens), California fescue (Festuca californica), red fescue (Festuca rubra), junegrass (Koeleria macrantha), Torrey’s melic (Melica torreyana), foothill needlegrass (Nassella lepida = Stipa lepida), ocean-bluff bluegrass (Poa unilateralis subsp. unilateralis).... California plantain (Plantago erecta), American brooklime (Veronica americana).... Franciscan coyote mint (Monardella villosa subsp. franciscana), yerba buena (Satureja douglasii = Clinopodium douglasii), California hedge-nettle (Stachys bullata).... farewells-to-spring (Clarkia rubicunda).... reduced in stature coastal bluff form with large flowers, willow herb (Epilobium ciliatum subsp. ciliatum).... one exceedingly robust specimen growing on western edge of marsh, 2 meters in height, inflorescence open with reduced leaves).... skunkweed (Navaretia squarrosa).... Indian paintbrush (Castilleja affinis subsp. affinis), dwarf orthocarpus (Triphysaria pusilla).... California maidenhair (Adiantum jordanii), goldback fern (Pentagramma triangularis subsp. triangularis).... bracken (Pteridium aquilinum var. pubescens).... wood fern (Dryopteris arguta).... toad rush (Juncus bufonius sensu lato), western rush (Juncus occidentalis), common rush (Juncus patens), brown-headed rush (Juncus phaeocephalus var. phaeocephalus).... few capitula each with numerous florets).... broad-leaved cattail (Typha latifolia).... miniscule duckweed (Lemma minuscula).... water fern (Azolla filiculoides).... rattlesnake weed (Daucus pusillus), floating pennywort (Hydrocotyle ranunculoides), footsteps-of-spring (Sanicula arctophytes), gambleweed (Sanicula crassicaulis).... short-stemmed sedge (Carex brevicaulis), small-bracted sedge (Carex subbracteata).... deerweed (Acmispon glaber var. glaber).... prostrate, mat-forming coastal bluff ecotype), yellow bush lupine (Lupinus arboresus), arroyo lupine (Lupinus succulentus), Lindley’s varied lupine (Lupinus varicolor).... sea lettuce (Dudleya caespitosa).... coast buckwheat (Eriogonum nudum/latifolium) intergrades).... shining willow (Salix lasiandra var. lasiandra).... western lady’s mantle (Aphanes occidentalis), wood strawberry (Fragaria vesca).... California poppy (Eschscholzia californica).... checkerbloom (Sidalcea malviflora subsp. malviflora).
Returning to and approaching the northwesterly summit of Swanton Road, just below the Last Chance entrance, a near vertical tapestry of interdigitating shrubbery and herbaceous flora, comprising coyote brush (Baccharis pilularis), poison oak (Toxicodendron diversilobum), lizard tail (Eriophyllum stoechas) and California hedge-nettle (Stachys bullata), yerba buena (Satureja douglasii = Clinopodium douglasii), stinging phacelia (Phacelia malvifolia), wood strawberry (Fragaria vesca) and California brome (Bromus carinatus var. carinatus), a robust form with leaves 2+ cm. in diameter, compliment a long-established population of California horkelia (Horkelia californica subsp. californica). At least one plant of this sporadically occurring member of the Rose Family (Rosaceae) exceeded a meter in diameter and when last inspected, was welcoming the mutually beneficial ministrations of bumble-bees (genus Bombus).

In addition to the species already discussed, here are some others, briefly noted, that margining either side of the tarmac, warrant further study: California oat grass (Danthonia californica sensu lato), yarrow (Achillea millefolium), checkerbloom (Sidalcea malviflora subsp. malviflora), skunkweed (Narcarretia squarrosa), footsteps-of-spring (Sanicula arctopoides), woody marbles (Psilocarphus tenellus var. tenellus), hirsute gumplant (Grindelia hirsutula sensu lato), coast tarplant (Hemizonia corymbosa subsp. corymbosa = Deinandra corymbosa), blue dicks (Dichelostemma capitatum subsp. capitatum), California goldenrod (Solidago californica = Solidago velutina subsp. californica), marsh baccharis (Baccharis douglasii = Baccharis glutinosa), and soap plant (Chlorogalum pomeridianum var. pomeridianum).

With Swanton Road still in an ascending mode, making a stop along the outer edge of the tarmac and looking down towards the Greyhound Rock State Beach, provides the viewer with an opportunity to trace the evolution of the Lasher Marsh Gulch. Both Harry Wain’s Arroyo and the Lasher Marsh Gulch share a perennial hillside spring, whose origin appears to be the back of an ancient landslide or possibly water transported along faults..... resulting in a landslide or fault derived, hydrologically active, bifurcation!!! The north coast scrub dominated slope overlooking the Lasher Marsh, until recently, combined two distinct vegetation types with a complex underlying drainage system..... while poison oak (Toxicodendron diversilobum) and coyote brush (Baccharis pilularis subsp. consanguinea) occupied the vertical profile, a sinuous thread of hydrophilic vegetation (Carex, Juncus, Scirpus) worked its way under the brushy canopy, demarcating the linkage between the spring and the marsh proper. Leveling off upon entering the Western Terrace, the streamlet passes through the Lasher Marsh, home to extensive populations of both California canary grass (Phalaris californica) and western dock (Rumex occidentalis), then upon exiting forms a narrow channel which abruptly terminates as a waterfall, sending the seasonally variable watercourse across the Santa Cruz Terrace (bisected by Highway 1) and ultimately via a second precipitous drop, entering the Pacific Ocean. Several native species of interest have been documented for this relatively short (circa 1/2 mile in length) drainage system over the past three decades, both with herbarium pressings and seed collections and underscore the need to view every coastal gulch as a potential refugium for "natives" poorly collected historically and/or imperfectly understood taxonomically. Besides the marsh population of the western dock (Rumex occidentalis), which has been documented by several collections of achenes deposited with the UCSC Arboretum, other documented taxa residing within the Lasher Marsh Gulch watershed and are notable for their uncommon/rare status.....
artist's popcorn-flower (*Plagiobothrys chorisianus* var. *chorisianus*), purple godetia (*Clarkia purpurea* subsp. *purpurea*), a population of wedge-leaved horkelia (*Horkelia cuneata*) which included representatives of both var. *cuneata* and the rare var. *sericea*, Davy's clarkia (*Clarkia davyi*), Bolander's golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*) and the unique disjunct population of Alaska rein orchid (*Piperia unalascensis*). Have also been documented via digital images, herbarium pressings, seed and divisions of in situ collected living material.

California hedge nettle (*Stachys bullata*)..... coast larkspur (*Delphinium decorum* subsp. *decorum*), California buttercup (*Ranunculus californicus* var. *californicus*).....

Note: Areas of biological/botanical/ecological/reference interest mentioned in this section of the essay, have the following Google Earth coordinates:

**Allium Marsh/Gulch #2**: 37°04'39.95"N, 122°15'34.36"W, elevation 366ft

**Upper Big Willow Gulch**: 37°04'23.25"N, 122°15'01.00"W, elevation 455ft

**Central Big Willow Gulch**: 37°04'17.75"N, 122°15'09.43"W, elevation 369ft

**Lower Big Willow Gulch**: 37°04'04.42"N, 122°15'17.29"W, elevation 197ft

**Big Willow Gulch, w-fork**: 37°04'18.51"N, 122°15'23.23"W, elevation 260ft

**Botanical "Hotspot", overlooking n-end of Greyhound Rock State Beach**: 37°04'48.08"N, 122°16'00.98"W, elevation 123ft

**Botanical "Hotspot", overlooking s-end of Greyhound Rock State Beach**: 37°04'27.02"N, 122°15'43.66"W, elevation 146ft

**China Ladder Marsh**: 37°03'59.51"N, 122°15'04.36"W, elevation 340ft

**Gulch #1**: 37°04'42.35"N, 122°15'42.23"W, elevation 269ft

**Gulch #3**: 37°04'36.14"N, 122°15'38.12"W, elevation 319ft

**Gulch #4**: 37°04'32.63"N, 122°15'32.37"W, elevation 311ft

**Gulch #5**: 37°04'22.45"N, 122°15'27.33"W, elevation 344ft

**Harry Wain’s Arroyo**: 37°04'51.90"N, 122°15'44.57"W, elevation 300ft

**Lasher Marsh**: 37°04'50.66"N, 122°15'37.95"W, elevation 391ft

**Morehus Arroyo/Marsh**: 37°04'07.70"N, 122°15'13.19"W, elevation 324ft

**Pumpkin Field Marsh**: 37°04'23.38"N, 122°15'19.50"W, elevation 385ft

**Sandy-bottom Reservoir**: 37°04'26.62"N, 122°15'10.42"W, elevation 464ft

"Washout Turn": 37°04'59.49"N, 122°15'49.80"W, elevation 268ft
Note: Select herbarium specimens of horticulturally meritorious, locally uncommon, rare county wide and agency listed species referred to in this section of the Traversal, collected and pressed, with noted exceptions, by Roy Buck and/or James West within the Scotts Creek Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:

Abronia latifolia/accession number SJSU10582/Coy, 10/04/70
Acaena pinnatifida var. californica/accession number JEPS82616/Buck & West #250
Agoseris apargioides var. eastwoodiae = Agoseris apargioides var. apargioides/accession number JEPS82557/West #167
Agrostis blasdalei/accession number JEPS82927/Buck & West #177
Agrostis blasdalei/accession number JEPS82924/Buck & West #178
Agrostis blasdalei/accession number JEPS83603/Buck & West #370
Agrostis blasdalei/accession number RSA502388/D.W. Taylor, Roy Buck, Jim West, Glenn Clifton, #9675, 05 22 1988
Agrostis blasdalei/accession number UCR70879/D.W. Taylor, Roy Buck, Jim West, Glenn Clifton, #9675, May 22 1988
Agrostis, "Agrostis blasdalei x Agrostis exarata var. monolepis hybrid complex"/accession number JEPS81525/Roy E. Buck, James A. West and Tom Hawke #4, May 24 1982
Agrostis, aff. Agrostis blasdalei/accession number JEPS82929/West #271
Agrostis, aff. Agrostis blasdalei/accession number JEPS82830/West #270
Agrostis, aff. Agrostis blasdalei/accession number JEPS82931/West #269
Agrostis, aff. Agrostis blasdalei/accession number JEPS82932/West #268
Agrostis, aff. Agrostis blasdalei/accession number JEPS82933/West #266
Agrostis, aff. Agrostis blasdalei/accession number JEPS82934/West #266
Agrostis, aff. Agrostis blasdalei/accession number JEPS82935/West #266
Agrostis, aff. Agrostis blasdalei/accession number JEPS82938/West #262
Agrostis densiflora/accession number JEPS82925/Buck & West #179
Agrostis densiflora/accession number JEPS82937/West #263
Agrostis microphylla/accession number JEPS100279/Dean Wm. Taylor #9307, Aug 20 1987
Allium unifolium/accession number JEPS83120/Buck & West #328
Allium unifolium/accession number JEPS82582/West #118
Amelanchier utahensis/accession number JEPS81565/Buck & West #81
Berberis pinnata subsp. pinnata/accession number JEPS83474/Buck & West #473
Calamagrostis nutkaensis/accession number JEPS83103/Buck & West #457
Calochortus albus/accession number JEPS82618/Buck & West #248
Camissonia ovata = Taraxia ovata/accession number JEPS81992/Buck & West #161
Cardionema ramosissima/accession number SJSU10202/Sharsmith #8783, May 15 1983
Carex densa/accession number SJSU10204/C.W. Sharsmith #8785, May 15 1983
Carex densa/accession number JEPS83083/West #367
Carex gianonei, pro. sp. nov./accession number JEPS82956/West #46.1
Carex gianonei, pro. sp. nov./accession number JEPS82940/West #16
Carex gianonei, pro. sp. nov./accession number JEPS82941/Buck & West #17.1
Carex gianonei, pro. sp. nov./accession number JEPS82942/Buck & West #19.1
Carex gianonei, pro. sp. nov./accession number JEPS82943/Buck & West #22.1
Carex gianonei, pro. sp. nov./accession number JEPS82951/West #35.1
Carex tumulicola/accession number JEPS82596/West #206
Carex tumulicola/accession number JEPS82607/West #212
Carex tumulicola / accession number JEPS85182 / Buck & West #488
Carex tumulicola / accession number JEPS85185 / Buck & West #490
Castilleja "sp" / accession number UCSC5621 / Randall Morgan, Dec 8 1976
Castilleja exserta subsp. latifolia / accession number JEPS82594 / West #165
Castilleja exserta subsp. latifolia / accession number UC1736314 / Taylor #9580
Castilleja exserta subsp. latifolia / accession number UC1736279 / Taylor #9666
Centaurium davyi = Zeltnera davyi / accession number JEPS81517 / Buck & West #12
Centaurium davyi = Zeltnera davyi / accession number JEPS82575 / West #140
Centaurium muehlenbergii = Zeltnera muehlenbergii / accession number JEPS83097 / Buck & West #438
Centaurium floribundum = Zeltnera muehlenbergii / accession number JEPS82574 / West #123.1
Centunculus minimus = Anagallis minima / accession number JEPS814941 / Buck & West #45
Centunculus minimus = Anagallis minima / accession number SJSU10206 / Sharsmith #8787
Clarkia davyi / accession number JEPS97593 / Stone #679
Clarkia prostrata / accession number JEPS83077 / Buck & West #423
Clarkia prostrata / accession number JEPS82555 / West #93
Clarkia prostrata / accession number JEPS81509 / Buck & West #17
Clarkia prostrata / accession number JEPS83118 / Buck & West #330
Clarkia purpurea subsp. purpurea / accession number JEPS81519 / Buck & West #10
Clarkia purpurea subsp. purpurea / accession number JEPS81520 / Buck & West #9
Clarkia purpurea subsp. purpurea / accession number JEPS82579 / West #125
Clarkia purpurea subsp. purpurea / accession number JEPS83091 / Buck & West #378
Corallorhiza maculata / accession number JEPS82633 / Buck & West #229
Corallorhiza maculata / accession number JEPS82635 / Buck & West #227
Crassula connata / accession number UCSC6147 / R. Morgan, Apr 18 1986
Cryptantha clevelandii / accession number JEPS85187 / Buck & West #493
Cryptantha clevelandii / accession number JEPS85192 / Buck & West #518
Delphinium decorum subsp. decorum / accession number JEPS81984 / Buck & West #185
Deschampsia cespitosa subsp. holciformis / accession number JEPS83108 / Buck & West #350
Elymus glaucus subsp. virescens / accession number JEPS81505 / Buck & West #21
Ericameria ericoides / accession number JEPS89555 / Taylor #9308
Eriophyllum stachadifolium / accession number JEPS81488 / Buck & West #60
Euphorbia spathulata / accession number JEPS82654 / Buck & West #207
Festuca roemer var. klamathensis / accession number JEPS82399 / Buck & West #265
Filago californica / accession number JEPS85188 / Buck & West #513
Fragaria vesca / accession number UC1543251 / Nelson #598
Fritillaria affinis / accession number JEPS82022 / Buck & West #190
Gaultheria shallon / accession number JEPS81981 / Buck, West & Morgan #189
Gilia achilleifolia subsp. achilleifolia / accession number JEPS82761 / West #60
Gilia achilleifolia subsp. achilleifolia / accession number JEPS82646 / Buck & West #214
Gilia achilleifolia subsp. achilleifolia / accession number JEPS85190 / Buck & West #515
Gilia clivorum / accession number JEPS82960 / West #53.1
Gilia clivorum / accession number JEPS81535 / Buck, West & Stone #463.1
Gilia clivorum / accession number JEPS81982 / Buck, West & Morgan #187
Gnaphalium bicolor = Pseudognaphalium biolletii / accession number JEPS85162 / Buck & West #512
Gnaphalium gianonei, pro. sp. nov. = Pseudognaphalium gianonei, pro. sp. nov. / accession number JEPS82653 / Buck & West #206
Gnaphalium gianonei, pro. sp. nov. = Pseudognaphalium gianonei, pro. sp. nov./accession number JEPS82801/Buck & West #293
Gnaphalium gianonei, pro. sp. nov. = Pseudognaphalium gianonei, pro. sp. nov./accession number JEPS82802/Buck & West #293
Gnaphalium gianonei, pro. sp. nov. = Pseudognaphalium gianonei, pro. sp. nov./accession number JEPS81533/Stone, Buck & West #461
Grindelia/accession number JEPS82624/Buck & West #241
Grindelia/accession number JEPS83128/Buck & West #352
Heterotheca sessiliflora subsp. bolanderi/accession number JEPS81545/Buck & West #111
Heterotheca sessiliflora subsp. bolanderi/accession number JEPS81546/Buck & West #110
Hordeum brachyantherum subsp. brachyantherum/accession number JEPS81515/Buck & West #14
Horkelia cuneata var. cuneata/accession number JEPS82781/Buck & West #323
Horkelia cuneata var. sericea/accession number JEPS82782/Buck & West #322
Hypericum anagalloides/accession number JEPS83112/Buck & West #346
Juncus hesperius x Juncus patens/accession number JEPS81543/Buck & West #114
Juncus hesperius x Juncus patens/accession number JEPS83075/Buck & West #407
Juncus mexicanus/accession number UCSC6016/R. Morgan, Apr 8 1982
Lasthenia californica/accession number JEPS82917/Buck & West #242
Linaria canadensis/accession number JEPS82661/Buck & West #268
Lotus formosissimus = Hosackia gracilis/accession number JEPS81916/Buck, West & Stone #199
Lotus heermannii var. orbicularis = Acmispon heermannii var. orbicularis/accession number JEPS83049/Buck & West #418
Lotus strigosus = Acmispon strigosus/accession number JEPS81917/Buck, West & Stone #198
Lotus wrangelianus = Acmispon wrangelianus/accession number JEPS82619/Buck & West #247
Melica torreyana/accession number SBBG95746/Keil #20630
Melica torreyana/accession number UCR67850/Keil #20630
Micropus amphibolus/accession number JEPS112742/Dean Wm. Taylor, 17959, Mar 21 2002
Micropus amphibolus/accession number JEPS82597/West #214
Micropus amphibolus/accession number JEPS82634/Buck & West #234
Micropus amphibolus/accession number UCSC4599/Randall Morgan, Apr 18 1986
Microseris paludosa/accession number JEPS82401/Buck & West #269
Minimus guttatus/accession number JEPS82966/West #79
Minimus guttatus/accession number JEPS82565/West #200
Minimus guttatus/accession number JEPS82564/West #201
Montia fontana/accession number JEPS89199/Buck & West #329
Navarretia atractyloides/accession number JEPS82577/West #163
Nemophila heterophylla = Nemophila aff. pulchella var. fremontii/accession number JEPS82017/Buck, West & Stone #191
Nemophila heterophylla = Nemophila aff. pulchella var. fremontii/accession number JEPS82573/Buck & West #208
Nemophila heterophylla = Nemophila aff. pulchella var. fremontii/accession number JEPS100958/Taylor #9652
Nemophila heterophylla = Nemophila aff. pulchella var. fremontii/accession number JEPS100959/Taylor #9653
Nemophila aff. pulchella var. fremontii/accession number JEPS82959/West #52.1
Nemophila aff. pulchella var. fremontii/accession number JEPS83082/West #335.1
Nemophila aff. pulchella var. fremontii/accession number JEPS82946/West #30.2
Nemophila aff. pulchella var. fremontii/accession number JEPS82949/West #33.2
Perideridia gairdneri subsp. gairdneri/accession number JEPS81492/Buck & West #56
Perideridia gairdneri subsp. gairdneri/accession number JEPS81491/Buck & West #57
Piperia elegans/accession number JEPS83102/Buck & West #456
Piperia elegans/accession number UCSC4562/Randall Morgan, Jan 1 1987
Piperia elegans/accession number UCSC4563/Randall Morgan, Jan 1 1987
Piperia michaelii/accession number JEPS81490/Buck & West #58
Piperia michaelii/accession number UCSC4679/Randall Morgan, Dec 30 1980
Piperia unalascensis/accession number JEPS81531/Stone #459
Plantago subnuda/accession number JEPS83094/Buck & West #395
Plantago erecta/accession number JEPS81987/Buck & West #184
Plagiobothrys chorisianus var. chorisianus/accession number JEPS82766/West #69
Plagiobothrys chorisianus var. chorisianus/accession number UC1561092/Taylor, Buck, West & Clifton #9651
Plagiobothrys chorisianus var. chorisianus/accession number RSA502387/Taylor #9651
Plagiobothrys chorisianus var. chorisianus/accession number UC1576781/Taylor #10193
Poa douglasii/accession number SJSU10473/S.C. Beede #189, May 4 1964
Prunella vulgaris var. lanceolata/accession number JEPS83109/Buck & West #349
Pterostegia drymaroides/accession number JEPS 82620/Buck & West #246
Rumex occidentalis/accession number JEPS81557/Buck & West #105
Sagina decumbens subsp. occidentalis/accession number JEPS82623/Buck & West #243
Salix lasiolepis/accession number UC1736169/Taylor #10196
Salix scouleriana/accession number JEPS82637/Buck & West #225
Salvia columbariae/accession number JEPS81989/Buck & West #180
Salvia columbariae/accession number JEPS83124/Buck & West #357
Sidalcea malviflora var. celata/accession number UCSC5412/Randall Morgan, Jul 2 1999
Silene verecunda (subsp. verecunda)/accession number JEPS82771/Buck & West #43
Silene verecunda (subsp. verecunda)/accession number JEPS82615/Buck & West #251
Silene verecunda (subsp. verecunda)/accession number JEPS81534/Stone, Buck & West #462
Silene verecunda (subsp. verecunda)/accession number JEPS82662/Buck & West #262
Silene verecunda (subsp. verecunda)/accession number JEPS82663/Buck & West #262
Silene verecunda (subsp. verecunda)/accession number JEPS90792/Taylor #9617
Silene verecunda (subsp. verecunda)/accession number RSA502348/Taylor #9617
Silene verecunda (subsp. verecunda)/accession number JEPS97527/Stone #678
Silene verecunda (subsp. verecunda)/accession number JEPS82967/West #80
Solanum douglasii/accession number JEPS101222/Dean Wm. Taylor #10194, Mar 30 1989
Solidago canadensis subsp. elongata = Solidago elongata/accession number JEPS81556/Buck #106
Stachys ajugoides/accession number UCR67852/Keil #20594
Stachys chamissonis/accession number JEPS81507/Buck & West #16
Stachys chamissonis/accession number JEPS81508/Buck & West #16
Stebbinsoseris decipiens/accession number JEPS82648/Buck & West #211
Stebbinsoseris decipiens/accession number JEPS85645/Buck, West & Hawke #235
Stebbinsoseris decipiens/accession number JEPS82652/Buck, West & Hawke #235
Stebbinsoseris decipiens/accession number JEPS81532/Stone, Buck & West #460
Stebbinsoseris decipiens/accession number JEPS13995/Chambers #670
Stebbinsoseris decipiens/accession number UC1561075/Taylor, Buck, West & Clifton #9656
Stebbinsoseris decipiens/accession number UCSC4622/Randall Morgan, Apr 18 1986
Trifolium “pseudo-barbigerum”/accession number JEPS85165/Buck & West #270
Trifolium “pseudo-barbigerum”/accession number JEPS85166/Buck & West #223
Trifolium willdenovii/accession number JEPS82613/Buck & West #253
Trifolium wormskiioldii/accession number JEPS83115/Buck & West #342
Tedianus biflora/accession number JEPS83122/Buck & West #374
Triteleia laxa/accession number JEPS83106/West #354
Triteleia laxa/accession number JEPS83117/West #331
Wyethia angustifolia/accession number JEPS82805/Buck & West #290

Last Chance Road to the Old Seaside Schoolhouse

Beginning our descent and looking eastward, we view the gauntlet of burl-forming manzanitas (Arctostaphylos crustacea, sensu lato) and knobcone pines (Pinus attenuata) which characterize the upper Schoolhouse Ridge/Seymore Hill complex, and experience the panoramic view of the watershed, its vastness and topographical complexity, giving one insight, an epiphany if you like, into the evolutionary dynamics, both geological and biological, which have given rise to the biodiversity that is the hallmark of this ecological “hot spot”!

The uppermost reaches of the Scotts Creek Watershed and its principal tributaries, center around Eagle Rock and the Locatelli/Lockheed Martin holdings, with their constituent drainages, namely Little Basin, Bannister and Bettencourt Gulches, plus the sources for the Mill, Big and Little Creek Watersheds. A number of rare, uncommon and/or sporadic in occurrence taxa have been documented for this infrequently studied area, some of which are: round-leaved hoita (Hoita orbicularis), California rose-bay (Rhododendron macrophyllum), canyon liveforever (Dudleya cymosa subsp. cymosa), false lupine (Thermopsis macrophylla var. macrophylla), white-rayed pentachaeta (Pentachaeta bellidiflora), Pacific marsh purslane (Ludwigia palustris), Harford’s melic (Melica harfordii), rush rose (Helianthemum scoparium), redwood penstemon (Keckiella corymbosa), rough bent grass (Agrostis scabra) and from personal communication (08/2011) with Scott Peden, at least one population of rattlesnake plantain (Goodyera oblongifolia) occurs on the Scotts Creek Watershed divide of Little Basin.

Note: While visiting the Lockheed holdings centered around the upper Mill Creek Watershed on 02/01/2011, a new species for the Scotts Creek Watershed was documented... namely, sweet-scented placelia (Phacelia suaveolens), which is a noted fire-follower. In spite of the 2009 Lockheed Fire inflicting substantial damage to the complex assemblage of manzanita species and hybrids which define the chaparral/chalks environment, a prevailing sense of rebirth pervaded much of the area explored... the two endemic taxa, Arctostaphylos glutinosa and Arctostaphylos ohloneana, while not being the beneficiaries of regenerative basal-burls, were spared total annihilation by the uneven topography and often minimal fuel load at their bases, coupled with the rapidity in which the fire swept through this part of the watershed. Like the upper Schoolhouse Ridge population of the Schreiber’s manzanita (Arctostaphylos glutinosa), numerous individuals were observed balancing lifeless branches with isolated healthy ones, the cambium intact. This raises some interesting questions... (1) what will be the life expectancy for those fire impacted but partially surviving plants, where the structural damage allows pathogens, both bacterial and fungal, potential access to the still viable portions? (2) how much viable (foliar) biomass is needed to both sustain and augment the surviving root system and how will this compromised status affect the flowering and fruiting capabilities of the surviving portions and impact the vigor/adaptive potential of the resulting
offspring? On a more optimistic note, the polyphyletic "genetic sponge" burl forming *Arctostaphylos crus-tacea subsp. crinita*, was resprouting vigorously throughout the area under study and even more impressive, was the sympatric association of the two endemics, *Arctostaphylos glutinosa* and *Arctostaphylos oholoneana*, often being joined by a third native "arcto", *Arctostaphylos sensitiva*. While not being related by 'blood' but definitely through occupying shared habitat, another fascinating taxon made a welcome appearance amongst the charred but basally regenerating manzanitas, namely the viniferous colored Indian warrior (*Pedicularis densiflora*). Margining arid roadbanks and spilling down into the burned chaparral, colonizing both the mesic environment where Powerhouse Grade and Boyer Creek Dam meet and appearing on riparian sandbars in the lower watershed, a still taxonomically unresolved species of lupine, *Lupinus propinquus*, has become a dominant player in the post-2009 Lockheed Fire ecology. Shorter lived and less woody than *Lupinus arboreus*, with distinctly fistulose aerial stems and lilac colored flowers, this taxon shares traits with both *Lupinus latifolius var. latifolius* and *Lupinus arboreus*, particularly when comparing foliage, flower and seed patterning..... definitely a taxon worth doing both morphological and molecular profile on!!!

The summit of the Seymore Hill is ringed with grasslands sheltering scattered clusters of California fuchsia (*Epilobium canum*), displaying cinereous foliage framing tubular scarlet flowers that glow like hidden caches of rubies when backlit by the setting sun. A quintet of *Aster* kin, punctuate the weathered mudstone and offer students of systematics and ecology a unique opportunity to study reproductive isolating strategies between sympatric related taxa: hirsute gumplant (*Grindelia hirsutula var. hirsutula*), a glandular ecotype of Bolander’s golden aster (*Heterotheca sessiliflora subsp. bolanderi*) which approaches ssp. *echioides* and exudes an odor of camphor...biochemically distinct from its coastal prairie analogue, California goldenrod (*Solidago velutina subsp. californica*), coyote brush (*Baccharis pilularis*) and California aster (*Lessingia filaginifolia var. filaginifolia = Corethrogyne filaginifolia*). Staying within the Asteraceae but belonging to the Sunflower Tribe (Heliantheae), an isolated colony of mules ears (*Wyethia glabra*) occupied a semi-sheltered niche just below the crest of the ridgetop and may have perished in the 2009 fire.... revisiting the area after the Spring(2010) rains may offer a more optimistic scenario but fortunately, collected seed from this lone local population has germinated and is growing up at the UCSC Arboretum. Two of the three documented clarkias for the immediate area manage to stake out territories along the wind-buffeted margin of the exposed ridge top: farewell-to-spring (*Clarkia rubicunda*) and four-spotted godetia (*Clarkia purpurea subsp. quadrivulnera*), the seeming fragility of their lilac/lavender flowers offset by the production of numerous capsules yielding viable seed and remarkably stable population sizes. Responding to the prevailing winds out of the northwest, Spanish trefoil (*Lotus purshianus var. purshianus = Acmispon americanus var. americanus*), radically altered its erect-ascending mode of growth by lowering its profile and becoming a visually attractive mat and retaining this prostrate status when raised from seed elsewhere. Visually obscured by the burnished end-of-season tangle of grass stalks, a taxon related to the dwarf brodiaea (*Brodiaea terrestris sensu lato*) but differing sufficiently in several ways from its coastal terrace counterpart to need further taxonomic clarification, leaves a trail of amethyst dust when viewed from afar, while Kellogg’s yampah (*Perideridia kelloggii*), the more common of the two species of this genus to be found within the watershed, plays sentinel to the proceedings.

Note: With a scattered population numbering in the high hundreds and occupying the crest of the Seymore Hill, from the Bettencourt Gulch side to the beginnings of the Schoolhouse
Gulch Complex, this variable taxon does not neatly fit into either the *Brodiaeae elegans* subsp. *elegans* or *Brodiaeae terrestris* subsp. *terrestris* circumscriptions…. (1) The scapes average 12-16(23.5) cm above ground with the pedicels being 2-4(8.5) cm in length and conspicuously shorter than the scapes, (2) The staminode morphology, which is of significant diagnostic value, is exceedingly variable within this extended population…. being whitish/translucent in color, with margins entire and shallowly inrolled from base to apex, averaging 6 mm in length, apically ranging from subentire or blunt/rounded with a miniscule extension (denticulate) to possessing a conspicuous notch with a centrally placed "tooth" giving the appearance of a three-pronged apex, basally constricted near point of attachment within floral tube and displaying minute lateral auricles….. when fully mature, the staminodes relative to the anthers are more or less parallel with outwardly curved apices, (3) The anthers are 4-6 mm long, their apices notched with a centrally positioned denticulation, which is variable as to size while the base of the filaments where attached to the floral tube, are flared on either side and margined with small tooth-like projections.

Located between the uppermost limits of the Schoolhouse Ridge and the emergence of the “Chalks”, the Seymore Hill presents two radically differing profiles: facing eastward towards the upper Mill Creek Watershed and **dropping off precipitously is an interrupted series of near-vertical grasslands**. Finding sanctuary in this most precarious of habitats, the families Boraginaceae and Ranunculaceae contribute two members each---- nievitas (*Cryptantha flaccida*), stems and calyces clothed with glistening encrusted trichomes and rusty popcorn-flower (*Plagiobothrys nothofulvus*), staining hands and herbarium sheets purple with anthocyanin colored sap, occupying separate niches from two sympatric species of *Delphinium*, western larkspur (*Delphinium hesperium* subsp. *hesperium*), extremely rare within the watershed and woodland larkspur (*Delphinium patens* subsp. *patens*), departing from the forma typica locally, with some plants pubescent not glabrous. Contrasting exserted reddish corollas with a densely cobwebby indument, Venus thistle (*Cirsium occidentale* var. *venustum*) makes scattered appearances, its sparsity offset by the Faberge like intricacy of its discoid flower heads. One, in a series of uncommon legumes to be found within the watershed, arroyo lupine (*Lupinus succulentus*), was observed circa two decades ago, growing in a transitional zone between coastal scrub and mixed coniferous/oak woodland, literally perched on an exposed section of weathered mudstone, its fleshy stems and broadly drawn leaflets contrasting with the aridity of the surrounding environment. Staying within the Fabaceae and surrounded by the formidably armed and monotypic chaparral pea (*Pickeringia montana* var. *montana*), the visually arresting silver bush lupine (*Lupinus albifrons* var. *albifrons*), stands out from the surrounding verdancy with foliar indument akin to brushed aluminum! **A 04/2010 preliminary field study, of the east/south facing, often near-vertical slopes overlooking the Upper and Lower Seymore Fields, yielded the following "native" species inventory….. an amazing assemblage of taxa, considering the entire area was burned in the 08/2009 Lockheed fire:** *Lathyrus vestitus sensu lato*, *Lotus humistratus*, *Lotus juncus var. juncus*, *Lotus micranthus*, *Lotus purshianus var. purshianus*, *Lotus salsuginosus var. salsuginosus*, *Lotus scoparius*, *Lotus strigosus*, *Lotus wrangelianus*, *Lupinus albifrons var. albifrons*, *Lupinus bicolor*, *Lupinus latifolius var. latifolius*, *Lupinus nanus*, *Lupinus succulentus*, *Pickeringia montana var. montana*, *Trifolium albopurpureum var. albopurpureum*, *Trifolium ciliolatum*, *Trifolium gracilentum var. gracilentum*, *Trifolium microcephalum*, *Trifolium microdon*, *Trifolium willdenovii*, *Vicia americana var. americana*, *Heracleum maximum*, *Osmorhiza berteroi*, *Sanicula arctopoides*, *Sanicula bipinnatifida*, *Sanicula crassicaulis*, *Sanicula gianonei*, *pro.sp.nov.*, *Sanicula "pseudo-laciniflata"*, *Eriogonum nudum sensu lato*, *Pterostegia drymarioidei*, *Achillea millefolium*, *Agoseris grandiflora*, *Lotus salsuginosus*, *Trifolium ciliolatum*, *Trifolium gracilentum var. gracilentum*, *Trifolium microcephalum*, *Trifolium microdon*, *Trifolium willdenovii*, *Vicia americana var. americana*, *Heracleum maximum*, *Osmorhiza berteroi*, *Sanicula arctopoides*, *Sanicula bipinnatifida*, *Sanicula crassicaulis*, *Sanicula gianonei*, *pro.sp.nov.*, *Sanicula "pseudo-laciniflata"*, *Eriogonum nudum sensu lato*, *Pterostegia drymarioidei*, *Achillea millefolium*, *Agoseris grandiflora*. 

Separating the Seymour Field from the Mill Creek riparian corridor is an intricate series of south-facing ridges, their intervening gulches ultimately draining down into Mill Creek. Basically comprising large expanses of weathered and fractured mudstone, this is an arid environment to be sure, but nonetheless home to extensive populations of a polymorphic tetraploid burl-forming manzanita complex (Arctostaphylos crustacea, sensu lato) and endemic to the watershed, the diploid non-burl forming Schreiber’s manzanita (Arctostaphylos glutinosa). To demonstrate that with the “Arctos”, what you see is not necessarily what you get (this caveat also applies to local members of the genus Carex as well), I will recount an experience with a “burl-forming” component of this particular manzanita population that took place some twenty-five years ago. While exploring this exposed ridge top and scanning the near-vertical slopes trailing off beneath my feet, three mature “arctos” caught my eye, standing out from the rest of their brethren with the following two distinguishing characteristics: the circa 1.5 meters wide x 2 meters high shrubs possessed stems colored a tannish-brown rather than the conspicuously darker reddish-brown of the general population and the smallish lanceolate-ovate shaped leaves were a vibrant grass-
green, contrasting with the darker and often duller foliage of their neighboring relatives. Working my way down to examine these “stand-outs” a third factor came into play, namely when the adaxial surfaces of the leaves were viewed under a hand-lens, a scattering of stomata could be seen, albeit far fewer than what existed on the abaxial sides. A well-rooted lower branch from one of the specimens was excised and dispatched to a private botanical garden where it thrived, morphing during its third year of residency into something quite different in gestalt, compared to its in situ origins— the leaves had trebled in size and were conspicuously auriculate/cordate at base! Representing a family and genus well distributed throughout the watershed, woolly Indian paintbrush (Castilleja foliolosa) lays claim to the upper reaches of the chaparral (generally growing in association with Eriophyllum confertiflorum var. confertiflorum), and the specimens growing in amongst the manzanitas on this particular ridge were producing yellow pigmented inflorescences. Of major biogeographical interest, considering the fact that most, if not all, of the upper watershed’s populations of Arctostaphylos glutinosa were severely impacted by the 2009 Lockheed Fire..... an isolated population of this rare endemic manzanita, occurs across Scotts Creek, on a southern facing ridge-top which initiates the Laird Gulch drainage system. Sharing this isolated portion Lower Last Chance Ridge chaparral, with its interdigitating oak/conifer woodlands, are two equally rare but for differing reasons, native taxa..... Hoffmann’s sanicle (Sanicula hoffmannii), disjunct populations of a species originally described from coastal San Luis Obispo and Santa Barbara Counties and the locally distinctive stipulate trefoil (Lotus stipularis var. stipularis), which is densely clothed with basalmic-scented glandular trichomes and historically in the literature, has been referred to as Lotus balsamiferus (Kell.) Greene. The fire of 2009 had a major impact, population wise, on another even rarer endemic manzanita..... namely, Arctostaphylos ohloneana M.C. Vasey & V.T. Parker. This recently discovered and described non-burl former, had its main population centered within the Boyer Creek Dam area, which took a major hit from the fire. Like its sister endemic, Arctostaphylos glutinosa, a disjunct population exists.... in this case, the upper reaches of the Bannister Gulch sub-watershed!!!

During 07/2010, I revisited the arid expanse of mudstone separating the upper Seymore Field from the Mill Creek Watershed proper on three separate occasions and was pleasantly surprised to find, that 10-20% of the Schreiber’s manzanita population (Arctostaphylos glutinosa) occupying that area had survived the 2009 Lockheed Fire, either wholly intact or where sections of the cambium was spared, producing vigorous new growth surrounded by charred and non-viable branches..... also present, were scattered seedlings of this localized endemic, having germinated in the mudstone fragments with taproots circa 7cm deep and aerial stems of comparable heigh, already displaying a tendency for basal branching, with stems and petioles clothed with gland-tipped trichomes (note: the aridity of the habitat and intense late summer heat, one year post 2009 lockheed Fire, impacted the nascent population, resulting in substantial seedling mortality). The Arctostaphylos glutinosa populations on this isolated ridge, lacking a basal burl and being obligate seeders, present an interesting gene flow scenario..... with the surviving specimens referencing one (persisting) genetic pattern and the seedling recruitment, representing a new resegregation of the parental genotype. The post fire “natives” sharing this exposed, minimalist environment constitute a botanical mosaic of extremes..... a juxtaposing of the common with the rarely seen, and in the case of the latter, usually only after a major fire, the last being in 1948. Here is a preliminary inventory of what has flourished in this lunar landscape, following the mild but protracted rainy season of 2010: rayless arnica (Arnica discoidea), slender fescue (Vulpia octoflora = Festuca octoflora), wooly malacothrix (Malacothrix floccifera..... type with mature ligulate heads whitish, corollas tinged pink in bud),
whispering bells (*Emmenanthe penduliflora*), bird’s-foot fern (*Pellaea mucronata var. mucronata*), 
Cleveland’s cryptantha (*Cryptantha clevelandii*), minute-flowered cryptantha (*Cryptantha micromeres*), 
bush poppy (*Deudorix rigidus*), twining snapdragon (*Antirrhinum kelloggii*), 
California mustard (*Caulanthus lasiophyllus*), rush trefoil (*Acmispon junceus sensu lato*), California 
huckleberry (*Vaccinium ovatum*), canyon live-oak (*Quercus chryssolepis*), chamise (*Adenostoma fasciculatum*), 
brittle-leaf manzanita (*Arctostaphyllos crustacea sensu lato*), deerweed (*Acmispon glaber var. glaber*), 
woolly Indian paintbrush (*Castilleja foliolosa*), sleepy catchfly (*Silene antirrhina*). 
observed sharing this habitat, was *Silene multiradiata*, new for the watershed and 
considered a native taxon in the Jepson Manual, 1993, but now considered conspecific with 
*Silene coniflora*, a taxon naturalized in California, rush rose (*Helenium scabriusculum*), morning 
glory (*Calystegia purpurata subsp. purpurata*), Brewer’s calandria (*Calandria breweri*), blue 
toadflax (*Linaria canadensis*), knobcone pine (*Pinus attenuata*), golden yarrow (*Eriophyllum 
confertiflorum var. confertiflorum*) and stephanomeria (*Stephanomeria aff. elata*). some plants 1.5+ 
meters high x 1 meter wide overall, flowering branches wand-like and spreading between 45 
and 90 degrees from main stem axis, florets 9+, calyculi with apices spreading/reflexed, 
cypselae 3-4 mm in length with faces tuberculate and grooved logitudinally, pappus plumose 
throughout. Other native taxa growing sympatrically with the emergent fire-followers, are as 
follows: Bioletti’s cudweed (*Pseudognaphalium bioletti*), California cudweed (*Pseudognaphalium 
californicum*), pink everlasting (*Pseudognaphalium ramosissimum*), California poppy (*Eschscholzia 
californica*), yerbs santa (*Eriodictyon californicum*), California bedstraw (*Galium californicum subsp. 
californicum*). forming cespitose tufts on the exposed fractured mudstone and clothed with 
stiffer trichomes than forms found further down the ridge growing in the mixed 
conifer/hardwood understory, climbing bedstraw (*Galium porrigens var. porrigens*), toyon 
(*Heteromeles arbutifolia*), Pacific madrone (*Arbutus menziesii*), sticky monkeyflower (*Mimulus 
aurantiacus*), sea lettuce (*Dudleya caespitosa*). its roots embedded within small fractures of 
the exposed mudstone, this population may be the watershed’s furthest inland population, for 
this complex, polyphyletic/polyploid taxon. the majority of the colony, have rosettes with 
chalky leaves and the apices of the unopened corollas, have a reddish-orange blush, which 
contrasts with the darker yellow corolla proper and anthocyanic tinted stems), blue blossom 
(*Ceanothus thyrsiflorus*). a copious reseeder following 2009 fire, Torrey’s melic (*Melica 
torreyana*), small-flowered trefoil (*Acmispon parviflorus*) and minute willow herb (*Epilobium 
minutum*). leaves plane not folded along midrib, seeds circa 1mm), also within this relatively 
narrow zone, ascending from the riparian to chaparral, two other species of *Epilobium* occur: 
namely, panicked willow herb (*Epilobium brachycarpum*) and willow herb (*Epilobium ciliatum 
subsp. ciliatum*).

***Note: From both a biogeographical and evolutionary perspective, a study should 
be initiated comparing this isolated population with those occurring in the Little Creek 
drainage and on the coastal bluffs/Agrostis Rectangle area.

Topographically complex and botanically diverse, the Scotts Creek aspect of the Seymore Hill is 
bounded by a series of interrupted, asymmetrical grasslands, flanked and bisected lengthwise by 
Bettencourt and Calf Gulches, and margined by a mosaic of mixed evergreen/coniferous stands 
and disjunct manzanita populations. Within an area circa 300 meters x 50 meters, aligned along a 
north/south axis and abutting the source of Calf Gulch, four valid and two recognized but 
unpublished taxa within the genus *Sanicula* (family Apiaceae) have been documented. Growing 
vertically on a grassy slope and sympatrically with but reproductively isolated from the common 
gamleweed (*Sanicula crassicaulis*), is *Sanicula “pseudo-laciniata”*, differing consistently from
Sanicula crassicaulis sensu strictu, in foliar morphology, the possession of bright clear-yellow flowers with large like-colored conspicuously exerted anthers and a distinct chemical signature. Occupying a transitional zone between the exposed, more mesic slopes and oak woodland, footsteps-of-spring (Sanicula arctopoides) and purple sanicle (Sanicula bipinnatifida) are often obscured from direct viewing by the competing grasses. Located deep within the oak understory, where light is subdued and less moisture is given up due to the actions of sun and wind, the rare Hoffmann’s sanicle (Sanicula hoffmannii) shares its domain with the common yet new to science Gianone’s sanicle (Sanicula gianonei, pro. sp. nov.). Within the watershed, purple sanicle (Sanicula bipinnatifida) occasionally produces plants with yellow flowers and regardless of floral coloration, the stems when broken and the oozing sap exposed to air, turns milky-white in color, a distinctive characteristic it shares with close relative, Hoffmann’s sanicle (Sanicula hoffmannii)!

Staying within and adjacent to the “Sanicula Rectangle”, several “pairs” of related species have been observed, these juxtapositions rarely or never encountered elsewhere within the watershed. Sharing a narrow near-perpendicular exposure of moss-bedecked mudstone, woodland star (Lithophragma affine) and hill star (Lithophragma heterophyllum) grow overlooking the steep and tortuous drop characterizing the upper reach of Calf Gulch...... also choosing to colonize this moisture-retentive “micro habitat”, is a locally uncommon, reduced in stature component of the Mimalus guttatus complex, with fugacious cleistogamous flowers readily passing for pale yellow miniaturized sausage casings (JEP82565/WEST#200). Cloistered within the upper recesses of this “pinched off” nascent gulch, which rapidly in its precipitous descent evolves into a hydrologically active sub-watershed, is an extensive colony of creelcawn fescue (Festuca subuliflora).... its inflorescences, delicate traceries hovering in midair, appear detached from foliage and rhizomes anchored to near-vertical slopes. Preferring the open and consequently far drier vertical grassland habitat, purple godetia (Clarkia purpurea subsp. purpurea) and four-spotted godetia (Clarkia purpurea subsp. quadrivulnera) represent two extremes in population demographics, subsp. purpurea being rare or extirpated throughout its known range and subsp. quadrivulnera, widespread, extremely variable and as to status, common. Sharing this open grassland but choosing a considerably more horizontal perspective, another locally uncommon species, valley tassels (Castilleja attenuata), was documented for the watershed in 1983 as Orthocarpus attenuatus, a pressing deposited in the Jepson Herbarium at UC Berkeley and as of 04/03/10, is still a viable population. A variation on the Clarkia purpurea paradigm is the relatively common/rare pairing of slender cottonweed (Micropus californicus var. californicus) and green cottonweed (Micropus californicus var. subvestitus). Growing sympatrically with purple godetia (Clarkia purpurea subsp. purpurea) and documented by herbarium pressings, green cottonweed (Micropus californicus var. subvestitus) has not been placed elsewhere in Santa Cruz County! If two rare taxa sharing the same localized niche isn’t intriguing enough, the more frequently encountered slender cottonweed (Micropus californicus var. californicus) was discovered circa 300 meters lower down the slope overlooking a transversely cut roadbed, which formerly descended into the depths of Bettencourt Gulch and provided habitat by way of another narrowly delimited grassland edge for the hopefully settled from a taxonomic perspective, San Francisco popcornflower (Plagiobothrys diffusus) and favoring moisture-retentive pockets roadside, our very own FSC/1B listed Santa Cruz clover (Trifolium buckweistiorum)! Further up the ridge and growing on a brush and oak shaded slope overlooking a rotational slump/pull apart landslide derived semi-lunate depression known as the “Bowl”, the only validated population for the Swanton area of honey-scented navarretia (Navarretia mellita) was discovered in the 1970’s: a widespread and relatively common species elsewhere but not, to date, in the Scotts Creek Watershed. A recently
bulldozed access road, circa 2008, paralleling and overlooking this area of considerable geomorphic interest, in the process of cutting through the chaparral duff and exposing a considerable amount of bare mineral soil, stimulated the germination of several "fire-following" species, encountered only sporadically in the senescent chaparral. In the process of disturbing the 60+ years of accumulated organic debris and exposing dormant seed beds to the pulverized shale, a scenario analogous to a fire disturbance regime took place....with the embankments and road displaying extensive populations of Brewer's calandrinia (Calandrinia breweri), California mustard (Guillenia lasiophylla var. lasiophylla = Caulanthus lasiophyllus), with some individuals 2 meters in height, vigorous sympatric colonies of Cleveland's cryptantha (Cryptantha clevelandii) and minute-flowered cryptantha (Cryptantha micromeres), the visually cryptic twining snapdragon (Antirrhinum kelloggii), with violet-purple flowers attached to thread-like elongated pedicels, giving the flowers an impression of being suspended in mid-air, plus scattered tufts of slender fescue (Vulpia octoflora) sharing a horizontal alignment with miniature lupine (Lupinus bicolor) and rancheria clover (Trifolium albopurpureum var. albopurpureum) and making a not totally unexpected appearance, one plant of honey-scented navarretia (Navarretia mellita)!!!. Returning to the aforementioned "vertical grasslands", this one located nearer to the summit of the Seymore Hill, two sister species of Agoseris occur, their differences manifested in growth habits and conspicuously dissimilar presentation of the mature flower heads and achene morphologies: mountain dandelion (Agoseris grandiflora), a robust perennial with stout naked stems supporting the outsized fruiting heads looking ever so much like an aggregation of snowflakes held high above the surrounding grasses and annual agoseris (Agoseris heterophylla), a diminutive and delicate annual, usually overtopped by the competing seasonal vegetation and possessing polymorphic achenes, variable both as to color, tan through white and purple, and structure, ribbed or inflated.

Note: On 06/02/2011, while traversing the dirt road (oriented northwest of Calf Gulch) which links Purdy Road with the upper Seymore Ridge and in passing, branches northward down into Bettencourt Gulch, three native taxa of special interest were observed..... growing intermixed and superficially indistinguishable from each other, were bracted popcorn-flower (Plagiobothrys bracteatus) and the once thought extinct, San Francisco popcorn-flower (Plagiobothrys diffusus). When studying the nutlets of these two morphologically similar species, noticable differences immediately appear..... (a) the mature nutlets of Plagiobothrys diffusus are 1-2 times larger than those of Plagiobothrys bracteatus and are grayish-tan not coal black in coloration at maturity, (b) they have a thick bony pericarp, which reflects light as if ceramic (with a crystalline component) in composition and are ovoid in outline, (c) on the ventral (inner) side the conspicuous attachment scar is basal-lateral, configured in a variable sub-deltoid/elliptical/ovoid pattern, which is recessed/deeply sculpted and topped with an elevated keel which extends to the apex of the nutlet, is enfolded 1/2-3/4 of its length by the margins of a deep channel/groove and framed by reticulate patterned ridges extending outward on either side of the keel, (d) the dorsal (outer) side is distinctly convex (curved) in profile, keeled its entire length and bookended by elevated ridges, these often forming an interconnected network alternating with elevated tubercles. Plagiobothrys bracteatus, locally scattered in distribution and often overlooked due to its prostrate mode of growth and being overtopped by competing forbes and grasses, can also be separated from occasionally sympatric Plagiobothrys diffusus in having a ventral keel not in a groove and a small, almost inconspicuous, basal-lateral attachment scar. While both of the popcorn-flower species have bracted inflorescences, Plagiobothrys bracteatus tends to be below the middle while Plagiobothrys diffusus can have bracts subtending the flowers all the way up to apex. The
other member of this botanically distinguished trio is the most recently described member, namely the Santa Cruz clover (Trifolium buckwestiorum). This small, localized population was discovered prior to the 2009 Lockheed Fire and in spite of its habitat being in the direct path of the conflagration, has survived in its precarious niche along with the proximal Plagiobothrys duo! Trifolium buckwestiorum was documented prior to the devastating 2009 season, with seeds deposited with the UCSC Arboretum, and mature nutlets along with illustrative dried plant materials of the two popcorn-flower species will be accessioned and stored for future study, by mid-June 2011.

Calf Gulch is a complex bifurcate drainage system with several ancillary gulchlets feeding into it. Beginning near the summit of the Seymore Hill and ultimately emptying into Scotts Creek. Like its oceanside analog, Big Willow Gulch, what it lacks in stature into it...beginning near the summit of the Seymore Hill and ultimately emptying into Scotts Creek. Here is a preliminary (post 2009 Lockheed Fire) inventory, grouped by familial affinities, of the native plant taxa found within the Calf Gulch subwatershed: Arbutus menziesii, Arctostaphylos crustacea sensu latu, Vaccinium ovatum..... Amsinckia menziesii var. intermedia, Cryptantha clevelandii, Cryptantha micromeres, Cynoglossum grande, Eriodictyon californicum, Nemophila parviflora var. parviflora, Phacelia malvifolia..... Notholithocarpus densiflorus var. densiflorus, Quercus agrifolia var. agrifolia, Quercus x chasei, Quercus parvula var. shrevei..... Pinus attenuata, Pseudotsuga menziesii var. menziesii..... Bowlesia incana, Daucus pusillus, Heracleum maximum, Osmorhiza berteroi, Perideridia kelloggii, Sanicula arctopoides, Sanicula bipinnatifida, Sanicula crassicaulis, Sanicula gianonei, pro.sp.nov., Sanicula hoffmannii, Sanicula "pseudo-laciniata"..... Equisetum telmateia subsp. braunii..... Athyrium filix-femina var. cyclocorum, Dryopteris arguta, Polystichum munitum, Polygodium calirhiza, Pteridium aquinum var. pubescens, Adiantum jordanii, Woodwardia fimbriata, Pentagramma triangularis subsp. triangularis..... Sequoia sempervirens..... Umbellularia californica.....

Lathyrus vestitus sensu latu, Lotus junceus = Acmispon junceus var. junceus, Lotus micranthus = Acmispon parviflorus, Lotus scoparius var. scoparius = Acmispon glaber var. glaber, Lotus strigosus = Acmispon strigosus, Lotus wrangelianus = Acmispon wrangelianus, Lupinus bicolor, Lupinus nanus, Trifolium barbigerum var. barbigerum = Trifolium barbigerum, Trifolium buckwestiorum, Trifolium microcephalum, Trifolium microdon, Trifolium oliganthum, Trifolium aff. variegatum (plants growing in lower section of gulch, in open meadow, reduced in stature with involucres cut 1/2-3/4 to base, calyx lobes longer than tube, entire and not splitting as fruit matures), Trifolium willdenovii..... Acer negundo var. californicum..... Toxicodendron diversilobum..... Verbenà laisiiostachus var. laisiiostachus..... Adenocaulon bicolor, Anisocarpus madioides, Artemisia douglasiana, Baccharis pilularis, Cirsium brevistylum, Deinandra corimbosa, Eriophyllum confertiflorum var. confertiflorum, Eurybia radulina, Gamochaeta ustrulata, Hieracium albiflorum, Layia platyglossa, Madià gracilis (gland-tipped trichomes from midway up stem to apex of inflorescence emitting a cherry-syrup scent), Madià sativa (clothed with gland-tipped trichomes from near base of stem..... scent varies between different populations and may represent interspecific hybridization or more than one species being lumped together under the same name), Microseris bigelowii, Micropus californicus var. subvestitus, Pseudognaphalium ramosissimum, Pseudognaphalium stramineum, Psilocarpus
Growing inflorescences/ripe caryopsis. Note: Comprehensive collections documenting both "phases" of isolated thriving morphological self-awned forms, is a subject worthy of study, especially in the 1970s. Growing under three different ecological regimes, albeit proximal to each other, the genus *Agrostis exarata* with mature inflorescences/ripe caryopsis from Beaver Flat, have been deposited with the UCSC Arboretum.
**Triteleia** diversifies in this secluded environment: when studied at length and in depth during the 1970s, white brodiaea (*Triteleia hyacinthina*) occupied the lower and wettest part of the “marsh”, while Ithuriel's spear (*Triteleia laxa*) chose the higher and drier grasslands overlooking the wet zone and staking out the middle ground, growing up out of a patch of California blackberries (*Rubus ursinus*), was a small colony of golden brodiaea (*Triteleia ixioides* subsp. *ixiodes*). Favoring long established “ancient” marshes, the locally uncommon trifid bedstraw (*Galium trifidum* var. *pacificum* = *Galium trifidum* subsp. *columbianum*) makes its home growing up through old expansive clumps of *Juncus effusus* var. *pacificus*, its root systems secure from seasonal hydrological changes and its scandent stems protected from herbivory. **Staking out the forested slopes that circumscribe Beaver Flat proper** and also representing the Madder Family (Rubiaceae), sympatric populations of California bedstraw (*Galium californicum* subsp. *californicum* and climbing bedstraw (*Galium porrigens* var. *porrigens*) can be observed..... often scandent by nature, with their 4-sided stems both tactually and visually distinguished by short-scabrous versus cinereous-spreading trichomes. Continuing with the subject of related pairings, this time the juxtaposing of rare and ubiquitous taxa, Hoffmann’s sanicle (*Sanicula hoffmannii*) and gambleweed (*Sanicula crassicaulis*) present an interesting duo..... it has been proposed, that the polyploid *Sanicula crassicaulis* has as one of its putative parents, the diploid *Sanicula hoffmannii*, and when the foliar variation of the gambleweed is examined from a structural context, the ancestral affinities are readily apparent! Scattered throughout the marsh proper and its periphery are colonies of Gianone sedge (*Carex gianonei* pro. sp. nov.), while growing more or less restricted to the marsh’s lower east-facing section, are individual plants of the “imperfecta” phase. Growing in a seasonally wet pond at the head of Beaver Flat within a dense colony of common spikerush (*Eleocharis macrostachya*), two county-wide rarities were observed and documented, namely narrow canary grass (*Phalaris angusta*) and smooth goldfields (*Lasthenia glaberrima*). Several decades ago, the decidedly uncommon western inflated sedge (*Carex vesicaria* var. major = *Carex exsiccata*) was found, both in this seasonal pond draining into Beaver Flat and along the east facing edge of Last Chance Lagoon..... recent efforts to rediscover both populations have resulted in failure! Two monocots not found elsewhere within the watershed were also studied, pressed and dispatched to the Jepson, the duo being annual hairgrass (*Deschampsia danthonioides*) and what appeared to be an isolated colony of slender rush (*Juncus tenuis*), specimens pressed and deposited in the Jepson Herbarium, U.C. Berkeley (accession number JEPS82593, James A. West, 101, May 26 1983)....this distinctive taxon, which consistently displays a very open inflorescence, not unlike that of *Juncus tenuis*, may in fact be an extreme local phase of western rush (*Juncus occidentalis*)..... as of 07/09, a sexually reproducing sub-population of this taxon still exists and select plants have been collected and are being raised at the UCSC Arboretum for study. Two members of the common monkeyflower complex (*Mimulus guttatus* var. *guttatus* and var. *arvensis*) grew sympatrically without displaying any signs of intermediacy..... (the var. *arvensis* is inodorous and this trait, in conjunction with differences in the patterning of the lower corolla lip and whether the palate creates an open or nearly closed throat, could be the mechanism(s) maintaining the reproductive isolation between the two sympatric varieties)..... while threading their way through the basal seepage, extensive colonies of artist’s popcorn-flower (*Plagiobothrys chorisianus* var. *chorisianus*) luxuriated, carpeting the wet spots and perfuming the surrounding area with fragrant white and yellow flowers and **virtually invisible due to its diminutive stature**, timwort (*Cicendia quadrangularis*) would pass unnoticed, were it not for the eye-catching **cruciferous yellow corollas**, acting as points of light against the verdancy of the peripheral grassland but even more inconspicuous, is chaffweed (*Anagallis minima*), recently removed from Primulaceae and nested within the Myrsinaceae.
Note: The following supplemental listing of "native" taxa arranged by familial affinities, found within the confines of Beaver Flat, is part of an ongoing documentation for this unique landslide derived wetland. Luzula comosa, Juncus hesperus, Juncus occidentalis, Juncus patens, Juncus phaeocephalus var. phaeocephalus, Agrostis hallii/pallens intergrades, Bromus carinatus var. carinatus, Bromus vulgaris, Elymus glaucus subsp. glaucus, Melica torreyana, Melica subulata, Phalaris californica, Oenothera pilosa, Aphanes occidentalis, Fragaria vesca, Heteromeles arbutifolia, Horkelia californica var. californica, Oemleria cerasiformis, Rubus parviflorus, Notholithocarpus densiflorus var. densiflorus, Quercus agrifolia var. agrifolia, Lonicera hispidula, Cryptoglossum grande, Nemophila parviflora var. parviflora, Hypericum anagalloides, Lathyrus vestitus var. vestitus, Acer macrophyllum, Arbutus menziesii, Iris douglasiana, Sisyrinchium bellum, Clinopodium douglasii, Monardella villosa sensu lato, Stachys bullata, Achillea millefolium, Anisocarpus madioides, Artemisia douglasiana, Baccharis pilularis subsp. consanguinea, Solidago elongata, Dryopteris arguta, Polystichum munitum, Pteridium aquilinum var. pubescens, Athyrium filix-femina var. cyclosorus, Mimulus aurantiacus, Persicaria punctata, Carex obtuna, Sidalcea malviflora subsp. malviflora, Ranunculus californicus var. californicus, Heracleum maximum, Oenothera sarmentosa, Osmorhiza berteroi, Sanicula gianonei, pro. sp. nov., Ceanothus thyrsiflorus Frangula californica subsp. californica, Calystegia purpurata, purpurata, Pseudotsuga menziesii var. menziesii, Torreya californica, Corylus cornuta subsp. californica, Galium triflorum, Umbellularia californica, Chlorogalum pomeridianum, Pentagramma triangularis subsp. triangularis, Solanum douglasii, Solanum umbelliferum, Urtica dioica subsp. gracilis, Ribes divaricatum var. pubiflorum, Camissonia ovata = Taraxia ovata, Pinus attenuata, Cardamine oligosperma, Claytonia perfoliata subsp. perfoliata

Lair Gulch, like several other morphologically complex sub-watersheds draining into Scotts Creek, can be viewed as a "living laboratory": where the adaptive plasticity of residing taxa and extremes of habitat available within a confined zone, interact to produce ecotypes of the same species varying widely in gestalts. A cogent example is found in two forms of the coast redwood (Sequoia sempervirens), the forma typica residing deep within the gulch bottom and adjacent forested slopes, while the golden-hued reduced-in-stature chaparral form exists in a markedly xeric and exposed environment, which it shares with knobcone pine (Pinus attenuata), hairy manzanita (Arctostaphylos crustacea sensu lato), Schreiber’s manzanita (Arctostaphylos glutinosa), disjunct population which survived 2009 Lockheed Fire, California huckleberry (Vaccinium ovatum), another taxon, like the redwood, adapting to habitat extremes), chaparral pea (Pickeringia montana var. montana), chamise (Adenostoma fasciculatum), toyon (Heteromeles arbutifolia), canyon live-oak (Quercus chrysolepis), forest live-oak (Quercus parvula var. shrevei), golden chinquapin (Chrysolepis chrysophylla var. minor), Pacific madrone (Arbutus menziesii), Bioletti’s trefoil (Lotus juncus var. bioletti = Acmispon juncus var. bioletti), variable as to length of peduncle) and stipulate trefoil (Lotus stipularis = Hosackia stipularis var. stipularis), isolated populations are uniformly clothed with resinous glands, sweetly fragrant and possibly referable to Lotus balsamiferus (Kell.)Greene. Due to the near vertical topography which defines much of this drainage system, a full accounting of all "native" taxa residing within its mapped boundaries may never be fully realized but the following species list, grouped by familial affinities, sets the groundwork/creates a baseline for future such endeavors: California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass (Calamagrostis...
rubescens), California bottlebrush grass (Elymus californicus), California wild rye (Elymus glaucus subsp. glaucus), California fescue (Festuca californica), western fescue (Festuca occidentalis), crinkle-awn fescue (Festuca subuliflora), vanilla grass (Hierochloe occidentalis), Alaska onion grass (Melica subalpina), Torrey's melic (Melica torreyana), California canary grass (Phalaris californica), Howell's bluegrass (Poa howellii), tall trisetum (Trisetum canescens),... chamise (Adenostema fasciculatum), western lady's mantle (Aphanes occidentalis), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus discolor), wood rose (Rosa gymnocarpa), black-cap raspberry (Rubus leucoderms), thimbleberry (Rubus parviflorus), California blackberry (Rubus ursinus),... pitcher sage (Lepechinia calycina), coyote mint (Monardella villosa sensu lato),... populations variable, ranging from subsp. villosa thru subsp. franciscana, yerba buena (Satureja douglasii), California hedge-nettle (Stachys bullata),... yarrow (Achillea millefolium), trail plant (Adenocaulon bicolor), mountain dandelion (Agoseris grandiflora), woodland madia (Anisocarpus madioides), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis), Indian thistle (Cirsium brevispulum), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), broad-leaved aster (Eurybia radulina), purple cudweed (Garnochaeta ustulata), white hawkweed (Hieracium albiﬂorum), California cudweed (Pseudognaphalium californicum), pink everlasting (Psilothamnus ramosissimus), woolly marbles (Psilarcopus tenellus var. tenellus), California chicory (Rafinesquia californica),... cow-parsnip (Heracleum maximum), sweet cicely (Osmorhiza berterei), gambleweed (Sanicula crassicaulis), Gianone sanicle (Sanicula gianonei, pro sp. nov.), Hoffmann's sanicle (Sanicula hoffmannii),... baneberry (Actaea rubra), pipestems (Clematis lasiantha),... California bay laurel (Umbellularia californica),... California nutmeg (Toerreya californica),... bush poppy (Dendromecon rigida),... Pacific starﬂower (Trientalis latifolia),... morning glory (Calystegia purpurata subsp. purpurata),... Douglas's nightshade (Solanum douglasii),... blue hawkweed (Solanum umbelliferum),... brown bog-rush (Juncus hederinus), common rush (Juncus patens), common wood rush (Lucenta conosa),... Pacific pea (Lathyrus vestitus sensu lato), rush trefoil (Lotus junceus sensu lato),... erect to prostrate in mode of growth, with peduncles abbreviated to conspicuously elongate), small-flowered trefoil (Lotus micranthus),... deerweed (Lotus scoparius var. scoparius), stipulate trefoil (Lotus stipularis, aff. Lotus balsamifera),... stigose trefoil (Lotus strigosus),... chaparral pea (Pickeringia montana var. montana),... few-flowered clover (Trifolium oliganthum), American vetch (Vicia americana var. americana),... giant vetch (Vicia gigantea),... Hasse's vetch (Vicia hassei),... golden chinquapin (Chrysolepis chrysophylla var. minor),... tan-oak (Notholithocarpus densiflorus var. densiflorus),... coast live-oak (Quercus agrifolia var. agrifolia),... canyon live-oak (Quercus chrysolepis),... forest live-oak (Quercus parvula var. shrevei),... bracken (Pteridium aquilinum var. pubescens),... lady fern (Athryum filix-femina var. cyclosorus),... wood fern (Dryopteris arguta),... western sword fern (Polystichum munitum),... five-finger fern (Adiantum aleuticum),... goldback fern (Pentagramma triangularis subsp. triangularis),... deer fern (Blechnum spicant),... giant chain fern (Woodwardia fimbriata),... nested polypody (Polypodium caliﬁriza),... growing as an epiphyte, with lowermost 1-3 sets of pinna shorter than succeeding ones),... giant horsetail (Equisetum telmateia subsp. braunii),... knobcone pine (Pinus attenuata), Monterey pine (Pinus radiata),... reflecting the Pinus attenuata gestalt in branching pattern, open gray-green needle morphology and often angled umbo, the Last Chance Ridge populations may be closer to the original primary cross, with the initial gene flow uni-directional,... going from Pinus attenuata to Pinus radiata, and the knobcone's prominent apically aligned prickles (mucros) being recessive in subsequent generations, Douglas-fir (Pseudotsuga menziesii var. menziesii),... redwood (Sequoia sempervirens),... big-leaf maple (Acer macrophyllum),... Hooker's fairy bells (Prosartes hookeri),... spotted coralroot (Corallorhiza maculata forma immaculata),... royal rein orchid (Piperia transversa),... white globe lily (Calochortus albus),... red clintonia (Clintonia andrewsiana),... checker lily (Fritillaria affinis var. affinis),... slink pod (Scoliopus bigelovii),... California milkwort (Polygala
future challenges such as global warming? tolerance/adaptive capabilities of these two putatively different, proximal to each other, are there any reproductive barriers preventing gene exchange? (3) what are the evolutionary implications in terms of population variability and the subsequent tolerance/adaptive capabilities of the offspring from this theoretical gene exchange relative to future challenges such as global warming? and (4) are the post 2009 Lockheed Fire chaparral populations are proximal to each other, are there any reproductive barriers preventing gene exchange? (3) what are the evolutionary implications in terms of population variability and the subsequent tolerance/adaptive capabilities of the offspring from this theoretical gene exchange relative to future challenges such as global warming? and (4) are the post 2009 Lockheed Fire chaparral

... small population observed circa 30 years ago, growing in marshy habitat adjacent to Last Chance Road which drains into Lair Gulch but not seen in recent years... area since original observation was made, has been overgrown with poison oak (Toxicodendron diversilobum) which may have out-competed and eventually displaced the currant)... Carex gianonei complex (several examples of this putative polysectional hybrid, with inflorescences displaying compound-congested lower spikelets, were found currently growing in the same marsh-like habitat, that the aforementioned pink-flowering currant formerly occupied), foothill sedge (Carex tumulicola), umbrella sedge (Cyperus eragrostis)... soap plant (Chlorogalum pomeridianum var. pomeridianum)... blue dicks (Dickélastémum capitatum subsp. capitatum)... blue elderberry (Sambucus nigra subsp. canadensis)... California bedstraw (Galium californicum subsp. californicum), sweet-scented bedstraw (Galium triflorum)... Douglas’s iris (Iris douglasiana)... common milkmaids (Cardamine californica var. californica), popweed (Cardamine oligosperma)... hairy wood sorrel (Oxalis corniculata subsp. pilosa), redwood sorrel (Oxalis oregana)... Pacific madrone (Arbutus menziesii), brittle-leaf manzanita (Arctostaphylos crassicaulis var. lato)... extensive populations of this complex burl-forming "genetic sponge", referencing traits, in part, attributable to Arctostaphylos andersonii, Arctostaphylos glutinosa and Arctostaphylos sensitiva), Schreiber’s manzanita (Arctostaphylos glutinosa... one of two endemic manzanitas residing within the Scotts Creek Watershed), western azalea (Rhododendron occidentale), California huckleberry (Vaccinium ovatum)... red alder (Alnus rubra), hazelnut ( Corylus cornuta var. californica)... two-eyed violet (Viola ocellata)... California figwort (Scrophularia californica subsp. californica)... miner’s lettuce (Claytonia perfoliata subsp. perfoliata)... coast nettle (Urtica dioica subsp. gracilis)... variable as to ratio of stinging to non-stinging hairs on stems and abaxial leaf surfaces, often tending towards subsp. holosericea)... hairy honeysuckle (Lonicera hispida)... sticky monkeyflower (Mimulus aurantiacus)... varied-leaved collomia (Collomia heterophylla)... California harebell (Asyneuma prenanthoides) and elk-clover (Aralia californica).

Note: streamside in the lower portion of Lair Gulch, the following six species of ferns were observed growing sympatrically within a three square meter area... deer fern (Blechnum spicant), giant chain fern (Woodwardia fimbriata), lady fern (Athyrium filix-femina var. cyclosorum), five-finger fern (Adiantum aleuticum), wood fern (Dryopteris arguta) and western sword fern (Polystichum munitum).

Note: regarding the two ecotypes of Sequoia sempervirens occurring within the Lair Gulch sub-watershed, the following studies could be initiated: (1) Study the second growth populations within the canyon bottoms and determine if the ploidy levels are hexaploid and compare with the reduced-in-stature unharvested chaparral ecotype (technically old growth, at least in origin and age if not stature) and see if those populations are triploid (n=33), (2) where these two putatively different, both in ecological preferences and ploidy levels, populations are proximal to each other, are there any reproductive barriers preventing gene exchange?, (3) what are the evolutionary implications in terms of population variability and the subsequent tolerance/adaptive capabilities of the offspring from this theoretical gene exchange relative to future challenges such as global warming? and (4) are the post 2009 Lockheed Fire chaparral...
populations of *Sequoia sempervirens*, growing in the transitional zone between the Seymore Hill, upper Bettencourt Gulch and the "chalks" and **vigorous coppicing**, converted to hexaploid status or are they, in part due to the 1948 fire, resprou ting second growth?

Viewed from an aerial perspective, **West's Spring** and **Marti's Park Marshes** appear as a series of ever descending self-contained wetlands, spring fed year round. What they do or do not share in the way of native taxa, with the adjacent **Last Chance Lagoon, Rosetta Stone Pine Marsh** and **Beaver Flat**, is intriguing from a biogeographical frame-of-reference..... artist's popcorn-flower (*Plagiobothrys chorisanus* var. *chorisanus*) forms hidden colonies beneath the Juncus tussocks and often grows up and through their supportive stems, this rare borage's furtive presence revealed by the intoxicating vanilla scent of its flowers yet it is absent from Laguna de las Trancas while forming stable populations in all the above sympatric habitats!!! Restricted primarily to old coastal marshes, the decidedly uncommon trifid bedstraw (*Galium trifidum var. pacificum* = *Galium trifidum* subsp. *columbianum*) frequents Beaver Flat, the Last Chance Lagoon and Marti's Park Marsh. The behemoth of native docks, decidedly uncommon western dock (*Rumex occidentalis*), misses the Rosetta Stone Pine Marsh but has representatives in the other three named marshes plus the nearby "lagoon". Distinctive and phylogenetically significant, *Carex *"imperfecta", is well established in all of the previously described hydrologically influenced refugia and more recently, was found to have taken up residence with its relatives surrounding the 55,000+ years old palustrine wetland (**on 06/30/2011, a small population of this taxonomic bridge between the sections Multiflorae and Ovales, was observed growing sympatrically with Carex densa and Carex subbracteata, proximal to the Laguna de las Trancas** and within the outflow zone which drains down into Gianone Barn Gulch..... **living material and inflorescences were collected and dispatched to the UCSC Arboretum**). The rare, turion forming Hall's willow herb (*Epilobium halleanum*), first discovered adjacent to the West Spring Marsh also occurs in Beaver Flat and Marti's Park Marsh, where it continues to thrive sharing habitat with its variable sister species, *Epilobium ciliatum*, sensu lato, while Pacific reed grass (*Calamagrostis nutkaensis*), nearing the southern end of its range, defines West's Spring Marsh, Marti's Park Marsh and the Last Chance lagoon, with its outsized tussocks.....perhaps the prevailing wind direction, out of the northwest, and first hitting the "Laguna", has played a role historically, in referencing the airborn achenes eastward. Canada goldenrod (*Solidago elongata*), a long lived Aster kin and having merit as a wild garden introduction, resides within the soggy confines of Beaver Flat, West's Spring Marsh and Marti's Park Marsh leaving the south end of Laguna de las Trancas to its cousin, western goldenrod (*Euthamia occidentalis*). Within the Poaceae, the gigs form of western bent grass (*Agrostis exarata*, sensu lato), locally rare and morphologically distinctive, acts like a set of bookends..... with one population found in the Marti's Park Marsh and the other, conspicuously present in Beaver Flat. This "in your face" ecotype, can exceed 2 meters in heigh and has two phases, with both exhibiting elongate, verticillate inflorescences comprising distinctly separate glomerules: phase one possesses awned lemmas while phase two, acts like *Agrostis exarata var. exarata* on steroids..... within the confines of Beaver Flat, the awnless variant secures the upper third of the marsh leaving the lower two-thirds to its awned analog. Collected material of both types with mature seed heads (2008-2009), now reside at the UCSC Arboretum's seed repository, awaiting growing out and resolving the conundrum, as to whether both taxa are reproductively isolated or are each capable of producing both phases and/or are inter-fertile!!! Finally, the West's Spring Marsh can lay claim to sheltering the only known population to date, within the watershed at least, of whorled pennywort (*Hydrocotyle verticillata*), its sister species, floating pennywort (*Hydrocotyle ranunculoides*), a vigorous member of long standing within the Last Chance Lagoon's aquatic repertoire..... **both of**
these species, formerly placed in the Apiaceae, are now ensconced within the Araliaceae.

Note: A cursory overview of the West's Spring Marsh and the immediate surrounding watershed during 07/29/2011, yielded the following indigenous taxa, prevailing in spite of the enroachment of “non-natives” impacting the marsh’s northern and eastern margins: Anisocarpus madioides, Artemisia douglasiana, Baccharis glutinosa, Baccharis pilularis subsp. consanguinea, Cirsium brevistylum, Euthamia occidentalis, Helenium puberulum, Madia sativa, Solidago elongata….. Juncus bufonius var. bufo(nius, Juncus effusus var. pacificus, Juncus hesperius, Juncus patens….. Persicaria punctata, Rumex occidentalis….. Toxicodendron diversilobum….. Scrophularia californica….. Fragaria vesca, Holodiscus discolor var. discolor, Rubus parviflorus, Rubus ursinus…..

Agrostis exarata (robust form, with panicles dense and interrupted, lemmas awned, growing within the marsh proper), Bromus carinatus, Bromus vulgaris, Calamagrostis nutkaensis, Deschampsia elongata, Hordeum brachyantherum subsp. brachyantherum, Phalaris californica….. Pinus radiata, Pseudotsuga menziesii var. menziesii….. Hypericum anagalloides….. Ribes divaricatum var. pubiflorum….. Iris douglasiana, Sisyrinchium bellum….. Carex “imperfecta”, Carex obturata, Carex subbracteata, Cyperus eragrostis…..

Note: Marti’s Park Marsh, ensconced within a bowl-like depression (possibly of landslide origin), is aligned along a nw/se axis and shaped somewhat like a boomerang, being fed at its upper end by an active spring and draining eastward down into the Scotts Creek riparian corridor. A native species overview (07/12/2011), arranged by families, includes the following taxa….. growing within the marsh proper and its immediate surroundings: Hypericum anagalloides….. Plantago subnuda, Veronica americana….. Juncus bufonius var. bufo(nius, Juncus effusus var. pacificus, Juncus hesperius, Juncus occidentalis, Juncus patens, Juncus phaeocephalus var. phaeocephalus….. Carex densa, Carex gianonei syn<gameon, Carex “imperfecta” (concentrated population, 10+ plants, lower east end of marsh), Carex obturata, Cyperus eragrostis, Scirpus microcarpus….. Mimulus aurantiacus, Mimulus guttatus (var. grandis/subsp. litoralis, flowers redolent of honey)…..

Epilobium ciliatum sensu lato (variable as to flower size/color, inflorescence open/subtending floral bracts small = subsp. ciliatum or dense/with foliaceous bracts = subsp. watsonii), Epilobium hallianum (rare in county, apparently restricted to old marshes)….. Heteromeles arbutifolia, Oenothera cerasiformis, Rubus parviflorus, Rubus ursinus….. Pinus radiata, Pseudotsuga menziesii var. menziesii….. Notholithocarpus densiflorus var. densiflorus, Quercus agrifolia var. agrifolia, Quercus var. pubescens, shrub….. Ceanothus thyrsiflorus, Frangula californica subsp. californica….. Arbutus menziesii….. Anisocarpus madioides, Artemisia douglasiana, Baccharis glutinosa, Baccharis pilularis subsp. consanguinea, Cirsium brevistylum, Ga<u>mochaet<e>u stultula, Madia sativa, Pseudo<e>gnaphalium stramineum, Solidago elongata….. Ribes divaricatum var. pubiflorum….. Persicaria punctata….. Scrophularia californica….. Clinopodium douglasii, Stachys bullata….. Lonicera hispidula….. Agrostis exarata var. exarata (1-2 meters high form found locally in old marshes, distinctly verticillate, showing naked rachis between separate whorls and florets with awnless lemmas), Bromus carinatus var. carinatus, Bromus vulgaris, Calamagrostis nutkaensis, Deschampsia elongata, Elymus glaucus subsp. glaucus, Melica subulata, Melica torreyana, Phalaris californica…..

Galium californicum subsp. californicum, Galium porrigens var. porrigens, Galium trifidum subsp. columbianum (an uncommon species locally and generally restricted to old marshes), Galium triflorum….. Urtica dioica subsp. gracilis (variable as to stature and foliar gestalt, with some plants tending toward subsp. holosericea, displaying soft non-stinging trichomes on both the stems and abaxial leaf surfaces)….. Toxicodendron diversilobum….. Heracleum maximum, Oenanthe sarmentosa, Osmorhiza berteroi, Sanicula crassicaulis, Sanicula gianonei, pro.sp.nov. (growing on moist shaded banks margining west edge of Marti’s Park Marsh)….. Sambucus nigra subsp.
caerulea, Sambucus racemosa var. racemosa..... Marah fabaceus..... Claytonia perfoliata subsp. perfoliata..... Ranunculus californicus var. californicus..... Solanum douglasii..... Lathyrus vestitus (subsp. bolanderi, in part..... with stems and foliage subglabrous)..... Corylus cornuta subsp. californica..... Rumex occidentalis..... Umbellularia californica..... Acer macrophyllum..... Verbena lasiostachys var. lasiostachys..... Cardamine oligosperma, Rorippa palustris subsp. palustris..... Cynoglossum grande, Nemophila parviflora var. parviflora, Phacelia malvifolia, Plagiobothrys chorissianus var. chorissianus..... Iris douglasiana..... Maianthemum stellatum..... Pteridium aquilinum var. pubescens..... Woodwardia fimbriata..... Athyrium filix-femina var. cyclosorum..... Dryopteris arguta, Polystichum munitum..... Pentagramma triangularis subsp. triangularis.

Due west, across Last Chance Road from Laguna de las Trancas, is a relatively short but deep, narrow and complex in configuration drainage area, aptly named Arroyo de las Trancas. Margining the lower half of the gulch on its eastern flank and overlooking the northern entrance/exit of Swanton Road, an extensive but isolated population of Arctostaphylos cristaee, sensu lato, cloaks the weathered, exfoliating mudstone. In keeping with the expected polymorphism displayed by the Scotts Creek “burl-former”, one is not disappointed: displaying growth patterns ranging from prostrate through erect, leaves short-petioled with cordate/auriculate bases at one end of the foliar spectrum and long-petioled with rounded or cuneate bases at the other, enough variability in indument, tomentum and trichomes plus presence/absense of glands to perplex all but the most seasoned taxonomist and several plants referencing sensitive manzanita (Arctostaphylos nummularia = Arctostaphylos sensitiva) genes, with sub-quadrate, apically emarginated leaves and inflorescences, often downward-appressed, displaying both 4- and 5-merous corollas! Also ensconced in this island of diversity, a long-established population of coast redwood (Sequoia sempervirens), closer to the oceanic influences than anywhere else in the north county and exhibiting no signs of foliar distress but reduced in stature, due to the fast-draining substrate, prevailing westerly winds and reliance on seasonal rainfall/fog induced condensation for its principal water sources. Other plant taxa of interest, occurring on the upper grasslands which drain down into the arroyo from the Laguna de las Trancas side, the narrow strips of grassland paralleling the lower portion of the arroyo, on the steep soil-poor exposed habitats down slope from the bordering oak woodlands or the wind-referenced dune systems inland from Highway 1, are: a localized colony of small-flowered primrose (Camissonia micrantha) discovered circa twenty-five years ago..... an uncommon member of the Apiaceae in the county, wild celery (Apiastrum angustifolium)..... a concentrated population of the uncommon marsh microseris (Microseris paludosa) growing sympatrically with the rare Santa Cruz microseris (Microseris decipiens) and distant cousin, mountain dandelion (Agoseris grandiflora)..... California mustard (Caulanthus lasiophyllus)..... Michael’s rein orchid (Piperia michaelii)..... the yet-to-be-defined clarkia with a defiantly erect posture, bicolored flowers and gray-encrusted seeds, provisionally given the appellation, Davy’s clarkia (Clarkia davyi)..... and one large plant of broad-leaved lupine (Lupinus latifolius aff. var. dudleyi), stems and herbage densely clothed with stiff dark hairs, first discovered in the late 1970s and persisting for several years afterwards but now apparently lost! Documented in the 1980s with herbarium pressings, an isolated population of San Francisco wallflower (Erysimum franciscanum, formerly classified as var. crassifolium) shared a semi-stabilized sand dune with a densely glandular form of grassland gilia (Gilia clivorum): a distinctive variant with dark purplish corollas, which if it still exists in situ, warrants further study, comparing the living material with that of Gilia millefoliata! Finally, marching down the spine of the ridge, and even closer to the ocean than the aforementioned redwoods, stands of canyon live-oak (Quercus chrysolepis), reduced in stature and taking on an eldritch status. The Arroyo de las Trancas, draining both chaparral and
westward dipping grasslands, is in reality, two sub-watersheds that converge before crossing under Highway 1 and emptying into the Pacific Ocean, via waterfall, near Post Rock..... an in depth botanical overview is warranted, for other undocumented native taxa may still exist on steep out of reach slopes or moist crevices deep within the recesses of this understudied coastal drainage system. Arranged in familial groupings, the following native taxa help to define this westmost watershed component of our Traversal: dense sedge (Carex densa), Gianone sedge (Carex gianonei, pro sp. nov. (plants studied over the past few years producing some inflorescences with compound-congested lower spikelets), Carex “imperfecta” (putative aneuploid derivative from Carex nitidicarpa complex), Carex nitidicarpa (hybrid complex, derived in part, from Carex densa x Carex subbracteata), small-bracted sedge (Carex subbracteata).Juncus aff. brevleri (rhizomatous, culms dk green, robust, some twisted/flattened... inflos lateral, compact, perianth parts dark brown, 5-6mm long. no upper leaf blade present as per Juncus mexicanus and differs consistently from that taxon as found growing on coastal slopes and prairie, between China Ladder Marsh and Morehus Arroyo), toad rush (Juncus bufonius), Pacific bog-rush (Juncus effusus var. pacificus), brown bog-rush (Juncus hesperius), Juncus (hesperius x patens) hybrid, western rush (Juncus occidentalis), brown-headed rush (Juncus phaeocephalus var. phaeocephalus..... plants with with few, many-flowered heads). yarrow (Achillea millefolium), pearly everlasting (Anaphalis margaritacea), woodland madia (Aniscarpus madoides), California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis), California corethogyne (Corethogyne filaginifolia var. californica), common corethogyne (Corethogyne filaginifolia var. filaginifolia), lizard tail (Eriophyllum stachadifolium), broad-leaved aster (Eurybia radulina), hirsute gumnplant (Gindelia hirsutula var. hirsutula), white hawkweed (Hieracium albiflorum), coast tarweed (Madia sativa..... clothed with gland-tipped trichomes, from base of stem up thru inflorescence), Bioletti’s cudweed (Pseudognaphalium bioletti), California cudweed (Pseudognaphalium Californicum), pink everlasting (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum), California chicory (Rafinesquia californica). Monterey pine (Pinus radiata..... part of complex, highly reticulate ancient hybrid swarm with Pinus attenuata, and showing recombinant characteristics in both gross morphology and ovulate cone gestalt), Douglas-fir (Pseudotsuga menziesii var. menziesii)..... chamise (Adenostema fasciculatum), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus discolor), oso berry (Oenothera graciflora), wood rose (Rosa gymnocarpa), thimbleberry (Rubus parviflorus), California blackberry (Rubus ursinus)..... Hall’s/leafy bentgrass intergrades (Agrostis hallii x pallens..... throughout the Scotts Creek Watershed, numerous populations of these “native” Agrostis exist, that combine in varying ways, traits specific to either putative parent), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass (Calamagrostis rubescens), California oat grass (Dannhonya californica sensu lato..... forms attributable, to both var. americana and var. californica, are present), California wild rye (Elymus glaucus subsp. glaucus), California fescue (Festuca californica), western fescue (Festuca occidentalis), junegrass (Koeleria macrantha), Alaska onion grass (Melica subulata), Torrey’s melic (Melica torreyana), foothill needlegrass (Nassella lepida), California canary grass (Phalaris californica), tall trisetum (Trisetum canescens..... reduced in stature form, morphologically akin to taxa found growing on Santa Cruz Terrace overlooking south end of Greyhound Rock State Beach)..... hairy honeysuckle (Lonicera hispida), snowberry (Symphoricarpos albus var. laevigatus)..... sticky monkeyflower (Mimulus aurantiacus)..... coyote mint (Monardella villosa sensu lato..... within area under discussion, both subsp. villosa and subsp. franciscana occur, plus intermediate forms), yerba buena (Satureja douglasii = Clinopodium douglasii), California hedge-nettle (Stachys bullata)..... Pacific madrone (Arbutus menziesii), California huckleberry (Vaccinium
ovatum)..... California milkwort (Polygala californica)..... Bioletti's trefoil (Acmispon junceus var. bioletti), deerweed (Acmispon glaber var. glaber), Pacific pea (Lathyrus vestitus var. vestitus), yellow bush lupine (Lupinus arboresus), giant vetch (Vicia gigantea)..... poison oak (Toxicodendron diversilobum)..... Douglas's iris (Iris douglasiana), blue-eyed grass (Sisyrinchium bellum)..... soap plant (Chlorogalum pomeridianum var. pomeridianum)..... tan-oak (Notholithocarpus densiflorus var. densiflorus), coast live-oak (Quercus agrifolia var. agrifolia), forest live-oak (Quercus parvula var. shrevei)..... lady fern (Athyrium filix-femina var. cyclosorum)..... wood fern (Dryopteris arguta), western sword fern (Polystichum munitum)..... bracken (Pteridium aquilinum var. pubescens)..... giant chain fern (Woodwardia fimbrata)..... California maidenhair (Adiantum jordani), goldback fern (Pentagramma triangularis subsp. triangularis)..... Douglass's nightshade (Solanum douglasii)..... Pacific starflower (Trientalis latifolia)..... baneberry (Actaea rubra)..... western nettle (Hesperocnide tenella), coast nettle (Urtica dioica subsp. gracilis)..... small-flowered alum root (Heuchera micrantha)..... red elderberry (Sambucus racemosa var. racemosa)..... cow-parsnip (Heracleum maximum), sweet cicely (Osmorhiza berteroi), gambleweed (Sanicula crassaulis)..... blue blossom (Ceanothus thyrsiflorus), California coffeeberry (Frangula californica subsp. californica)..... blue dicks (Dichelostemma capitatum subsp. capitatum), Thuriel's spear (Triteleia laxa)..... forma typica, with laterally symmetrical stamens, whitish anthers, and filaments of unequal length)..... California bedstraw (Galium californicum subsp. californicum), climbing bedstraw (Galium porrigens var. porrigens)..... hound's tongue (Cynoglossum grande)..... Watson's willow herb (Epilobium ciliatum subsp. watsonii)..... giant horsetail (Equisetum telmateia subsp. braunii)..... slim Solomon's seal (Smilacina stellata)..... miner's lettuce ( Claytonia perfoliata subsp. perfoliata)..... straggly gooseberry (Ribes divaricatum var. pubiflorum)..... California figwort (Scrophularia californica subsp. californica)..... yellow willow (Salix lasiandra var. lasiandra), arroyo willow (Salix lasiolepis)..... water smartweed (Persicaria punctata)..... broad-leaved cattail (Typha latifolia)..... mare's tail (Hippuris vulgaris)..... one of two populations to be found within the watershed sensu lato, AND THE ONLY POPULATIONS, to date, documented for Santa Cruz County)..... farewell-to-spring (Clarkia rubicunda)..... stinging phacelia (Phacelia malvifolia).

Note: After crossing under Highway 1 and dropping over a circa 6 meter high waterfall, Arroyo de las Trancas crosses the seasonally shifting beach and enters the Pacific Ocean..... even at the end of this botanically diverse drainage system, native species of interest can be found! Here is a partial inventory and several of these taxa appear to have a high tolerance for wind-born salt spray: three square (Schoeonoplesus americanus), Pacific cinquefoil (Potentilla anserina subsp. pacifica), Pacific oenanthe (Oenanthe sarmentosa), large-flowered sand-spurrey (Spergularia macrotheca var. macrotheca), common scouring rush (Equisetum hyemale subsp. affine), Mexican plantain (Plantago subnuda), sea lettuce (Dudleya caespitosa), California bent grass (Agrostis densiflora), and growing on the near vertical drop-off perpetually moistened by the waterfall, low club rush (Isoplepis cervina), common monkeyflower (Mimulus guttatus) and adhering to the saturated mudstone as ornately textured sheets visually akin to blue-green fish scales, water fern (Azolla filiculoides).

Situated along the lower section of Last Chance Road and seasonally draining into a gulch that parallels this portion of our traversal before emptying into Scotts Creek, Laguna de las Trancas (Last Chance Lagoon) is a “must see” repository for studying rare and uncommon native plants, growing in isolation, sharing both a terrestrial and aquatic habitat, which seasonally is in a state of hydrological flux. Tephrachronological studies have placed this ancient “pond” (technically a palustrine wetland) at 55,000+ years in age and the following native species, meriting study, reside there. Home to one of the two known populations in the county of mare’s tail (Hippuris
vulgaris), which shared habitat with the infrequently encountered (last observed in the "marsh" in the early 1980's) western inflated sedge (Carex vesicaria var. major = Carex exscicata). ... bog yellow cress (Rorippa palustris var. occidentalis = Rorippa palustris subsp. palustris) and its locally uncommon sister species, western yellow cress (Rorippa curvisiliqua) hidden from sight, its semi-prostrate stems overtopped by an extensive colony of western goldenrod (Euthamia occidentalis). ... flowering quillwort (Lilaea scilloides = Triglochin scilloides), a locally rare liverwort (Ricciocarpus natans), water fern (Azolla filiculoides) forming irregular pinkish-red patches akin to an intricate jig-saw puzzle and a visually striking clover with cerise flower heads circa 3-4 cm. in diameter, bouquet clover (Trifolium grayi), documented as an herbarium specimen in 1983 and deposited in Jepson Herbarium, UC Berkeley (note. six flowering plants observed on 06/09/09). The preferred habitat of western dock (Rumex occidentalis) appears to be old marshes and this landslide derived repository of aquatic and ecologically related vegetation is no exception. ... this uncommon native “giant” can also be found in adjacent Beaver Flat, West Spring Marsh and Marti’s Park Marsh, often towering over the long established native grass clumps. The trifid bedstraw (Galium trifidum var. pacificum = Galium trifidum subsp. columbianum) is found growing within the protective embrace of Pacific bog-rush (Juncus effusus var. pacificus), which along with robust tussocks of Pacific reed grass (Calamagrostis nutkaensis), California hairgrass (Deschampsia cespitosa subsp. holciformis) and slough sedge (Carex obnupta), margin the water’s edge and overlook floating pennywort (Hydrocotyle ranunculoides), Bolander’s water starwort (Callitriche heterophylla var. bolanderi) forming clustered rosettes floating on the surface of the water or diffuse prostrate patches on the moist bank. ... but both phases with sessile fruit sporting styles double its body length, common spikerush (Eleocharis macrostachya), inconspicuous patches of water buttercup (Ranunculus aquatilis var. capillaceus) with thread-like submerged foliage and ephemeral flowers and equally diffuse in mode of growth, fennel-leaf pondweed (Potamogeton pectinatus = Stuckenia pectinata) sharing habitat with a morphologically dissimilar sister species, which appears to be long-leaved pondweed (Potamogeton nodosus). Cloistered between the edge of the grassland and the water’s edge, lowland cudweed (Gnaphalium palustre), artfully makes its presence known through ground-hugging, scattered patches of reflective foliage clothed with a silvery indument and like a taxonomically displaced orphan, appears to be the only valid native member of the genus Gnaphalium now residing within the watershed! Creating a centrally positioned island of densely packed, vertically aligned, overarching culms/stems, common tule (Scirpus acutus var. occidentalis = Schoenoplectus acutus var. occidentalis) and broad-leaved cattail (Typha latifolia) help to bookend the aqueous corridor that defines the pond proper and provide shelter for the bur-reed (Sparganium eurycarpum subsp. eurycarpum), flaunting fruiting capitula looking ever-so-much as if a mad scientist had crossed a hedgehog with a golf ball and added chloroplasts for coloration. A brown bog-rush (Juncus effusus var. brunnneus = Juncus hesperius) x common rush (Juncus patens) hybrid, whose clonal expansiveness superficially suggesting a long established colony, secures the northwestern edge of the pond, while a trio of rare clarkias: purple clarkia (Clarkia purpurea subsp. purpurea), prostrate clarkia (Clarkia prostrata) and an erect growing “species” with bicolor flowers and gray-encrusted seeds, aff. Davy’s clarkia (Clarkia davyi), have been observed growing, over the past three decades, in the siliceous soil defining a narrow arc-like zone overlooking the eastern edge of the pond. Creating a visual counterpoint of pink and yellow, checkerbloom (Sidalcea malviflora ssp. malviflora) and California buttercup (Ranunculus californicus) create vibrant drifts of color, while scattered plants of sympatric hirsute gumplant (Grindelia hirsutula var. hirsutula) up the ante by displaying vibrant reddish-purple stems with intense butter-yellow rayed heads......playing the game with a subtle touch, ground-hugging rosettes of suncups (Camissonia ovata = Taraxia ovata) throw consistency out the window and
contrast golden-yellow flowers with foliage, either totally green or with claret-colored veins. Varying radically in stature and mode of growth, several members of the Rose Family (Rosaceae) can be sleuthed out, starting with a true micro-species, western lady’s mantle (Aphanes occidentalis), which even when mature and in flower, can be small enough to look like moss to the casual viewer.....sister species but differing in foliar aroma, are wedge-leaved horkelia (Horkelia cuneata var. cuneata), whose prostrate rosettes glisten in the sunlight due to the presence of a glandular exudate coating the adaxial surface of its leaflets and California horkelia (Horkelia californica var. californica), sheltered by the brambles of its ubiquitous cousin, California blackberry (Rubus ursinus).....with drupes for fruit in spite of its colloquial name to the contrary, oso berry (Oemleria cerasiformis) provides food for birds, while hidden within the moist recesses between grass tussocks is the only yellow-flowered relative sporting bicolor leaves, green adaxially/silver abaxially, Pacific cinquefoil (Potentilla anserina subsp. pacifica), and finally, along the marsh’s southeastern edge and thriving in the organically rich muck, a vigorous population of wood strawberry (Fragaria vesca). Scattered on the seasonally watered grassy slopes which surround this "ancient" body of water but distaining “wet feet”, are two taxa of interest: an isolated colony of brownie thistle (Cirsium quercetorum), unique for our area, being a combination of native, perennial, rhizomatous and conspicuously low growing and having florets the color of muddy water to boot (biennial native sister species, Cirsium brevistylum aka Indian thistle, favors the palustrine's moist sheltered margins) and a solitary hybrid between the yellow bush lupine (Lupinus arboreus) and Lindley’s varied lupine (Lupinus varicolor), with both proud parents present and the lone offspring being intermediate between the two, as to stature, foliar gestalt and coloration of flowers.

Note: a supplemental native species inventory (07/05/10) for the Laguna de las Trancas and the area immediately circumscribing it, is as follows: sticky monkeyflower (Mimulus aurantiacus), common monkeyflower (Mimulus guttatus var. grandis), tinker’s penny (Hypericum anagalloides), miniscule duckweed (Lemna minucula), California coffeeberry (Fragula californica subsp. californica), western sword fern (Polystichum munitum), yerba buena (Satureja douglasii = Clinopodium douglasii), bugle hedge-nettle (Stachys ajugoides), purple cudweed (Gamochaeta ustulata), Watson’s willow herb (Epilobium ciliatum subsp. watsonii), hoary nettle (Urtica dioica subsp. holosericea), western rush (Juncus occidentalis), brown-headed rush (Juncus phaeocephalus var. phaeocephalus), meadow barley (Hordeum brachyantherum subsp. brachyantherum), California oat grass (Danthonia californica var. californica), dense sedge (Carex densa), Gianone sedge (Carex gianonei syngameon..... C. harfordii matrix, with some of the lower 1-5 spikelets compound-congested, variable sexually with androgynous, gynaecandrous and/or mixed forms occurring, occasionally concurrent on the same plant), imperfect sedge (Carex “imperfecta”..... putative an euploid derivative from C. densa x C. subbracteata hybridization, in part, with lowermost 1-5+ spikelets usually compound-congested, pistillate flowers non-functional and staminate ones, with some pollen producing anthers), nitid sedge (Carex nitidicarpa..... fertile taxon, putatively derived from Multiflorae/Ovales hybridization, Carex densa x Carex subbracteata, with lowermost 1-5 spikelets compound-congested, androgynous, gynaecandrous and/or mixed, culms often thick/robust, distinctly trigonous and margins scabrous), Monterey pine (Pinus radiata..... representatives of an ancient hybrid swarm between Pinus attenuata and Pinus radiata, reticulate in its hybrid gene flow patterns and showing parental intermediacy, in overall gestalt, particularly with branch alignment, needle color/length and ovulate cone morphology), coast live-oak (Quercus agrifolia var. agrifolia), straggly gooseberry (Ribes divaricatum var. pubiflorum), gambleweed (Sanicula crassicaulis), California man root (Marah fabaceus), poison oak (Toxicodendron diversilobum), coyote brush (Baccharis pilularis  subsp.
consanguinea), American winter cress (Barbara orthoceras) and California figwort (Scrophularia californica subsp. californica).

Between the entrance to Last Chance Road and the Upper Gianone Barn Gulch Marsh, a hydrologically active spring gives rise to a tilted oceanward micro-marsh, which drains down slope towards Swanton Road and then disappears underground. This monocot defined and possibly landslide derived refugium, acts as a living laboratory for studying an isolated population of the Carex gianonei syngameon and comparing its genotype with analogous populations/habitats nearby. Preparing a botanical profile for this zone of Carex activity and the immediate habitat surrounding it, yields the following native species: Carex subbracteata (some plants with thicker, angulate, scabridulous-margined culms possibly reflecting Carex densa genes and relationship with Carex nitidicarpa, pro.sp.nov.), Carex obnupta, Cyperus eragrostis.....Juncus bufonius, Juncus effusus var. pacificus, Juncus hesperius, Juncus occidentalis, Juncus patens, Juncus phaeocephalus var. phaeocephalus (population with few, many-flowered heads condensed into one large quasi-capitate terminal inflorescence).....Agrostis exarata (var. pacifica, with awned lemmas), Bromus carinatus, Deschampsia elongata, Elymus glaucus subsp. glaucus, Phalaris californica, Stipa lepida, Stipa pulchra.....Horkelia californica var. californica, Rubus ursinus.....Pinus radiata.....Persicaria punctata.....Epilobium ciliatum subsp. watsonii.....Artemisia californica, Artemisia douglasiana, Baccharis pilularis subsp. consanguinea.....Urtica dioica tending towards subsp. holosericea.....Toxicodendron diversilobum.....Solanaum douglasii.....Verbena lasiostachys var. lasiostachys.....Mimulus aurantiacus.....Sisyrinchium bellum.....Quercus agrifolia var. agrifolia, Quercus parvula var. shrevei.....Sambucus racemosa var. racemosa.....Frangula californica subsp. californica.....Galium porrigens var. porrigens.....Stachys rigida var. quercetorum.....Scrophularia californica.....Lathyrus vestitus sensu lato.....Chlorogalum pomeridianum var. pomeridianum.

The deeply incised Gianone Barn Gulch, which drains the overflow of Laguna de las Trancas and the seasonally saturated benched grasslands to the southeast, can be viewed roadside during this part of our botanical exploration, containing throughout its course, several intergrading habitats with their constituent species of interest: surrounding the permanent spring (= Upper Gianone Barn Gulch Marsh) which is the principal water source for the upper drainage area feeding into the gulch are seven components of the genus Juncus, an amazing concentration for so small an area.....toad rush (Juncus bufonius), brown bog-rush (Juncus effusus var. brunneus = Juncus hesperius), Pacific bog-rush (Juncus effusus var. pacificus), a robust form of Mexican rush (Juncus mexicanus) with dark green tortile-compressed culms, these often arcuate and lacking blades on basal bracts, compact inflorescences with perianth parts 5-6 mm in length, showing possibly a closer affinity with Juncus breveri or Juncus lesueurii (= Juncus lescurii), western rush (Juncus occidentalis), common rush (Juncus patens) and brown-headed rush (Juncus phaeocephalus var. phaeocephalus) plus scattered colonies of locally uncommon and unrelated dwarf club rush (Scirpus koilelepis = Isolepis carinata) and with a nod to the dicots, bog yellow cress (Rorippa palustris var. occidentalis); further along but still in the upper drainage area, some displaced specimens of knobby cone pine (Pinus attenuata) look woefully out of place, the closest chaparral some distance away but genuine knobcones, none the less, with the thickened/flattened incurved prickles of the elevated cone scales aligned apically; an amazing number of tree species and arboreal wannabes defines this abbreviated but hydrologically complex watershed—big-leaf maple (Acer macrophyllum), California buckeye (Aesculus californica), Pacific madrone (Arbutus menziesii), blue blossom (Ceanothus thyrsiflorus), hazelnut (Corylus cornuta var. californica), one specimen near mouth of gulch circa 7-8 meters in height, tan-oak (Lithocarpus densiflorus var.
densiflorus), Monterey pine (Pinus radiata), Douglas-fir (Pseudotsuga menziesii var. menziesii), coast live-oak (Quercus agrifolia var. agrifolia), forest live-oak (Quercus parvula var. shrevei), California coffeeberry (Frangula californica subsp. californica), arroyo willow (Salix lasiolepis), yellow willow (Salix lucida subsp. lasiandra), blue elderberry (Sambucus mexicana = Sambucus nigra subsp. canadensis), red elderberry (Sambucus racemosa var. racemosa), redwood (Sequoia sempervirens) and California bay laurel (Umbellularia californica); where our traversal takes a sharp turn to the right, the gulch abruptly stops, drops some 10 meters vertically as a seasonally fluctuating waterfall, the exposed bedding planes home to the uncommon deer fern (Blechnum spicant) growing sympatrically with fellow pteridophytes, lady fern (Athyrium filix-femina var. cyclosorum) and five-finger fern (Adiantum aleuticum), while the surrounding precipitous banks sustain scattered colonies of western burning bush (Euonymus occidentalis var. occidentalis) growing on the adjacent forested slopes, scattered colonies of red clintonia (Clintonia andrewsiana); sharing the lower portion of the gulch, sometimes growing intermixed in various combinations, are seven native grass species— California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), California wild rye (Elymus glaucus subsp. glaucus), Elmer’s fescue (Festuca elmeri), Torrey’s melic (Melica torreyana), California canary grass (Phalaris californica) and tall trisetum (Trisetum canescens); finally, the gulch fans out into the Scotts Creek riparian corridor and paralleling Swanton Road in a southerly direction for circa 200 meters as a seasonally wet marsh, creates favorable habitat for the infrequently encountered artist’s popcorn-flower (Plagiobothrys chorisianus var. chorisianus) obscured from view by expanding populations of brown bog-rush (Juncus effusus var. brunnneus = Juncus hesperius), Pacific bog-rush (Juncus effusus var. pacificus), common rush (Juncus patens), California canary grass (Phalaris californica) and Gianone’s sedge (Carex gianonei, pro. sp. nov.). The topography of this water-retentive habitat, coupled with the well defined drainage patterns of two gulches entering it at either end plus the current mosaic of vegetation, strongly suggests that this was at one time a much larger marsh, historically modified by human land use practices— the drainage course of the lower section is deflected eastward into Scotts Creek, by what could be the remnants of an ancient landslide. Deep within the heart of the remaining marsh, colonies of water-loving Pacific oenanthe (Oenanthe sarmentosa) abide, overtopped by box elder (Acer negundo var. californicum) and sharing this seasonally inundated environment with water smartweed (Polygonum punctatum), willow herb (Epilobium ciliatum subsp. ciliatum), California vervain (Verbena lasiostachys var. lasiostachys), robust forms of western bent grass (Agrostis exarata) and slender hairgrass (Deschampsia elongata), both exceeding 1.5 meters in height, plus straggly gooseberry (Ribes divaricatum var. pubiflorum). This isolated basin warrants the same palynological studies accorded Laguna de las Trancas, which ironically represents the alpha and omega of one continuous, albeit seasonal, drainage course. A rare assemblage of nemophila species can also be found growing within the transitional zone where Gianone Barn Gulch enters the flood plain: the sympatric trio consisting of small-flowered nemophila (Nemophila paraflora var. paraflora), meadow nemophila (Nemophila pedunculata) and a recent addition to the watershed’s flora, a taxon sharing affinities with Fremont’s nemophila (Nemophila pulchella var. fremontii)! Parenthetically, molecular studies done on the Waterleaf Family (Hydrophyllaceae) have resulted in segregating several key genera, including Eriodictyon, Nemophila and Phacelia, and embedding them in the Borage Family (Boraginaceae)!

Note: While being overrun with poison hemlock (Conium maculatum), the degraded Lower Gianone Barn Gulch Marsh still contains and is surrounded by a substantial number of native taxa….. revisiting this area during the first week of 07/2011, the following “natives” were observed growing within the marsh proper and its immediate surroundings: Ribes
divaricatum var. pubiflorum..... Marah fabaceus..... Asarum caudatum..... Toxicodendron diversilobum..... Alnus rubra, Corillus cornuta subsp. californica..... Cornus sericea subsp. sericea..... Artemisia douglasiana, Baccharis pilularis subsp. consanguinea..... Rubus parviflorus, Rubus ursinus..... Urtica dioica subsp. gracilis..... Scrophularia californica..... Clinopodium douglasii, Stachys bullata..... Nemophila parviflora var. parviflora, Phacelia malvifolia..... Frangula californica subsp. californica..... Oenanthe sarmentosa, Sanicula gianonei, pro.sp.nov. ..... Galium triflorum..... Bromus vulgaris, Elymus glaucus subsp. glaucus, Festuca elmeri, Melica subulata, Phalaris californica..... Trillium chloropetalum..... Iris douglasiana..... Maianthemum stellatum..... Epilobium ciliatum subsp. ciliatum..... Barbarea orthoceras..... Verbena lasiostachys var. lasiostachys..... Sambucus nigra subsp. caerulea, Sambucus racemosa var. racemosa..... Umbellularia californica..... Sequoia sempervirens..... Salix lasiolepis..... Acer negundo..... Carex bolanderi, Carex gianonei complex (Carex harfordii matrix with lower 1.5+ spikelets compound-congested)..... Juncus effusus var. pacificus, Juncus hesperius, Juncus patens..... Dryopteris arguta, Polystichum munitum..... Pteridium aquilinum var. pubescens..... Equisetum telmateia subsp. braunii.

Entering Swanton Road from a southerly direction, “Back Ranch Road” allows one an unrestricted access, both visually and physically, to the inner grasslands, with their deeply incised forested gulches draining down into Scotts Creek and forming a mirror-image compliment to the prairie proper, from which they are separated by an elevated ridge which gently dips eastward. The number of native species documented for this sinuous corridor and their unusual concentration within specific sites, are impressive both as to diversity and rarity status, several not known from or uncommon elsewhere in Santa Cruz County. Rare species and hybrid complexes abound within and peripheral to this faux-prairie: on the monocot side of the aisle, at least twenty documented specimens of hooded lady’s tresses (Spiranthes romanzoffiana) have been discovered over the past decade, plus interspecific crosses occurring between Blasdale’s bent grass (Agrostis blasdalei) and western bent grass (Agrostis exarata), brown bog-rush (Juncus effusus var. brunneus = Juncus hesperius ) and common rush (Juncus patens), and a mind-boggling hybrid complex involving at least three sections within the genus Carex (Montanae, Multiflorae and Ovales). Giving the dicots equal time, with less emphasis on sex and more on species diversity, a potentially new species of Nemophila (aff. N. pulchella var. fremontii) shares growing space with a dioecious shrub pretending to be an oak with opposite leaves, silk tassel (Garrya elliptica) and an easily overlooked, even in flower, member of the Bellflower Family (Campanulaceae), common bluecup (Githopsis specularioides). As the grassland peters out and the dirt road ascends towards Mt. Cook, a scattered population of skunkweed (Navarretia squarrosa) was studied for several seasons, producing a disproportionately large number of plants, circa 20-30%, with white flowers. The white-flowered specimens were distributed throughout the entire population, which comprised an estimated 120% reduced in stature, mephitic-scented individuals. In the 1970’s, an analogous occurrence was observed at Harris Flat, along upper Scotts Creek, but differing in that the population consisted of plants 40-60 cm.+ in height with thick, spinescent herbage, still possessing the “odor of skunk” but looking like they had acquired some genetic material from the holly-leaved navarretia (Navarretia atractyloides). Sandwiched between the “Solar-panel Hotspot” and Scotts Creek Marsh, with Mt. Cook squarely in the middle, are two major sub-watersheds..... both are characterized by deeply incised gulches flanked with steep slopes, losing their verticality when crossing the Western Terrace aka coastal prairie and return to gulch status prior to draining under Highway 1. For future reference, the main watershed to the west of Mt. Cook is given the designation Cowboy Shack Gulch and its southeastern counterpart will be called Prairie Overlook Gulch, with one smaller unnamed
drainage system between the aforementioned “main” gulches and two increasingly reduced-in-
stature and less botanically diverse (at least in their upper sections) subsidiary systems, flanking
the southeastern edge of the Mt. Cook ridge system. While basically sharing the same
alignment/overall length and having the upper portions of their w-facing slopes defined by
condensed conifer “woodlands”, the distribution patterns for several rare native species are
anything but predictable! For starters, the conifer populations inhabiting the upper half of the
Cowboy Shack Gulch, consist of a 60/40 ratio of Douglas-fir (Pseudotsuga menziesii var. menziesii)
to the “hybrid swarm” Monterey pine (Pinus radiata), interspersed with both coast live-oak
(Quercus agrifolia var. agrifolia) and forest live-oak (Quercus parvula var. shrevei), while the
analogous forested portion of Prairie Overlook Gulch, consists of just a highly variable and
densely concentrated population of mature Pinus radiata, with a younger generation of
replacement trees, in a seemingly haphazard fashion, scattered along the lower portions of the
drainage system! An ecological constant, characterizing the west-facing slopes of the coastal
gulches between Scotts Creek Marsh and Las Trancas Arroyo, are the extensive, often near
vertical populations of California fescue (Festuca californica)..... the interstices between the long-
lived tussocks of this highly decorous grass and valued erosion abater, providing shelter for a
number of refractory moisture-loving annuals and low-growing herbaceous perennials. Within
the west-facing conifer shrouded slopes of the Cowboy Shack Gulch, a veritable treasure-trove of
native taxa is concentrated..... conspicuous by their absence in the adjacent gulches to the
south-east, are the following rarities and uncommoners..... an extensive scattering (more than 100
plants observed) of lovage (Ligusticum apifolium) co-existing in the semi-shaded habitat with
coast barberry (Berberis pinnata subsp. pinnata), mosquito bills (Dodecatheon hendersonii..... 4-
merous ssp. cruciatum) and two highly localized taxa, both discovered and studied in situ 30
years ago but as of this writing (02/18/2010) not yet refound, namely the Utah service-berry
(Amelanchier utahensis) and rarest of the rare, the coastal genotype of Alaska rein orchid (Piperia
unalascensis). While sharing perhaps 90% of its native flora (100+ species) with the two adjacent
gulches to the northwest, the Prairie Overlook Gulch, can claim a few “uncommoners” for its
own..... bent-flowered fiddleneck (Amsinckia lunaris), narrow-leaved fringepod (Thysanocarpus
lacinatus), coast larkspur (Delphinium decorum subsp. decorum), San Francisco collinsia (Collinsia
multicolor) and Santa Cruz microseris (Microseris decipiens = Stebbinsoseris decipiens). Several
species and one putative natural hybrid, either locally uncommon or in need of further study,
which thread their way through this complex maritime ecosystem are as follows: Gianone
everlasting (Pseudogynephilum gianonei, pro sp. nov.), Gianone sanicle (Sanicula gianonei,
pro sp. nov.), brownie thistle (Cirsium quercetorum), cream cups (Platystemon californicus..... this
once plentiful taxon, has locally undergone a major numbers reduction/population size over
the past few decades), checkerbloom (Sidalcea malviflora subsp. malviflora), tall layia (Layia
hieracioides), California goosefoot (Chenopodium californicum), hoary bowlesia (Bowlesia incana) and
Dannie’s skullcap (Scutellaria tuberosa). Two variable species in the foliar department, occupying
the wind-buffeted ridge tops and worthy of being included within an artfully designed “native
garden”, are California fuchsia (Epilobium canum subsp. canum) and California goldenrod
(Solidago velutina subsp. californica)..... the former displaying foliage that in the same population
can be green or cinereous while the latter goes the structural route and presents, in separate
populations, basal leaves that range from oblanceolate to one population carpeting the near-
vertical slope with sub-orbicular leaves, akin to silver dollars in outline.

note: Both Solar Panel Gate and Cowboy Shack Gulches merge near the edge of the
Western Terrace, drop down over a waterfall and cross under Highway 1, only to exit the Santa
Cruz Terrace and enter, via an 80+ foot drop, the Pacific Ocean. Here is a supplemental listing of
native taxa, arranged by families, that occur specifically, within this ecologically diverse drainage system: Davy's Clarkia (Clarkia davyi), mode of growth erect, flowers bicolor and seeds gray-encrusted), farewell-to-spring (Clarkia rubicunda), California fuchsia (Epilobium canum subsp. canum), willow herb (Epilobium ciliatum sensu lato), variable throughout area under discussion, with both subsp. ciliatum [open inflorescences/leaves conspicuously reduced upwards] and subsp. watsonii [inflorescences congested/leaves barely reduced upwards] present, with subsp. watsonii tending to favor perennial seepsmarshes on the exposed coastal headlands. Blasdale's bent grass (Agrostis blasdalei), Hall's leafy bent grass intergrades (Agrostis hallii Agrostis pallens), throughout Scotts Creek Watershed proper and its environs, populations of these two taxa show introgression and with combined characters, make absolute separation at a species level difficult, at best. Pacific reed grass (Calamagrostis nutkaensis), California wild rye (Elymus glaucus subsp. glaucus), creeping wild rye (Elymus triticoides), prevalent on Western Terrace, where eolian sand deposits define the coastal prairie soil composition, Torrey's melic (Melica torreyana), foothill needlegrass (Nassella lepida), California canary grass (Phalaris californica), ocean-bluff bluegrass (Poa unilaterialis), pearly everlasting (Anaphalis margaritacea), California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), marsh baccharis (Baccharis glutinosa), coyote brush (Baccharis pilularis subsp. consanguinea), California corethrogyn (Corethrogyn filaginifolia var. californica), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), lizard tail (Eriophyllum strachadifolium), broad-leaved aster (Eurybia radulina), western goldenrod (Euthamia occidentalis), sneezeweed (Helenium puberulum), coast tarweed (Madia sativa), California cudweed (Pseudognaphalium californicum), pink everlasting (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum), California aster (Symphyotrichum chilense), wild celery (Apiastrum angustifolium), cow-parsnip (Heracleum maximum), floating pennywort (Hydrocotyle ranunculoidea, now placed in the Araliaceae), lovage (Ligusticum apiifolium), Pacific oenanth (Oenanthe arvensis), sweet cicely (Osmorhiza bertelii), gambleweed (Sanicula crassicaulis), blue blossom (Ceanothus thyrsiflorus), California coffeeberry (Frangula californica subsp. californica), toad rush (Juncus bufonius), Pacific bog-rush (Juncus effusus var. pacificus), brown bog-rush (Juncus hesperius), Mexican rush (Juncus aff. mexicanus), rhizomatous, tortile-compressed dark green culms lacking upper leaf blades, western rush (Juncus occidentalis), common rush (Juncus patens). Juncus hesperius x Juncus patens hybrids, division of one large specimen growing at UCSC Arboretum, brown-headed rush (Juncus phaeocephalus var. phaeocephalus), water fern (Azolla filiculoides), California poppy (Eschscholzia californica), arroyo willow (Salix lasiolepis), shining willow (Salix lasiandra subsp. lasiandra), red elderberry (Sambucus racemosi var. racemosa), deerweed (Acmispon glaber var. glaber), Pacific pea (Lathyrus vestitus sensu lato), variable as to foliar indument and overall morphology, yellow bush lupine (Lupinus arboreus), giant vetch (Vicia gigantea), short-stemmed sedge (Carex brevicaulis), dense sedge (Carex densa), Carex gianonei complex, nodal proliferations, inflorescences with compound-congested lower 1-5(+5) spikelets, gynaecandrous, androgynous and/or mixed, Carex nitidicarpa complex, slough sedge (Carex obturata), small-bracted sedge (Carex subbracteata), umbrella sedge (Carex eragrostis), dwarf club rush (Isolepis carinata), low club rush (Isolepis cernua), California tule (Schoenoplectus californicus), paniced bulrush (Scirpus microcarpus), California plantain (Plantago erecta), Mexican plantain (Plantago subnuda), American brooklime (Veronica americana), coast barberry (Berberis pinnata subsp. pinnata), Indian paintbrush (Castilleja affinis subsp. affinis), wood strawberry (Fragaria vesca), oso berry (Oemleria cerasiformis), Pacific cinquefoil (Potentilla anserina subsp. pacifica), wood rose (Rosa gymnocarpa), California blackberry (Rubus ursinus), morning glory (Calystegia purpurata subsp. purpurata), California man root (Marah fabaceus), sea lettuce (Dudleya caespitosa), soap plant (Chlorogalum pomeridianum var. pomeridianum).

**populations variable as to proportion of stinging to non-stinging hairs on stems and abaxial surface of leaves, with some plants tending towards subsp. holosericea**, giant horsetail (*Equisetum telmateia* subsp. *braunii*), California poppy (*Eschscholzia californica*), poison oak (*Toxicodendron diversilobum*), coast buckwheat (*Eriogonum latifolium/nudum* intergrades), red elderberry (*Sambucus racemosa* var. *racemosa*), coast live-oak (*Quercus agrifolia* var. *agri folia*), forest live-oak (*Quercus parvula* var. *shrevei*), Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), mosquito bills (*Dodecatheon hendersonii*).

Bounded on the west by Cowboy Shack Gulch and the east with Prairie Overlook Gulch and bookended north and south by the edge of the coastal prairie (aka Western Terrace) and Highway 1, are a series of exposed, remnant eastward-dipping bedding planes, reminiscent of the mesas of the southwest albeit greatly reduced in stature. Each of these "mesitas", is a micro-ecosystem unto itself and interface with the various sized drainage systems that have their origins northeast and of overlapping the prairie grasslands. Included within the aforementioned parameters, is the lower drainage of **Prairie Overlook Gulch** giving the following, rare and common natives, refuge: *Rumex occidentalis*, with overarching leaves reminiscent of a banana relative growing vertically adjacent to small waterfall, an apetalous/dioecious member of the Ranunculaceae *Thalictrum poly carpum*, a quartet of Rosaceae members growing intermixed..... *Rosa gymnocarpa* var. *gymnocarpa*, *Fragaria vesca*, *Potentilla glandulosa* subsp. *glandulosa* = *Drynocallis glandulosa* var. *glandulosa* and *Aphanes occidentalis*, *poly phyletic* *Castilleja affinis* subsp. *affinis* with a scattered population **dis playing extreme ancestral re segregation and looking ever-so-much like a dozen different species**, *Dudleva caespitosa*, *Berberis pinnata* subsp. *pinnata*, *Sambucus nigra* subsp. *caerulea*, an inodorous *Dicholestemma capitatum* subsp. *capitatum* sharing the monocot stage with a near-vertical population of *Smilacina racemosa* = *Maianthemum racemosum*.... displaying more than 100 inflorescences discharging an intoxicating fragrance olfactorily perceived long before seen, while *Solanum umbelliferum* gives competition from the dicot side of the aisle. A virtual kaleidoscope of "natives", create a visual tapestry of color and texture, showing the infinite variations in structure and form that Nature is capable of conjuring up: *Lotus wrangelianus* = *Acmispon wrangelianus*, *Trifolium bifidum*, *Vicia americana* subsp. *americana*, *Vicia gigantea*, *Vicia haseei*, *Phacelia malvifolia*, a grassland favorite which has undergone 3 (Oenothera = Camissonia = Taraxia) name changes in as many decades *Taraxia ova*, *Carex subbracteata*, *Carex tumulicola*, *Cyperus eragrostis*, *Plantago subnuda*, *Sisyrinchium bellum*, *Triphymisia pusilla*, *Baccharis douglasii* = *Baccharis glutinosa*, *Holar dicus discolor* var. *discolor*, *Oenanthe sarmentosa*, *Sanicula arctopoides*, a ubiquitous native *Pseudognaphalium californicum* and its localized putative offspring *Pseudognaphalium gianonei*, pro sp. nov., *Polypodium californicum* aff. var. *kaufussii*, *Athyrium filix-femina* var. *cyclosorum*, *Polystichum munitum*, *Epilobium ciliatum* subsp. *watsonii*, *Phalaris californica*.... often producing asexual nodal propagules on old flowering culms, *Bromus carinatus* var. *carinatus*, *Nasella lepida* = *Stipa lepida*, *Festuca californica*, *Poa unilateralis* subsp. *unilateralis*, *Melica...
Further expounding on the concentrated and diverse "native" flora within this general area...... the western facing slopes (from ridge top to canyon bottom) of the last sub-watershed draining under Highway 1, before the Western Terrace drops off into the Scotts Creek Marsh proper, contains an extraordinary representation of coastal taxa for an area subjected to human disturbance over the course of more than 150 years! As with the analogous gulches bisecting the coastal prairie, the near vertical nature of the terrain may be one of the contributing factors that has turned these mesic habitats into refugia for biodiversity..... being outside the reach of traditional agricultural practices. Eschewing the colloquial names, here is a documentation-in-progress, for the species confined to this micro hot-spot, further validating the premise that human presence and biodiversity are not incompatible: Pseudognaphalium gianonei, pro.sp.nov. (note: this taxon of putative hybrid origin, is relatively common within area under discussion), Erigeron glaucus, Fragaria vesca, Castilleja affinis subsp. affinis (complex series of resegregates validating the polyphyletic origins of this locally wide spread taxon), Eriophyllum stachadifolium, Sanicula cressicaulis, Baccharis pilularis, Mimulus aurantiacus, Cardamine oligosperma, Chlorogalum pomeridianum sensu lato, Toxicodendron diversilobum, Claytonia parviflora var. parviflora, Claytonia perfoliata sensu lato, Rubus ursinus, Satureja douglasii, Galium porrigens var. porrigens, Polypodium californicum, Artemisia californica, Dudleya caespitosa, Apiastrum angustifolium, Pterostegia drymarioides, Layia hieracioides, Melica torreyana, Fritillaria affinis aff. var. affinis, Pentagramma triangularis subsp. triangularis, Scorphularia californica subsp. californica, Daucus pusillus, Adiantum jordani, Phacelia malevolentia, Crassula connata, Cryptantha micromeres, Artemisia douglasiana, Pseudognaphalium californicum, Piperia michaelii, Solidago velutina subsp. californica, Achillea millefolium, Oemleria cerasiformis, Deschampsia elongata, Nasella lepida, Sagina apetala, Trifolium microdon, Trifolium wildenovii (occasionally, a nanistic phase, with long-pedunculate reduced-in-stature inflorescences and some calyx-lobes displaying vestigial teeth can be found growing sympatrically with the forma typica..... note: this taxon may prove to be a variant of Trifolium oliganthum), Sanicula gianonei, pro.sp.nov., Stachys bullata, Pteridium aquilinum var. pubescens, Festuca californica, Berberis pinnata subsp. pinnata, Triteleia laxa (rare coastal headland form with radially symmetrical stamens, darker and narrower flowers, short, equal filaments and blue anthers that turn brown), Lathyrus vestitus sensu lato, Potentilla glandulosa subsp. glandulosa, Urtica dioica subsp. gracilis, Anaphalis margaritacea, Gamochaeta ustulata, Smilacina stellata, Dryopteris arguta, Saxifraga californica, Luzula comosa, Lithophragma affine, Cardamine californica var. californica, Eriogonum latifolium sensu lato, Calochortus albus, Frangula californica subsp. californica, Salix lasiandra var. lasiandra, Sidalcea malvaeflora subsp. malvaeflora, Horkelia californica subsp. californica, Heracleum maximum, Symphyotrichum chilense, Bromus carinatus sensu lato, Marah fabaceus, Solanum umbelliferum, Yabea microcarpa, Cirsium brevistylum, Vicia americana var. americana), Vicia gigantea, Polystichum munitum , Sambucus nigra subsp. canadensis,
Delphinium decorum subsp. decorum, Pseudognaphalium stramineum, Barbarea orthoceras, Solanum douglasii, Ribes divaricatum var. pubiflorum, Amsinckia menziesii var. internodia = Amsinckia menziesii, Salix lasiolepis, Lotus junceus var. bioletti (peduncles of mature inflorescences 15-25 mm long), Lotus serangelianus and Plectritis brachystemon (convex side of fruit body distinctly keeled, flowers circa 3-3.5 mm and pale pink).

While 150+ years of agricultural based land use, coupled with the attendant invasion/entrenchment of European non-native taxa, should render the existence of "native" biodiversity moot..... a small section of the Western Terrace, overlooking the Highway 1 entrance to CalPoly's Swanton Pacific Ranch (circa 1/8 mile east of Agrostis Rectangle) and the lower drainage system of Cowboy Shack Gulch, tosses that assumption out-the-window and forces us to re-examine habitats with an extensive history of "human induced" disturbance and our accrued perceptions/biases of said areas, with a fresh perspective! This mini-refugium, consisting of an eastward-dipping (due to an underlying syncline) isolated portion of exposed bedding plane, topped with and surrounded by grassland modified by a long history of grazing, supports an amazing albeit concentrated rolecall of native species, which warrants listing in full. Measuring circa 30 meters along an east/west axis, at least three ecological profiles can be drawn to support the degree of biodiversity present: (1) the east/south facing bedding planes are exposed to the early morning sun plus the relentless winds and their concomitant desiccating effects, (2) the west/north aspects are cloaked in shadow for much of the morning and during the winter/spring months, stay damp throughout the day and (3) the top and periphery of the remnant terrace are circumscribed by a matrix of grasses and forbes, which form a moisture retentive skin. As of 04/22/10, here are the "legitimate stakeholders" in this microcosm of coastline: footsteps-of-spring (Sanicula arctopoides), checkerbloom (Sidalcea malvaeflora ssp. malvaeflora), California aster (Corethrogynne filaginifolia..... var. californica), miner’s lettuce ( Claytonia perfoliata, sensu lato), grassland gilia (Gilia clavorum), California hedge-nettle (Stachys bullata), stinging phacelia (Phacelia malvifolia), lizard tail (Eriophyllum stachadifolium), hoary bowlesia (Bowlesia incana), rattlesnake weed (Daucus pusillus), seaside daisy (Erigeron glaucus), popweed (Cardamine oligosperma), dwarf orthocarpus (Triphysaria pusilla), yellow bush lupine (Lupinus arboresus), morning glory (Calystegia purpurata subsp. purpurata), coast buckwheat (Eriogonum latifolium, sensu lato), purple sack clover (Trifolium depauperatum var. truncatum), pin-point clover (Trifolium gracilentum var. gracilentum), double-headed clover (Trifolium macraei), soap plant (Chlorogalum pomeridianum var. divaricatum), California poppy (Eschscholzia californica), sea lettuce (Dudleya caespitosa), ocean-bluff bluegrass (Poa unilateralis), purple needlegrass (Nasella pulchra), California brome (Bromus carinatus var. carinatus), California polypody (Polypodium californicum), yarrow (Achillea millefolium), California man root (Marah fabaceus), California blackberry (Rubus ursinus), pygmyweed (Crassula connata), California mustard (Caulanthus lasiophyllus), red maids (Calandrinia ciliata), shining peppergrass (Lepidium nitidum var. nitidum), western lady's mantle (Aphanes occidentalis), sky lupine (Lupinus nanus), Gianone everlasting (Pseudognaphalium gianonei, pro.sp.nov.), cotton batting plant (Pseudognaphalium stramineum), California figwort (Scrophularia californica subsp. californica), California goosefoot (Chenopodium californicum), oso berry (Oemleria cerasiformis), deerweed (Lotus scoparius var. scoparius), California plantain (Plantago erecta) and California sagebrush (Artemisia californica).

One relatively small area, literally designated “Solar Panel Hotspot”..... is principally vertical in orientation and capped with an exposed, sinuous grassland..... faces west/northwest overlooking Cal Poly’s metal gate cum solar panel, south/southwest overseeing the Western Terrace and the confluence of the Cowboy Shack and Solar Panel Gate Gulches, east/southeast paralleling
upper Cowboy Shack Gulch and supports an intensely concentrated, highly diverse "native" flora. Essentially a remnant terrace girdled on three sides by a complex overlapping of coastal scrub, oak/conifer woodland components and mesic canyon bottom elements with vegetation defined hillside seeps on the ocean side. Paralleling the “Magic Triangle”, not only in alignment but also sharing species of considerable rarity, this “micro-refugium” is a case study unto itself, being home to more than 100 native plant taxa observed by the author of this text over the past three decades! Two species rare within the county, which occur on both sites, are lovage (Ligusticum apiifolium)[1] and the Santa Cruz microseris (Stebbinsoseris decipiens)[2], chaperoned by both of its diploid parents .... coast microseris (Microseris bigelovii)[3] and silver puffs (Uropappus lindleyi)[4]. Another shared species is mosquito bills (Dodecatheon hendersonii)[5]: a small population was discovered growing on the “Solar-panel Hotspot” circa 30 years ago (in actuality, long before the existence of the solar panel), which individual plants had either 4-merous or 5-merous flowers, raising taxonomic questions about the validity of subsp. cruciatum..... pressings were made, documenting both the subsp. hendersonii and subsp. cruciatum forms, and dispatched to the Jepson Herbarium, UC Berkeley..... as of 02/13/10, a small (circa 25 plants) population still exists, with at least one 4-merous representative flowering early. Easily overlooked when out-of-flower and often failing to complete its seasonal reproductive cycle due to lack of sufficient water, leafy daisy (Erigeron foliosus var. franciscensis)[6]..... documented by digital images and incorporated into the Swanton Pacific Ranch visual herbarium/data base, and to date with only two populations documented for the watershed), maintains a precarious foothold within this dynamic area of concentrated biodiversity, its narrowly defined habitat shrinking due to competing vegetation. Easy to overlook when in flower, defines the following four natives, widespread to the degree that the status of their nativity is sometimes questioned..... pygmyweed (Crassula comnata)[7], California plantain (Plantago erecta)[8], western lady’s mantle (Aphanes occidentalis)[9] and shining peppergrass (Lepidium nitidum var. nitidum)[10], play hide-and-go-seek in the narrow strip of grassland, their adult stature ranging from 0.5-5.5cm in heighth!!! Dominating the moist understory pockets of soil rich in organic material, Gianone’s sanicle (Sanicula gianonei, pro-sp. nov.11] stands out just by virtue of its yellow-green foliage and where it co-exists with its darker-hued relative, gambleweed (Sanicula crassaiculis)[12], the visual contrast is so marked that diagnosis from a distance is easily accomplished..... another member of the Carrot Family (Apiaceae), not so readily discerned from the surrounding vegetation, hoary bowlesia (Bowlesia picana)[13], further compounds its taxonomic status by superficially mimicking a sympatric non-relative, downy buttercup (Ranunculus holocarpus)[14]. Not willing to be left out of the proceedings, the Madder Family (Rubiaceae) contributes two members to this diverse assemblage of natives, California bedstraw (Galium californicum subsp. californicum15] and climbing bedstraw (Galium porrigens var. porrigens16] and complementing this duo and raising the ante by adding olfactory stimulation to the mix, California hedge-nettle (Stachys bullata17] and yerba buena (Satureja douglasii = Clinopodium douglasii18], are notable representatives of the Mint Family (Lamiaceae). Extending the pairing concept a bit further, two local relatives of the domestic sweet pea, both visually attractive but lacking any noticable fragrance, Pacific pea (Lathyrus vestitus var. vestitus19] and American vetch (Vicia americana subsp. americana20], make their presence felt by scaling up through and over any adjacent shrubbery. So far, by itemizing less than one fifth of the “natives” occupying this elevated transitional zone, between coastal prairie and inner grassland, the biogeographical implications alone, should convince the skeptics, that even the most prosaic of habitats from a distance should not be dismissed out-of-hand without a closer look! From an ecological perspective, this refugium is a valuable laboratory for the study of interconnected micro-habitats..... influenced by such factors as (a) slope orientation, (b) wind patterns, (c) proximity to the ocean, (d) canopy diversity with the
contrasting dynamics of evergreen versus deciduous behavior, (e) long term impact of introduced herbivory, (f) pollen and seed dispersal vectors, (g) changes in soil behavior and associated flora along a vertical cline, (h) corresponding diversity in the faunal representation. ...to further emphasize the unifying botanical thread holding this biologically diverse microcosm together, in the form of an addendum, the following native taxa interact to form a complex interdigitating mosaic: California aster (Lessingia filaginifolia var. californica = Corethrogynne filaginifolia)[21], sea lettuce (Dudleya caespitosa)[22], oso berry (Oemleria cerasiformis)[23], pearly everlasting (Anaphalis margaritacea)[24], coast live-oak (Quercus agrifolia var. agrifolia)[25], forest live-oak (Quercus parvula var. shrevei)[26], California bay laurel (Umbellularia californica)[27], Monterey pine (Pinus radiata). Scattered population reflecting in ovulate cone morphology and overall gestalt, Pinus attenuata influence[28], Douglas-fir (Pseudotsuga menziesii var. menziesii)[29], red elderberry (Sambucus racemosa var. racemosa)[30], California figwort (Scrophularia californica)[31], skunkweed (Navarretia squarrosa)[32], blue dicks (Dichelostemma capitatum subsp. capitatum)[33], Lithuriel’s spear (Triteleia laxis... forma typica, with laterally symmetrical stamens, whitish anthers and filaments of unequal length)[34], blue-eyed grass (Sisyrinchium bellum)[35], soap plant (Chlorogalum pomeridianum var. pomeridianum)[36], wild celery (Apsiunstra angustifolia)[37], willow herb (Epilobium ciliatum subsp. ciliatum)[38], rattlesnake weed (Daucus pusillus)[39], cow-parsnip (Heracleum lanatum = Heracleum maximum)[40], coyote brush (Baccharis pilularis subsp. consanguinea)[41], California coffeeberry (Frangula californica subsp. californica)[42], California sagebrush (Artemisia californica)[43], mugwort (Artemisia douglasiana)[44], pale plectritis (Plectritis brachystemon)[45], dwarf orthocarpus (Triphysaria pusilla)[46], woodland star (Lithophragma affine)[47], California poppy (Eschscholzia californica)[48], rancher’s fiddleneck (Amsinckia menziesii)[49], miner’s lettuce (Claytonia perfoliata subsp. perfoliata)[50], ocean spray (Holodiscus discolor)[51], yellow bush lupine (Lupinus arboreus)[52], stinging phacelia (Phacelia malvifolia)[53], coast buckwheat (Eriogonum latifolium/nudum) intergrades[54], Hall’s/leafy bent grass complex (Agrostis hallii/pallens) intergrades... as with Californis wild rye and California canary grass, some plants producing asexual nodal proliferations on spent flowering culms[55], California wild rye (Elymus glaucus subsp. glaucus)... some plants with spent flowering stems forming asexual nodal propagules[56], Roemer’s fescue (Festuca roemeri = Festuca roemeri var. klanathensis)[57], junegrass (Koeleria macrantha)[58], Torrey’s melic (Melica torreyana)[59], ocean-bluff bluegrass (Poa unilateralis)[60], California fescue (Festuca californica)[61], foothill needlegrass (Stipa lepida)[62], golden yarrow (Eriophorum confertiflorum var. confertiflorum)[63], California man root (Marah fabacaeus)[64], Indian paintbrush (Castilleja affinis subsp. affinis)[65], California buttercup (Ranunculus californicus)[66], California maidenhair (Adiantum jordanii)[67], western sword fern (Polystichum munitum)[68], wood fern (Dryopteris arguta)[69], California polypody (Polypodium californicum)... lithophyte, lowest sets of pinna longer than succeeding ones[70], footsteps-of-spring (Sanicula arctopoides)[71], western nettle (Hesperocnide tenella)[72], coast nettle (Urtica dioica subsp. gracilis/holosericea) intergrades... propagation of stinging to non-stinging trichomes on abaxial leaf surfaces, petioles and stems of plants within area under discussion extremely variable[73], mountain dandelion (Agoseris grandiflora var. grandiflora)[74], California aster (Symphyotrichum chilense)[75], sticky monkeyflower (Mimulus aurantiacus)[76], slim Solomon’s seal (Smilacina racemosa = Maianthemum stellatum)[77], checker lily (Fritillaria affinis)[78], American winter cress (Barbea orthoceras... apices and sides of sepals with stiff trichomes)[79], common milkmaids (Cardamine californica)[80], popweed (Cardamine oligosperma)[81], sticky cinquefoil (Potentilla glandulosa subsp. glandulosa = Drimocallis glandulosa var. glandulosa)[82], wood strawberry (Fragaria vesca)[83], Bioletti’s cudweed (Pseudognaphalium biotletii)[84], California cudweed (Pseudognaphalium californicum)[85], Gianone everlasting (Pseudognaphalium gianonei,
Triphysaria eriantha, a trio of paintbrush relatives and a sporadic nature hybrid between two of them: butter-and-eggs (Triphysaria eriantha subsp. eriantha), dwarf orthocarpus (Triphysaria pusilla), and purple-beaked owl’s clover (Triphysaria microseris). The documented hybrids are between Triphysaria eriantha subsp. eriantha x Triphysaria pusilla, with the latter existing in two forms, one with anthocyanic-
pigmented foliage and maroon-brown colored flowers, the other with green herbage and pale yellow flowers. Hugging this wind-swept ascending mosaic of reduced-in-stature vegetation, two members of the Carrot Family (Apiaceae) warrant close study: caraway-leaved lomatium (Lomatium caruifolium var. caruifolium), with extremely variable foliage ranging from glabrous through densely pubescent and footsteps-of-spring (Sanicula arctopoides), with radially aligned, horizontal, yellow-green foliage looking like a surreal sun-dial. Scattered across this tilted grassland, tidytips (Layia platyglossa) perfumes the warm summer days with a memorable scent redolent of cinnamon. Lastly, a species for years thought to be extinct, the San Francisco popcorn-flower (Plagiobothrys diffusus/reticulatus = Plagiobothrys diffusus), creates isolated tapestries of miniature white-and-yellow flowers on prostrate plants referenced millimeters above a thin skin composed of grass and moss, which covers the exposed geometry of the fractured coastal terraces. The ultimate taxonomic status of this resurrected taxon is still unresolved, strongly suggesting the need for work on the molecular level to determine its place within the Plagiobothrys reticulatus complex! (note: as of 2007, the appellation Plagiobothrys diffusus, has been reinstated for the aforementioned taxon, resurrecting from extinction, a coastal California native).

Note: Revisiting the "Magic Triangle" on 04/25/2011 yielded the following natives, arranged by families and representing a partial overview for this unique zone of concentrated biodiversity..... California man root (Marah fabaceus)..... California coffeeberry (Frangula californica subsp. californica)..... western rush (Juncus occidentalis), common rush (Juncus patens), common wood rush (Luzula comosa)..... basically form with capitate/congested inflorescences but a few plants had in addition, axillary/subtending clusters on elongate peduncles which overtopped the central one)..... western lady's mantle (Aphanes occidentalis), sticky cinquefoil (Drymocallis glandulosa var. glandulosa), wood strawberry (Fragaria vesca), ocean spray (Holodiscus discolor var. discolor), California horkelia (Horkelia californica var. californica), oso berry (Oemleria cerasiformis), California blackberry (Rubus ursinus)..... western nettle (Hesperocnide tenella), coast/hoary nettle intergrades (Urtica dioica subsp. gracilis/subsp. holosericea)..... variable as to leaf shape and color, proportion of stinging to non-stinging, soft or stiff trichomes on abaxial leaf surface, petioles and stems)..... rattlesnake weed (Daucus pusillus), cow-parsnip (Heracleum maximum), lovage (Ligusticum apifolium..... a rare native, apparently restricted in Santa Cruz County, to a narrow zone within the Scotts Creek Watershed, between the Mt. Cook and Magic Triangle Synform drainage systems), caraway-leaved lomatium (Lomatium caruifolium var. caruifolium), footsteps-of-spring (Sanicula arctopoides), gambleweed (Sanicula crassicaulis), Gianone sanicle (Sanicula gianonei, pro sp nov.)..... yarrow (Achillea millefolium), mountain dandelion (Agoseris grandiflora), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis subsp. consanguinea), brownie thistle (Cirsium quercetorum..... extensive population, both flowering adults and recruitment seedlings, on upper west-facing slope), California corethrogyn (Corethrogyn filaginifolia var. californica), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), lizard tail (Eriophyllum stachadchadifolium), tidytips (Layia platyglossa), coast microseris (Microseris bigelovii), California cudweed (Pseudognaphalium californicum), Gianone everlasting (Pseudognaphalium gianonei, pro sp nov.)..... pink everlasting (Pseudognaphalium ramosissimum), California aster (Symphyotrichum chilense)..... California bay laurel (Umbellularia californica)..... California bedstraw (Galium californicum subsp. californicum), climbing bedstraw (Galium porrigenes var. porrigenes)..... Gianone sedge (Carex gianonei, pro sp nov)..... Carex harfordii matrix, with lower 1-5 spikelets compound-congested), small-bracted sedge (Carex subbracteata)..... common linanthus (Leptosiphon androsaceus..... corolla color ranging from white through pink)..... California plantain (Plantago erecta)..... California poppy (Eschscholzia californica), cream cups (Plantystemon californicus).....
California brome \((Bromus carinatus)\), seaside brome \((\text{aff.} \: \text{Bromus maritimus})\), \textbf{inflorescences with apressed-ascending branches}, California oat grass \((Danthonia californica)\), slender hairgrass \((\text{Deschampsia elongata})\), California wild rye \((\text{Elymus glaucus subsp.} \: \text{glaucus})\), California fescue \((Festuca californica)\), Roemer’s fescue \((\text{aff.} \: \text{Festuca roemeri} \: \text{var.} \: \text{klamathensis})\), red fescue \((Festuca rubra)\), \textbf{type with diffuse growth pattern},Junegrass \((\text{Koeleria macrantha})\), California melic \((\text{Melica californica})\), Torrey’s melic \((\text{Melica torreyana})\), pine bluegrass \((\text{Poa secunda subsp.} \: \text{secunda})\), ocean-bluff bluegrass \((\text{Poa unilatralis} \: \text{subsp.} \: \text{unilatralis})\), foothill needlegrass \((\text{Stipa lepida})\), purple needlegrass \((\text{Stipa pulchra})\), sticky monkeyflower \((\text{Mimulus aurantiacus})\), dwarf brodiaea \((\text{Brodiaea terrestris} \: \text{subsp.} \: \text{terrestris})\), blue dicks \((\text{ Dichlolesteum capitatum} \: \text{subsp. capitatum})\), Lindley’s varied lupine \((\text{Lupinus paricolor})\), pinole clover \((\text{Trifolium bifidum} \: \text{var.} \: \text{decipiens})\), double-headed clover \((\text{Trifolium macræi})\), tomat clover \((\text{Trifolium willdenowi})\), American vetch \((\text{Vicia americana} \: \text{subsp.} \: \text{americana})\), crimson columbine \((\text{Aquilegia formosa})\), coast larkspur \((\text{Delphinium decorum} \: \text{subsp.} \: \text{decorum})\), California buttercup \((\text{Ranunculus californicus})\), downy buttercup \((\text{Ranunculus hexacarpus})\), white globe lily \((\text{Calochortus albus})\), checker lily \((\text{Fritillaria affinis})\), blue-eyed grass \((\text{Sisyrinchium bellum})\), slim Solomon’s seal \((\text{Maianthemum stellatum})\), sun cup \((\text{Taraxia ovata})\), checkerbloom \((\text{Sidalcea malviflora} \: \text{subsp.} \: \text{malviflora})\), sea lettuce \((\text{Dudleva caespitosa})\), sea blush \((\text{Plectritis congesta} \: \text{subsp.} \: \text{congesta})\), \textbf{variable populations, intermediate between subsp. congesta and subsp. brachystemon, with corollas pale to dark pink, 3(+3)mm across face and bilabiate}, poison oak \((\text{Toxicodendron diversilobum})\), California figwort \((\text{Scrophularia californica})\), snowberry \((\text{Symphoricarpus albus} \: \text{var.} \: \text{lacifigatus})\), Johnny jump-up \((\text{Viola pedunculata})\), popweed \((\text{Cardamine oligosperma})\), slender miner’s lettuce \((\text{Claytonia parviflora} \: \text{subsp.} \: \text{parviflora})\), miner’s lettuce \((\text{Claytonia perfoliata} \: \text{subsp.} \: \text{perfoliata})\), Monterey pine \((\text{Pinus radiata})\), Douglas-fir \((\text{Pseudotsuga menziesii} \: \text{var.} \: \text{menziesii})\), forest live-oak \((\text{Quercus parvula} \: \text{var.} \: \text{shrevei})\), coast buckwheat \((\text{Eriogonum latifolium} \: \text{rubrum})\), rein orchid \((\text{Piperia} \: \text{species})\), \textbf{when observes, still in foliar stage without inflorescence}, California maidenhair \((\text{Adiantum jordanii})\), goldback fern \((\text{Pentagramma triangularis} \: \text{subsp.} \: \text{triangularis})\), wood fern \((\text{Dryopteris arguta})\), western sword fern \((\text{Polystichum munitum})\), polypondy \((\text{aff.} \: \text{Polyodium californicum})\), \textbf{growing as a lithophyte}, yerba buena \((\text{Clinopodium douglasii})\), California hedge-nettle \((\text{Stachys bullata})\), soap plant \((\text{Chlorogalum pomeridianum} \: \text{var.} \: \text{pomeridianum})\).

Although it encompasses less than a sixth of the roadside tour, the descending stretch between the Last Chance turnoff and the “Old Seaside School” contains 15 tree and 4 sub-tree species native to the watershed, a remarkable tally for a mere blip on the pedometer. Mature specimens of coast live-oak \((\text{Quercus agrifolia})\) and forest live-oak \((\text{Quercus parvula} \: \text{var.} \: \text{shrevei})\), plus related tan-oak \((\text{Lithocarpus densiflorus} \: \text{var.} \: \text{densiflorus} = \text{Notholithocarpus densiflorus})\), grow side by side, their differences in branching patterns, leaf morphologies, fruit maturation times, and bark topographies are easily observed. Presenting a fall display in gold, big-leaf maple \((\text{Acer macrophyllum})\) brightens the deep canyon recesses as the shorter days herald the onset of winter, while sister species, box elder \((\text{Acer negundo} \: \text{var.} \: \text{californicum})\), margins the alluvium-rich flood plains and during the overheated and brightly lit summer months, provides a canopy of soft, diffused light. A sinus clearing aroma, pungent to some and headache inducing to others, is exuded from the crushed leaves of California bay laurel \((\text{Umbellularia californica})\), country cousin to the domestic avocado \((\text{Persea americana})\) and offers olfactory counterpoint to the overpowering sweetness released by the California buckeye \((\text{Aesculus californica})\), whose nectar and pollen are toxic to honeybees! Sharing familial connections with such local natives as the inimitably fragrant western azalea \((\text{Rhododendron occidentale})\), the endemic Schreiber’s manzanita \((\text{Arctostaphylos glutinosa})\), and the delectable California huckleberry \((\text{Vaccinium ovatum})\), the Pacific madrone.
(Arbutus menziesii) is by far, aesthetically, our noblest arboreal resident... the fluid curvature and lacquered sheen of its trunk bring to mind the otherworldly sculptures of Brancusi. Exceeding sub-tree status, toyon (Heteromeles arbutifolia).... one specimen inhabiting the conifer/oak woodland above the road may exceed 10 meters in height, with the trunk six feet above ground level measuring 30+ cm in diameter, blue elderberry (Sambucus mexicana = Sambucus nigra subsp. caerulea).... a sure sign of aboreal status is when nested polypody (Polypodium calirhiza) colonizes the braided bark cloaking your 5+ meter high trunk, California coffeeberry (Frangula californica subsp. californica) and its cousin blue blossom (Ceanothus thyrsiflorus), are each represented along this particular segment of our walk by individuals exceeding five meters in height. One arboreal species that occasionally strays out of its preferred habitat, margining streams and colonizing sand-bars with replacements of itself, is the red alder (Alnus rubra).... a scattering of young trees overlooking the lower portion of our down slope journey, most likely are the result of updrafts from the riparian corridor below, occurring as the narrowly winged nutlets are being shed from the coniferous pistillate catkins. A ubiquitous presence along much of our watershed tour, aboreal by inclination and within touching distance as we approach Scotts Creek Bridge and The Old Seaside School, arroyo willow (Salix lasiolepis) has established residence throughout the watershed, wherever sufficient moisture is present. Sharing this aqueous ecosystem, with rhizomes, tenacious root systems and a tolerance for wet feet, are an unusual trio, often found growing sympatrically along the riparian corridors..... in descending order by virtue of stature, red elderberry (Sambucus racemosa var. racemosa), salmonberry (Rubus spectabilis) and blue creek-sedge (Carex amplifolia).

Note: Without leaving the tarmac, between the entrance to Back Ranch Road and the Archibald Creek’s interface with Swanton Road, one can encounter/observe Quercus agrifolia var. agrifolia and Quercus parvula var. shrevei, displaying a wide range of intraspecific foliar variability and where interdigitation between the two taxa occurs, a complex series of morphological templates..... some of which, are manifesting F1 intermediacy, while others may be reticulate recombinants, with gene flow reflecting both ancestral and contemporary hybridization. What role does the accumulation of understory debris and ground-hugging vegetation play in the prevention of fertile acorns from germinating and in areas where putative interspecific hybridization could occur due to sympathy, are a substantial number of hybrids destined to be trapped in a limbo between being potentially fertile and unable to secure an favorable habitat conducive for germination? Are more hybrids, F1 and above, successfully produced at the pollination/fertilization stage than are ever observed in situ, simply because the transition from acorn to developing seedling is derailed by understory debris? How critical is the periodic disruption thru natural processes such as fire and geomorphological disturbances such as landslides, in maintaining a genetic variability in the local Quercus populations by exposing the mineral rich substrate beneath the leaf litter and what role can human disturbance, intentional or inadvertant, such as road/trail building play in being a proxy to the naturally occurring disruptions?

Overlooking Swanton Road, between the Brown/West driveway and the interface with the “Old Road”, a sinuous ribbon of conifer/oak woodland, often no more than 350-400 feet in width, affords the serious ecologist a treasure trove of diverse “natives”. Starting at its western edge and moving in a southeast then southerly direction, the following native botanical residents can be encountered while exploring this verdant tapestry of biodiversity: Monterey pine (Pinus radiata).... descendents of a complex and highly reticulate hybrid swarm between Pinus attenuata and Pinus radiata), Pacific madrone (Arbutus menziesii), Douglas-fir (Pseudotsuga
menziesii var. menziesii), common rush (Juncus patens), poison oak (Toxicodendron diversilobum),

major provider of the watershed’s most vibrant fall colors), California wild rye (Elymus glaucus
subsp. glaucus), California bedstraw (Galium californicum subsp. californicum), California brome
(Bromus carinatus var. carinatus), woodland madia (Anisocarpus madioides), gambleweed (Sanicula
crassicaulis), California blackberry (Rubus ursinus), California coffeeberry (Trandera californica
subsp. californica), forest live-oak (Quercus parvula var. shrevei), California bay laurel (Umbellularia
california), nodding brome (Bromus vulgaris), coast live-oak (Quercus agrifolia var. agrifolia), oracle
oak (Quercus x moreluus.... a decade ago, five juvenile examples of this misdiagnosed non-F1
hybrid, were removed from their localized habitat under a Quercus parvula var. shrevei colony
and transplanted to the neighboring property of the late Harry Wain...... over the intervening
years, the majority of transplants have continued to survive, showing a remarkable variation
in growth patterns and foliar gestalt , while the remaining scattered examples continue to
survive and have been digitally documented in situ ), yerba buena (Satureja douglasii =
Clinopodium douglasii), wood fern (Dryopteris arguta), blue blossom (Ceanothus thyrsiflorus..... of
the several mature sub-trees present, one stands out with an estimated 30’ height and a lower
trunk that is circa 1’ in diameter at 6’ above ground level), hairy honeysuckle (Lonicer a hispidula),
sticky monkeyflower (Mimulus aurantiacus), California hedge nettle (Stachys bullata), tan-oak
(Notholithocarpus densiflorus var. densiflorus), Alaska onion grass (Melica subulata), Pacific pea
(Lathyrus vestitus var. vestitus), Douglass’s iris (Iris douglasiana), sweet cicely (Osmorhiza bertero i),
California maidenhair (Adiantum jordanii), spotted coralroot (Corallorhiza maculata sensu lato.....
the taxon in question lacks any spotting on the labelum, which at best, shows a pale pink
suffusion post-anthesis plus other structural differences from the type..... whether the
designation forma immaculata is an accurate biological definition or the current appellation,
var. occidentalis best applies to the local populations under discussion, reflects the need for an
in depth examination from a combined ecological, morphological and molecular perspective),
coyote brush (Baccharis pilularis), mugwort (Artemisia douglasiana), American vetch (Vicia
americana var. americana), hound’s tongue (Cynoglossum grande), Gianone sedge complex (Carex
gianonei, pro sp.nov.), California aster (Symphyotrichum chilense), pine grass (Calamagrostis
rubescens), broad-leaved aster (Eurybia radulina), Hall’s/leafy bent grass intergrades (Agrostis
hallii/pallens complex), foothill needlegrass (Nassella lepida), tall trisetum (Trisetum aff. canescens),
coast redwood (Sequoia sempervirens), toyon (Heteromeles arbutifolia..... one asymmetrical “old”
specimen possibly exceeds 30’ in height, with the trunk 6’ from ground level, measuring 124”
in diameter), western sword fern (Polystichum munitum), Torrey’s melic (Melica torreyana.....
perhaps the most polymorphic member of the Poaceae in the watershed), Hooker’s fairy bells
(Prosartes hookeri), wood rose (Rosa gymnocarpa), ground rose (Rosa spithamea..... uncommon in
watershed), hazelnut (Corvus cornuta subsp. californica), Pacific starflower (Trientalis latifolia),
wood strawberry (Fragaria vesca), blue elderberry (Sambucus nigra subsp. caerulea), Indian thistle
(Cirsium brevistylum), California man root (Marah fabaceus), Elmer’s fescue ( Festuca elmeri), western
fescue ( Festuca occidentalis), oso berry (Oemleria cerasiformis), blue witch (Sol dium umbelliferum),
coast tarweed (Madia sativa), coyote mint (Monardella villosa subsp. villosa), goldback fern
(Pentagramma triangularis subsp. triangularis), California figwort (Scrophularia californica subsp.
california), climbing bedstraw (Galium porrigens var. porrigens), bracken (Pteridium aquilinum var.
pubescens), straggly gooseberry (Ribes divaricatum var. pubiflorum), slim Solomon’s seal (Smilacina
stellata), fat Solomon’s seal (Smilacina racemosa), nested polypody (Polypodium calih rhiza..... lowest
sets of pinna shorter than succeeding ones), white hawksweed (Hieracium albiflorum), California
buckeye (Aesculus californica), giant trillium (Trillium chloropetalum), western trillium (Trillium
ovatum subsp. ovatum), coast nettle (Urtica dioica subsp. gracilis), California nutmeg (Torreya
californica), Ithuriel’s spear ( Tritelea laxa..... forma typica, with laterally symmetrical stamens,
whitish anthers, and filaments of unequal length), white globe lily (Calochortus albus), checker lily (Fritillaria affinis var. affinis), sweet-scented bedstraw (Galium triflorum) and blue dicks (Dichelostemma capitatum subsp. capitatum).

Occupying the steep slopes, which flank the outer edge of Swanton Road and drain down into Scotts Creek, is a quartet of gymnosperms: Monterey pine (Pinus radiata), Douglas-fir (Pseudotsuga menziesii), California nutmeg (Torreya californica), and coast redwood (Sequoia sempervirens). Drawing from both the monocots and dicots, a varied tapestry of understory associates can be identified by the seasoned observer, although when out of flower and lost in the welter of poison oak (Toxicodendron diversilobum), in addition to shifting patterns of sunlight and shadow, can challenge even the most experienced naturalist. On occasion reaching two to three meters in height, bracken (Pteridium aquilinum var. pubescens) joins thimbleberry (Rubus parviflorus), wood rose (Rosa gymnocarpa), oso berry (Oemleria cerasiformis), Douglass’s nightshade (Solanum douglasii), cow-parsnip (Heracleum maximum) and straggly gooseberry (Ribes divaricatum var. pubiflorum) in providing a further, albeit lower layer of canopy overtopping sweet cicely (Osmorhiza chilensis = Osmorhiza bertero), woodland madia (Madia madioides = Anisocarpus madioides), wood strawberry (Fragaria vescana), the “fat” and “slim” Solomon’s seals (Smilacina racemosa and Smilacina stellata), white hawkweed (Hieracium albidum), a taxon second only to the previously noted poison oak for being a dispenser of fear and discomfort.....coast nettle (Urtica dioica subsp. gracilis), broad-leaved aster (Aster radulinus = Eurybia radulina), hound’s tongue (Cynoglossum grande), hairy honeysuckle (Lonicera hispida var. vacillans) along with its cousin snowberry (Symphoricarpos albus var. laevigatus) and California man root (Marah fabaceus).....the man root, out of spite, will seasonally attempt to smother any shrub within reach of its tendrils!

The alternation of common Chinese houses (Collinsia heterophylla) with rare San Francisco collinsia (Collinsia multicolor)....both sharing a preference for mudstone debris.....presents an intriguing distributional pattern, further complicated by the fact that the inflorescences of both species possess gland-tipped trichomes, which when pressed firmly leave an iodine-colored stain on some, but not all, hands! This rare/common combination, was previously placed in the Figwort Family (Scrophulariaceae), but now, due to molecular studies, resides within the Plantaginaceae and shares reorganized familial linkages with several other species occurring within our specifically defined viewshed, namely Indian paintbrush (Castilleja affinis subsp. affinis)..... family Orobanchaceae, sticky monkeyflower (Mimulus aurantiacus)..... family Phrymaceae, American brooklime (Veronica americana)..... family Plantaginaceae and California figwort (Scrophularia californica subsp. californica), including its uncommon flavistic (yellow-flowered) form and staying put within its namesake family, the Scrophulariaceae!!! Castilleja affinis subsp. affinis constitutes an extremely variable complex, with putative elements of Castilleja latifolia (leaves oblong-orbicular and entire), Castilleja applegatei (wavy leaf margins), Castilleja subinclusa subsp. franciscana (exserted lower lip, forward-pointed galea, upthrusted calyces and distinctly pedicellate flowers), Castilleja wrightii (yellow flowers, more or less included galea, glandular indument and numerous short axillary shoots below the inflorescence) and Castilleja foliolosa or Castilleja mollis (occasional branched/forked trichomes). An uncommon and perhaps endemic component of the Castilleja densiflora complex occurs on a few coastal headlands, with creamy-white flowers exuding a vanilla-like scent. Plants of owl’s clover (Castilleja densiflora) away from the immediate coast (Schoolhouse Ridge) have rose-purple flowers with a spicy cinnamon scent and most likely adapted locally (the Orthocarpus noctuinus analogue) to a vespertine pollinating vector in response to the prevailing diurnal coastal wind patterns. One exposed and isolated coastal grassland, hosted sympatric populations of the
extremely rare banded owl’s clover (*Castilleja exserta* subsp. *latifolia*) and the vanilla-scented form of owl’s clover (*Castilleja densiflora*), which were observed and studied for several seasons.

From a floristic perspective, one of the values derived from the watershed’s biodiversity is the study of contrasts: the variety and plasticity of morphological templates within a specific family, occupying different niches in the same ecosystem.

(a) Unless one is versed in Apiaceae taxonomy and has fruiting plants at hand with their highly dissimilar schizocarps, it would be difficult to connect water hemlock (*Cicuta douglasii*), Pacific oenanthe (*Oenanthe sarmentosa*), California angelica (*Angelica tomentosa*), hoary bowlesia (*Bowlesia incana*), California hedge-parsley (*Yabea microcarpa*), lovage (*Ligusticum apiifolium*) and rattlesnake weed (*Daucus pusillus*) with cow-parsnip (*Heracleum lanatum = Heracleum maximum*), sweet cicely (*Osmorhiza chilensis = Osmorhiza berteroi*), footsteps-of-spring (*Sanicula arctopoides*), wild celery (*Apiastrum angustifolium*), caraway-leaved lomatium (*Lomatium caruifolium var. caruifolium*), coyote thistle (*Eryngium armatum*) and Gairdner’s yampah (*Perideridia gairdneri subsp. gairdneri*). A diverse family indeed, but the constituent taxa are united by the structure of their fruits, these when mature splitting into two halves, each containing one seed and temporarily remaining attached to a portion of the central axis known as a carpophore.

(b) What is found growing on sandbars along Scotts Creek’s riparian corridor, is a monocot, vegetatively simulates an *Iris* but is not one? Excluding flowers and fruits, the genus *Juncus* affords the student of form and function, a rare opportunity to observe a bewildering array of variations on a theme, often approaching a sophisticated level of mimicry that can seduce the uninitiated into making a hastily arrived at misdiagnosis! The aforementioned “*Iris poseur*” is none other than the iris-leaved rush (*Juncus xiphioides*). On the coastal prairies another foliar chameleon can be found, brown-headed rush (*Juncus phaeocephalus var. phaeocephalus*), which often grows with and masquerades as the blue-eyed grass (*Sisyrinchium bellum*)* and occasionally forming a threesome is western rush (*Juncus occidentalis*), producing caespitose tufts with leaves and nascent culms acting like counterfeit California hairgrass (*Deschampsia cespitosa subsp. holciformis*) plants, which to confuse matters even further, can be found growing sympatrically!

*Note: blue-eyed grass (*Sisyrinchium bellum*), while common throughout the watershed and elsewhere, behaves in a decidedly uncommon fashion locally when it comes to the range of colors exhibited and the concomitant variability of the perianth parts, both as to dimensions and overall gestalt. During the past 30+ years, specimens have been collected and raised, either in containers or naturally in the ground, which produced (a) unblemished white flowers, white flowers with pink or blue pheasant eyes, white flowers veined pink or bluish-purple, (b) pale pink flowers, (c) pale blue flowers, (d) flowers in various shades of blue, violet and purple and (e) rarest of all, purple flowers with the adaxial surface of the perianth parts speckled with pigment free, transparent patches which glistened like mica. The equally, as to configuration, variable perianth divisions, range from stellate with parts separate through flowers with parts so broadly drawn that they + overlap and appear rotate.

Locally, taxonomic conundrums abound within the Rush Family (*Juncaceae*), namely reconciling morphological differences within one circumscription for a “variable” species. Such a species, with a decidedly schizophrenic nature, is Mexican rush (*Juncus mexicanus*). At least two taxa, scattered in marsh-like areas within/bordering the coastal prairies and adjacent grasslands, which
due to the possession of tortile-compressed culms and basal bracts occasionally displaying conspicuous blades, are referable to the *Juncus balticus* complex, aff. *Juncus mexicanus*:

**Taxon 1:** culms dark green, stout, often arcuate, inflorescences **compact** with perianth parts **dark brown and nitid**, 5-6 mm. long, in overall gestalt, simulating a nanistic phase of salt rush (*Juncus lesueurii*) or possibly referable to *Juncus brevior* but on occasion producing basal bracts with readily identifiable blades.

**Taxon 2:** culms light green, sometimes with a bluish cast, usually erect, **slender**, tortile-compressed, inflorescences **open**, perianth parts **pale**, 3-5 mm. long, basal bracts sporadically displaying culm-like blades. The aerial portion of the seasonal culms behaves in a strictly annual fashion, turning tannish-brown and rapidly become desiccated with the approach of fall.

Just when you have brought the *Juncus* to heel and feel secure in possessing skills of discernment, a roadside discovery runs your ship of confidence aground: scattered colonies of an unknown grass appear on the upper slopes—perennial, with basally sheathing plane leaves, these margined with conspicuous filiform whitish hairs unlike any local member of the Poaceae you have seen! A few remnant inflorescences, holdovers from last season are found, these displaying in a very un-grasslike fashion, partially disintegrated one-chambered capsules. Thus common wood rush (*Luzula comosa*) enters the scene, a sister genus to *Juncus*, their foliar disparities overshadowing the shared anatomical structuring of their reproductive organs.

If certain character traits can be ascribed to a specific group of plants within our “green” sightseeing jaunt, then “not knowing their place,” fits the ferns perfectly.

1. Updraft-borne spores of the lady fern (*Athyrium felix-femina* var. *cyclosorum*) from adjacent Scott’s Creek create a nascent colony in a shaded but only seasonally damp roadside ditch.

2. Periodic slope failure transports Western sword fern (*Polystichum munitum*) and wood fern (*Dryopteris arguta*) from their woodland habitat to near-vertical positions of long-term uncertainty.

3. California maidenhair (*Adiantum jordanii*) beats the summer heat by going dormant and leaving discreet traces of its existence with papery dried pinna and wiry varnished black petioles, while the goldback fern (*Pentagramma triangularis* subsp. *triangularis*) twists and contorts its basically deltoid-in-silhouette blades into a gold-dusted Mobius Loop.

4. And finally, nested polypody (*Polypodium calirhiza*).....an allotetraploid derivative of California polypody (*Polypodium californicum*) and the licorice fern (*Polypodium glycyrrhiza*).....decides that living the high life of an epiphyte on long-lived oaks and California bay laurel (*Umbellularia californica*) is preferable to the terrestrial uncertainties of its brethren.

Adding contrast to the mix, with extremes of stature and overall gestalt, are western burning bush (*Euonymus occidentalis* var. *occidentalis*), displaying fleshy flowers suspended on thread-like stalks and looking as if they escaped from a tidepool and shining chickweed (*Stellaria nitens*), so delicate and finely drawn in stature as to be invisible unless properly backlit. From a purely horticultural perspective, it would be very difficult to best the foliar display put on by small-
flowered alum root (*Heuchera micrantha*), with leaves exceedingly variable, both as to pigmentation and adaxial surface patterns, rivaling those found on Rex begonias.

Sadly, not all native species persist in a specific site within a given area and such is the case with Torrey’s cryptantha (*Cryptantha torreyana*). This locally uncommon annual borage, in past years appeared seasonally, restricted to certain east-facing road banks, often concentrated in small groupings and as such, was vulnerable to natural extirpation. When massive sliding, the result of El Nino driven weather patterns, radically changed this species preferred habitat, no replacement seeds were apparently available to reestablish the total population loss for that site. Also factoring into this survival equation, is the longevity of some seeds, actually nutlets in this case, and if short-lived, one or two seasons, even if present may not have been viable when actually needed!

Many observers, encountering California bedstraw (*Galium californicum* subsp. *californicum*), climbing bedstraw (*Galium porrigens* var. *porrigens*), and sweet-scented bedstraw (*Galium triflorum*) would be surprised to learn that this low-profile trio of “locals” belonging to the Madder Family (Rubiaceae), is in fact related to the exotic genera *Cichona* (Quinine), *Coffee* (Coffee), and *Gardenia* (Gardenia)!

Again, the mixing of the widespread with the locally uncommon defines some of the native grasses found growing along this singled-out portion of our botanical survey, with Elmer’s fescue (*Festuca elmeri*) leading the pack in the uncommon category (plants vary throughout the watershed as to stature, ca. 0.5-2 m. in height, number of florets per spikelet and anther color, yellow or purple), followed in frequency of occurrence by tall trisetum (*Trisetum canescens* = *Trisetum cernuum* subsp. *canescens*?), Alaska onion grass (*Melica subulata*), Howell’s bluegrass (*Poa howellii*), Western fescue (*Festuca occidentalis*), slender hairgrass (*Deschampsia elongata*), pine grass (*Calamagrostis rubescens*), California wild rye (*Elymus glaucus* subsp. *glaucus*) extremely variable with some populations displaying “branched” inflorescences, polymorphic Torrey’s melic (*Melica torreyana*), California brome (*Bromus carinatus* var. *carinatus*), and nodding brome (*Bromus vulgaris*). *Bromus carinatus* var. *carinatus* constitutes a complex assemblage of “micro-species”, some self-pollinating/cleistogamous (stamens included), others out-breeding (stamens exserted). Plants with broad leaves and large inflorescences, these sometimes displaying drooping branches with few spikelets, may represent ancient hybridization with *Bromus sitchensis*. Less than ¼ mile from the tarmac but out of viewing range, one of the rarest grasses found within the riparian corridor, crinkle-awn fescue (*Festuca subuliflora*), resides as a component of the redwood under story, visually looking like its sister species, Elmer’s fescue (*Festuca elmeri*), but possessing long-stipitate florets and conspicuous awns.

Mimicry and shared habitat provide food for thought, as one peruses the damp banks with their moss covered rocks and exposed root systems: here, varied-leaved collomia (*Collomia heterophylla*), popweed (*Cardamine oligosperma*), and small-flowered nemophila (*Nemophila parviflora* var. *parviflora*), three unrelated annual species, play out their seed-to-seed life cycles, featuring overlapping juvenile growth patterns of basal rosettes with pinnatifid leaves. Do all three species merely prefer the same ecological conditions, or does one of the three possess chemical constituents that repel predation, insect or otherwise, thereby bestowing protection on the other two imitators? Pacific starflower (*Trientalis latifolia*) also engages in a form of mimicry, perhaps more from this observers perspective than any co-evolutionary causation.....but not only, when still in foliar mode and growing in dappled light, does it superficially look like an
anorexic version of the often sympatric western trillium (*Trillium ovatum*) but like that unrelated taxon, also possesses a thickened rootstock. Parenthetically, both *Trientalis* and *Centunculus* have now been removed from the family Primulaceae and resettled within the Myrsinaceae.

A brief notice to the unfortunate passing of an uncommon and controversial taxon which, with its scattered brethren, occupy the mixed coniferous/hardwood tract overshadowing this installment of our walk: I am making reference to the oracle oak (*Quercus x morehus*), which in the case of our local specimens, represent in my opinion, the highly localized manifestation of ancient hybridization between the black oak (*Quercus kelloggii*) and forest live-oak (*Quercus parvula var. shrevei*). Throughout the watershed, certain “mother trees” (*Quercus parvula var. shrevei*) produce, within a population of “normal” offspring, a percentage reflecting *Quercus kelloggii* influence, perhaps acquired during an earlier time frame when the two taxa grew sympatrically and the forest live-oak, as it expanded its coastal range, carried the recessive “hybrid genes” with it. Since the oracle oak specimens are site specific and are always in association with a population or individual specimen of the forest live-oak, in theory the production of *Quercus x morehus* may need two proximal *Quercus parvula var. shrevei* trees carrying the recessive “hybrid genes” to produce the oracle oaks! The hybrid offspring are readily distinguished from the surrounding oaks by their slower rate of growth and plane, sinuately-lobulate, semi-deciduous foliage. The taxon in question, was perched on the forested edge overlooking Swanton Road and early into the rainy season, had its root system undercut by slope failure and slowly starved to death by desiccation—an ignoble ending for a noble tree in the making! Offsetting the demise of one oracle oak along this particular stretch of viewshed are two healthy specimens, growing proximal to each other and within viewing range from the tarmac..... but to the untrained eye, so integrated within the surrounding oak woodland as to be rendered indistinguishable (save for a few yellowing leaves of a deciduous nature) from their parental stock, the forest live-oak (*Quercus parvula var. shrevei*)! Incidentally, both of these specimens of *Quercus x morehus* have been digitally documented along with several other examples found growing throughout the Scotts Creek Watershed and with much other material of a documentary nature, deposited at the UCSC Arboretum for future study. Within the time frame of 05/2011, a third representative of this taxon in taxonomic limbo was discovered along the same stretch of Swanton Road..... ironically while studying an equally uncommon member of the family Rosaceae locally, namely *Rosa spithamea*. Casually scanning the roadside cum slide area behind and above the ground rose hoping to find more representatives of this exceedingly fragrant native, yielded several dried leaves with telltale lobulations..... standing out as discordant but immediately recognizable elements amongst the remnant leaf litter of other deciduous and semi-deciduous shrubs/trees but without an obvious source forced the viewer to carefully peruse the upper reaches of the tree shrouded slope and what appeared to be a shrub-like displaced red alder lurking in the shadows, proved to be a non-F1 oracle oak (*Quercus x morehus*) with exceedingly large leaves.

Before moving on to the next leg of our rural trek, here is a mini-survey that underscores the diversity of the native flora found bordering this small section of country road: spotted coralroot (*Corallorhiza maculata*..... *immaculata form*), lip unblemished but occasionally during the post-anthesis stage, the lip aging with a pale pink suffusion and possibly the best name, to assign this morphologically uniform taxon, should be var. *occidentalis*, striped coralroot (*Corallorhiza striata*), royal rein orchid (*Piperia transversa*), cream cups (*Platystemon californicus*), Hasse’s vetch (*Vicia hassei*), checker lily (*Fritillaria affinis* var. *affinis*), American winter cress (*Barbarea orthoceras*), downy buttercup (*Ranunculus hebecarpus*), hairy wood sorrel (*Oxalis corniculata* subsp. *pilosa* =
Oxalis pilosa), brown bog rush (Juncus hesperius), common rush (Juncus patens), western nettle (Hesperocnide texella), canyon gooseberry (Ribes menziesii), Pacific pea (Lathyrus vestitus var. vestitus), ground rose (Rosa spithamea, new addition to Scotts Creek Watershed native species checklist), Hooker’s fairy bells (Disporum hookeri = Proserartes hookeri), bleeding heart (Dicentra formosa), Douglas’s iris (Iris douglasiana), intermediate fiddleneck (Amsinckia menziesii var. intermedius = Amsinckia menziesii), Pacific starflower (Trillium chloropetalum), giant trillium (Trillium helvatum), bread-leaved lupine (Lupinus latifolius var. latifolius), yerba buena (Satureja douglasii = Clinopodium douglasii) and Indian thistle (Cirsium brevistylum).

One of the hidden or illusory aspects of journeying down Swanton Road, is that several of the smaller sub-watersheds feeding into Scotts Creek, while seeming relatively mundane at their terminus often begin from complex, multi-branched albeit abbreviated drainage systems. One of these highly reticulate assemblages of “gulchlets”, encompasses an arc-like swath of acreage...... which includes at its head, the entire east dipping Magic Triangle Synform and within its legitimate boundaries, evolves via erosion, into the Old Road, Magic Triangle, Bifurcate, Dump, Haybarn, Buckeye Grove and Bulb Field “Gulches”, before coalescing into a surprisingly narrow exit just below the Scotts Creek Bridge and parallels the final 200+ feet of this segment of our traversal. The number and variety of “natives” documented for this relatively small component of the Scotts Creek Watershed over the past four decades, are as follows..... arranged by families, many which are undergoing nomenclatural changes resulting from molecular based systematics: intermediate fiddleneck (Amsinckia menziesii var. intermedius), bent-flowered fiddleneck (Amsinckia lunaris), hound’s tongue (Cynoglossum grande), white baby-blue-eyes (Nemophila menziesii var. atomaria..... genetically complex populations, with some plants gynodioecious and others tending towards var. menziesii in floral coloration and extremely variable as to corolla size and shape), small-flowered nemophila (Nemophila parviflora var. parviflora), Fremont’s nemophila (Nemophila pulchella var. fremontii..... this taxon, either represents a disjunct series of populations within the Scotts Creek Watershed of an interior non-coastal ranging species or a related but new entity!), stinging phacelia (Phacelia malvifolia), bracted popcorn-flower (Plagiobothrys bracteatus), artist’s popcorn-flower (Plagiobothrys chorismianus var. chorismianus, San Francisco popcorn-flower (Plagiobothrys diffusus)..... western burning bush (Euonymus occidentalis var. occidentalis)..... Monterey pine (Pinus radiata..... extensive representation of a morphologically variable sub-population derivative of ancient hybridization between Pinus attenuata and Pinus radiata), Douglas-fir (Pseudotsuga menziesii var. menziesii)..... Pacific madrone (Arbutus menziesii), brittle-leaf manzanita (Arctostaphylos crustacea sensu lato..... oak/conifer woodland succession, has reduced once viable colonies on the ocean side of Scotts Creek to skeletal remnants, with few if any now showing signs of life), California huckleberry (Vaccinium ovatum)..... coast barberry (Berberis pinnata subsp. pinnata)..... straggly gooseberry (Ribes divericatum var. pubiflorum), canyon gooseberry (Ribes menziesii)..... creek dogwood (Cornus sericea subsp. sericea)..... arroyo willow (Salix lasiolepis), Scoular’s willow (Salix scoulerianna..... one small tree with conspicuously obblanceolate leaves, growing on brushy slope overlooking lower portion of gulch complex)..... redwood (Sequoia sempervirens)..... big-leaf maple (Acer macrophyllum), California buckeye (Aesculus californica)..... the genera Acer and Aesculus have now been placed together within the Sapindaceae)..... bleeding heart (Dicentra formosa), California poppy (Eschscholtzia californica)..... California nutmeg (Torrey californica)..... silk tassel (Garriga elliptica)..... California bedstraw (Galium californicum subsp. californicum), climbing bedstraw (Galium porrigens var. porrigens), sweet-scented bedstraw (Galium triflorum)..... red alder
(Alnus rubra)..... California bay laurel (Umbellularia californica)..... poison oak (Toxicodendron diversilobum)..... common bluecup (Githopsis speculatoides)..... hoary bowlesia (Boulezia incana), rattlesnake weed (Daucus pusillus), cow-parsnip (Heracleum maximum), lovage (Ligusticum apifolium)..... rare for county, localized populations within Swanton area, are the only known and documented ones to date), caraway-leaved lomatium (Lomatium caruifolium var. caruifolium), sweet cicely (Osmorhiza hetero), footsticks-of-spring (Sanicula arctopoides), purple sanicle (Sanicula bipinnatifida)..... a yellow flowered form of this taxon was found several years ago growing in the upper part of the Magic Triangle Gulch), gambleweed (Sanicula crassicaulis), Gianone’s sanicle (Sanicula gianonei, pro.sp. nov.)..... fat Solomon’s seal (Smilacina racemosa), slim Solomon’s seal (Smilacina stellata)..... Hooker’s fairy bells (Prosartes hookeri)..... Pacific starflower (Trientalis latifolia)..... western trillium (Trillium ovatum subsp. ovatum)..... sticky monkeyflower (Mimulus aurantiacus), musk monkeyflower (Mimulus moschatus)..... circa three decades ago, an extensive population of this rhizomatous perennial was observed growing where the two main stems of this drainage system converge..... only to be buried and extirpated by a substantial debris flow during the 1982-83 rainy season)..... California maidenhair (Adiantum jordanii), coffee fern (Pellaea andromedifolia), goldback fern (Pentagramma triangularis subsp. triangularis)..... wood fern (Dryopteris aquarud), western sword fern (Polystichum munitum)..... lady fern (Athyrium filix-femina var. cyclosorum)..... bracken (Pteridium aquilinum var. pubescens)..... nested polypody (Polypodium calirhiza)..... lowest sets of pinna shorter than succeeding ones)..... Douglas’s iris (Iris douglasiana)..... hairy honeysuckle (Loniceria hispidula)..... Blasdale’s bent grass (Agrostis blasdalei)..... localized disjunct populations, highly variable as to overall gestalt and showing, on occasion, introgression from sympatric California bent grass (Agrostis densiflora) and western bent grass (Agrostis exarata sensu lato), Hall’s/leafy bent grass intergrades (Agrostis hallii/pallens), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass (Calamagrostis rubescens), California oat grass (Dianthus californica sensu lato), California hairgrass (Deschampsia cespitosa subsp. holciformis), California wild rye (Elymus glaucus subsp. glaucus), California fescue (Festuca californica)..... adaxial surfaces of leaves clothed with a cinerous indument akin to fine velvet in texture but not mentioned in the literature), Elmer’s fescue (Festuca elmeri), western fescue (Festuca occidentalis), red fescue (Festuca rubra), junegrass (Koeleria macrantha), California melic (Melica californica), Alaska onion grass (Melica subulata), Torrey’s melic (Melica torreyana), purple needlegrass (Nassella pulchra), California canary grass (Phalaris californica)..... western lady’s mantle (Aphanes occidentalis), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus disciflorus), California horkelia (Horkelia californica var. californica), oso berry (Oemleria cerasiformis), California wild rose (Rosa californica), wood rose (Rosa gymnocarpa), thimbleberry (Rubus parviflorus), salmonberry (Rubus spectabilis), California blackberry (Rubus ursinus)..... yarrow (Achillea millefolium), mountain dandelion (Agoseris grandiflora), coast dandelion (Agoseris hirsuta), woodland madia (Anisocarpus madioides), California sagebrush (Artemisia californica), coyote brush (Baccharis pilularis), Indian thistle (Cirsium brevistylum), California aster (Corethrogne filaginifolia..... var. californica), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), broad-leaved aster (Eurybia radulina), purple cudweed (Gamochaeta ustulata), sneezeweed (Helenium puberulum), white hawkweed (Hieracium albinum), tall layia (Layia hieracioides), tidytips (Layia platyglossa), slender tarweed (Madia gracilis)..... scattered populations attributable to this taxon are often reduced in stature, with few heads on branches which are positioned in a somewhat flexuous pattern, and the gland-tipped trichomes are redolent of an odor reminiscent of cherry syrup..... the aforementioned traits possibly derived from past hybridization with Madia exigua? ), coast tarweed (Madia sativa), slender cottonweed (Micropus californicus var. californicus), Santa Cruz microseris (Microseris decipiens), marsh microseris (Microseris paludosus)..... uncommon in Santa
Cruz County, this population from the upper section of the "Old Road" documented with pressings and deposited in the Jepson Herbarium at UC Berkeley. California cudweed (Pseudognaphalium californicum). One plant observed, 06/2010, with pink-tinged phyllaries.

Gianone everlasting (Pseudognaphalium gianonei, pro.sp.nov.), pink everlasting (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum), woolly marbles (Psilocarphus tenellus var. tenellus), California goldenrod (Solidago velutina subsp. californica). Stephanomeria (Stephanomeria virgata [?]). Several years ago, I found a localized population growing on the lower east facing edge of Buckeye Grove Ridge, with flowers colored an apricot suffused pink. Small population rediscovered 10/1010 in analogous habitat on adjacent Haybarn Gulch Ridge, and based on the possession of longitudinal grooves on cypselae and pappus plumose throughout, possibly referable to Stephanomeria aff. elata), California aster (Symphyotrichum chilense). Small-flowered alum root (Heuchera micrantha). White globe lily (Calochortus albus). Checkered lily (Fritillaria affinis var. affinis). Giant horsetail (Equisetum telmateia subsp. braunii). Blue elderberry (Sambucus nigra subsp. canadensis), red elderberry (Sambucus racemosa subsp. racemosa). Coast nettle (Urtica dioica subsp. gracilis). Some plants tending towards and intermediate with subsp. holosericea, specifically the ratio of stinging to non-stinging hairs on leaves and stems.

Blue blossom (Ceanothus thyrsiflorus). California coffee bean (Frangula californica subsp. californica). Pale plectritis (Plectritis congesta subsp. brachystemon). California man root (Marah fabaceus). Tan-oak (Notholithocarpus densiflorus var. densiflorus), coast live oak (Quercus agrifolia var. agrifolia). Forest live oak (Quercus parvula var. shrevei). Sea lettuce (Dudleya caespitosa). Scattered and isolated populations, growing on near-vertical, exposed bedding planes, usually east facing in orientation. Gianone sedge complex (Carex gianonei, pro.sp.nov.), "imperfect" sedge (Carex imperfecta). This taxon occurs with some frequency on coastal prairie and to a lesser degree, within the Beaver Flat and West Spring Marshes. Pistillate flowers non-functioning and infertile fruits often hosting a whitish fungus, while some plants have functioning stamens which produce pollen and other plants are apparently, wholly sterile. Slough sedge (Carex obnupta), small-bracted sedge (Carex subbracteata), foothill sedge (Carex tumulicola). Dwarf brodiaea (Brodiaea terrestris subsp. terrestris), blue dicks (Dicheleostema capitatum subsp. capitatum), Ithuriel's spear (Triteleia laxa). Typical form with laterally symmetrical stamens, whitish anthers and filaments of unequal length. Pacific pea (Lathyrus vestitus var. vestitus), small-flowered trefoil (Lotus micranthus = Acnispis parviflorus). Yellow bush lupine (Lupinus arboreus), sky lupine (Lupinus nanus).

Lindley's varied lupine (Lupinus varicolor), long-keeled clover (Trifolium appendiculatum), bearded clover (Trifolium barbigerum), purple sack clover (Trifolium depauperatum var. truncatum), pin-point clover (Trifolium gracilentum var. gracilentum), double-headed clover (Trifolium macraei), maiden clover (Trifolium microcephalum), Valparaiso clover (Trifolium microdon), white-tipped clover (Trifolium variegatum), tomcat clover (Trifolium willdenovii), American vetch (Vicia americana subsp. americana). California figwort (Scrophularia californica subsp. californica). Spotted coralroot (Corallorhiza maculata forma immaculata). Several hundred plants of this taxon have been studied this season (2010), growing throughout this subwatershed under the mixed conifer/oak woodlands, and all the observed specimens lack the maculate lips. Some post-anthesis plants, have the lip lightly flushed with a pale pink suffusion but nothing remotely resembling the labellum gestalt or maculations of the forma typica and perhaps best REFERABLE to Corallorhiza maculata var. occidentalis), hooded lady's tresses (Spiranthes romanzoffiana). Growing on exposed slope overlooking grassy ridge separating Haybarn and Buckeye Grove "gulchets". Growing sympatrically with Agrostis blasdalei. Indian paintbrush (Castilleja affinis subsp. affinis), owl's clover (Castilleja densiflora sensu lato). Aff. Orthocarpus nocturnus, with white bract tips and flowers exuding a vanilla scent. Franciscan paintbrush (Castilleja
subinclusa subsp. franciscana..... only known population for Santa Cruz County, growing near base of the northeast facing edge of the "Magic Triangle" and documented by herbarium pressings for the Jepson Herbarium, UC Berkeley in 04/17/85), butter-and-eggs (Triphysaria eriantha subsp. eriantha), purple-beaked owl's clover (Triphysaria micrantha..... only documented populations for Santa Cruz County, with pressings made on 03/25/83 and 03/03/84, and deposited at the Jepson Herbarium, UC Berkeley), dwarf orthocarpus (Triphysaria pusilla)..... coyote mint (Monardella villosa sensu lato..... highly variable, with various populations ranging from sub-glabrous, lance-ovate, thin-leaved subsp. villosa through tomentose, sub-orbicular, thick-leaved subsp. franciscana), selfheal (Prunella vulgaris var. lanceolata), yerba buena (Satureja douglasii = Clinopodium douglasii), California hedge-nettle (Stachys bigliria var. quercetorum), brown bog-rush (Juncus hesperius), western rush (Juncus occidentalis), common rush (Juncus patens), common wood rush (Luzula comosa)..... observed growing sympatrically with another hummingbird pollinated taxon, Castilleja subinclusa subsp. franciscana, within brush-covered base of "Magic Triangle"), pipestems (Clematis lasiantha), California larkspur (Delphinium californicum subsp. californicum), coast larkspur (Delphinium decorum subsp. decorum), California buttercup (Ranunculus californicus)..... soap plant (Chlorogalum pomeridianum var. pomeridianum and var. divaricatum)..... American winter cress (Barbarea orthoceras), common milkmaids (Cardamine californica var. californica), popweed (Cardamine oligosperma)..... morning glory (Calystegia purpurata subsp. purpurata)..... coast buckwheat (Eriogonum atitlanium/nudum intergrades), creeping hearts (Pterostegia drymarioidea)..... common linanthus (Leptosiphon androsaceus)..... San Francisco collinsia (Collinsia multicolor), California plantain (Plantago erecta)..... miner's lettuce (Claytonia perfoliata subsp. perfoliata)..... Johnny jump-up (Viola pedunculata)..... Douglas's nightshade (Solanum douglasii).

Note: Without leaving the tarmac, between the entrance to Last Chance Road and the Mill Creek Bridge, three native species of wild roses can be observed..... in order of appearance heading southward, wood rose (Rosa gymnocarpa), ground rose (Rosa spithamnea) and California wild rose (Rosa californica), all three related taxa growing with a mile of each other!!!

Note: Areas of biological/botanical/ecological/reference interest mentioned in this section of the essay, have the following Google Earth coordinates:

Beaver Flat: 37degrees05'40.14"N, 122degrees15'24.36"W, elevation 599feet

Upper Calf Gulch (a): 37degrees05'55.92"N, 122degrees14'35.91"W, elevation 529feet

Upper Calf Gulch (b): 37degrees05'48.94"N, 122degrees14'28.90"W, elevation 717feet

Upper Cowboy Shack Gulch: 37degrees03'52.56"N, 122degrees14'24.45"W, elevation 601feet

Lower Cowboy Shack Gulch: 37degrees03'39.27"N, 122degrees14'45.36"W, elevation 315 feet

Laguna de las Trancas: 37degrees05'17.78"N, 122degrees15'31.55"W, elevation 591feet
Upper Lair Gulch Complex: 37°06′23.23″N, 122°15′45.91″W, elevation 613ft

Lower Lair Gulch Complex: 37°05′48.09″N, 122°15′21.35″W, elevation 450ft

Marti’s Park Marsh: 37°05′15.92″N, 122°14′23.23″W, elevation 361ft

Upper Prairie Overlook Gulch: 37°03′31.18″N, 122°14′08.71″W, elevation 578ft

Lower Prairie Overlook Gulch: 37°03′17.22″N, 122°14′27.57″W, elevation 258ft

Rosetta Stone Pine Marsh: 37°05′28.39″N, 122°15′28.67″W, elevation 605ft

Upper Seymore Field: 37°05′48.55″N, 122°14′07.90″W, elevation 628ft

Lower Seymore Field: 37°05′33.07″N, 122°14′05.72″W, elevation 444ft

Seymore Hill: 37°05′50.41″N, 122°14′17.60″W, elevation 1025ft

Solar-panel Hotspot: 37°03′58.79″N, 122°14′40.41″W, elevation 561ft

Squirrel Flat: 37°05′05.14″N, 122°14′49.58″W, elevation 119ft

West’s Spring Marsh: 37°05′23.94″N, 122°15′22.05″W, elevation 499ft

Note: Select herbarium specimens of horticulturally meritorious, locally uncommon, rare county wide and agency listed species referred to in this section of the Traversal, collected and pressed, with noted exceptions, by Roy Buck and/or James West within the Scots Creek Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:

Adiatum jordanii/accession number UC1583770/Keil, Holland & Kelly #20580
Agoseris apargioides = Agoseris hirsuta/accession number JEPS83123/Buck & West #375
Agoseris grandiflora/accession number JEPS83090/Buck & West #376
Agoseris heterophylla/accession number JEPS82556/West #108
Agrostis blasdalei (“pseudo-densiflora”)/accession number JEPS82926/Buck & West #182
Agrostis blasdalei (“pseudo-densiflora”)/accession number JEPS82923/Buck & West #184
Agrostis blasdalei (“pseudo-densiflora”)/accession number JEPS82922/West #192
Arctostaphylos “sp”/accession number UCSC4633/Randall Morgan, Oct 1 1977
Arctostaphylos “sp”/accession number UCSC4798/Randall Morgan, Oct 1 1977
Arctostaphylos “sp”/accession number UCSC5772/R. Morgan, Oct 2 1977
Arctostaphylos “sp”/accession number UCSC6208/R. Morgan, Feb 1977
Arctostaphylos glutinosa/accession number JEPS81979/Buck & West #153
Arctostaphylos glutinosa/accession number JEPS81980/Buck & West #152
Arctostaphylos sensitiva/accession number UCSC5566/Randall Morgan, Dec 22 1976
Disporum hookeri

Dicentra

Deschampsia

Deschampsia danthonioides

Delphinium patens

Delphinium patens

Delphinium hesperium

Daucus

Cryptantha flaccida

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Collinsia

Cirsium occidentale

Ceanothus

Castilleja subinclusa

Castilleja densiflora

Castilleja densiflora

Castilleja densiflora

Castilleja densiflora

Castilleja densiflora

Castilleja densiflora

Castilleja densiflora

Castilleja attenuata

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja densiflora subsp. densiflora

Castilleja subinclusa subsp. franciscana

Castilleja subinclusa subsp. franciscana

Castilleja subinclusa subsp. franciscana

Cerastium thyrsiflorum

Cirsium occidentale var. occidentale

Collinsia heterophylla

Collinsia heterophylla

Collinsia heterophylla

Collinsia heterophylla

Collinsia multicolor

Collinsia multicolor

Cryptantha flaccida

Daucus pusillus

Delphinium hesperium subsp. hesperium

Delphinium patens subsp. patens

Delphinium patens subsp. patens

Deschampsia danthonioides

Deschampsia danthonioides

Deschampsia elongata

Dicentra formosa

Disporum hookeri = Prosartes hookeri
Dodecatheon hendersonii/accession number JEPS83088/West #347
Epilobium hallianum/accession number JEPS82591/West #100
Epilobium hallianum/accession number JEPS83116/Buck & West #341
Erysimum franciscanum/accession number JEPS82773/West #38.2
Festuca elmeri/accession number JEPS81500/Buck & West #26
Festuca howellii = Festuca elmeri/accession number JEPS81499/Buck & West #27
Festuca subuliflora/accession number JEPS83045/Buck & West #421
Garrya elliptica/accession number JEPS82649/Buck & West #205
Githopsis specularioidea/accession number JEPS83465/Buck & West #528
Heuchera micrantha/accession number UCR67971/Keil #20573
Juncus mexicanus/accession number JEPS81506/Buck & West #15
Juncus xiphoides/accession number JEPS83061/Buck & West #453
Lasthenia glaberrima/accession number JEPS82599/Buck & West #104
Layia platyglossa/accession number JEPS82806/Buck & West #289
Ligusticum apiifolium/accession number JEPS81521/Buck & West #8
Lupinus latifolius var. latifolius/accession number UCR67868/Keil #20655
Lupinus nanus/accession number JEPS82769/West #59
Lupinus succulentus/accession number JEPS83472/Buck & West #475
Melica subulata/accession number JEPS82786/Buck & West #305
Micropus californicus var. californicus/accession number JEPS82586/West #95
Micropus californicus var. subvestitus/accession number JEPS82588/West #96
Montia fontana/accession number USCC3458/Randall Morgan, Apr 9 2002
Osmorhiza chilensis = Osmorhiza berteroi/accession number UC1583617/Keil, Holland & Kelly #20584
Phalaris californica/accession number JEPS83114/Buck & West #343
Plagiobothrys diffusus/accession number JEPS83121/Buck & West #317
Plagiobothrys nothofulvus/accession number JEPS82824/West #62
Platystemon californicus/accession number JEPS82808/Buck & West #287
Poa howellii/accession number JEPS85127/Buck & West #530
Poa unilateralis/accession number JEPS82617/Buck & West #249
Polypodium californicum/accession number SBBG95532/Keil #20579
Polypodium calirhiza/accession number JEPS81993/Buck & West #158
Quercus chrysolepis/accession number JEPS81489/Buck & West #59
Quercus parvula var. shrevei/accession number SBBG96047/Keil #20641
Sanicula arctopoides/accession number JEPS82013/Buck & West #151
Sanicula arctopoides/accession number JEPS83473/Buck & West #474
Sanicula crassicaulis ("pseudo-laciniata")/accession number JEPS82959/West #403
Sanicula bipinnatifida/accession number JEPS83475/Buck & West #472
Sanicula hoffmannii/accession number UCSC6030/R. Morgan, Apr 8 1982
Sanicula hoffmannii/accession number UCSC6024/R. Morgan, Mar 23 1982
Sanicula hoffmannii/accession number UCSC6174/R. Morgan, Mar 23 1982
Sanicula hoffmannii/accession number UCSC6175/R. Morgan, Mar 23 1982
Scrophularia californica/accession number JEPS82630/Buck, West & Hawke #236
Solanum douglasii/accession number UCSC4621/Randall Morgan, Oct 27 1976
Spiranthes romanzoffiana/accession number JEPS81566/Buck & West #75
Trifolium barbigerum var. andrewsii = Trifolium grayi/accession number JEPS101723/Taylor,
Scotts Creek Bridge to Big Creek Bridge

The next phase of our watershed perambulation, situated between Scotts Creek and Big Creek Bridges, takes place on a relatively horizontal plane and affects the sinuosity of a real-time stream course. Sheltered within an intricately branched and indirectly lit box elder (Acer negundo var. californicum = Acer negundo*) and arroyo willow (Salix lasiolepis) grove, a flourishing colony of Gianone’s sanicle (Sanicula gianonei, pro.sp.nov.), welcomes the attention of the taxonomically inclined. The criteria used to define this widespread but repeatedly misdiagnosed taxon center on ecology and habitat preference, biochemical signature, foliar/bract morphology and cellular structure/behavior of marginal trichomes (becoming indurate and forming callosities in S. crassicaulis versus caducous.....withering and detaching....with S. gianonei, pro.sp.nov.), flower color, an unblemished epigynous disc, mature schizocarp configuration, color and alignment of the uncinate bristles. Comparison studies with the related, and where grassland meets woodland understory, sympatric species gambleweed (Sanicula crassicaulis), should be undertaken: with emphasis on chromosome counts, biochemical (alkaloids, et al.) analysis.... using gel electrophoresis techniques, a histological investigation of the foliar trichomes, below ground stem and root structures and breeding systems (obligate selfer versus out-breeder) with emphasis on reproductive isolation mechanisms versus potential for reciprocal/unidirectional gene flow. Since Sanicula hoffmannii and Sanicula laciniata have been the proposed putative parents of the polyploid Sanicula crassicaulis, study the foliar
polymorphism of the latter in conjunction with *Sanicula gianonei*, pro.sp.nov., *Sanicula pseudo-laciniata*, pro.sp.nov. and the rare and, at least in the upper Calif Gulch area, sympatric *Sanicula hoffmannii*. Focusing on the role *Sanicula hoffmannii* may play in the *Sanicula crassicaulis* genome, note the following features which can be observed in situ..... (1) a distinct chemical signature when stems and foliage are crushed, (2) the viniferous pigmentation found on the lower third of the petiole, (3) the free and narrowing to the point of attachment, central lobe of the leaf, (4) the usually present glaucous bloom/blue-green pigmentation on/of the adaxial surface of the leaves, (5) the shared trait with related *Sanicula bipinnatifida*, of the stem sap turning a milky white upon exposure to the air when the petiole is snapped in half and (6) the distinctive schizocarp morphology. A comparative study based on stamen morphology, anther color, size and degree of exsertion, between the various *Sanicula* taxa found within the watershed, may yield some valuable data from a taxonomic perspective.

*formerly placed in Family Aceraceae, now placed in Family *Sapindaceae*, along with the local genus *Aesculus*.

Momentarily trading asphalt for the au natural ambience of the *Purdy Road*, allows one to peruse new habitats roadside for several miles into the heart of the Scotts Creek Watershed and throw into relief, the botanical riches that await the serious student of ecology when leaving the superabundance already present along Swanton Road. Underlying the trajectory towards Eagle Rock is the counterpoint of Scotts Creek proper, a descending journey from Little Basin to the Pacific Ocean that is defined, in part, by the complex sinuosity of the watershed. A cross section of “native” taxa encountered without leaving the reticulate pattern of dirt roads shadowing both sides of the riparian corridor deep into the upper reaches of Scotts Creek and ascending, as old logging roads, into the flanking ridges, is as follows: brook foam (*Boykinia occidentalis*), aptly demonstrating its aesthetic value for landscaping shaded stream banks and moss surmounted, water-splattered rocks; western azalea (*Rhododendron occidentale*), prior to the 1960’s, an extensive colony, some individual shrubs exceeding 6 meters in height, lined the lower portion of Lair Gulch where it enters Scotts Creek; leopard lily (*Lilium pardalinum*), scattered populations still existing throughout the upper portion of the watershed in spite of cyclical scouring, often found growing in alluvium filled recesses proximal to the stream course; and along a still negotiable road bed which threads its way up the west-facing, near-vertical canyon slope into a benched depression of considerable size and overlooked by chaparral, several species of considerable interest make their appearance--- starting near the canyon bottom and working upward, crinkle-awn fescue (*Festuca subuliflora*), rarest of the six species of *Festuca* native to area, bicolored linanthus (*Linanthus bicolor = Leptosiphon bicolor*), only one small population discovered to date, minute willow herb (*Epilobium minutum*), royal rein orchid (*Piperia transversa*), with its elongate, horizontally aligned spurs looking like a collection of knitting needles and giving off a spicy scent at dusk, golden fleece (*Ericameria arborescens*), beargrass (*Xerophyllum tenax*), sheltered within an impenetrable tangle of huckleberries and oaks, vegetatively this locally rare monocot could easily be mistaken as a depauperate example of pampas grass, rayless arnica (*Arnica discoiden*), pussy ears (*Calochortus tolmiei*), an uncommon species locally, when compared to the widespread and variable white globe lily (*Calochortus albus*), buckbrush (*Ceanothus cuneatus var. cuneatus*) and sensitive manzanita (*Arctostaphylos nummularia = A. sensitiva*), this distinctive species contributing its genes for virgate positioned stems, quadrate leaves with impressed veins and 4-merous flowers on branched inflorescences that often align themselves in a downward appressed fashion, to the ubiquitous “local” burl-former (*Arctostaphylos crustacea*, sensu lato). On the west-
facing ridge complex, which separates Bannister and Bettencourt Gulches and bore the initial brunt of the 2009 Lockheed Fire, Pacific stonecrop (Sedum spathulifolium), favors moss-lined depressions in the weathered mudstone and displays grass-green rosettes tinted orange through purple, these often frosted with a glaucous bloom. Directly across from the upper Scotts Creek riparian corridor and facing southeast, Pine Mountain hosts scattered populations of Indian warrior (Pedicularis densiflora), growing in the chaparral understory and the uncommon chapparral broomrape (Orobanche bulbosa), while back down in the riparian corridor, another jettisoned genus from the Scrophulariaceae, Veronica serpyllifolia subsp. humifusa, luxuriates in the dappled light provided by overtopping conifers and the adjacent spring-fed micro-marsh, which quite possibly is landslide derived and offers sanctuary to an assortment of native Carex, Cyperus and Scirpus and their moisture loving friends. On 05/20/10, over the course of three hours, I walked the dirt road from the bridge across lower Bettencourt Gulch (Purdy Barnyard) up into the landslide derived “perched marsh”, which feeds the unnamed gulch between Bannister and Bettencourt Gulches and made the loop back down to the beginning of my post 2009 Lockheed Fire botanical exploration..... while a substantial part of this traversal had been impacted by the fire with some areas remaining untouched, the sheer number of native species observed and thriving, reminded me of the importance of various disturbance regimes, both natural and human induced, needed to maintain a high degree of biodiversity within a given environment, specifically where the human footprint has an extensive history. The following list of “native” taxa , is recorded as I encountered each species (without leaving the dirt road)..... a botanical narrative, in which the plants speak for themselves via documentation: white globe lily (Calochortus albus), California huckleberry (Vaccinium ovatum), two-eyed violet (Viola ocellata), woodland maidia (Anisocarpus madioides), California milkwort Polygala californica, western fescue (Festuca occidentalis), crinkle-awn fescue (Festuca subuliflora), Hooker’s fairy bells (Prosartes hookeri), Douglas’s iris (Iris douglasiana), yerba buena (Satureja douglasiana), sweet cicely (Osmorhiza berteroii), bracken (Pteridium aquilinum var. pubescens), tan-oak (Notholithocarpus densiflorus var. densiflorus), redwood (Sequoia sempervirens), sweet-scented bedstraw (Galium triflorum), California bedstraw (Galium californicum subsp. californicum), wood strawberry (Fragaria vesca), poison oak (Toxicodendron diversilobum), gambleweed (Sanicula crassicaulis), common milkmaids (Cardamine californica var. californica), round-fruit sedge (Carex globosa), redwood violet (Viola sempervirens), varied-leaved collomia (Collomia heterophylla), California bay laurel (Umbellularia californica), Pacific pea (Lathyrus vestitus sensu lato), hairy honeysuckle (Lonicera hispidula), California water starwort (Callitriche marginata), leopard lily (Lilium pardalinum subsp. pardalinum), black-cap raspberry (Rubus leucodermis), small-flowered nemophila (Nemophila parviflora var. parviflora), hazelnut (Corylus cornuta subsp. californica), miner’s lettuce (Claytonia perfoliata subsp. perfoliata), western sword fern (Polystichum munitum), redwood sorrel (Oxalis oregana), elk-clover (Aralia californica), Alaska onion grass (Melica subulata), fat Solomon’s seal (Smilacina racemosa), goldback fern (Pentagramma triangularis subsp. triangularis), windflower (Anemone oregana), Pacific starflower (Tridentis latifolia), western trillium (Trillium ovatum subsp. ovatum), slink pod (Scoliopus bigelovii), red clintonia (Clintonia andrewsiana), California hedge nettle (Stachys bullata), sedge sect. Ovales. Ovales (Carex aff. Carex giannonei complex, some inflorescences with lowermost spikelets compound-congested), nodding brome (Bromus vulgaris), slender hairgrass (Deschampsia elongata), Howell’s bluegrass (Poa howelli), vanilla grass (Hierochloe occidentalis = Anthoxanthum occidentale), small-flowered alum root (Heuchera microstachys), Torrey’s melic (Melica torreyana), white hawkweed (Hieracium albiflorum), wood rose (Rosa gymnocarpa), slender tarweed (Madia gracilis), canyon gooseberry (Ribes menziesii), Santa Cruz clover (Trifolium buckwesteri), few-flowered clover (Trifolium oliganthum), tomat clover (Trifolium wilddenesi), maiden clover (Trifolium microcephalum), common wood rush (Luzula comosa), small-flowered
trefoil (*Lotus micranthus*), blue blossom (*Ceanothus thyrsiflorus*), golden yarrow (*Eriophyllum confertiflorum var. confertiflorum*), coyote brush (*Baccharis pilularis*), California nutmeg (*Torreya californica*), sticky monkeyflower (*Mimulus aurANTIACS*), Fremont's star lily (*Toxicoscordion fremontii*), morning glory (*Calystegia purpura* subsp. *purpura*), Venus's looking-glass (*Triodanis biflora*), tall trisetum (*Trisetum canescens*), California polyody (*Polypodium californicum*),


Retracing our steps back to a point less than a mile in from Swanton Road, one periodically reactivated "slide area" overlooking Purdy Road, studied and observed for more than 40 years, accommodates common linanthus (*Linanthus androsaceus = Leptosiphon androsaceus*), with flowers ranging in color from white through deep lavender, favoring “vertical grasslands” which mask landslide debris and associated with a species of *Adela*, a genus of locally uncommon diurnal Fairy Moths (Family Adelidae), with gossamer antennae that are nearly double the body length in size; also concentrated within this narrow zone of vertical instability are naked-stemmed buckwheat (*Eriogonum nudum* sensu lato), woodland larkspur (*Delphinium patens subsp. patens*) with glabrous stems and inflorescence branches, pale plectritis (*Plectritis brachystemon*), hairy fringed (*Thysanocarpus curvipes*) with lower portion of stems hirsute, drying with maroon-brown blotches and cauleine leaves sagittate-clasping growing sympathetically with narrow-leaved fringed (*Thysanocarpus laciniatus*) displaying glabrous/glaucous lower stems and cauleine leaves lacking basal auricles extending across stem axis, the taxonomically perplexing gynodioecious form of white baby-blue-eyes (*Nemophila menziesii var. atomaria*), California hedge-parsley (*Yahea macrocarpum*), a former population of bent-flowered fiddleneck (*Amsinckia lanata*), an extremely rare CNPS-listed 1B cousin of our beloved hound’s tongue (*Cynoglossum grande*) but not seen in recent years, and a vegetatively robust, pale pink, large-flowered variant of farewell-to-spring (*Clarkia rubicunda*), looking more like the San Gregorio (San Mateo County) populations; playing ecological leapfrog along this section of Purdy Road, the pale-flowered form of Chinese houses (*Collinsia heterophylla*) and San Francisco collinsia (*Collinsia multicolor*) repeat their alternating status that conspicuously occurs along Swanton Road, culminating with an extensive population of *Collinsia heterophylla* occupying the aforementioned slide area and within view of Old Seaside School, a sheltered near-vertical portion of the lower Schoolhouse Ridge blanketed with a shimmering violet haze of *Collinsia multicolor*! Though small in stature, circa 40’ long x 25’ high, and seasonally rendered unstable by the vagaries of Winter rains, an amazing number of “natives”, both rare and common, co-exist
within the the fluid boundaries of the "Cattleguard Slide".....snowberry (Symphoricarpus albus var. laevigatus), displaying long after the shedding of its seasonal foliage, small white orbicular fruits, texturally simulating Christmas tree ornaments made out of styrofoam and coinciding with the advent of this almost universal holiday; achieving sub-shrub status and retaining their foliage during the "sunless" months, between Fall and Spring, coyote mint (Monardella villosa sensu lato) and golden yarrow (Eriophyllum confertiflorum var. confertiflorum) share textural contrast with five Pteridophytes with differing gestalts..... seasonally deciduous California maidenhair (Adiantum jordanii); the ubiquitous woodlandland understory duo, wood fern (Dryopteris argula) and western sword fern (Polystichum munitum); a confirmed alpinist, at least where rock outcroppings and tree trunks are concerned, Polypodium calirhiza (an allotetraploid derived from Polypodium californicum x Polypodium glycyrrhiza) which luxuriates on the bark of the overhanging California buckeyes (Aesculus californica) and goldback fern (Pentagramma triangularis subsp. triangularis), when in active growth and ready to shed its reproductive spores, more than willing to make an artistic impression on the back of an observer’s hand and during its dormant period, looking ever so much like a tortured piece of origami. When removed from the dessicating impacts of wind and sun, that the fractured mudstone experiences throughout the higher elevation "Chalks", it is amazing how much retained moisture this medium provides various taxa deep down within the riparian corridor proper..... both California saxifrage (Saxifraga californica = Micranthes californica) and broad-leaved lupine (Lupinus latifolius var. latifolius) maximize their growth potential, sharing this seasonally renewed micro-habitat with two aromatic members of the Carrot Family (Apiaceae): sweet cicely (Osmorhiza berteroii) and gambleweed (Sanicula crassicaulis)..... the former imparting a licorice scent when its foliage and schizocarps are crushed and the latter, an odor reminiscent of its European cousin, celery (Apium graveolens). Scattered across the ever-changing face of this biologically active unstable slope, are two native early "risers" or more appropriate in designation, "bloomers", and both belonging to the Mustard Family (Brassicaceae), known locally more for its weedy, non-native, members.... common milkmaids (Cardamine californica var. californica), standing out from all the local "crucifers" by possessing tuberous rhizomes and popweed (Cardamine oligosperma), daring the unsuspecting observer to massage its ripe siliques and get an explosive burst of seed in the face!!! A checklist of additional "native" taxa occurring on this slide-face, a virtual botanical feast for the eyes, includes: checker lily (Fritillaria affinis var. affinis), blue dicks ( Dichelostemma capitatum subsp. capitatum), coast tarweed (Madia sativa..... variable as to stature, stems clothed with gland-tipped trichomes from base and lacking cherry-syrup scent), California brome (Bromus carinatus var. carinatus), Torrey’s melic (Melica torreyana), Howell’s bluegrass (Poa howellii), Pacific fescue (Vulpia microstachys var. pauciflora = Festuca microstachys), varied-leaved collomia (Collomia heterophylla), California gilia (Gilia achilleifolia subsp. achilleifolia..... with some plants falling within the circumscription of subsp. multicaulis), Pacific pea (Lathyrus vestitus var. vestitus), miniature lupine (Lupinus bicolor), pinole clover (Trifolium bifidum var. decipiens), maiden clover (Trifolium microcephalum), few-flowered clover (Trifolium olyganthum), tomat clover (Trifolium willdenovii..... at least one off-white variant has been seasonally observed occuring within this landslide defined population), Hasse’s vetch (Vicia hassei), woodland star (Lithophragma affine), hill star (Lithophragma heterophyllum), common wood rush (Luzula comosa), California man root (Marah fabacea), miner’s lettuce (Claytonia perfoliata subsp. perfoliata), California blackberry (Rubus ursinus), yarrow (Achillea millefolium), Douglas-fir (Pseudotsuga menziesii var. menziesii), California coffeeberry (Frangula californica subsp. californica), small-flowered nemophila (Nemophila parviflora var. parviflora) and poison oak (Toxicodendron diversilobum).

Not extending below the confluences of Lair and Calf Gulches with Scotts Creek proper but
sharing and peripheral to the redwood understory, are the rare Hoffmann’s sanicle (Sanicula hoffmannii). On 03/17/2011, an isolated population of this rare sanicle was discovered growing in a mixed conifer/oak woodland, overlooking Scotts Creek between the Cookhouse Gulch and Mt. Cook Gulch drainages, the aptly named skink pod (Scoliopus bigelovii). An unusual lilioid with maroon mottled leaves and flowers smelling like dead fish, and the fetching but inodorous two-eyed-violet (Viola ocellata), one of five “native” species of violets found within the watershed. Growing roadside, between the south-west edge of Squirrel Flat and the cattleguard, both in ditches and on overhanging banks, several native “taxa” of interest present themselves: tree clover (Trifolium ciliatum), the sporatically encountered Chinese caps (Euphorbia crenulata), a surprise to the botanically uninitiated, being a visually low-keyed sister species of Mexico’s gift for the holidays, the poinsettia (Euphorbia pulcherrima), both legitimate members of a genus containing 1,500+ other species and taking top honors in the fragrance catagory, a long established plant of fat Solomon’s seal (Smilacina racemosa), surviving the recent holocaust and currently, (02/2010), initiating at least thirty new growths. An often overlooked and misdiagnosed species, lowland cudweed (Gnaphalium palustre), favors the margins of poorly drained areas with pooled water, sharing this preference with the near-endemic artist’s popcorn-flower (Plagiobothrys chorisianus sensu lato) and opting for more rapidly draining underpinings, two site specific taxa documented three decades ago for the area but not seen recently: leather fern (Polypodium scouleri) and tower mustard (Arabis glabra var. glabra = Turritis glabra). Retaining a foothold on the seasonally unstable road banks, several monocots make their presence felt, namely blue dicks (Dichelostemma capitatum subsp. capitatum) and foothill sedge (Carex tumulicola), while Elmer’s fescue (Festuca elmeri) and Howell’s bluegrass (Poa howellii) flourish, the former uncommon county-wide and the latter forming scattered populations which depending on the locale, can be highly variable as to stature. Following the 2009 fire and subsequent early Winter rains, the scorched slopes overlooking the lower portion of Purdy Road have brought forth some interesting ecological responses: two examples of the rare oracle oak (Quercus x morehus), both rendered null and void as far as aerial stems and foliage are concerned, are resprouting with a multiplicity of new growths: a solitary specimen of Fremont’s nemophila (Nemophila pulchella var. fremontii) or a “new” species related to this inner valley taxon, exploits the rosette pattern of growth along with several sympatric specimens of downy buttercup (Ranunculus hebecarpus); following the variations on a theme concept but raising the complexity threshold, the 1-2 pinnately lobed horizontally positioned basal leaves of the California gilia (Gilia achilleifolia sensu lato), rival the Irish-lace doileys of yesteryear and perhaps due to the residual ash or lack of competition, are putting on a vigorous growth display!

Note: The lone specimen of Nemophila aff. pulchella var. fremontii observed in 2010, has reseeded itself and as of 04/13/2011, a small population exists on the west-facing roadbank not far from the burnt but resprouted Quercus x morehus. During the month of May (05/2001), seed was collected from this recently discovered population and deposited at the UCSC Arboretum to be raised out and studied.

Note: The steep west-facing slopes making up the lower part of the Schoolhouse Ridge Complex (down to the Purdy Road) and directly overlooking Squirrel Flat (Swanton Pacific Ranch/CalPoly holdings), were severely impacted by the 2009 Lockheed Fire and contained several taxa of both special interest and documented rarity: here is a post-fire (04-07/2010) survey of the area in question and the native species (arranged by familial relationships) present: Lathyrus vestitus sensu lato, Lotus micranthus, Lotus wrangelianus, Lupinus bicolor sensu lato, Lupinus hirsutissimus, Lupinus latifolius var. latifolius, Lupinus
and calyces viniferous, corollas white with bases and apices maroon and corollas an opalescent pinkish bronze, calyces green with viniferous apices and corollas pale pink..... (5) pedicels bronze with a viniferous suffusion and darker apices, and corollas pale pink..... (4) pedicels greenish-corollas off-suffusion..... (2) pedicels bronze, calcyes green with bases and apices maroon and corollas pale pink..... (1) pedicels bronze, calyces green with bases and corollas pale pink..... (9) pedicels green, calyces

Note: Margining Purdy Road, between the cattleguard/landslide area and Swanton Road, Claytonia perfoliata subsp. perfoliata exhibits a high degree of variability..... in regards to stature, foliar and inflorescence gestalt, calyces pigmentation/patterning and corolla coloring. Here are nine examples of these often sympatric but self-replicating micro-populations: (1) pedicels green, calyces concolored green, corollas off-white with a pinkish suffusion..... (2) pedicels bronze, calyces green with a bronze suffusion and darker apices, corollas off-white tinted with a pinkish suffusion..... (3) pedicels viniferous, calyces bronze with a viniferous suffusion and darker apices, and corollas pale pink..... (4) pedicels greenish-bronze, calyces green with viniferous apices and corollas pale pink..... (5) pedicels bronze-maroon, calyces bronze-maroon with pink apices and corollas a pearlescent white..... (6) pedicels green, calyces green and corollas a pearlescent white..... (7) pedicels bronze, calyces green with bases and apices maroon and corollas an opalescent pinkish-white..... (8) pedicels and calyces viniferous, corollas white with a pale pink overlay..... (9) pedicels green, calyces

114
green with white apices, corollas white. The basal rosette of leaves and the connate-perfoliate disc subtending the inflorescences also show a plasticity as to shape and color, from linear to linear with spatulate or rhomboidal apices and ranging in color, from an unblemished grass green to being overlaid with a glaucous bloom.

Note: Along Purdy Road, between the mouth of Schoolhouse Gulch and the cattleguard (which separates CalPoly/Swanton Pacific Ranch’s property from Big Creek Lumber’s holdings), two inflorescence extremes of Luzula comosa occur: (1) on a northwest facing bank overlooking the Purdy Road and directly across from Squirrel Flat, a localized population with inflorescences consisting of a central glomerate head on an abbreviated stalk, overtopped by 4-6 smaller capitulate clusters comprising 2-10 flowers each, these on elongate filiform stalks/peduncles subtended by foliaceous bracts, giving the whole affair the look of a cat-of-nine-tails cum modified umbel and (2) growing on the slide area adjacent to the cattleguard, a form while varying in stature, occurs throughout the watershed, namely a densely congested inflorescence of greatly reduced branches subtended and overtopped by foliaceous bracts. Both forms have leaf and bract bases which are conspicuously clothed with ciliate hairs and to a lesser extent can also be found margining the leaves. While both forms are morphologically stable in their respective habitats, it might prove interesting under controlled conditions, to see (a) if they are interfertile, (b) if they can be selfed, are they homozygous for their respective inflorescence gestalts, (c) on a molecular level, are they the same species or two related taxa and (d) map the watershed for all known occurrences and see if there are any correlations between habitat and morphology?

Further inland along Purdy Road, another near vertical area of concentrated biodiversity remains hidden to all but the most intrepid botanist..... starting at the cattleguard and using the dirt road as the base line for our botanical sleuthing for the next 250 meters or so, one encounters directly upslope to the top of the ridge, a series of “vertical grasslands” framed by conifer/oak woodlands and exposed rock outcroppings, which act as mini-refugia for a number of uncommon taxa. Although forming a continuous zone of steeply inclined slopes, beginning at the mouth of Schoolhouse gulch and extending along Purdy Road to a “nameless drainage system” just south of Calf Gulch (aka the Scotts Creek side of Schoolhouse Ridge Complex), the native species distribution within this relatively short distance is anything but predictable..... here is an partial inventory of the rare and common “native” taxa which were observed just within this fire scarred area during the month of May/2010: Dryopteris arguta, Polystichum munitum..... Adiantum jordani, Pellaea andromedifolia, Pentagramma triangularis subsp. triangularis..... Pteridium aquilinum var. pubescens..... Bromus carinatus var. carinatus, Elymus glaucus subsp. glaucus, Festuca elmeri, Melica californica, Melica subulata, Melica torreyana, Trisetum canescens sensu lato..... Toxicodendron diversilobum..... Pinus attenuata, Pinus radiata (interface of ancient hybrid swarm between knobcone and Monterey pines..... initial gene flow unidirectional, from knobcone into Monterey, with branch patterns, needle and ovulate cone gestalts strongly influenced by knobcone but alignment and shape of mucro on knobcone’s umbo, recessive), Pseudotsuga menziesii var. menziesii..... Euphorbia crenulata, Euphorbia spathulata..... Lathyrus vestitus sensu lato (variable as to foliar indument, with some plants tending towards subsp. puberulus and others approaching subsp. bolanderi..... throughout the watershed, populations of this taxon vary from being sub-glabrous to having foliage clothed with a cinerous indument and also exhibit a high degree of variability as to the width [1-2mm] of the wings margining the stems and peduncles), Lupinus latifolius var. latifolius, Lupinus nanus, Trifolium bifidum var.
decipiens (some plants observed, within area under discussion, displaying narrow shallowly-notched leaflets, referable to var. bifidum), Trifolium ciliolatum, Trifolium gracilentum var. gracilentum, Trifolium microcephalum, Trifolium microdon, Trifolium oliganthum, Trifolium willdenovii, Vicia hassei, Aesculus californica, Torreya californica, Campanula prenanthoides = Asyuncum prenanthoides (discovered on 07/14/2011, while revisiting area), Monardella villosa sensu lato, Satureja douglasii, Stachys bulatata, Smilacina stellata, Corylus cornuta var. californica, Scrophularia californica subsp. californica, Galium californicum subsp. californicum, Galium triflorum, Sequoia sempervirens, Cynoglossum grande, Phacelia miltovifolia, Nemophila menziesii var. atomaria (scattered population displaying flowers variable as to both coloration and patterning), Nemophila parviflora var. parviflora, Achillea millefolium, Agoseris grandiflora, Anisocarpus madioides, Artemisia douglasiana, Cirsium brevistulum, Cirsium occidentale var. venustum, Eriophyllum confertiflorum var. confertiflorum, Eurybia radulina, Layia gaillardioides (extremely rare in county and within Scotts Creek Watershed, restricted to a highly localized section of "vertical grassland" overlooking Purdy Road, herbage redolent of a citrus-based fragrance and ray-flowers concolored yellow, with two color forms present: (1) a bright umbellished concolored lemon yellow, which represents about 97% of the total population and (2) a pale yellow that appears seasonally but represents 2-3% or less), Madia gracilis (throughout watershed, extremely variable as to overall gestalt and biochemical signature, possibly the result of past hybridization with Madia exigua and Madia sativa), Microseris decipiens, Pseudognaphalium californicum, Pseudognaphalium stramineum, Rausidesqui californica, Symphyotrichum chilense, Dickostemma capitatum subsp. capitatum, Trillium ovatum, Marah fabaceus, Daucus pusillus, Osmorhiza berteroi, Sanicula crassicaulis, Heteromeles arbutifolia, Oemleria cerasiformis, Rubus ursinus, Quercus agrifolia var. agrifolia, Quercus parvula var. shrevei, Umbellularia californica, Frigittalaria affinis var. affinis, Clarkia rubicunda, Epilobium ciliatum, aff. subsp. watsonii (inflorescence dense, leafy and glandular, flowers dark pink with petals 7+ mm in length), Crassula connata, Dudleya caespitosa (colonies growing on west facing exposed near-vertical bed-planes, may be furthest inland for watershed and genetically isolated from populations on immediate coastal headlands, interior populations, in the Scotts, Mill, Big and Little Creek sub-watersheds, have paler more elongate yellow corollas, which differ from the darker, more intensely pigmented "stouter" corollas of their coastal brethren), Hesperocnide tenella, Claytonia perfoliata subsp. perfoliata, Eschscholzia californica, Gilia achilleifolia subsp. multicaulis, Leptosiphon androsaceus, Eriogonum nudum, Pterostegia drymarioides, Mimulus aurantiacus, Plectritis brachystemon (fruit with keeled back), Collinsia heterophylla (variable as to flower color but generally off-white to pale lilac with contrasting veinal patterning), Frangula californica subsp. californica, Stellaria nitens (since the local populations are few and isolated from each other and the populations appear to be self-pollinating, are there any measurable genetic differences between them?), Sambucus nigra subsp. canadensis, Lonicera hispidula, Cardamine oligosperma, Thysanocarpus lacinatus, and Delphinium patens.

Note: A recently discovered (2011) population of Dudleya caespitosa further inland, occupying an exposed, weathered and save for some patches of moss, bare mudstone slope, between the upper Seymore Field and Mill Creek, has been documented by digital images, seeds and living material, which were entrusted to the UCSC Arboretum for study.

Separating the Mill Creek and Scotts Creek drainages from Swanton Road to the summit of the Seymore Hill, and extending up into the "Chalks", with mudstone so bleached by the elements that from a distance it simulates snow, the Schoolhouse Ridge complex is an extraordinarily rich series of benched grasslands, mixed hardwood/coniferous woodlands, deeply incised, often
branched, gulches and chaparral, both horizontal and vertical in inclination. Within this one geomorphically defined area, a lifetime could be spent just studying (1) the widespread burl-forming manzanita (*Arctostaphylos crustacea*, sensu lato) and its evolutionary origins, (2) the role of hybridization, both ancient and modern, within the oak (*Quercus*) subgenus Erythrobalanus, (3) if the isolated populations of sea lettuce (*Dudleya caespitosa*), with their narrow, elongate, pale-yellow corollas are genetically distinct from the coastal bluff populations, (4) the role of fire, both ancient and modern, in the broaching of reproductive isolating mechanisms within the sympatric populations of knobcone pine (*Pinus attenuata*) and Monterey pine (*Pinus radiata*) and the subsequent gene flow patterns (outcrossing versus selfing, coupled with the prevailing wind patterns as pollen delivery vectors) with their corresponding changes in the hybrid population’s gross morphology, and measured in part, by ovulate cone gestalt, (5) the impact of herbivory in the shrinking/expansion of the benched grasslands and how this correlates with the associated species diversity, (6) what has been the net result, ecologically, with the current policies of fire suppression, the 2009 Lockheed Fire and the balance between beneficial and pathogenic fungi/bacteria plus the rampant colonization of invasive exotics? and (7) investigate the post 2009 Lockheed Fire impact on local populations of pine grass (*Calamagrostis rubescens*) and what percentage of the inflorescences have yielded fertile caryopsis and with the clonally established parental source regenerating, how successful is the recruitment of new and potentially competitive seedlings?

Whether one ventures up or down the access trail along the Mill Creek side of the ridge, the panorama of this ecological journey is a metaphorical overview, an interlocking chain of biological events that stretches from the bone-chilling ocean’s edge to the desiccated ridges that reference the top of the world for the Scotts Creek Watershed. Passing by mudstone so weathered that it has been reduced to powder-like fragments, these artfully reconfigured into miniature dunes, reminiscent of a Zen garden, one becomes immediately aware of one genus of related taxa, besides the knobcone pine (*Pinus attenuata*) and chamise (*Adenostema fasciculatum*), that defines this harsh and unyielding environment, the pioneering manzanitas: while Santa Cruz manzanita (*Arctostaphylos andersonii*), sensitive manzanita (*Arctostaphylos nummularia* = *A. sensitiva*), endemic Schreiber’s manzanita (*Arctostaphylos glutinosa*), and a recently discovered localized species (aff. *Arctostaphylos manzanita* subsp. *laevigata* = *Arctostaphylos ohloneana* M.C.Vasey & V.T.Parker), reside for the most part, in the upper reaches of the watershed, their genetic fingerprints manifest themselves throughout the extensive range of the burl-forming manzanita (*Arctostaphylos crustacea*, sensu lato). This phoenix-like fire-regenerative taxon, a genetic sponge of such complexity, that no two specimens are alike, as to stature, foliar gestalt/alignment and inflorescence configuration, shares habitat and longevity status with the coast redwood (*Sequoia sempervirens*), seemingly out of place in this unforgiving but intensely compelling arena, often golden in hue and greatly reduced in stature. Anomalous manifestations occur, even within these populations of extreme morphological diversity, which immediately stand out as discordant elements. **One such example, tentatively diagnosed by one reviewer as *Arctostaphylos tomentosa* [crustacea] subsp. *subcordata*, a Channel Islands taxon, distinguished itself with tannish-brown smooth branches, non-tinted white corollas, scabridulous adaxial foliar surfaces, lacking stomata, which could pass for high-grade sandpaper and all vegetative parts densely glandular-bristly. This iconoclastic manzanita also behaved in an unexpected fashion when transplanted to a controlled environment, by giving its broadly ovate-orbicular leaves cordate bases with conspicuous auriculations!** (note: on 08/15/10, while revisiting this portion of the Schoolhouse Ridge, the aforementioned disjunct population of *Arctostaphylos crustacea* subsp. *subcordata*, after suffering major damage from
the 2009 Lockheed Fire, was observed vigorously resprouting from basal burls. Less than five meters away, another distinctive burl-former circa half a meter in height and surrounded by overtopping relatives demands closer observation, its manifest differentiae being stature and attendant gestalt, compact inflorescences and foliar presentation..... the latter of particular interest, with leaf outline oblanceolate, apiculate, adaxial surface with impressed reticulate venation and mature petioles retrorse (bent downward). One final manzanita note..... further down the Mill Creek aspect of the ridge, on either side of the access trail but out of direct view, are two singular occurrences: (a) near the edge of the ridge overlooking the Mill Creek riparian corridor, an isolated population of Schreiber’s manzanita (Arctostaphylos glutinosa) exists with one member reflecting its Santa Cruz manzanita (Arctostaphylos andersonii) parentage with glabrous, glaucous, thinner in texture, leaves with fewer stomata on the adaxial surface and (b) positioned circa five meters into the oak woodland/chaparral transition, an arboreal example of the local Arctostaphylos crustacea complex, approaching six meters in height, occasionally producing auriculate leaves with new growth and inflorescences glandular-pubescent—height, auriculations and glandulosity an inheritance from the Santa Cruz manzanita (Arctostaphylos andersonii)? (note: while doing a post-fire review (08/15/10) of this satellite Arctostaphylos glutinosa population, some seedling recruitment is beginning to take place, with two examples observes and studied..... again like their counterparts higher up in the "Chalks", during the seedling stage, conspicuous lateral branching takes place, just above ground level, leaves elliptic/oblanceolate and irregularly denticulate on upper half, cinerous indument over glaucous coating, stomata isofacial, and stems with eglandular, gland-tipped and nascent dendritic trichomes..... also discovered concurrent with studying the "arctos", was a vigorous flowering specimen of Pseudognaphalium beneolens, new to this locale but found in the upper parts of the watershed ). Working backwards, from top to bottom, the paucity of soil, intense exposure to sun and wind, and rapidly draining fractured substrate, places severe restrictions on the growth potential of trees and woody shrubs, which luxuriate in the watershed’s canyon bottoms and soil-retentive, often benched, slopes: behaving as shrubs, scattered specimens of golden chinquapin (Chrysolepis chrysophylla var. minor), act as understory associates of distantly related maul oaks (Quercus chrysolepis) subgenus Protobalanus, lichen-festooned with reduced thickened leaves contrasting with the production of outsized acorns, also sharing its arid aerie with what purports to be chaparral live-oak (Quercus wislizeni var. frutescens), displaying small, holly-like leaves and possibly a chaparral ecotype of forest live-oak (Quercus parvula var. shrevei), with foliar margins running the gamut from entire through undulate-spinescent. Adding spice to the oak stew, scattered specimens of oracle oak (Quercus x morehus) and in the upper reaches of Calf Gulch, at least one mature example of Quercus x chasei, have been observed!

A tantalizing overview of the species diversity found within this geomorphically complex slice of the Scotts Creek Watershed is as follows: padre’s shooting star (Dodecatheon clevelandii subsp. sanctarum), a genus highly vulnerable to overgrazing, its shallowly embedded rootstocks easily ripped from their moorings and potential for seed production lost; Dannie’s skullcap (Scutellaria tuberosa), an odorless member of the Mint Family (Lamiaceae), with rootstocks terminating in tubers, often found growing under chamise and manzanitas, with bilaterally symmetrical pale blue flowers contrasting with the green or bronze-tinted foliage; A monocot with an attitude, Fremont’s star lily or chaparral deathcamas (Zigadenus fremontii = Toxicoscordion fremontii), with all plant parts toxic, particularly the bulbs, the principal toxin being zygadenine, an alkaloid, favoring brush-covered rocky slopes; twining snapdragon (Antirrhinum kelloggii), a unique native "scroph" with violet-purple flowers on elongate pedicels, which readily attach themselves by
coiling as they ascend up through the surrounding shrubbery; growing within the distinct “vertical grassland” habitat, either on the partially colonized mudstone debris or appearing to defy gravity securing the near-vertical exposed mudstone “in place”, such species of interest as Douglas’s sandwort (Minuartia douglasii), clustered broomrape (Orobanche fasciculata), bird’s-foot fern ( Pellaea mucronata var. mucronata), dwarf athyusan (Athyusan pusillus), few-flowered clover (Trifolium oliganthum) and grassland gilia (Gilia clivorum) make themselves at home; found along the access trail’s margin, either under or emerging through the canopy of the drought-resistant thickets, one can find bush poppy (Dendromecon rigida), pipetems ( Clematis lasianthi), western pearlwort ( Sagina decumbens subsp. occidentalis), pitcher sage (Lepechinia calycina), California chicory (Rafinesquia californica), rare woodland layia ( Layia gaillardioides) with concolor yellow rays and tall layia ( Layia hieracioides) with a somewhat different chemical signature from its coastal scrub counterparts, yerba santa ( Eriodictyon californicum) and rush trefoil ( Lotus juncus var. juncus = Acnispon juncus var. juncus)..... growing on the exposed ridge-top overlooking Mill Creek, the violet pigmented flowers of blue toadflax ( Linaria canadensis) are awash in a sea of mauve, generously provided by a concentrated population of blue dicks ( Dichelostemma capitatum subsp. capitatum). Some of the less common species found within this area under discussion, often occur as small isolated colonies, disjunct in range but favoring analogous sites within the Schoolhouse Ridge environs: some examples are wooly malacothrix ( Malacothrix floccifera) and stinging lupine ( Lupinus hirsutissimus), found together or growing separately on the bare, exposed, fragmented mudstone; where the densely-wooded slopes transition up into the fingers of chaparral, locally rare sleepy catchfly ( Silene antirrhina) has been documented; favoring the oak understory with its complex admixture of coniferous, hardwood and deciduous arboreal associates, one can find three orchid species, dense-flowered rein orchid ( Piperia elongata), documented during the late 1970s and revisited in pre-fire 2009, growing on the west-facing slopes overlooking “Squirrel Flat” sharing habitat with sister species, royal rein orchid ( Piperia transversa) and deep within the converging drainages that define the lower portion of Schoolhouse Gulch, striped coralroot ( Corallorhiza striata), variable as to coloration with a rare flavidic form, also observed and photographed in the late 1970s. As Schoolhouse Gulch intersects the Purdy Road, an extensive population of bracted popcorn-flower ( Plagiobothrys bracteatus), prostrate in mode of growth, occupies a fan-like section of the roadbed. Documented for this general area but not seen by the author of this text, Plagiobothrys hispidulus/accession number UCR 67980/Kiel # 20636, if not mis-identified, would add a new species to the watershed! Half-hidden in the benched grasslands that constitute the lower section of the ridge-complex, dwarf brodiaea ( Brodiaea terestreis subsp. terestreis), our visual/aesthetic equivalent of the European crocus, co-exists with the cinnamon-scented owl’s clover ( Castilleja densiflora subsp. densiflora) and a species uncommon countywide, caraway-leaved lomatium ( Lomatium carufolium var. carufolium). Perhaps most remarkable in the way of concentrated rarity, is the distribution pattern found within the lower portion of the Schoolhouse Ridge complex for the rare Santa Cruz microseris ( Microseris decipiens = Stebbinsoseris decipiens)..... six separate populations exist: the largest, which at one time contained in excess of 1,000 plants, overlooks Scotts Creek/ Squirrel Flat on a very steep “vertical grassland” and shares this botanically rich hillside with related silver puffs ( Uropappus lindleyi), woolly malacothrix ( Malacothrix floccifera) and California chicory ( Rafinesquia californica)..... facing southeast also on a “vertical grassland” and looking down into the Mill Creek drainage, is a smaller population of circa 100-150 plants; on the benched grassland which comprises the backbone of the upper Pozzi Meadow, a concentrated population of 150-200 plants occupy the transitional grassland/woodland zone, sharing habitat with one parental species, coast microseris ( Microseris bigelovii)..... segueing back to the Scotts Creek side, Beehive Hill, midway between the entrance to Purdy Road and the mouth of Schoolhouse Gulch,
maintains a small but stable population (circa 50-60 plants) and sharing a habitat of fractured and fragmented mudstone with a long-established colony of sea lettuce (Udela caespitosa) and a uncommon constituent of the Phlox Family, grassland gilia (Gilia divorum)...most recently, (08/2010), a small colony was discovered growing on a oak-canioned slope comprised mainly of mudstone debris, which overlooks the Harvey Field and Mill Creek Bridge... while saving the best for last, flanking the incipient portion of a gulch which drains the upper Pozzi meadow and empties into Mill Creek, are two opposite facing steep grassy slopes, studded with fractured mudstone fragments and acting as a "magnet," attracting not only Stebbinsoseris decipiens, but three related members of the Cichorieae... mountain dandelion (Agoseris grandiflora), annual agoseris (Agoseris heterophylla) and coast microseris (Microseris bigelovii)!! The 2009 Lockheed Fire moved through all six Stebbinsoseris decipiens populations and it will be of considerable interest to see how fragmented the post-fire germination of this unique allotetraploid near-endemic will be... comprehensive achene collections have been made for all six populations and their sympatric relatives and were deposited with the UCSC Arboretum.

Note: One native species that, post fire (2009/2010), has asserted itself to the point of becoming a dominant understory "germinator", is the native morning glory (Calystegia purpurata subsp. purpurata). In some areas, particularly within the oak/conifer woodlands that define much of the Schoolhouse Ridge complex, solid sheets of seedlings define the understory!!!

Note: The lower portion of Schoolhouse Ridge consists of two benches (Upper and Lower Pozzi Meadows), elevationally 200(+) feet apart, which possibly are unmapped terrace remnants whose eastwardly aligned halves, drain into Mill Creek via two "gulchlets"... the upper one, deep and steep, demonstrating the long term erosive power of water on mudstone, while the lower one, is abbreviated, shallower and drains directly into the Harvey Field. The following, is a botanical overview of the Mill Creek side of this ecological equation (which bore the full brunt of the 2009 Lockheed Fire), with the documented native taxa arranged by family: Clarkia purpurea subsp. quadrirenulera (two separate populations, each with its own distinctive floral color/patterning), Clarkia rubicunda..... Helianthemum scoparium..... Daucus pusillus, Heracleum maximum, Osmorhiza berteroi, Sanicula arctopoides, Sanicula bipinnatifida, Sanicula crassicaulis, Sanicula gianonei, pro.sp.nov...... Marah fabaceus..... Adenostema fasciculatum, Fragaria vesca, Holodiscus discolor, Rubus parviflorus, Rubus ursinus..... Antirrhinum kelloggii..... Toxicoscordion fremontii..... Cardamine californica var. californica, Cardamine oligosperma, Caulanthus lasiophyllus (siliques reflexed)..... Toxicodendron diversilobum..... Ceanothus thyrsiflorus, Frangula californica subsp. californica..... Achillea millefolium, Agoseris grandiflora, Anisocarpus madioides, Baccharis pilularis, Artemisia douglasiana, Cirsium brevistylum, Corethrogynoe filaginifolia, Eurybia radulina, Gamochaeta ustulata, Madia gracilis (stems generally slender with narrow leaves, glandular in upper half and possessing a chemical signature akin to that of cherry syrup..... a trait shared with Madia exigua, inflorescences variable, racemose or paniculate, with lowest branches not overtopping terminal), Madia sativa/capitata (plants often robust, densely glandular from base to apex, inflorescences consisting of cymose glomerules or open and paniculate, with differing chemical signatures present), Microseris decipiens, Pseudognaphaliun californicum, Pseudognaphaliun aff. gianonei, pro.sp.nov., Pseudognaphaliun ramosissimum, Pseudognaphaliun stramineum, Rafinesquia californica, Solidago velutina subsp. californica, Symphyotrichum chilense..... Lathyrus estivus var. estivus (variable as to foliar indument and wing-like margins of stems), Lotus micranthus, Lotus salsuginosus var. salsuginosus, Lotus scoparius var. scoparius, Lotus strigosus, Lotus urangelianus, Lupinus nanus, Trifolium barberi var. barberi var, Trifolium bifidum var.
decipiens, Trifolium bifidum var. bifidum, Trifolium buckwesterorum (area where type specimen for Santa Cruz clover was collected), Trifolium ciliaturn, Trifolium gracilentum var. gracilentum, Trifolium microcephalum, Trifolium microdon, Trifolium willdenovii, Vicia americana var. americana, Vicia hassii..... Pinus radiata (subpopulation reflecting intermediacy of key character traits of both Pinus attenuata and Pinus radiata and perhaps closer in overall gestalt to original hybrid population rather than specimens on the coastal headlands..... which are the byproduct of a highly reticulate pattern of selfing, backcrossing and isolation from direct reintroduction of Pinus attenuata genes), Pseudotsuga menziesii var. menziesii..... Umbellularia californica..... Arbutus menziesii, Arctostaphylos crustacea sensu lato..... Cardamine oligosperma, Caulanthus lasiophyllus..... Cryptantha clevelandii, Cryptantha micromeres, Emmenanthe penduliflora, Nemophila parviflora..... Agrostis hallii/palens intergrades, Bromus carinatus var. carinatus, Bromus vulgaris, Danthonia californica sensu lato, Elymus glaucus subsp. glaucus, Festuca occidentalis, Festuca subuliflora, Melica californica, Melica subulata, Melica torreyana, Nassella pulchra, Poa howellii, Vulpia octoflora var. octoflora..... Eschscholzia californica..... Quercus agrifolia var. agrifolia..... Monardella villosa sensu lato (Schoolhouse Ridge is home to a complex assemblage of forms, which range from Monardella villosa subsp. villosa thru Monardella villosa subsp. franciscana), Satureja douglasii, Scutellaria tuberosa, Stachys bullata, Stachys rigida sensu lato (where both species form interdigitating populations, there appears to be gene exchange/flowbetween the two, with some plants showing intermediacy in chemical signatures, folial gestalt, positioning of calyx/corolla with respect to inflorescence axis, corolla coloration and veinal patterning, alignment of internal ring of hairs in corolla tube and expression of external saccate base of corolla..... Juncus bufonius sensu lato, Juncus patens..... Dicholestemma capitatum var. capitatum..... Calandrinia breviri, Claytonia perfoliata subsp. perfoliata..... Verbena lasiostachys var. lasiostachys..... Veronica serpyllifolia subsp. humifusa..... Euphorbia crenulata..... Sequoia sempervirens..... Aesculus californica..... Acer macrophyllum..... Galium californicum subsp. californicum, Galium porrigenus var. porrigen, Galium triflorum..... Hesperocnide tenella, Urtica dioica subsp. gracilis, Urtica dioica subsp. holosericea (populations along Mill Creek riparian corridor/lower Schoolhouse ridge interface, are variable as to ratio of stinging versus non-stinging trichomes on stems and leaves..... Alnus rubra..... Sambucus racemosa var. racemosa..... Calystegia purpurata subsp. purpurata..... Navarretia squarrosa..... Scrophularia californica subsp. californica..... Lonicera hispidula..... Dudleya caespitosa..... Mimulus aurantiacus..... Chlorogalum pomeridianum var. pomeridianum..... Elecrtritis brachystemon (both winged and wingless fruit populations present, but not mixed)...... Castilleja densiflora subsp. densiflora (yellow pouch, lilac-purple gaela, off-white bract tips)..... Actaea rubra..... Adiantum jordani..... Dryopteris arguta, Polystichum munitum..... Pteridium aquilinum var. pubescens..... Polypodium calirhiza (lichophyte, lowest sets pinna shorter than succeeding ones)..... Epilobium ciliatum sensu lato (within this area under discussion, forms which can be assigned to subsp. ciliatum and subsp. watsonii, occur) and Sisyrinchium bellum.

Doing a post-fire vegetation response analysis on the near-vertical Beehive Hill mini-refugium (03/10), has resulted in the following “native” taxa being documented for the burned area, which begins along the inner edge of Purdy Road and extends upward to a narrow, west-facing grassland extension of the Upper Pozzi Meadow..... flanked on the north by the mouth of Schoolhouse Gulch and to the south by a nameless “micro” drainage system that with time, could evolve into a small gulch. Although restricted in size, at least four specific habitat subsets exist..... central to and readily seen from a distance, is the “vertical grassland” component, which most likely is the byproduct of an ancient landslide and is bounded at its base by a zone of fire-responsive, deciduous and evergreen shrubs, flanked by mixed coniferous/oak woodlands,
overlooked by an exposed terrace face which is capped with a gently sloping meadow: *Pinus radiata, Sequoia sempervirens, Smilacina stellata, Calystegia purpurata subsp. purpurata, Lathyrus vestitus sensu lato, Oenothera cerasiformis, Pentaphragma triangularis subsp. triangularis, Nemophila parviflora var. parviflora, Quercus parvula var. shrevei, Sanicula crassicaulis, Anisocarpus madioides, Drupoteris arguta, Marah fabaceus, Adiantum jordanii, Rubus ursinus, Umbellularia californica, Baccharis pilularis, Iris douglasiana, Satureja douglasii, Toxicodendron diversilobum, Fragaria vesca, Lonicera hispidula, Scrophularia californica subsp. californica, Pteridium aquilinum var. pubescens, Frangula californica subsp. californica, Galium porrigens var. porrigens, Artemisia douglasiana, Sambucus nigra subsp. canadensis, Anaphalis margaritacea, Galium californicum subsp. californicum, Oxalis corniculata subsp. pilosa, Stachys bulbata, Claytonia perfoliata, Leptosiphon androsaceus, Nemophila menziesii sensu lato, Pseudotsuga menziesii var. menziesii, Agoseris grandiflora, Lupinus nanus, Madia gracilis, Osmorhiza berteroii, Aesculus californica, Clarkia rubicunda, Achillea millefolium, Eschscholzia californica, Lotus wrangelianus, Trifolium ciliatum, Dudleya caespitosa, Thysanocarpus aff. lacinatus (stems glabrous and glaucous, leaves not conspicuously sagitate-auriculate and extending beyond other side of stem, style conspicuously exerted), Cuscuta connata, Gilia clivorum, Dichlostemma capitatum subsp. capitatum, Polypodium aff. californicum (growing as lithophyte), Chlorogalum pomeridianum var. pomeridianum, Phacelia distans., Festuca elmeri, Melica torreyana, Calandrinia ciliata, Sanicula arctopoides, Ranunculus californicus, Plectritis aff. brachystemon, Lomatium carriofolium var. carriofolium, Solidago velutina subsp. californica, Bromus carinatus, Trisetum canescens, Camissonia ovata = Taraxia ovata, Oxalis pilosa, Elymus glaucus subsp. glaucus, Poa howellii and Quercus x moreus.

While the total number of native plant species for the watershed is not and may never be known, what is remarkable from a biodiversity perspective, is that wherever one decides to take a brief stroll or extended walk, an impressive cross-section of California’s native flora will be encountered. This is amply demonstrated by the following list of native species found along a relatively short section of Purdy Road (which was substantially burned during the 2009 Lockheed Fire), between the Swanton Road entrance up to the cattleguard and observed without leaving the road. On 04/27/2011, over the course of two hours, the following taxa were documented as encountered, from the entrance gate up to the Swanton Pacific Ranch/Big Creek Lumber property boundary and do not represent a final total for the area traversed..... California man root (*Marah fabaceus*), California blackberry (*Rubus ursinus*), forest live-oak (*Quercus parvula var. shrevei*), blue elderberry (*Sambucus nigra subsp. caerulea*), miner's lettuce (*Claytonia perfoliata subsp. perfoliata*.... extremely variable as to stature, foliar gestalt, calyx color/patterning and corolla pigmentation), coast nettle (*Urтика dioica subsp. gracilis*.... variable as to ratio of stinging to non-stinging trichomes, cinerous pubescence on stems and overall shape and color of foliage, with some populations tending towards *subsp. holosericea*), California bay laurel (*Umbellularia californica*), western sword fern (*Polystichum munitum*), California hedge nettle (*Stachys bulbata*), bracken (*Pteridium aquilinum var. pubescens*), poison oak (*Toxicodendron diversilobum*), California nutmeg (*Torreya californica*), California buckeye
(Aesculus californica), sweet-scented bedstraw (Galium triflorum), California figwort (Scrophularia californica), wood fern (Dryopteris arguta), California coffeeberry (Frangula californica subsp. californica), Pacific pea (Lathyrus vestitus sensu lato),... variable as to angulation/wing margins of stems, foliar indument and flower color. This species was a rapid colonizer of woodland understory and steep brush covered slopes, post 2009 Lockheed Fire), oso berry (Oemleria cerasiformis), coast redwood (Sequoia sempervirens), California brome (Bromus carinatus),... complex and variable, with some forms 1-1.5 meters in height and possessing stem leaves 2.5-3 cm in diameter), arroyo willow (Salix lasioplepis), toad rush (Juncus bufonius), American winter cress (Barbarea orthoceras), red alder (Alnus rubra), Douglas-fir (Pseudotsuga menziesii var. menziesii), oracle oak (Quercus x morehus),... two specimens exist along this section of Purdy Road, both lost most if not all of their aerial stems in the 2009 fire and both have resprouted), Monterey pine (Pinus radiata),... complex and morphologically variable hybrid swarm, derived from hybridization with Pinus attenuata), common rush (Juncus patens), willow herb (Epilobium ciliatum subsp. ciliatum), San Francisco collinsia (Collinsia multicolor),... extensive population of this rare taxon has rebounded after hillside habitat was completely burned in 2009 fire), giant trillium (Trillium chloropetalum), yerba buena (Clinopodium douglasii), small-flowered nemophila (Nemophila parviflora var. parviflora), hairy honeysuckle (Lonicera hispida), mugwort (Artemisia douglasiana), Torrey’s melic (Melica torreyana), broad-leaved lupine (Lupinus latifolius var. latifolius), blue blossom (Ceanothus thyrsiflorus), morning glory (Calystegia purpurata subsp. purpurata), coyote brush (Baccharis pilularis subsp. consanguinea), skunkweed (Navarretia squarrosa), Indian thistle (Cirsium brevistylum), coyote mint (Monardella villosa sensu lato), California cudweed (Pseudognaphalium californicum), slim Solonon’s seal (Maianthemum stellatum), cow-parsnip (Heracleum maximum), blue witch (Solanium umbelliferum), Douglas’s iris (Iris douglasiana), slough sedge (Carex obnupta), thimbleberry (Rubus parviflorus), nested polypody (Polypodium calirhiza), lady fern (Athyrium filix-femina var. cyclusorum), giant horsetail (Equisetum telmateia subsp. brauni), gambleweed (Sanicula crassicaulis), woolly marbles (Psilocarphus tenellus), bracted popcorn-flower (Plagiobothrys bracteatus), California buttercup (Ranunculus californicus var. californicus), Harford’s sedge (Carex harfordii),... aff, Carex gianonei, pro.sp. nov., not producing compound-congested lower spikelets when observed), creek dogwood (Cornus sericea subsp. sericea), shining willow (Salix lasiandra var. lasiandra), wild ginger (Asarum caudatum), straggly gooseberry (Ribes divaricatum var. pubiflorum), meadow rue (Thalictrum fendleri sensu lato),... aff, var. polycarpum, distal leaflets appear glabrous to the naked eye on the abaxial surface but have scattered subsessile vesicular golden glands), goldback fern (Pentagramma triangularis subsp. triangularis), sweet cicy (Osmorhiza beterai), wood strawberry (Fragaria vesca), woodland madia (Anisocarpus madioides), western fescue (Festuca occidentalis), red elderberry (Sambucus racemosa var. racemosa), hound’s tongue (Cynoglossum grande), common milkmaids (Cardamine californica), small-flowered alum root (Heuchera micrantha), popweed (Cardamine oligosperma), common wood rush (Luzula comosa),... distinctive, localized form with inflorescences consisting of arching, elongated peduncles, uneven in length, ending in clusters of 3-9(+) flowers and looking like a cat-of-ninetails, possibly reflecting a relationship with Luzula subcongesta), Hassie’s vetch (Vicia hassei), California bedstraw (Galium californicum subsp. californicum), checker lily (Fritillaria affinis), ocean spray (Holodiscus discolor var. discolor), downy buttercup (Ranunculus hebecarpus), Howell’s bluegrass (Poa howellii), few-flowered clover (Trifolium oliganthum), giant vetch (Vicia gigantea), California maidenhair (Adiantum jordanii), wood rose (Rosa gymnocarpa),... on slope above second Quercus x morehus), white hawkweed (Hieracium albiflorum), Fremont’s nemophila (Nemophila aff. pulchella var. fremontii),... rare local taxon, a possible disjunct, first
appearing on this particular site following the 2009 Lockheed fire and now becoming established..... also occurs as isolated populations elsewhere within the watershed and has been document both by pressings and seed collections), fat Solomon’s seal (Maianthemum racemosum), yarrow (Achillea millefolium), miniature lupine (Lupinus bicolor), maiden clover (Trifolium microcephalum), coast live-oak (Quercus agrifolia var. agrifolia), pinole clover (Trifolium bifidum var. decipiens), blue dicks (Dichelostemma capitatum subsp. capitatum), pin-point clover (Trifolium gracilentum), slender tarweed (aff. Madia gracilis..... lower half eglandular, with upper half/inflorescence clothed with short gland-tipped trichomes and when rubbed, exuding a chemical signature that is decidedly not redolent of cherry syrup), coast tarweed (Madia sativa), sky lupine (Lupinus nanus), American vetch (Vicia americana subsp. americana), tomcat clover (Trifolium willdenovii), stinging phacelia (Phacelia malvifolia), purple cudweed (Ganochaeta ustulata), climbing bedstraw (Galium porrigens var. porrigens), California melic (Melica californica), purple needlegrass (Stipa pulchra), rancher’s fiddleneck (Amsinckia menziesii), coast buckwheat (Eriogonum latifolium/mudum intergrades), hairy wood sorrel (Oxalis pilosa), Gianone everlasting (Pseudognaphalium gianonei, pro.sp.nov.), foothill sedge (Carex tumulicola), tall trisetum (Trisetum aff. canescens..... inflorescence erect/ascending, dense, often arcuate in profile), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), tree clover (Trifolium ciliatatum), varied-leaved collomia (Collomia heterophylla), sticky monkeyflower (Mimulus aurantiacus), California chicory (Rafinesquia californica), Chinese caps (Euphorbia crenulata..... capsules lacking verrucosities and ridges), box elder (Acer negundo), California gilia (Gilia achilleifolia sensu lato..... population including forms attributable to both subsp. achilleifolia and subsp. multicaulis), Elmer’s fescue (Festuca elmeri), Gianone sanicle (Sanicula gianonei, pro.sp.nov.), hill star (Lithophragma heterophyllum..... base of hynanthium truncate and bulbils where petiole and stem merge), nodding brome (Bromus vulgaris), hazelnut (Corylus cornuta var. californica), Chinese houses (Collinsia heterophylla), pale plectritis (Plectritis brachystemon), snowberry (Symphoricarpus albus var. laevigatus), common linanthus (Leptosiphon androsaceus), Chilean trefoil (Acmispon wrangelianus), white baby-blue-eyes (Nemophila menziesii var. atomaria), woodland larkspur (Delphinium patens subsp. patens), hairy fringepod (Thysanocarpus curvipes), narrow-leaved fringepod (Thysanocarpus laciniatus..... both species of fringepod grow sympatrically on the slide area and some interbreeding appears to be taking place), California hedge-parsley (Yabea microcarpa), farewell-to-spring (Clarkia rubicunda..... a population of robust plants, some in past years reaching one meter or more in heighth), common wood rush (Luzula comosa..... forma typica with densely capitate inflorescences), bent grass (Agrostis hallii/pallens intergrades), Pacific fescue (Festuca microstachys), western nettle (Hesperocnide tenella), California aster (Symphyotrichum chilense) and slender hairgrass (Deschampsia elongata).

Returning back to Swanton Road and the centenarian duo, blue elderberry (Sambucus mexicana = Sambucus nigra subsp. caerulea) "trees,” (circa 7-8 meters in height and trunks circa 2 meters in circumference at 1.8 meters from ground level), their furrowed bark replicating the patterning of desiccated mud flats, we pass through a zone of Rosaceae diversity. Presenting themselves are California wild rose (Rosa californica), California blackberry (Rubus ursinus), wood strawberry (Fragaria vesca), oso berry (Oemleria cerasiformis), and California horkelia (Horkelia californica subsp. californica). Easily lost on the disinterested viewer and in plain sight for the botanically curious, are scattered representatives of the hybrid Gianone everlasting (Pseudognaphalium gianonei, pro.sp.nov.) and one of its putative parents, cotton batting plant (Pseudognaphalium stramineum). Like another hybrid-derived member of the Asteraceae, Santa Cruz microseris (Microseris decipiens = Stebinoseris decipiens), the presence of one or both parents is not necessary
for the continued existance of the fertile offspring, the main difference being, that the diploid Gianone everlasting can backcross with either diploid parent producing a complex and variable series of intermediates and the Santa Cruz microseris, being an allotetraploid, is interfertile with its siblings but not with its diploid parents. The presence of two oaks, both members of the section Erythrobalanus, coast live-oak (Quercus agrifolia var. agrifolia) and forest live-oak (Quercus parvula var. shrevei), growing so close together that from a distance they can be perceived as a single entity, allows for the serious viewer all the diagnostic tools necessary to separate these related taxa in the field.

Just between the entrance to Last Chance and the mouth of George Valentine Gulch, the roadside offers up an interesting series of botanical duos..... species sharing the same genus, habitat and phenologies but evidencing no inclination to exchange genetic material!!! The reproductive isolating mechanisms underlying each of the following duo's apparent reluctance to crossbreed may be incompatability on a chromosomal level (size and/or number of), differing pollinating vectors and time frames (diurnal, vespertine, nocturnal), stigma/pollen receptivity, relative flower size, coloration, scent and conformation, differing breeding systems (obligate selfer versus outbreeder) just to entertain a few possibilities. Here are the indifferent duos, as they are encountered moving along Swanton Road in a southerly direction: Chinese houses (Collinsia heterophylla) and San Francisco collinsia (Collinsia multicolor)..... California bedstraw (Galium californicum subsp. californicum) and sweet-scented bedstraw (Galium triflorum)..... common milkmaids (Cardamine californica) and popweed (Cardamine oligosperma)..... small-flowered nemophila (Nemophila parviflora var. parviflora) and meadow nemophila (Nemophila pedunculata)..... fat Solomon's seal (Maianthemum racemosum) and slim Solomon's seal (Maianthemum stellatum)..... California bedstraw (Galium californicum subsp. californicum) and climbing bedstraw (Galium porrigens var. porrigens)..... thimbleberry (Rubus parviflorus) and California blackberry (Rubus ursinus)..... California sagebrush ( Artemisia californica) and mugwort (Artemisia douglasiana). Expanding upon this theme, encompassing not only along the entire length of tarmac from the north entrance down to the Molino Creek divide but elsewhere within the 30 square miles of watershed, here are some additional duos (and a few trios to boot) that do not appear to interbreed even when they are sympatric and share the same/overlapping flowering times: thimbleberry (Rubus parviflorus), salmonberry (Rubus spectabilis) and California blackberry (Rubus ursinus)..... shining willow (Salix lasiandra subsp. lasiandra), arroyo willow (Salix lasiolepis) and velvet willow (Salix sitchensis)..... Pacific bog-rush (Juncus effusus var. pacificus) and brown bog-rush (Juncus hesperius)..... dense-flowered rein orchid (Piperia elongata) and royal rein orchid (Piperia transversa)..... blue elderberry (Sambucus nigra subsp. caerulea) and red elderberry (Sambucus racemosa var. racemosa)..... straggly gooseberry (Ribes divaricatum var. pubiflorum) and canyon gooseberry (Ribes menziesii)..... golden yarrow (Eriophyllum confertiflorum var. confertiflorum) and lizard tail (Eriophyllum stachadifolium)..... gambleweed (Sanicula crassicaulis) and false coast sanicle (Sanicula pseudolaciata, pro.sp.nov.)..... gambleweed (Sanicula crassicaulis) and Gianone's sanicle (Sanicula gianonei, pro. sp. nov.)..... white baby-blue-eyes (Nemophila menziesii var. atomaria) and small-flowered nemophila (Nemophila parviflora var. parviflora)..... small-flowered nemophila (Nemophila parviflora var. parviflora) and Fremont's milkmaids (aff. Nemophila pulchella var. fremontii)..... giant trillium (Trillium chloropetalum) and western trillium (Trillium ovatum subsp. ovatum)..... California brome (Bromus carinatus) and nodding brome (Bromus vulgaris)..... marsh baccharis (Baccharis glutinosa) and coyote brush (Baccharis pilularis subsp. consanguinea)..... Cleveland's cryptantha (Cryptantha clevelandii) and minute-flowered cryptantha (Cryptantha micromeres)..... occasionally growing together on sandbars
along Scotts Creek, floriferous monkeyflower (*Mimulus floribundus*) and musk monkeyflower (*Mimulus moschatus*).

A given throughout the watershed and the habitat buffering it, are the isolated pockets of concentrated biodiversity, these often found at the backs of landslides, ancient or modern. Facing east/northeast and overlooking the convergence of Mill Creek with the watershed’s namesake, Scotts Creek, one such botanical aggregation, downslope from the “Bulb Field” and wholly hidden from view, warrants discussion. Occupying a benched, bowl-shaped depression, comprising circa 1.5 acres, with the surrounding forested slopes fan-shaped in contour and centrally incised by seasonal drainage, this concealed environment showcases an extensive population of western azalea (*Rhododendron occidentale*), variable both as to flower size and color! Complementing the aesthetic values, both visual and olfactory, that this sequestered component of the Heath Family (Ericaceae) offers the intrepid naturalist, is a diverse assemblage of “natives”, a comprehensive cross-section of the watershed’s flora contained within a metaphorical pinprick on the local topographical map! The tally for arboreal associates within this compressed ecosystem is a veritable who’s who: Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii var. menziesii*), California nutmeg (*Torreya californica*), redwood (*Sequoia sempervirens*), tan-oak (*Notholithocarpus densiflorus var. densiflorus*), forest live-oak (*Quercus parvula var. shrevei*), some trees showing the influence of coast live-oak (*Quercus agrifolia var. agrifolia*), California bay laurel (*Umbellularia californica*), arroyo willow (*Salix lasiolypos*), big-leaf maple (*Acer macrophyllum*), and California buckeye (*Aesculus californica*). Less elevated in stature, but often conspicuously ligneous, evergreen or deciduous and varied in gestalt, the shrubs weigh in significantly, both in number and variety: blue elderberry (*Sambucus mexicana* = *Sambucus nigra subsp. caerulea*), not acquiring tree status like its brethren along Swanton Road, red elderberry (*Sambucus racemosa var. racemosa*), coyote brush (*Baccharis pilularis*), one individual studied two decades ago south of Mill Creek Bridge exceeded 6 meters in height, the gooseberry duo, straggly gooseberry (*Ribes divaricatum var. pubiflorum*) and canyon gooseberry (*Ribes menziesii*), the latter with memorably aromatic glandular herbage, hazelnut (*Corylus cornuta var. californica*), two members of the Buckthorn Family (Rhamnaceae), blue blossom (*Ceanothus thyrsiflorus*), and California coffeeberry (*Frangula californica subsp. californica*), blue witch (*Solanum umbelliferum*) and sub-shrub sister species, Douglas’s nightshade (*Solanum douglasii*), osy berry (*Oemleria cerasiformis*), its fruit a drupe not a berry, and depending on the circumstances, a woody shrub or vine, poison oak (*Toxicodendron diversilobum*). Creating an understory tapestry, ranging from the prostrate stems of sweet-scented bedstraw (*Galium triflorum*) and California bedstraw (*Galium californicum subsp. californicum*) to the virgate stramineous canes of thimbleberry (*Rubus parviflorus*) and the 2.5+ meter high fistulous stems of cow-parsnip (*Heracleum maximum*) are a host of “locals”: California hedge-nettle (*Stachys bulatata*), hound’s tongue (*Cynoglossum grande*), California figwort (*Scrophularia californica subsp. californica*), common milkmaids (*Cardamine californica*), small-flowered nemophila (*Nemophila parviflora var. parviflora*), baneberry (*Actaea rubra*), two scendent members of the Legume Family (Fabaceae), Pacific pea (*Lathyrus vestitus var. vestitus*) and giant vetch (*Vicia gigantea*), a robust form of California man root (*Marah fabaceus*), growing in an exposed sunny niche with leaves 25+ centimeters wide x 21+ centimeters long, coast tarweed (*Madia sativa*), cotton batting plant (*Pseudognaphalium stramineum*) along with sibling species pink everlasting (*Pseudognaphalium ramosissimum*), a colony of slough sedge (*Carex obnupta*) fulfilling its mandate as erosion abater plus its diagnostically challenging relative, the Gianone sedge (*Carex gianonei* pro. sp. nov.) as unrepentant as ever and sharing habitat with two diplomats from the Carrot Family (Apiaceae), sweet cicely (*Osmorhiza chilensis* = *Osmorhiza*).
Torrey's carinatus intergrades (displayed localized hybridization with sympatric population, documented by mature inflorescences observed in the faux prairie/inner grassland component of this subgrass (Phaeocephalus western rush (Iris douglasiana)), slim Solomon's seal (Smilacina stellata), giant trillium (Trillium chloropetalum), western trillium (Trillium ovatum subsp. ovatum) and a sextet of grasses: Hall's bent grass (Agrostis hallii), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass (Calamagrostis rubescens), California wild rye (Elymus glaucus subsp. glaucus) and Alaska onion grass (Melica subulata). Rounding out this mini-survey with the vascular challenged ferns, present and accounted for, are wood fern (Dryopteris arguta), western sword fern (Polystichum munitum), nested polypody (Polypodium calirhiza) and bracken (Pteridium aquilinum var. pubescens).

Moving in a south, southeasterly direction, the next drainage system encountered raises the complexity stakes a few notches higher. Cookhouse Gulch drains a considerable swath of the inner prairie/grassland southeast of the origins of Big Willow Gulch (which decends oceanward in the opposite direction) and before entering Scotts Creek, augments its hydrological capacity through the addition of an unnamed gulch, whose source covers an even larger portion of the faux prairie.... extending up the northwest facing, coastal scrub dominated ridge, which separates the Western Terrace from the sinuous grassland corridor, its contours shaped by the underlying syncline. Before entering Scotts Creek, these two sub-watersheds converge as a pair of waterfalls, which through the passage of time have scoured out a short in length but deep/steep in profile, gorge...... home to one of the several "white redwoods" (Sequoia sempervirens) documented for the Swanton area. Here is a botanical inventory (grouped by families), of the "native" species found to date within this kalidoscopic journey thru coastal scub, grassland, bencched marshes and mixed conifer/hardwood forested slopes, which stretches from streamside up to ridgetop and traverses several ecologically distinct zones: short-stemmed sedge (Carex brevicaulis), dense sedge (Carex densa), gianone sedge complex, in part (Carex harfordii matrix), slough sedge (Carex obnupta), small-bracted sedge (Carex subbracteata), foothill sedge (Carex tumulicola), umbrella sedge (Cyperus eragrostis), California tule (Schoenoplectus californicus)..... brown bog-rush (Juncus hesperius), brown bog-rush x common rush hybrid (Juncus hesperius x Juncus patens)..... overlooking the se edge of the Bulb Field, a long established plant of this uncommon hybrid has been documented via divisions growing at the UCSC Arboretum), mexican rush (I. mexicanus...... rhizomatous, culms generally slender and dk green, predominantly tortile-compressed, upper leaf-blades not present), western rush (Juncus occidentalis), common rush (Juncus patens), brown-headed rush (Juncus phaeocephalus var. phaeocephalus), common wood rush (Luzula comosa)..... Blasdale's bent grass (Agrostis blasdalei)..... two separate populations of this rare coastal native have been observed in the faux prairie/inner grassland component of this sub-watershed and one population, documented by mature inflorescences and deposited with the UCSC Arboretum, displayed localized hybridization with sympatric Agrostis exarata, Hall's/leafy bent grass intergrades (Agrostis hallii/pallens intergrades), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass (Calamagrostis rubescens), California oat grass (Danthonia californica), California wild rye (Elymus glaucus subsp. glaucus), fescue (f. Festuca roemeri), red fescue (Festuca aff. rubra), Alaska onion grass (Melica subulata), Torrey's melic (Melica torreyana), foothill needlegrass (Stipa lepida)..... giant trillium (Trillium chloropetalum), western trillium (Trillium ovatum subsp. ovatum)..... Hooker's fairy bells (Proserstes hookeri)..... slim Solomon's seal (Maianthemum stellatum)..... checker lily (Fritillaria affinis)..... soap plant (Chlorogalum pomeridianum var. pomeridianum)..... spotted coralroot
(Corallorhiza maculata aff. var. occidentalis... most commonly encountered variety of this taxon within the watershed, with overall gestalt different from var. maculata and lip unmarked), hooded lady's tresses (Spiranthes romanzoffiana... circa 30+ plants have been observed over the past few years, occurring within the eastward dipping, benched ribbon of grassland connecting the upper portion of the bifurcate Cookhouse Gulch complex)... Douglas's iris (Iris douglasiana), blue-eyed grass (Sisyrinchium bellum... yarrow (Achillea millefolium), mountain dandelion (Agoseris grandiflora var. grandiflora), pearly everlasting (Anaphalis margaritacea), woodland madia (Anisocarpus madioides), California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis subsp. consanguinea), Indian thistle (Cirsium brevistylum), purple cudweed (Ganochaeta ustulata), white hawkweed (Hieracium albidiflorum), California aster (Corethrogynus filaginifolia... var. californica), Bioletti's cudweed (Pseudognaphalium bioletti), California cudweed (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum), California aster (Symphyotrichum chilense)... western lady's mantle (Aphanes occidentalis), sticky cinquefoil (Drymocallis glandulosa var. glandulosa), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus discolor var. discolor), oso berry (Oemleria cerasiformis), wood rose (Rosa gymnocarpa), thimbleberry (Rubus parviflorus), salmonberry (Rubus spectabilis), California blackberry (Rubus ursinus)... Monterey pine (Pinus radiata... ancient hybrid swarm reflecting Pinus attenuata characteristics, particularly in the branching patterns and ovulate cone morphology), Douglas-fir (Pseudotsuga menziesii var. menziesii)... coast redwood (Sequoia sempervirens)... California nutmeg (Torreya californica)... California man root (Marah fabaceus)... poison oak (Toxicodendron diversilobum)... hairy honeysuckle (Lonicera hispidula)... California poppy (Eschscholzia californica)... straggly gooseberry (Ribes divaricatum var. pubiflorum), canyon gooseberry (Ribes menziesii)... western nettle (Hesperocnide tenella), coast nettle (Urtica dioica subsp. gracilis)... red alder (Alnus rubra), hazelnut (Corylus cornuta subsp. californica)... wild ginger (Asarum caudatum)... California bedstraw (Galium californicum subsp. calcifornicum), climbing bedstraw (Galium porrigens var. porrigens), sweet-scented bedstraw (Galium triflorum)... redwood sorrel (Oxalis oregana)... morning glory (Calystegia purpurata subsp. purpurata)... varied-leaved collomia (Collomia heterophylla), skunkweed (Navarretia squarrosa)... California figwort (Scrophularia californica)... Johnny jump-up (Viola pedunculata)... buckwheat (Eriogonum latifolium/nudum intergrades)... tan-oak (Notholithocarpus densiflorus var. densiflorus), coast live-oak (Quercus agrifolia var. agrifolia), forest live-oak (Quercus parvula var. shrevei)... hound's tongue (Cynoglossum grande), small-flowered nemophila (Nemophila parviflora var. parviflora)... California buttercup (Ranunculus californicus var. californicus), downy buttercup (Ranunculus hebecarpus), meadow rue (Thalictrum fendleri var. polycarpum = Thalictrum polycarpum)... Pacific madrone (Arbutus menziesii), hairy manzanita (Arctostaphylos crustacea sensu lato... isolated individual growing just outside southern edge of Bulb Field, its origins/possible fruit distribution vectors, possibly coyotes or robins), salal (Gaultheria shallon), California huckleberry (Vaccinium ovatum)... California bay laurel (Umbellularia californica)... floating pennywort (Hydrocotyle ranunculoides... removed from Apiaceae and now placed within Araliaceae)... cow-parsnip (Heracleum maximum), Pacific oenanthe (Oenanthe sarmentosa), sweet cicely (Osmorhiza berteroii), footsteps-of-spring (Sanicula arctopoides), gambleweed (Sanicula crassicaulis), Gianone sanicle (Sanicula gianonei, pro. sp. nov.)... Pacific pea (Lathyrus vestitius var. vestitus), yellow bush lupine (Lupinus arboreus), summer lupine (Lupinus formosus var. formosus... a highly localized species within the Scotts Creek Watershed, concentrated on north-east facing grassy slopes overlooking the Bulb Field and the
upper portion of the Cookhouse Gulch drainage. Within this narrowly circumscribed area, two hybrids with sympatric *Lupinus arborescens* have been observed, one of which can be seen on the Cal Poly/Swanton Pacific Ranch Watershed, in their ongoing in situ digital documentation of the watershed's flora), sky lupine (*Lupinus nanus*), Lindley's varied lupine (*Lupinus varicolor*), red maids (*Calandrinia ciliata*), miner's lettuce (*Claytonia perfoliata subsp. perfoliata*), sticky monkeyflower (*Mimulus aurantiacus*), common milkmaids (*Cardamine californica*), popweed (*Cardamine oligosperma*), big-leaf maple (*Acer macrophyllum*), California buckeye (*Aesculus californica*), both *Acer* and *Aesculus*, are now placed in the family Sapindaceae), yerba buena (*Micromeres douglasii*), California hedge nettle (*Stachys bullata*), checkerbloom (*Sidalcea malviflora subsp. malviflora*), blue elderberry (*Sambucus nigra subsp. caerulea*), red elderberry (*Sambucus racemosa var. racemosa*), both species of *Sambucus* now reside within the family Adoxaceae), willow herb (*Epilobium ciliatum var. ciliatum*), sun cup (*Taraxia ovata*), arroyo willow (*Salix lasiolepis*), blue blossum (*Ceanothus thyrsiflorus var. thyrsiflorus*), a small isolated population of six specimens with unblemished white flowers [clear cell sap, no pigmentation] overlooking the "twin" waterfalls area, was documented with herbarium pressings in 1983), California coffeeberry (*Frangula californica subsp. californica*), creek dogwood (*Cornus sericea subsp. sericea*), western burning bush (*Euonymus occidentalis var. occidentalis*), small-flowered alum root (*Heuchera micrantha*), dwarf orthocarpus (*Triphysaria pusilla*), hairy wood sorrel (*Oxalis pilosa*), Douglas's nightshade (*Solanum douglasii*), blue witch (*Solanum unbelliferum*), wood fern (*Dryopteris arguta*), western sword fern (*Polystichum munitum*), lady fern (*Athyrium filix-femina var. cyclosorum*), now placed in the family Woodsiaceae), nested polypody (*Polypodium califiriza*), giant chain fern (*Woodwardia fimbriata*), five-finger fern (*Adiantum aleuticum*), California maidenhair (*Adiantum jordanii*), goldback fern (*Pentagramma triangularis subsp. triangularis*), bracken (*Pteridium aquilinum var. pubescens*).

Between the Cookhouse Gulch bifurcation and the Mt. Cook drainage system (which enters Scotts Creek between the confluences of Big and Little Creeks), there is a continuum of nw-aligned gulches, with the sinuous inner grassland/faux prairie acting as a rainfall catchbasin, channeling water down through deeply incised slopes covered with a complex arboreal, suffrutescent and herbaceous mix of native taxa... and if studied in its entirety, this aggregation of micro-watersheds, affords the student of biodiversity, an impressive overview of the Scotts Creek Watershed's "natives" and the underlying geomorphology supporting them. The following native taxa, collated by families, represent an ongoing study documenting the botanical richness of this overlooked portion of the Scotts Creek Watershed: California brome (*Bromus carinatus*), nodding brome (*Bromus vulgaris*), California bottlebrush grass (*Elymus californicus*), scattered populations, ranging in a vertical profile, from just above creek level up to the mixed hardwood/conifer woodland defining the inner grassland's nw-border and often following/margining seasonal micro-drainage systems), pine grass (*Calamagrotis rubescens*), California oat grass (*Danthonia californica*), Elmer's fescue (*Festuca elmeri*), western fescue (*Festuca occidentalis*), crinkle-awn fescue (*Festuca subuliflora*), this locally uncommon native, parallels the distribution pattern of the California bottlebrush grass, and occasionally shares the same location), Alaska onion grass (*Sanicula hoffmannii*), Torrey's melic (*Melica torreyana*), Howell's bluegrass (*Poa howelli*), cow-parsnip (*Heracleum maximum*), sweet cicely (*Osmorhiza berteroi*), gambleweed (*Sanicula crassicaulis*), extremely variable as to foliar gestalt throughout area under discussion but all variants sharing the same biochemical signature, with occasional populations closely reflecting their *Sanicula hoffmannii* ancestry.
displaying viniferous lower petioles, adaxial surface of leaf-blades pigmented a bluish-green with central lobe distinctly narrowed but still basally connate to lateral lobes), Gianone’s sanicle (Sanicula gianonei, pro. sp. nov.), Hoffmann’s sanicle (Sanicula hoffmannii...... only known population found to date [03/17/2011] on ocean side of Scotts Creek...... growing, as with the Upper Calf Gulch population, in an understory association of coast redwood (Sequoia sempervirens), coast live-oak (Quercus agrifolia var. agrifolia), forest live-oak (Quercus parvula var. shrevei) and Douglas-fir (Pseudotsuga menziesii var. menziesii)...... sympatric with gamblueweed (Sanicula crassicaulis) and gianone sanicle (Sanicula gianonei, pro. sp. nov.) and in part, margining trail used by cattle, deer and occasionally horses...... western lady’s mantle (Aphanes occidentalis), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus discolor var. discolor), oso berry (Oemleria cerasiformis), wood rose (Rosa gymnocarpa), salmonberry (Rubus spectabilis), California blackberry (Rubus ursinus)...... wild ginger (Asarum caudatum)...... western burning bush (Euonymus occidentalis var. occidentalis)...... California nutmeg (Torreya californica)...... coast redwood (Sequoia sempervirens)...... one “albino” on slope overlooking horsetrail, growing sympatrically with scattered population of Elmus californicus)...... Monterey pine (Pinus radiata)...... complex hybrid between Pinus attenuata and Pinus radiata, resegregating in various combinations characteristics of both parents, with branching patterns and ovulate cone morphology readily observable, Douglas-fir (Pseudotsuga menziesii var. menziesii)...... Pacific madrone (Arbutus menziesii)...... California bay laurel (Umbellularia californica)...... box elder (Acer negundo), California buckeye (Aesculus californica)...... red alder (Alnus rubra), hazelnut (Corylus cornuta subsp. californica)...... California coffeeberry (Frangula californica subsp. californica), blue blossom (Ceanothus thyrsiflorus var. thyrsiflorus)...... straggly gooseberry (Ribes divaricaturn var. pubiflorum)...... form with clear gland-tipped trichomes interspersed amongst non-glandular ones occurring within area under discussion), canyon gooseberry (Ribes menziesii var. menziesii)...... baneberry (Actaea rubra), pipestems (Clematis lasiantha), woodland buttercup (Ranunculus uncinatus var. parviflorus)...... new addition [04/23/2011] to watershed’s native species listing: localized population along riparian corridor, with erect fistulous stems covered with a light bloom, leaves deeply 3-lobed, sepals clothed with short hairs, petals circa five and readily deciduous with a flap-like scale on basal gland and fruits with stiff-hairs on margins and body...... when viewed from a distance, shares the same basic gestalt as sympatric Sanicula crassicaulis)...... redwood sorrel (Oxalis oregana)...... fat Solomon’s seal (Maianthemum racemosum), slim Solomon’s seal (Maianthemum stellatum)...... bleeding heart (Dicentra formosa), California poppy (Eschscholzia californica)...... American winter cress (Barbara orthoceras)...... common milkmaids (Cardamine californica), popweed (Cardamine oligosperma)...... brown bog-rush (Juncus hesperius), common rush (Juncus patens), common wood rush (Luzula comosa)...... coast live-oak (Quercus agrifolia var. agrifolia), forest live-oak (Quercus parvula var. shrevei)...... mountain dandelion (Agoseris grandiflora var. grandiflora), woodland madia (Anisocarpus madioides), coyote brush (Baccharis pilularis subsp. consanguinea), Indian thistle (Cirsium brevistylum), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), purple cudweed (Gamochaeta ustulata), Bieletti’s cudweed (Pseudognaphalium biollettii), California cudweed (Pseudognaphalium californicum), pink everlasting (Pseudognaphalium ramosissimum)...... Douglas’s iris (Iris douglasiana), blue-eyed grass (Sisyrinchium bellum)...... giant trillium (Trillium chloropetalum), western trillium (Trillium ovatum subsp. ovatum)...... small-flowered alum root (Heuchera micrantha), hill star (Lithophragma heterophyllum)...... California water starwort (Callitriche marginata)...... hound’s tongue (Cynoglossum grande), small-flowered nemophila (Nemophila parviflora var. parviflora), stinging phacelia (Phacelia malvifolia)...... California figwort (Scrophularia californica)...... Pacific
starflower (Tridentalis latifolia)..... western nettle (Hesperocnide tenella), coast nettle (Urtica dioica subsp. gracilis)..... spotted coralroot (Corallorhiza maculata, aft. var. occidentalis..... immaculata form, differing in gestalt from forma typica, possessing an unspotted lip which occasionally displays pink-suffused veins but no maculations and by far the most common representative of this taxon in the watershed)..... poison oak (Toxicodendron diversilobum)..... California bedstraw (Galium californicum subsp. californicum), climbing bedstraw (Galium porrigenus var. porrigenus), sweet-scented bedstraw (Galium triflorum)..... hairy honeysuckle (Lonicera hispidula)..... Douglas’s nightshade (Solanum douglasii), blue witch (Solanum umbelliferum)..... coyote mint (Monardella villosa sensu lato), yerba buena (Clinopodium douglasii), California hedge nettle (Stachys bullata)..... California man root (Marah fabacea)..... red elderberry (Sambucus racemosa var. racemosa)..... slough sedge (Carex obturata)..... Hooker’s fairy bells (Prosartes hookeri)..... miner’s lettuce (Claytonia perfoliata subsp. perfoliata)..... variable as to juvenile and adult foliage and patterning of calyces), blinks (Montia fontana..... growing in a quasi-vernial pool habitat aka depressions in horse trail, along with Callitriche and Plagiobothrys)..... skunkweed (Navarretia squarrosa)..... morning glory (Calystegia purpurata subsp. purpurata)..... sticky monkeyflower (Mimulus aurantiacus)..... Pacific pea (Lathyrus vestitus var. vestitus), yellow bush lupine (Lupinus arborescens), California tea (Rupertia physodes), American vetch (Vicia americana subsp. americana)..... nested polypody (Polypodium calirhiza)..... lady fern (Athyrium filix-femina var. cyclosorum)..... bracken (Pteridium aquilinum var. pubescens)..... wood fern (Dryopteris arguta), western sword fern (Polystichum munitum)..... California maidenhair (Adiantum jordanii), coffee fern (Pellaea andromedifolia), goldback fern (Pentagranum triangularis subsp. triangularis).

Perhaps the narrowest of the secondary drainage systems entering into Scotts Creek, Mill Creek, in spite of the near-vertical severity of its upper watershed, rewards the intrepid plant-hunter with botanical novelties uncommon or rare elsewhere in the county. Without straying more than 5-6 meters from the banks of Mill Creek, one can encounter long established colonies of leopard lily (Lilium pardalinum), perhaps the most amenable to cultivation of the North American lilies, sharing the riparian habitat with robust specimens of western azalea (Rhododendron occidentale), seasonally inundated tussocks of torrent sedge (Carex nudata), dimorphic coltsfoot (Petasites frigidus var. palmatus) with its ± dioecious, bracted, vanilla-scented inflorescences appearing before the stalked palmate leaves, these looking ever so much like they were purloined from sympatric big-leaf maple (Acer macrophyllum), impenetrable colonies of another admirer of the foliar gestalt displayed by maples, thimbleberry (Rubus parviflorus), extensive monocultures of giant horsetail (Equisetum telmateia var. braunii) and in apparent defiance of gravity, five-finger fern (Adiantum aleuticum) and western burning bush (Euonymus occidentalis var. occidentalis), growing out of the overtopping moist banks that appear to reach skyward. Imparting an exotic mien to the streamside amblence, elk-clover (Aralia californica) acts as a perfect foil to the more prosaic red elderberry (Sambucus racemosa var. racemosa), both deciduous with distinctively textured stems and sporting contrasting clusters of miniature fruits attractive to birds. Other riparian inhabitants sharing the leafless syndrome during the winter months that add an aesthetic richness to the proceedings, whether naked or not, are red elderberry’s cousin, snowberry (Symphoricarpos albus var. laevisgatus) and kin to the previously noted thimbleberry, ocean spray (Holodiscus discolor). As with other ancillary roads branching off from Swanton Road and accessing the various sub-watersheds en route, the circa half-mile journey into the lower Mill Creek drainage and terminating at the one-lane bridge, yields the following windfall of native plant species..... all of which can be seen without leaving the dirt road: small-flowered nemophila (Nemophila parviflora var. parviflora), stinging phacelia (Phacelia
the alluvium exceedingly variable as to foliar gestalt; of the remaining two species which can be found species, Californiawoodlands along with red clintonia (Clintonia andrewsiana), while its omnipresent sister species, California blackberry (Rubus ursinus) is not finicky in habitat preference and exceedingly variable as to foliar gestalt; of the remaining two species which can be found together securing the stream banks, salmonberry (Rubus spectabilis) does not stray to far from the alluvium-rich bottomlands, contrasting with thimbleberry (Rubus parviflorus), a valuable indicator species for the presence of water, often found growing around hillside seeps.
contrasting with the adjacent scrub. As Spillway Gulch enters Mill Creek from the east, it forms an alluvial fan, providing habitat for two unrelated species, windflower (Anemone oregana), decidedly uncommon within the watershed and Pacific starflower (Trientalis latifolia), in leaf looking like an aberrant, slightly undernourished member of the genus Trillium, found throughout the watershed, even growing on seasonally disturbed embankments along Swanton Road. Also taking up residence in this cyclically scoured transitional zone are California harebell (Campanula prenanthoides), redwood violet (Viola sempervirens), trail plant (Adenocaulon bicolor) and California milkwort (Polygala californica). Several decades ago, a colony of calypso orchid (Calypso bulbosa) was discovered in the upper part of Spillway Gulch, growing within a grove of redwoods (Sequoia sempervirens), making it the third known site for this rarely seen orchid in the watershed. Revisiting (08/2010) the lower 100 meters of Spillway Gulch as it interfaces with Mill Creek proper..... an area severely impacted by the 2009 Lockheed Fire..... demonstrated the resiliency and co-evolved adaptive mechanisms that the various native taxa have developed in response to periodic fire disturbances. Observing the post-burn terminus of Spillway Gulch as it enters Mill Creek, yielded the following species...... documented as they were encountered: Anemone oregana, Scoliopus bigelovii, Trillium ovatum subsp. ovatum, Trientalis latifolia, Melica subulata, Oxalis oregana, Polystichum munitum, Galium triflorum, Adenocaulon bicolor, Stachys bullata, Pteridium aquilinum var. pubescens, Bromus vulgaris, Notholithocarpus densiflorus var. densiflorus, Galium californicum subsp. californicum, Dryopteris arguta, Umbellularia californica, Sequoia sempervirens, Rubus ursinus, Laythrus vestitus var. vestitus, Iris douglasiana, Festuca subuliflora, Torreya californica, Asyneuma prenanthoides, Acer macrophyllum, Calystegia purpurata subsp. purpurata, Adiantum aleuticum, Toxicodendron diversilobum, Ribes menziesii, Equisetum telmateia subsp. braunii, Lonicera hispidula, Aralia californica, Athyrium filix-femina var. cyclosum, Rhododendron occidentale, Arnica discoidea, Polygala californica, Iunca patens, Viola sempervirens, Cardamine californica var. californica, Cynoglossum grande, Osmorhiza berteroi, Sanicula crassicaulis, Epilobium ciliatum subsp. ciliatum, Carex amplifolia, Scrophularia californica subsp. californica, Frangula californica subsp. californica, Persicaria punctata, Rubus parviiflorus, Alnus rubra, Juncus hesperius, Trisetum canescens, Petasites frigidus var. palmatus, Cyperus eragrostis, Urtica dioica subsp. holosericea (abaxial surface of leaves clothed with soft cinerous pubescence), Carex bolanderi (some plants with lower spikelets compound-congested), Boykinia occidentalis, Lilium pardalimum subsp. pardalimum, Micromeres (Satureja) douglasii and Elymus glaucus subsp. glaucus.

Note: While doing post-Lockheed Fire exploration (08/2010) in the upper reaches of the Mill Creek riparian corridor, the following taxa were observed growing streamside or proximal to it..... Mimulus cardinalis, Anthoxanthum (Hierochloe) occidentale, Juncus effusus var. pacificus and Montia parvifolia (making infrequent appearances on moss-buffered boulders).

The chaparral surrounding and overlooking the upper section of the Mill Creek Watershed is both topographically and ecologically complex, with the west facing ridge slopes extending up towards Mill Creek Dam, the subject of a major forest fire in 1948, leaving in its wake an extensive zone of mature knobcone pine (Pinus attenuata). This area, along with its east facing counterparts, is the domain of Arctostaphylos crustacea, sensu lato, a polyphyletic taxon that morphologically displays recombined traits attributable to at least six different species and natural hybrids: sympatric with the burl-forming tetraploid, are interdigitating colonies of Schreiber’s manzanita (Arctostaphylos glutinosa) and sensitive manzanita (Arctostaphylos
nummularia), chaparral pea (Pickeringia montana var. montana), knobcone pine (Pinus attenuata),
golden chinquapin (Chrysolepis chrysophylla var. minor) and an assortment of shrubby to sub-
arboreal oaks, section Erythrobalanus, possibly representing a transitional zone where forest live-
oak (Quercus parvula var. shrevei) and chaparral live-oak (Quercus wislizeni var. frutescens) co-exist.
Further down the fingers of mudstone that anchor the xeric fire-responsive vegetation, new
additions to the flora appear: some like the pitcher sage (Lepechinia calycina), during the heat of
mid-day make their presence known through the volatile oils in their herbage, others like the
chamise (Adenostoma fasciculatum) and bush poppy (Dendromecon rigida) by their distinctive
heather-like foliage or delicate yellow flowers seemingly out-of-place in such an arid
environment. Often growing around the bases of these resilient shrubs, sheltered from both the
moisture stealing wind and desiccating effects of the sun are unnoticed annuals, such as
Cleveland’s cryptantha (Cryptantha clevelandii) and minute-flowered cryptantha (Cryptantha
micromeres). Hardy perennials also share this specialized habitat, with its water-retentive
carpeting of moss and leaf-litter, prime examples being California bedstraw (Galium californicum
subsp. californicum), Dannie’s skullcap (Scutellaria tuberosa) and California milkwort (Polygala
california). Secured to an exposed section of bedding plane by several small patches of moss, an
isolated population of small-leaved bent grass (Agrostis microphylla) stands out in its singularity
but considered from an ecological perspective, replicates the far more extensive populations
found growing, on the seasonally moist vertical cliff faces, overlooking Greyhound Rock State
Beach! Sporadically distributed throughout the understory and often overlooked due to its
nondescript floral presentation, rayless arnica (Arnica deltoides) rewards the olfactorily curious
with a glandular indument, which is both distinctive and somewhat unpleasant! A reintroduction
to the native species list for the watershed occurred recently (10/06) and post 2009 fire (07/10)
while exploring the lower portion of this ridge, the species in question being Torrey’s cryptantha
(Cryptantha torreyana): to further sweeten the Boraginaceae pot, nievitas (Cryptantha flaccida)
was documented in the early 1980’s by herbarium pressings, growing on the east facing slope of
the Seymore Hill and overlooking the very same site that the rediscovered Torrey’s cryptantha
was found, making a total of four Cryptantha species existing within an area less than a mile
square! Two days prior to the Lockheed Fire, 08/10/09, while exploring the coast redwood
margined spring that separates the upper and lower portions of the Seymore Field, another rare
and new to the watershed native was discovered, mat-forming and superficially resembling the
redwood violet (Viola sempervirens): namely, Dichondra donelliana. I revisited this ecologically
diverse continuum, unified geologically by the underlying Santa Cruz Mudstone, almost one
year (07/10) after the 2009 conflagration, and found little loss in the way of native species
composition (but a numerically increased representation of rarely seen fire-following species).
With leaf litter converted to ash and a decidedly changed light regime, at least two of the
locally common native Madieae, slender tarweed (Madia gracilis) and coast tarweed (Madia
sativa), were behaving as ruderals...... agressive in their colonization and outsized, some
attaining two meters in heigth status (although this essay/discussion is focused primarily on
native taxa, numerous non-native species were behaving in a similar fashion). As this narrow
slice of ridge dips downward towards Mill Creek and with both the gulchlet derived incising
and mixed hardwood/conifer canopy cover increasing, so does the species diversity. Grouped
by families, here is an preliminary overview of the native taxa found within this transitional
zone, between chaparral and riparian corridor: lady fern (Athyrium filix-femina var.
cyclosorus)..... five-finger fern (Adiantum aleuticum), goldback fern (Pentagramma triangularis
subsp. triangularis)..... wood fern (Dryopteris arguta), western sword fern (Polystichum munitum).....
California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), pine grass
(Calamagrostis rubescens), slender hairgrass (Deschampsia elongata), California wild rye (Elymus
west...
The riparian corridor between Scotts and Big Creek Bridges (on the Scotts Creek side of Swanton Road), features a mixture of deciduous/evergreen trees and shrubs, that from an ecological perspective, warrant a study unto itself. Besides providing shade during the hottest months of the year and mitigating water temperatures of the shallower and slower moving streams, the arboreal and sub-arboreal vegetation that define this segment of Scotts Creek’s sinuous journey to the ocean, also act as moderators for air movement, recycle valuable nutrients through their seasonal or periodic foliar replacement and with extensive root systems, help to stabilize the stream banks during periods of high water flow. Here is a listing of the native components of this complex ecological drama and following their latin names, in bractets, (D) signifies seasonally deciduous, (P) perennial, usually from below ground root systems but with aerial flowering stems being seasonal and (E) represents those taxa that maintain their foliage for several continuous seasons..... while the principals in this equation are arboreal, I have also included those associate species, with both subshrub and herbaceous characteristics, which play supportive roles in both the understory and streamside composition. The seasonal shedding of foliage is not an abrupt, simultaneous occurrence but a staggered pattern that can extend into mid-winter but is initially is triggered by shortening of day length and a drop in temperature..... concurrent with the annual leaf loss by the deciduous components of the riparian corridor, is the every 3-5(+) years foliar replacement by the constituent evergreens, which add a different textural/chemical component to the leaf litter and this litter enhancement is often exacerbated by the severity of the Winter storms. Are there qualitative/quantitative differences in seasonal leaf drop and litter composition between El Nino and La Nina weather cycles and how does this affect the litter accumulation/breakdown and nutrient recycling patterns? What is the impact from a net loss/gain perspective, where periodic outbreaks of insect (tent caterpillar infestation) predation, causes substantial defoliation to evergreen coast live-oak (Quercus agrifolia var. agrifolia) and forest live-oak (Quercus parvula var. shrevei) populations?

Acer macrophyllum (D)
Acer negundo var. californicum (D)
Aesculus californica (D)
Alnus rubra (D)
Aralia californica (D)
Athyrium filix-femina var. cyclosorum (D) ..... important streambank stabilizer
Carex amplifolia (E) ..... important sandbar stabilizer
Ceanothus thyrsiflorus (E)
Cornus sericea subsp. sericea (D)
Corylus cornuta var. californica (D)
Dryopteris arguta (E) ..... slope stabilizer
Euonymus occidentalis var. occidentalis (D)
Frangula (Rhamnus) californica subsp. californica (E)
Juncus hesperius (E) ..... important stabilizer for stream margins and sand bars
Juncus patens (E) ..... important stabilizer for both dry and seasonally inundated soils
Oemleria cerasiformis (D)
Pinus radiata (E) ..... variable and highly adaptive endemic component derived from a highly reticulate pattern of hybridization between Pinus attenuata and Pinus radiata
Petasites frigidus var. palmatus (D) ..... important sandbar and streambed component
Polystichum munitum (E) ..... important slope stabilizer
Pseudotsuga menziesii var. menziesii (E)
Pteridium aquilinum var. pubescens (D)
Quercus agrifolia var. agrifolia (E)
Quercus parvula var. shrevei (E)
Ribes divaricatum var. pubiflorum (D)
Ribes menziesii (D)
Rubus parviflorus (D)
Rubus spectabilis (D) ..... all three species of Rubus valuable erosion abaters with their clonal expansivity and bird referenced seed dispersal
Rubus ursinus (D)
Salix lasiandra subsp. lasiandra (D)
Salix lasiolepis (D) ..... these three species of Salix constitute one of the most important erosion control/habitat modifiers native to the in the watershed
Salix sitchensis (D)
Sambucus nigra subsp. canadensis (D)
Sambucus racemosa var. racemosa (D) ..... along with Alnus rubra, Rubus spectabilis and the Salix trio, these two species, particularly var. racemosa, act as stream bank buffers in mitigating erosion
Sequoia sempervirens (E) ..... in terms of permanent canopy/shade provider, sheer biomass plus major water consumer, the coast redwood is in a class by itself
Torreya californica (E)
Toxicodendron diversilobum (D) ..... very important erosion control, particularly on slopes dipping down into riparian corridor
Umbellularia californica (E)
Urtica dioica subsp. gracilis and subsp. holosericea (E) ..... extensive root systems important stream bank and sandbar protectors
Woodwardia fimbriata (E) ..... evergreen analog of seasonally deciduous Athyrium filix-femina var. cyclosoirus

Minor “native” contributors in terms of biomass, but present throughout the area under discussion and distinctly rhizomatous, are as follows:

Artemisia douglasiana (D) ..... perennial below ground, flowering stems usually seasonal in duration
Asarum caudatum (E)
Cyperis eragrostis (E)
Equisetum arvense (D/E) ..... fertile stems short lived/sterile stems chlorophyllous and persisting for several seasons
Equisetum telmateia subsp. braunii (D/E) ..... fertile stems short lived/sterile stems chlorophyllous and persisting for several seasons
Oenanthe sarmentosa (E)
Oxalis oregana (E)
Persicaria punctata (E)
Scirpus microcarpus (E) ..... when present in sufficient numbers, important colonizer/stabilizer of saturated soils adjacent to streams and ponds
Scrophularia californica subsp. californica (P) ..... perennial by rootstocks with flowering stems seasonal
Stachys bullata (E)
Symphyotrichum chilense (E)
Veronica americana (E)..... often stoloniferous where moist substrate is present

Included within this overview, are other "native" taxa, principally perennial (P) with some annuals (A) also present, which play various supporting roles in this ecological drama:

Actaea rubra (P)
Bromus carinatus var. carinatus (P)..... short-lived perennial with flowering stems seasonal
Bromus vulgaris (P)..... perennial with seasonal flowering stems
Calystegia purpurata subsp. purpurata (P)..... scandent stems often covering sympatric shrubs and sub-trees (e.g., Ceanothus thyrsiflorus)
Carex bolanderi (P)
Deschampsia elongata (P)
Dicentra formosa (P)
Elymus californicus (P)
Elymus glaucus subsp. glaucus (P)..... semi-deciduous, with old flowering stems often producing nodal/adventitious proliferations
Epilobium ciliatum (P)..... perennial by basal rosettes and flowering stems usually seasonal in duration
Festuca elmeri (P)..... uncommon but well represented within watershed proper and scattered on mixed coniferous/hardwood dominated slopes margining riparian corridor
Festuca subuliflora (P)..... uncommon within Santa Cruz County and usually restricted to interior portions of sub-watersheds draining into Scotts Creek
Galium triflorum (P)
Heracleum maximum (P)..... perennial by rootstocks with flowering stems seasonal in duration
Lathyrus vestitus var. vestitus (P)..... perennial by rhizomes with aerial, scandent stems usually seasonal with flowering stems drying brown and leaves shed as Fall approaches
Lemna minor (P)..... during summer months often forming verdant sheets on surface of ponds, backwaters and slow moving streams
Marah fabaceus (P)..... perennial from massive tuber with extensive scandent aerial stems seasonal in duration
Melica torreyana (P)..... often going dormant in Fall, with dry foliage and spent inflorescences covering exposed road banks and rocky slopes
Mimulus floribundus (A)..... both Mimulus floribundus and Mimulus moschatus are principally sandbar occupants
Mimulus moschatus (P)
Osmorhiza beteroi (P)..... perennial with flowering stems seasonal in duration
Phalaris californica (P)..... semi-deciduous, with old flowering stems often producing nodal proliferations aka asexual propagules
Sanicula crassicaulis (P)..... short-lived perennial with flowering stems seasonal in duration
Sanicula gianonei, pro.sp. nov. (P)..... short-lived perennial with flowering stems seasonal in duration
Solanum douglasii (P)
Symphoricarpos albus var. laevigatus (D)..... long-lived deciduous shrub, sporadic in occurrence but where established, often forming extensive colonies
Thalictrum polycarpum (P)..... perennial from roostock and flowering stems seasonal in duration

In a blatant case of familiarity breeds contempt, miner’s lettuce (Claytonia perfoliata subsp.
perfoliata), is a botanical leitmotiv, accompanying and rewarding the perspicacious observer with structural nuances missed when viewed hastily or from afar. Categorized by stature, this "species" exhibits environmental plasticity to an extreme degree, ranging from diminutive to exceedingly robust with stems and leaves varying in coloration from green to bronze and reddish-pink. The fused cauline leaves, taking the shape of an orbicular or angled disc, when thin are like sheets of paper but in some populations can exhibit thickness in the 1-2 millimeter range! A varied constellation of characters greets one when cataloguing the inflorescences, both as to gestalt and pigmentation: displaying a full spectrum from stalked thru sessile, open or condensed, with calyces concolored green thru chocolate, uniformly viniferous or bicolored with bases and apices pigmented differently from the main body..... some populations distinguished by vertical barring analogous to those found on a bird cage. Flowers can vary not only in size but color, with white predominant but some populations suffused with pink and even the shiny black seeds refusing to be held hostage to one particular measurement. Paradoxically, as widespread and variable miner's lettuce is within the watershed, its sister species candy flower (Claytonia sibirica), currently exists only in the lower portion of the Little Creek Watershed, is relatively uniform in gross morphology and where populations of the two species overlap, no evidence of interspecific hybridization has been observed. Other family members documented as residing within our "ecological hot spot", are serpentine miner's lettuce (Claytonia exigua subsp. exigua), slender miner's lettuce (Claytonia parviflora subsp. parviflora) and little-leaf montia (Montia parvifolia). During the summer of 2005, a small population of what purported to be red-stemmed miner's lettuce (Claytonia rubra subsp. depressa) was digitally photographed growing on a ne-facing ridge connecting the “Bulb Field” with Swanton Road. Using this relatively small (thirty square miles) but topographically complex watershed as a living laboratory to investigate, on several fronts, the causal factors underlying the polymorphism inherent in the local populations of miner's lettuce (Claytonia perfoliata subsp. perfoliata), is a research project eminently worth considering. Lines of inquiry should include, the interplay between environmental and genetic factors, ploidy levels and direction of gene flow, out-breeding versus obligate selfing patterns, pollination and seed dispersal vectors and the potential for cryptic species/endemism with the mapping of local morphologies occurring outside of the watershed. The following genera, Caladrinia, Claytonia and Montia, formerly placed within the Portulacaceae have been given their own family..... the Montiaceae.

Within the Scotts Creek Watershed, several populations of white baby blue-eyes (Nemophila menziesii var. atomaria) have been found, combining traits of both var. menziesii and var. atomaria: the taxa in question produce polymorphic flowers, ranging from 3-25+ mm. in diameter, highly variable as to coloration and a certain percentage, producing 1-5 non-functional stamens with pinkish-tan anthers on reduced filaments but with functional stigmas, making the plants ♀ gynodioecious! The high degree of variability, as to both foliar and floral morphologies, coloration and 10-20% occurrence of imperfect androecia, may be the result of past hybridization between populations of both var. menziesii and var. atomaria, some of which exhibit in varying degrees, reproductive isolating mechanisms, which range from partial through total incompatibility. Further work needs to be done clarifying these morphological anomalies and their evolutionary significance.

Locally, the native tarweeds form a complex series of intergrades: some are sporadic and highly localized, threadstem madia (Madia exigua) x slender tarweed (Madia gracilis) with its distinctive zigzag growth pattern and cherry-syrup aroma, while along the roadbanks and their
highly disturbed bases, **coast tarweed (Madia sativa/capitata)** x **slender tarweed (Madia gracilis)** gives rise to an often bewildering assemblage of forms differing in stature, glandulosity/chemical signatures and foliar/floral morphologies. There may even be an unrecognized or unnamed species hiding within this taxonomic free-for-all! **Threadstem madia (Madia exigua)**, **slender tarweed (Madia gracilis)** and **coast tarweed (Madia sativa/capitata)** are in varying degrees clothed with gland-tipped trichomes, each species defined by a specific chemical signature, with the hybrids displaying scents intermediate between the putative parents.

The forested tracts margining the central portion of our passage through Swanton Valley collectively act as a refugium for at least 2,000 all-age category California nutmegs (**Torreya californica**). Claiming ecological association with this lone local member of the Yew Family (Taxaceae) is a most diverse cast of characters. Sampling those species visible from our rigidly defined viewing area, several intergrading habitats give the discerning observer a virtual smorgasbord of biota to study:

1. The richly vegetated slopes, ascending from road embankment to ridge top, offer sanctuary to hairy honeysuckle (**Lonicera hispidula var. vacillans** = **Lonicera hispidula**) and snowberry (**Symphoricarpos albus var. lacvigatus**), which although dissimilar in overall appearance are both members of the Honeysuckle Family (Caprifoliaceae). Two other occasionally sympatric members of this family famed for its often-scented ornamental vines, are blue elderberry (**Sambucus mexicana** = **Sambucus nigra subsp. canadensis**) and red elderberry (**Sambucus racemosa var. racemosa**).  

   **Note:** due to recent molecular studies, the genus **Sambucus** is now placed in the family ADOXACEAE.

2. Giving the Nightshade Family (Solanaceae) its due, a set of unlike species, with careful scrutiny, can be ferreted out from the brushy margins on either side of the roadway. Scentless, deeply-lobed, white corollas with basal greenish blotches characterize Douglas’s nightshade (**Solanum douglasii**) while blue witch (**Solanum umbelliferum**) wins over even the most insensitive of observers with exceedingly fragrant, shallowly-lobed, bluish-purple corollas, eminently deserving a place of honor in any wild garden.

3. Formerly representing the Waterleaf Family (Hydrophyllaceae) but now ensconced within the **Borage Family (Boraginaceae)**, are small-flowered nemophila (**Nemophila parviflora var. parviflora**), extremely variable as to foliar gestalt but fairly uniform in floral configuration, and stinging phacelia (**Phacelia malvifolia**), the stiff, pustulate-based trichomes on leaves and stems packing a wallop when inadvertently squeezed and the plants, when growing in a suitable environment forming a monoculture, aggressively colonizing a sunny slope often at the expense of neighboring species.

Several unrelated species sharing this environment are intrinsically fascinating just because of their foliar polymorphism. Besides the aforementioned species of Nemophila, included in this group are California figwort (**Scrophularia californica** subsp. **californica**), which includes rare individuals with flavistic flowers; common milkmaids (**Cardamine californica var. californica**), variable as to both floral and foliar pigmentation; Pacific pea (**Lathyrus vestitus var. vestitus**), some road bank populations combining aspects of formerly recognized subsp. **puberulus** and subsp. **...**
bolanderi, with herbage glabrous or pubescent and stipules ranging from narrow and entire through broad with undulate margins and when found growing intermixed with American vetch (*Vicia americana* var. *americana*) in a non-flowering state, can challenge all but the most seasoned observer; and finally ubiquitous mugwort (*Artemisia douglasiana*), adjacent populations often looking like separate species, exceedingly variable as to stature, chemical signature, foliar morphology and indument.

Adding an olfactory component to the observational mix are three members of the Mint Family (Lamiaceae): coyote mint (*Monardella villosa* subsp. *villosa*), yerba buena (*Satureja douglasii*), and California hedge nettle (*Stachys bullata*), differing in modes of growth and scents released from their crushed herbage. Blending into the roadside banks already brimming with visual and olfactory treats, a visually unpretentious member of the Legume Family (Fabaceae), California tea (*Rupertia physodes*), startles and rewards the scent-driven connoisseur with gland-stippled foliage that aromatically lingers both on the hands and in the memory.

The presence of Scotts Creek, even when outside of direct viewing, makes itself known by the arborous mosaic that lines and secures the streambanks. During the winter months, the leafless red alder (*Alnus rubra*) becomes a ghostly procession of interlocking skeletal branches, ashen and lichen dappled. When bathed in rising mist, they attain a fluidity that rivals the headlong rush of the water they overarch. Entering the creek, between spring and summer, at any point along its 6+ mile journey to the ocean and merely wading some 50 meters, in either direction, can yield unexpected botanical treasures, in some cases just the number of species representing one genus and collectively occupying a sandbar or stream bank. One sandbar observed circa 25 years ago, above the confluence of Schoolhouse Gulch with Scotts Creek, hosted scarlet monkeyflower (*Mimulus cardinalis*), floriferous monkeyflower (*Mimulus floribundus*), Snouted monkeyflower (*Mimulus guttatus* var. *gracilis* = *Mimulus nasutus*), musk monkeyflower (*Mimulus moschatus*) and downy monkeyflower (*Mimulus pilosus*). Also during this time frame, a gigas (giant) form of common rush (*Juncus patens*) was discovered growing on sandbars scattered throughout the watershed. Robust in stature, with glaucous-blue culms circa 1-1.5+ meters in height and 2-4+ mm. in diameter, these topped off with spreading inflorescences 10-12+ cm. across, offered the creative landscaper a superb accent plant to utilize in the water garden or seasonally wet areas in need of stabilization. Regrettably, several seasons of high winter flow, eradicated or reconfigured the sand bars in question, virtually eliminating this highly distinctive form from the riparian corridor. Parenthetically, somewhat less robust individuals have been observed in recent years, growing in the upper Scotts Creek Watershed and possibly representing the source material for the original find. Two species that also grace the streamside margins are the relatively common, common horsetail (*Equisetum arvense*) looking like a malnourished variant of the giant horsetail (*Equisetum telmateia* subsp. *braunii*) and the decidedly uncommon clammy clover (*Trifolium obtusiflorum*), subtly passing for an overtly glandular version of tomat clover (*Trifolium willdenovii*). Another legume, an infrequently encountered sandbar/stream bank denizen, coastal trefoil (*Lotus salsuginosus* var. *salsuginosus* = *Acmispon maritimus* var. *maritimus*), was found growing down stream below the entrance of Mill Creek into Scotts Creek and disappeared following the “El Nino” scouring (this population was fortunately documented by a seed collection deposited at the UCSC Arboretum..... during a post 2009 Lockheed Fire botanical review of the upper/central portion of the Schoolhouse Ridge, which took place in early spring of 2010, more than 1,000 plants of this previously rare to the watershed taxon, were observed, rendering the rarity status moot!).
Sharing habitat and foliar nakedness, salmonberry (*Rubus spectabilis*) sports muted-gold stems, which contrast with the glossy, vinaceous twigs of creek dogwood (*Cornus sericea* subsp. *sericea*) and the gnarled asymmetry of the red elderberry. Hugging the moist leaf litter, and visible from our perspective only in winter due to the deciduous nature of the understory shrubbery, wild ginger (*Asarum caudatum*), with brownish-maroon flowers, sporting attenuate calyx lobes and pungently aromatic, sub-surface rhizomes topped with cordate leaves, gives a first impression of being more animal than plant. Occupying the same relatively narrow zone between road bed and stream bed, semi-dormant during Winter when viewing from tarmac is possible and screened by leafed-out bushes from Spring through Summer, renders from our traversal point-of-view, a peek at uncommon California bottlebrush grass (*Elymus californicus*), a logistical nightmare!

A sigmoid pattern to the roadbed affords the botanically immersed statistician a chance to observe along the creek two sets of three: (1) arroyo willow (*Salix lasiolepis*), yellow willow (*Salix lucida* subsp. *lasiandra* = *Salix lasiandra* var. *lasiandra*), and velvet willow (*Salix sitchensis*), sharing a bend in the watercourse with (2) representatives of the Sedge Family (Cyperaceae), namely blue creek-sedge (*Carex amplifolia*), its glaucous-blue, v-shaped in cross-section foliage contrasting with the surrounding greenery, Bolander's sedge (*Carex bolanderi*), a distinctive taxon locally, with inflorescences displaying 1-5+ compound-congested lower spikelets, these often androgy nous, and cousin paniced bulrush (*Scirpus microcarpus*), luxuriant during the growing season but dying back annually to long-lived, soil-binding rhizomes. Varying from several hundred to less than 5 meters in width, the area between road edge and stream bank is ecologically complex, in part due to cyclical hydrological disruptions.

One of the ecological values of sandbars within a watershed is the capturing via seed or asexual division, of floristic components, that by their nature are often uncommon and restricted to specific sites overlooking but not actually belonging to the riparian corridor proper. Such is the case with sharp-fruited rush (*Juncus acuminatus*), historically recorded as occurring along the edges of the pond behind Mill Creek Dam and recently (2003-2004) found growing circa 1/8 mile below the confluence of Mill Creek with Scotts Creek. Some other displaced native species, which occasionally crop up on Scotts Creek sandbars and normally frequent more mesic habitats which are higher in elevation, are Brewer's calandrinia (*Calandrinia breweri*), straggling gilia (*Allophyllum divaricatum*), coast whitethorn (*Ceanothus incanus*), wartleaf ceanothus (*Ceanothus papillosus* var. *papillosus*), fragrant everlasting (*Gnaphalium canescens* ssp. *beneolens* = *Pseudognaphalium beneolens*), stipulate trefoil (*Lotus stipularis/balsamiferus*), silver bush lupine (*Lupinus albifrons* var. *albifrons*), downy monkeyflower (*Mimulus pilosus*) and Pacific panic grass (*Panicum acuminatum* var. *acuminatum*). Although transitory by nature, sandbars can concentrate disparate elements of a watershed, creating a point of departure to study biodiversity, distribution mechanisms and adaptation strategies.

Along the Scotts Creek riparian corridor during the Summer/Fall transitional period when water levels drop and flow rates are often greatly reduced, the thalli of the smaller duckweed (*Lemna minor*), a monocot with minuscule flowers, often form extensive mat-like colonies, covering pools and stream margins. Do these clonal aggregations have a salutary value within the aquatic environment?

1. Do the verdant sheets of *Lemna minor* afford a visual protection for the young salmonids from aerial predators such as the Belted Kingfishers?
2. Do the *Lemna minor* colonies mitigate water temperatures by directly absorbing the radiant energy of the midday sun?
(3) Do the photosynthesizing thalli increase oxygen levels in the aqueous environment, thereby benefiting the associate biota?

Appearing sporadically throughout our botanical quest, intermediate fiddleneck (*Amsinckia menziesii var. intermedia*), carries with it a history of more than one hundred described variants. Self-pollination allows several forms to co-exist within a shared habitat and a least two distinct phases of this highly variable taxon occur locally, either growing separately or sympatrically. Phase #1 is early blooming, delicate in stature with linear ascending leaves clothed with appressed, soft to the touch, hairs and simple stems terminating in unbranched scorpioid spikes, the entire plant, save the orange salverform corollas, lost in the surrounding wash of green, while Phase #2 is robust with hispid pustulate hairs and branched spreading stems above, often still in or emerging from the basal rosette stage while Phase #1, is in full flower. A unique sister species, rare statewide and existing in a few isolated colonies locally, is bent-flowered fiddleneck (*Amsinckia lunaris*), either a relic or ahead of its time, choosing near-vertical, often exfoliating shale banks to call home. How ironic, that a species with the lowest chromosome number (n=4) in the genus, has undergone the most radical change in floral morphology, going from being radially to bilaterally symmetrical! Bringing the total number of resident “native” fiddleneck taxa to four, seaside fiddleneck (*Amsinckia spectabilis*) stakes out the coastal headlands as its home, often half-hidden within the California sagebrush (*Artemisia californica*) understory.

Two members of the Buttercup Family (Ranunculaceae), dissimilar in reproductive mechanisms and foliar patterns but sharing the same environment, are baneberry (*Actaea rubra*) with toxic, nitid red berries, leaves cauline, bi- or tri-ternately compound and meadow rue (*Thalictrum fendleri* var. *polycarpum* = *Thalictrum polycarpum*), dioecious and apetalous, pistillate plants with reddish-purple stigmas looking like miniature sea anemones and the male counterpart with bronze, pendant stamens mimicking tassels on an old-fashion lampshade, the fruit a laterally compressed achene, with emerging seasonal foliage readily passing for an undescribed species of maidenhair fern (genus *Adiantum*). Another pairing, this time within a genus, is that of fat Solomon’s seal (*Smilacina racemosa* = *Maianthemum racemosum*) and slim Solomon’s seal (*Smilacina stellata* = *Maianthemum stellatum*), the singular fragrance of the the “fat” one an elusive blending of violets and narcissi.

Sticking with the monocots are four more “treasures” that present themselves artfully along the roadside. Starting off with checker lily (*Fritillaria affinis* var. *affinis*)—occasional robust individuals can produce racemes with 10 or more Tiffany-like, pendant flowers, varying in size and ranging from chartreuse thru maroon in coloration. The second is giant trillium (*Trillium chloropetalum*), which presents a fascinating case study in the linkage between flower color, scent, habitat, and pollinating vectors—and ultimately, how does one define a species? Entering third in this ecological drama is western wake robin (*Trillium ovatum* subsp. *ovatum*), morphologically fairly consistent with pedicellate flowers, usually white drying a pinkish-lavender and fragrant of honey. At home in several moist habitats, ranging from isolated marshes to shaded woodland margins, number four is California canary grass (*Phalaris californica*), while caespitose in habit, gives the impression of being distinctly rhizomatous by producing asexual nodal propagules, which when touching the damp earth, root some distance from the origins of parent culms. Sharing this distinctive mode of replication and in some local forms, vegetatively mimicking the canary grass, is California wild rye (*Elymus glaucus* subsp. *glaucus*): focusing on blade and ligule differences, when inflorescences are not available, quickly separates the two genera.
Note: Within the area circumscribed by this essay..... from the coastal bluffs inland to the oak/coniferous woodland/chaparral transitional zone..... the checker lily (*Fritillaria affinis*) exhibits a high degree of plasticity, both as to stature and number, size and coloration of its flowers. There is untapped potential, found just within this narrow slice of central coastal California, for the establishing of a selective breeding program, with the intention of introducing into cultivation, flowers with new color patterns and perhaps a series of intraspecific hybrids more amenable to garden culture. The aforementioned checker lily discussion could be applied with even more enthusiasm when tallying up all the forms, both as to flower color and scent, of the Scotts Creek Watershed’s giant trillium (*Trillium chloropetalum*)..... for here is a complex of micro-species that offers the artist/breeder, a visual and olfactory palette, that ranges from chartreuse thru white and into the lilac and dark maroon/viniferous ranges of the spectrum..... often with contrasting sepals, leaves unmarked or decorated with complex maculations and a parade of scents ranging from spicy/cinnamon through flowers redolent of citrus (lemon)!!!

Adding visual spice to our botanical sleuthing, a disparate trio of unrelated “dicots”, punctuate the verdancy that frames our southward journey: hound’s tongue (*Cynoglossum grande*), a stately native embarrassed by the aggressive colonization of its upstart European cousin, forget-me-not (*Myosotis latifolia*); American winter cress (*Barbara orthoceras*), usually encountered as individual specimens or a scattering, unless growing in a recently disturbed environment and then sometimes behaving in a ruderal fashion; and Canada goldenrod (*Solidago canadensis* subsp. *elongata* = *Solidago elongata*), which of all our goldenrods is the least common and is usually restricted to old coastal marshes. Three “disjuncts” have been documented along Swanton Road, between Mill Creek and Big Creek Bridges, raising questions about the overall distribution pattern for this horticulturally desirable species within the watershed!

Situated between pavement and bank, drainage ditches are often mere slivers of habitat, subject to the vagaries of both nature and man—transient catchalls for a diverse assemblage of flora, usually naturalized exotics but some uncommon, localized and native! Sharing this micro-habitat of concentrated moisture, uncommon meadow nemophila (*Nemophila pedunculata*) can be found with stems intertwined, snuggling with its ubiquitous relative, small-flowered nemophila (*Nemophila parviflora* var. *parviflora*). Usually found growing in moist shaded spots within the riparian corridor, fringe cups (*Tellima grandiflora*) makes a brief appearance roadside, its pendulous flowers changing from green to rose during maturation. Growing intermixed with brown bog-rush (*Juncus effusus* var. *brunneus*), Gianone’s sedge (*Carex gianonei*, pro. sp. nov.) and willow herb (*Epilobium ciliatum* subsp. *ciliatum*) is bracted popcorn-flower (*Plagiobothrys bracteatus*): Beginning as a small rosette hidden deep within the shadows of its robust brethren and stimulated by and drawn to the higher light intensities reaching down through breaks in the vegetation, it sends out lateral stems, these branching and threading their way through the adjacent foliage, often some distance from its anchoring annual root system. Persisting in place through the seasonal production of seed (nutlets) gives the popcorn-flower an illusion of permanence. At the other extreme, underground rhizomes of the neighboring giant horsetail (*Equisetum telmateia* subsp. *braunii*) may persist for centuries, in spite of the abuse piled on them, literally, in the form of asphalt! Perennial status also grants the California dock (*Rumex salicifolius* var. *denticulatus* = *Rumex californicus*) a secure tenure, albeit a punctuated one, along our meandering route.
A Lilliputian world of flowering plants, wholly missed by weekend vehicular botanists and, in general, overlooked by the casual explorers of the coastal prairies, interior grasslands and riparian meadows, can be readily encountered by just getting down on “all fours” and sleuthing with a hand lens. Here is a tantalizing introduction into the world of “minimalist botany”: occasionally found growing together in moist ditches and the adjoining grassland, dwarf club rush (*Scirpus koilolepis* = *Isolepis carinata*) and timwort (*Cicendia quadrangularis*) make for a visually accommodating duo, the timwort with 4-merous yellow corollas passing for a dwarf “crucifer”, but in reality, a bona fide member of the Gentian Family (*Gentianaceae*); another habitat sharing pair, this time within the “Sandy-bottom Reservoir”, are water pygmyweed (*Crassula aquatica*), a micro-miniature when compared with the rosettes of its cousin, sea lettuce (*Dudleya caespitosa*), and thyme-leaved pogogyne (*Pogogyne serpylloides*), a native mint so diminutive in stature that an adult plant can be accommodated on the head of a dime but possessing a scent so penetrating that one’s first introduction is made through smell rather than sight; their root systems embedded within a water retentive skin composed of grass detritus and moss, which partially obscures the exposed angularity of the weathered mudstone, dwarf locoweed (*Astragalus gambelianus*), strigose trefoil (*Lotus strigosus*), tiny pentachaeta (*Pentachaeta alsinoides*), San Francisco popcorn-flower (*Plagiobothrys diffusus/reticulatus*), shining peppergrass (*Lepidium nitidum var. nitidum*), purple-beaked owl’s clover (*Triphysaria micrantha*), Mt. Diablo cottonweed (*Micropus amphibolus*) and slender goldfields (*Lasthenia californica*), to introduce just a small part of an extraordinary cast of players inhabiting a “world within a world” and more apt to be crushed underfoot than perused. To legitimately embrace and lay claim to the title of naturalist, demands that any traversal, whether on tarmac or naturally occurring terrain, should be leisurely, in order to savor the less conspicuous but not insignificant constituents of the plant world and recognize that ultimately it is only a matter of scale.

Whether common or otherwise, the following “legitimate” residents along this stretch of watershed add variety to the proceedings: purple cudweed (*Gnaphalium purpureum* = *Gamochaeta ustulata*), California poppy (*Eschscholzia californica*), hairy wood sorrel (*Oxalis albicans* subsp. *pilosa*), pinole clover (*Trifolium bifidum* var. *decipiens*), pin-point clover (*Trifolium gracilentum* var. *gracilentum*), Valparaiso clover (*Trifolium microdon*), Spanish trefoil (*Lotus purshianus* var. *purshianus* = *Acmispon americanus* var. *americanus*), gambleweed (*Sanicula crassicaulis*), mountain dandelion (*Agoseris grandiflora*), morning glory (*Calystegia occidentalis* subsp. *occidentalis* = *Calystegia purpurata* subsp. *purpurata*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), rattlesnake weed (*Daucus pusillus*), selfheal (*Prunella vulgaris* subsp. *lanceolata*), and canyon gooseberry (*Ribes menziesii*).

Note: Areas of biological/botanical/ecological/reference interest mentioned in this section of the essay, have the following Google Earth coordinates:

- **Bannister Gulch (a):** 37degrees07'14.97"N, 122degrees13'29.44"W, elevation 1457feet
- **Bannister Gulch (b):** 37degrees06'59.13"N, 122degrees14'29.17"W, elevation 673feet
- **Beehive Hill:** 37degrees04'55.08"N, 122degrees14'44.20W, elevation 194feet
- **Bettencourt Gulch (a):** 37degrees06'27.70"N, 122degrees14'21.52"W, elevation 476feet
Bettencourt Gulch (b): 37°06'07.60"N, 122°14'55.04"W, elevation 188 feet

Mill Creek Bridge: 37°04'40.19"N, 122°14'38.90"W, elevation 84 feet

Mill Creek Dam/Reservoir: 37°06'58.81"N, 122°43'29"W, elevation 1481 feet

Upper Cookhouse Gulch drainage(a): 37°04'16.81"N, 122°14'58.30"W, elevation 472 feet

Upper Cookhouse Gulch drainage(b): 37°04'04.87"N, 122°14'38.11"W, elevation 489 feet

Schoolhouse Gulch Complex: 37°05'03.81"N, 122°14'42.94"W, elevation 168 feet

Schoolhouse Ridge(Upper Pozzi Meadow): 37°05'01.18"N, 122°14'33.26"W, elevation 413 feet

Schoolhouse Ridge(Lower Pozzi Meadow): 37°04'50.05"N, 122°14'40.52"W, elevation 225 feet

Scotts Creek Bridge: 37°04'47.46"N, 122°14'50.01"W, elevation 81 feet

"Slide Area", Purdy Road: 37°05'13.87"N, 122°14'55.19"W, elevation 152 feet

Note: Select herbarium specimens of horticulturally meritorious, locally uncommon, rare county wide and agency listed species referred to in this section of the Traversal, collected and pressed, with noted exceptions, by Roy Buck and/or James West within the Scotts Creek Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:

*Acer negundo* var. *californicum* = *Acer negundo* /accession number JEPS42732/Jepson #4168

*Allophyllum divaricatum* /accession number JEPS81555/Buck & West #108

*Amsinckia lunaris* /accession number JEPS81537/Buck, West & Stone #466

*Amsinckia lunaris* /accession number UC1561077/Taylor, Buck, West & Clifton #9659

*Antirrhinum kelloggii* /accession number JEPS82645/Buck & West #215

*Antirrhinum kelloggii* /accession number JEPS85163/Buck & West #516

*Arctostaphylos* "sp" /accession number UCSC4784/Randall Morgan, Dec 22 1976

*Arctostaphylos* "sp" /accession number UCSC4785/Randall Morgan, Dec 22 1976

*Arctostaphylos* "sp" /accession number UCSC5684/R. Morgan, Jan 31 1977

*Arctostaphylos* "sp" /accession number UCSC5723/Randall Morgan, Jan 19 1977

*Arctostaphylos* "sp" /accession number UCSC5727/Randall Morgan, Dec 21 1976

*Arctostaphylos* "sp" /accession number UCSC5738/Randall Morgan, Dec 21 1976

*Arctostaphylos* "sp" /accession number UCSC8144/R. Morgan, Dec 26 1976
Arctostaphylos "sp"/accession number UCSC6152/R. Morgan, Jan 1979
Arctostaphylos "sp"/accession number UCSC6180/R. Morgan, Jan 1979
Arctostaphylos "sp"/accession number UCSC6181/R. Morgan, Jan 1979

*Arctostaphylos crustacea*, sensu lato/accession number JEPS82578/West #204.1
*Arctostaphylos crustacea*, sensu lato/accession number JEPS81974/Buck & West #212
*Arctostaphylos crustacea*, sensu lato/accession number JEPS81975/Buck & West #157
*Arctostaphylos crustacea*, sensu lato/accession number JEPS81976/Buck & West #156
*Arctostaphylos crustacea*, sensu lato/accession number JEPS81978/Buck & West #154
*Arctostaphylos "glandulosa"*/accession number UCSC5796/R. Morgan, Jan 1977
*Arctostaphylos "glandulosa"*/accession number UCSC5805/R. Morgan, Jan 17 1977
*Arctostaphylos crustacea*, sensu lato/accession number JEPS81977/Buck & West #155

subcordata/accession number JEPS81977/Buck & West #155

*Arctostaphylos tomentosa*, subsp. subcordata = *Arctostaphylos crustacea* subsp. subcordata

subcordata/accession number JEPS81977/Buck & West #155

Arnica discoidea/accession number JEPS30906/Thomas #4089
Astragalus gambelianus/accession number JEPS82614/Buck & West #252
Athyrsus pusillus/accession number JEPS82961/West #54.1

*Brodiea terrestris*, subsp. terrestris/accession number JEPS82807/Buck & West #288

*Carex bolanderi*/accession number JEPS82963/West #76.1
*Carex bolanderi*/accession number JEPS82964/West #77
*Carex bolanderi*/accession number JEPS83452/Morgan & West #1
*Carex bolanderi*/accession number JEPS82778/Buck & West #306
*Carex bolanderi*/accession number JEPS83060/Buck #454
*Carex bolanderi*/accession number JEPS101037/Taylor #9649

*Carex gianonei*, pro. sp. nov./accession number JEPS83024/West #296
*Carex gianonei*, pro. sp. nov./accession number JEPS85180/Buck & West #487

Claytonia exigua subsp. exigua/accession number JEPS81986/Buck & West #182

*Claytonia parviflora* subsp. parviflora/accession number JEPS82772/West #39

*Clematis lasiantha*/accession number JEPS83087/West #345
*Corallorhiza striata*/accession number JEPS89230/Buck & West #228
*Elymus californicus*/accession number JEPS81548/Buck & West #109
*Epilobium ciliatum*/accession number JEPS 83119/Buck & West #348
*Epilobium ciliatum*/accession number JEPS83098/Buck & West #439
*Epilobium minutum*/accession number JEPS85126/Buck & West #529

*Equisetum arvense*/accession number JEPS81561/Buck & West #86
*Eriogonum nudum*/accession number JEPS83099/Buck & West #441
*Eriogonum nudum*/accession number JEPS83100/Buck & West #442

*Gilia clivorum*/accession number JEPS82958/West #51.1
*Gilia clivorum*/accession number JEPS82571/Buck & West #210
*Gnaphalium purpureum = Gamochaeta ustulata*/accession number SJSU10203/Sharsmith #8784

*Juncus "sp"*/accession number UCSC4804/Randall Morgan, Oct 27 1976
*Juncus acuminatus*/accession number UC1009585/Hesse #1318
*Juncus acuminatus*/accession number JEPS86052/Hesse #1318

*Linanthus androsaceus = Leptosiphon androsacus*/accession number JEPS82809/Buck & West #286

*Lotus stipularis var. stipularis (balsamiferus)/accession number JEPS83126/Buck & West #372

*Madia exigua*/accession number JEPS83093/Buck & West #380
<table>
<thead>
<tr>
<th>Species</th>
<th>Accession Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Madia exigua</em></td>
<td>JEPS82580</td>
<td>West #114</td>
</tr>
<tr>
<td><em>Madia gracilis</em></td>
<td>JEPS82629</td>
<td>Buck &amp; West #237</td>
</tr>
<tr>
<td><em>Malacothrix floccifera</em></td>
<td>JEPS82788</td>
<td>Buck &amp; West #308</td>
</tr>
<tr>
<td><em>Mimulus cardinalis</em></td>
<td>JEPS83050</td>
<td>Buck &amp; West #417</td>
</tr>
<tr>
<td><em>Mimulus floribundus</em></td>
<td>JEPS81562</td>
<td>Buck &amp; West #85</td>
</tr>
<tr>
<td><em>Mimulus floribundus</em></td>
<td>JEPS82875</td>
<td>Buck &amp; West #416</td>
</tr>
<tr>
<td><em>Mimulus moschatus</em></td>
<td>JEPS81560</td>
<td>Buck &amp; West #87</td>
</tr>
<tr>
<td><em>Minuartia douglasii</em></td>
<td>JEPS82647</td>
<td>Buck &amp; West #213</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS81922</td>
<td>Buck, West &amp; Stone #192</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS82016</td>
<td>Buck, West &amp; Stone #135</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS82018</td>
<td>Buck &amp; West #162</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS82019</td>
<td>Buck &amp; West #163</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS82020</td>
<td>Buck &amp; West #164</td>
</tr>
<tr>
<td><em>Nemophila menziesii</em></td>
<td>JEPS82021</td>
<td>Buck &amp; West #165</td>
</tr>
<tr>
<td><em>Nemophila pedunculata</em></td>
<td>JEPS82775</td>
<td>West #57</td>
</tr>
<tr>
<td><em>Oemleria cerasiformis</em></td>
<td>JEPS81994</td>
<td>Buck &amp; West #150</td>
</tr>
<tr>
<td><em>Oemleria cerasiformis</em></td>
<td>UCR67869</td>
<td>Keil #20656</td>
</tr>
<tr>
<td><em>Pellaea mucronata var. mucronata</em></td>
<td>JEPS82789</td>
<td>Buck &amp; West #309</td>
</tr>
<tr>
<td><em>Phacelia malvifolia</em></td>
<td>UC794459</td>
<td>Constance &amp; Macbride #3307</td>
</tr>
<tr>
<td><em>Plagiobothrys bracteatus</em></td>
<td>UCSC4033</td>
<td>Randall Morgan, May 14 2003</td>
</tr>
<tr>
<td><em>Pogogyne serpylloides</em></td>
<td>JEPS82600</td>
<td>West #139</td>
</tr>
<tr>
<td><em>Polypodium scouleri</em></td>
<td>UCSC4869</td>
<td>Randall Morgan, May 26 (2)005</td>
</tr>
<tr>
<td><em>Quercus agrifolia</em></td>
<td>UCSC5525</td>
<td>Randall Morgan, Oct 13 1978</td>
</tr>
<tr>
<td><em>Rhododendron occidentale</em></td>
<td>JEPS83604</td>
<td>Buck &amp; West #443</td>
</tr>
<tr>
<td><em>Ribes menziesii</em></td>
<td>JEPS82000</td>
<td>Buck &amp; West #146</td>
</tr>
<tr>
<td><em>Ribes menziesii</em></td>
<td>JEPS82001</td>
<td>Buck &amp; West #148</td>
</tr>
<tr>
<td><em>Rubus spectabilis</em></td>
<td>JEPS81998</td>
<td>Buck &amp; West #147</td>
</tr>
<tr>
<td><em>Sanicula crassicaulis</em></td>
<td>JEPS83081</td>
<td>West #358</td>
</tr>
<tr>
<td><em>Sanicula crassicaulis</em></td>
<td>JEPS89270</td>
<td></td>
</tr>
<tr>
<td><em>Sanicula gianonei</em>, pro. sp. nov.</td>
<td>JEPS83051</td>
<td>West #298</td>
</tr>
<tr>
<td><em>Sanicula hoffmannii</em></td>
<td>JEPS83059</td>
<td>Buck &amp; West #455</td>
</tr>
<tr>
<td><em>Satureja douglasii</em></td>
<td>UCR67854</td>
<td>Keil #20598</td>
</tr>
<tr>
<td><em>Scirpus kiolepis</em></td>
<td>SJSU10205</td>
<td>C.W.Sharsmith #8786, May 15 1983</td>
</tr>
<tr>
<td><em>Scutellaria tuberosa</em></td>
<td>JEPS82626</td>
<td>Buck, West &amp; Hawke #240</td>
</tr>
<tr>
<td><em>Symphoricarpus albus var. laevigatus</em></td>
<td>JEPS85160</td>
<td>Buck &amp; West #491</td>
</tr>
<tr>
<td><em>Thysanocarpus curvipes</em></td>
<td>SBBG95498</td>
<td>Keil #20615</td>
</tr>
<tr>
<td><em>Torreya californica</em></td>
<td>SJSU15167</td>
<td>D. Garvey, Apr 13 1993</td>
</tr>
<tr>
<td><em>Torreya californica</em></td>
<td>UC463449</td>
<td>Wiggins #5086</td>
</tr>
<tr>
<td><em>Torreya californica</em></td>
<td>UC463450</td>
<td>Wiggins #5088</td>
</tr>
<tr>
<td><em>Trifolium ciliolatum</em></td>
<td>JEPS82644</td>
<td>Buck &amp; West #216</td>
</tr>
<tr>
<td><em>Trifolium gracilentum var. gracilentum</em></td>
<td>JEPS101286</td>
<td>Taylor, Buck, West &amp; Clifton #9662</td>
</tr>
<tr>
<td><em>Trifolium obtusiflorum</em></td>
<td>JEPS82876</td>
<td>Buck &amp; West #415</td>
</tr>
<tr>
<td><em>Trifolium oliganthum</em></td>
<td>JEPS82641</td>
<td>Buck &amp; West #219</td>
</tr>
</tbody>
</table>
Between Big Creek and Little Creek Bridges

Leaving Swanton Road for a brief detour into the Big Creek riparian corridor via an unpaved road affords us the luxury, of viewing five species not encountered on our primary traversal but still conforming to the protocol of not departing the road, dirt or otherwise! The quintet of “locals”, consists of sugar-scoop (Tiarella trifoliata var. unifoliata), with an apt colloquial name in view of its unequal 2-valved mature carpels, water hemlock (Cicuta douglasii), one of the most toxic native California plants that a bipedal clothed mammal can encounter, durango root (Datisca glomerata..... outside of an isolated plant found a few years back growing down stream from the confluence of Archibald and Scotts Creeks, this 2 meters high sandbar anchored goiliath, was the only other representative of this locally uncommon taxon observed and its parental source/origins a mystery..... until early in 2009, pre-Lockheed Fire, while visiting upper Dead Man’s Gulch, an extensive population of this toxic native was discovered..... its use as a fish poison by California Indians is well documented), Dudley's sword fern (Polystichum dudleyi), an uncommon fern species locally and co-parent of the rarer, California sword fern (Polystichum californicum), which also occurs within the Scotts Creek Watershed, and sticking with the ferns and found growing in the weathered/decomposed granite along lower “Powerhouse Grade”, California lace fern (Aspidotis californica). Bending the rules ever so slightly and moving up Big Creek a short distance, a fern-like plant is found growing in the shadowy recesses of the stream bank and if not in flower, could cause some consternation: the perpetrator in this case of botanical fraud is redwood ivy (Vancouveria planipetala), a member of the Barberry Family (Berberidaceae) and related to two other native taxa found in the watershed, barberry (Berberis nervosa) and coast barberry (Berberis pinnata subsp. pinnata). Still within our riparian detour and gracing the sculpted moist face of lower Big Creek Falls, is arguably our most beautiful larkspur, red larkspur (Delphinium nudicaule), hummingbird pollinated, a vector it shares with its cousin, crimson columbine (Aquilegia formosa) and non-relative, California fuchsia (Epilobium canum subsp. canum), both taxa sporadically occurring within the watershed. The Santa Cruz manzanita (Arctostaphylos andersonii), in species form rather than as a contributor to the polyphyletic burl-forming Arctostaphylos crustacea complex, makes an appearance near the top of Powerhouse Grade..... perhaps the lowest elevational point within the Scotts Creek Watershed that this occurs and going in the opposite direction from an ecological perspective, sea lettuce (Dudleya caespitosa) has been documented growing on the near-vertical banks above the lower Big Creek Falls..... note: this particular observation was made circa 30 years ago, and due to the severity of the El Nino driven winterstorms since then, whether the aforementioned Dudleya population still exists is uncertain. On 06/03/10, a two hour post fire exploration of the riparian corridor between the Fish Hatchery and below the first falls, yielded the following "legitimate" residents aka native taxa (listed more or less in order of appearance)..... in an area that was extensively burnt on both sides of the creek: Stachys bullata, Athyrium filix-femina var. cyclosorum, Juncus hesperius, Sambucus racemosa var. racemosa = Maianthemum racemosum, Rubus parviflorus, Rubus ursinus, Carex bolanderi (form with compound-congested lower spikelets), Sequoia sempervirens, Alnus rubra, Acer macrophyllum, Melica subulata, Hierochloe occidentalis = Anthoxanthum occidentale, Epilobium ciliatum sensu lato, Solanum douglasii, Notholithocarpus densiflorus var. densiflorus, Woodwardia fimbriata, Umbellaria californica, Cynoglossum grande,
Collomia heterophylla, Claytonia perfoliata subsp. perfoliata, Nemophila parviflora var. parviflora, Frangula californica subsp. californica, Melicia torreyana, Serrularia californica, Lathyrus vestitus sensu lato, Vicia gigantea, Phacelia californica (leaves, stems and inflorescences clothed with stiff, pustulate-based eglandular trichomes), Deschampsia elongata, Petasites frigidus var. palmaris, Carex amplifolia, Scirpus microcarpus, Pseudotsuga menziesii var. menziesii, Oxalis oregana, Galium triflorum, Cordamine californica var. californica, Smilacina stellata, Bromus carinatus var. carinatus, Urtica dioica subsp. gracilis, Mimulus guttatus complex (aff. Mimulus nasutus), Pteridium aquilinum var. pubescens, Poa henshawii, Cypres eragrostis, Aralia californica, Torreya californica, Equisetum telmateia subsp. braunii, Tiarella trifoliata var. unifoliata, Trillium ovatum, Cicutia douglasii, Callitriche marginata, Veronica americana, Juncus patens, Sanicula crassicaulis, Trisetum canescens, Elymus glaucus subsp. glaucus, Carex sect. Ovales (aff. Carex gianonei, pro. sp. nov.), Osmorhiza berteroi, Rubus salicifolius complex, Trifolium microphalum, Iris douglasiana, Polypodium californicum (lithophyte, lower sets of pinna longer than succeeding ones), Proserpina hookeri, Ribes menziesii, Vaccinium ovatum,..... concentrated within an area of circa 15 meters x 7 meters, on both sides of the dirt road, the following fern species were noted: Polypodium calirhiza (growing on stumps, lower sets of pinna shorter than succeeding ones), Woodwardia fimbriata, Athyrium filix-femina var. cyclosorus and Pteridium aquilinum var. pubescens (growing in alluvial deposits proximal to Big Creek), Polystichum dudleyi, Polystichum munitum, Dryopteris arguta, Adiantum aleuticum and Polypodium sp. (the quintet occupying a near vertical slope where the Santa Margarita Sandstone underlying the Santa Cruz Mudstone pinches out), Hesperocnide tenella, Dicentra formosa, Lilium pardalinum subsp. pardalinum (one impressive specimen exceeding 2.5 meters in height documented with several ready-to-harvest seed capsules), Scoliopteryx bigelovii, Calystegia purpurata subsp. purpurata, Pentagramma triangularis subsp. triangularis, Asyneuma prenanthoides, Festuca occidentalis, Carex globosa, Smilacina racemosa, Fritillaria affinis, Heuchera micrantha, Mimulus aurantiacus, Festuca elmeri, Fragaria vesca, Oxalis pilosa, Ceanothus thyrsiflorus, Trifolium wildenovii, Cirsium brevistylum, Anisocarpus madioides, Salix sitchensis, Calamagrostis rubescens, Holodiscus discolor, Festuca subuliflora, Delphinium nudicaule (growing on “granitics” aka quartz diorite cliff face and base, where quarrying took place historically), along with Calochortus albus, Eriophyllum confertiflorum var. confertiflorum and robust pendant clumps of Heuchera micrantha)..... moving further upstream and framed on both sides of the watercourse by ever-steepling banks, one encounters Lonicera hispida, Boykinia occidentalis, Veronica americana, Carex nudata, Mimulus cardinalis, Adiantum jordanii, Helenium frigidus, and Montia parvifolia (growing streamside on moss-covered boulders..... with compact colonizing rosettes and chartaceous white flowers, aesthetically holding its own when compared to florally vibrant cousins, the Lewisias).

While passing through Swanton, framed by pastures populated with cattle, horses, bobcats, coyotes, and an occasional great blue heron, the prospects for encountering even remnants of the native flora seem dim. A stretch of west-facing hillside, circa 60 meters in length and located near the end stage to this section of our journey rectifies the problem, producing a host of surprises! Only one addition to the observable native species list was recorded while crossing Big Creek Bridge, growing midstream with its rhizomes securely embedded in a cluster of mudstone fragments, coltsfoot (Petasites frigidus var. palmaris) proudly displayed its maple-like leaves on erect stalks.

Entering Scotts Creek more or less midway between the confluences of Big and Little Creeks and oriented in an easterly direction, an unnamed gulch, which extends up to Mt. Cook and drains
the brush covered slopes and adjacent grasslands, contains a remnant chaparral component with extensive, albeit fragmented, burl-forming manzanita (Arctostaphylos crustacea, sensu lato) populations. Mirroring each other across the deep but narrow in profile gulch, both “arcto” colonies are, for this watershed, typically perversive: displaying misplaced burls, isofacial or bifacial leaves with or without cordate bases and auriculations, a smorgasbord of trichomes, simple through dendritic, glandular or not, and inflorescences ranging from compact through open and intricately branched! Isolated from the chaparral fires that historically shaped the patterns of vegetation defining the ridges across the Scotts Creek riparian corridor, succession in the form of mixed coniferous/hardwood stands are overtopping and gradually shading out the pioneer “ericoids” and their unique genetic legacy! Sharing this habitat in transition, an extensive population of California tea (Rupertia physodes), randomly dispersed plants of Elmer’s fescue (Festuca elmeri), near the head of the gulch an oracle oak (Quercus x morehus), 3+ meters in height and growing with sympatric forest live-oak (Quercus parvula var. shrevei), also two reliable indicators of hillside moisture and constituents of the Rose Family (Rosaceae), ocean spray (Holodiscus discolor) and thimbleberry (Rubus parviflorus), long established hazelnut shrubs (Corylus cornuta var. californica), plus a scattering of sleepy catchfly (Silene antirrhina), which was observed, during the late 1970s-early 1980s, growing on the south facing steep slope supporting the larger of the two manzanita populations. As with the majority of secondary gulches feeding into Scotts Creek, the “Mt. Cook Gulch Complex” is a diverse self-contained ecosystem representing a microcosm, both in habitat and representative species, of the watershed as a whole. The relictual manzanita populations, mirroring their Schoolhouse Ridge counterparts, are growing, for the most part, on exposed/weathered mudstone modified by the accumulated detritus formed by their leaf litter and that derived from the ever encroaching coast live-oak (Quercus agrifolia var. agrifolia) and forest live-oak (Quercus parvula var. shrevei) populations, which in terms foliar variability, give the “arctos” a definite run for their money! The shaded and moist retentive west facing slopes are fast losing their remaining manzanitanas and within this decade will remain only as memories for those few observers fortunate enough to have studied them! Several of the species sharing the “disjunct chaparral” element of this ecologically complex gulch are also associated with the extensive “burl-forming” manzanita populations that define the ridges overlooking the upper watersheds of Scotts, Mill, Big and Little Creeks: bush poppy (Dendromecon rigida), pitcher sage (Lepechinia calycina), pine grass (Calamagrostis rubescens), California bedstraw (Galium californicum subsp. californicum), rush trefoil (Lotus juncus var. juncus = Acmispon juncus var. juncus), deerweed (Lotus scoparius var. scoparius = Acmispon glaber var. glaber), hairy honeysuckle (Lonicera hispidula), toyon (Heteromeles arbutifolia), pink everlasting (Pseudognaphalium ramosissimum) and scattered along the upper margins of an adjacent slope growing in coastal scrub, yerba santa (Eriodictyon californicum). During 05-06/10, preliminary exploration within this ancillary component of the Scotts Creek Watershed, yielded the following native taxa in addition to those previously discussed..... these grouped by familial alliances: yarrow (Achillea millefolium), mountain dandelion (Agoseris grandiflora), woodland madia (Anisocarpus madioides), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis subsp. consanguinea), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), purple cudweed (Gamochaeta ustulata), white hawkweed (Hieracium albiflorum), Bioletti’s cudweed (Pseudognaphalium bioletti), California cudweed (Pseudognaphalium californicum), Gianone everlasting (Pseudognaphalium gianonei, pro. sp. nov.), woolly marbles (Psilocarphus tenellus var. tenellus), California chicory (Rafinesquia californica)...... chaffweed (Anagallis minima), Pacific starflower (Trientalis latifolia)...... one white flowered plant observed)...... California water starwort (Calitriche marginata)...... fruit, both aquatic and terrestrial, distinctly pedicellate, California plantain (Plantago erecta)...... while appearing as strange bedfellows, on a molecular level, the
Water-Starwort clan has found a new home, nestled within the Plantaginaceae)..... toad rush (Juncus bufonius sensu lato), brown bog-rush (Juncus hirsutus), western rush (Juncus occidentalis), common rush (Juncus patens), brown-headed rush (Juncus phaeocapillus var. pharaoeophalus)..... bent grass hybrid complex (Agrostis hallii x Agrostis pallens putative intergrades), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), California oat grass (Dactylium californicum sensu lato), California fescue (Festuca californica), western fescue (Festuca occidentalis), red fescue (Festuca rubra..... localized population at top of gulch, nativity uncertain), California wild rye (Elymus glaucus subsp. glaucus), Torrey's melic (Melica torreyana), foothill needlegrass (Nassella lepida = Stipa lepida), purple needlegrass (Nassella pulchra = Stipa pulchra), Howell's bluegrass (Poa howellii)..... five-finger fern (Adiantum aleuticum), California maidenhair (Adiantum jordanii), coffee fern (Pellaea andromedifolia), goldback fern (Pentagramma triangularis subsp. triangularis)..... wood fern (Dryopteris arguta), western swordfern (Polystichum munitum)..... bracken (Pteridium aquilinum var. rubra)..... nested polypody (Polypodium calirhiza)..... Monterey pine (Pinus radiata)..... population part of ancient hybrid swarm, with Pinus attenuata being other species component), Douglas-fir (Pseudotsuga menziesii var. menziesii)..... big-leaf maple (Acer macrophyllum..... a magnificent old specimen, with five divergent ascending trunks, was observed high up on the west facing side of the gulch, growing in what appears to be a landslide derived draw )..... redwood (Sequoia sempervirens)..... California nutmeg (Torreya californica)..... California buckeye (Aesculus californica)..... California bay laurel (Umbellularia californica)..... coyote mint (Monardella villosa sensu lato..... variable as to stature and foliar morphology), yerba buena (Satureja douglasii), California hedge-nettle (Stachys bullata)..... putative intergrades with Stachys rigida, based on vestigual saccate base of corolla tube with corresponding positioning of internal ring of hairs found on some plants, plus biochemical signature differences and corolla alignment within calyx and corolla shape and coloration)..... short-stemmed sedge (Carex brevicaulis), dense sedge (Carex densa), Gianone sedge complex (Carex gianonei, pro sp nov..... lower 1-3 spikelets compound-congested), slough sedge (Carex obtusa), small-bracted sedge (Carex subbracteata), dwarf club rush (Issolepis carinata)..... red elderberry (Sambucus racemosa var. racemosa)..... sweet-scented bedstraw (Galium triflorum)..... sticky monkeyflower (Mimulus aurantiacus)..... poison oak (Toxicodendron diversilobum)..... blue blossum (Ceanothus thyrsiflorus), California coffeeberry (Frangula californica subsp. californica)..... California man root (Marah fabaceus)..... dwarf brodiaea (Brodiaea terrestris subsp. terrestris), blue dicks (Dichelostemma capitatum subsp. capitatum), Lithuriel's spear (Triteleia laxa)..... loväge (Ligusticum pilosifolium..... scattered population, of this rare for SC County taxon, growing on west facing slope overlooking upper potion of gulch), sweet cicely (Osmorhiza berteroii), gambleweed (Sanicula crassicaulis), Gianone sanicle (Sanicula gianonei, pro sp nov.), Hoffmann's sanicle (Sanicula hoffmannii..... the discovery of a second population of this rare member of the Apiaceae on the coastal side of Scotts Creek [04/24/2011] has further expanded its range locally and provides more data towards understanding its biogeography. This scattered but extensive population, was found growing along a horse trail within the the lower southeastern portion of the Mt. Cook drainage system and was sympatric with Sanicula crassicaulis..... wood strawberry (Fragaria vesca), oso berry (Oemleria cerasiformis), ground rose (Rosa spithamea..... isolated population, growing on upper part of north/northwest facing ridge top overlooking lower portion of gulch)..... dwarf in stature, rhizomatous, with hypanthium covered with stalked glands and sepalis persistent on fruit..... habitat, unlike its south facing "displaced chaparral" counterpart directly across gulch, modified by succession, with wind-sculpted oak woodland overtopping former Arctostaphylos crassica sensu lato population, leaving a graveyard of lifeless trunks and branches anchored in non-viable burls)..... California blackberry (Rubus ursinus)..... slim Solomon's seal (Smilacina stellata = Maianthemum stellatum).....
giant trillium (Trillium chloropetalum), western trillium (Trillium ovatum subsp. ovatum), canyon gooseberry (Ribes monerzii) California figwort (Scrophularia californica), hound’s tongue (Cynoglossum grande), small-flowered nemophila (Nemophila parviflora), stinging phacelia (Phacelia malvifolia), soap plant (Chlorogalum pomeridianum var. pomeridianum), Douglas’s iris (Iris douglasiana), blue-eyed grass (Sisyrinchium bellum), American winter cress (Barbara orthoceras), popweed (Cardamine oligosperma), checker lily (Fritillaria affinis), coast nettle (Urtica dioica subsp. gracilis), some plants tending towards subsp. holosericea, with more non-stinging hairs on stems and abaxial surface of leaves. Douglas’s nightshade (Solanum douglasii), blue witch (Solanum umbelliferum), Hooker’s fairy bells (Prosartes hookeri), Pacific pea (Lathyrus vestitus var. vestitus, variable as to foliar indument), yellow bush lupine (Lupinus arboresus), checkerbloom (Sidalcea malviflora subsp. malviflora), small-flowered alum root (Heuchera micrantha), striped coralroot (Corallorhiza striata), rein orchid (Piperia species), still in foliar stage, hairy wood sorrel (Oxalis pilosa), dwarf orthocarpus (Triphysaria pusilla), baneberry (Actaea rubra), California buttercup (Ranunculus californicus).

Back along Swanton Road, a sedge new to our inventory, round-fruit sedge (Carex globosa), displays antrorse scabridulous culms and leaves with fibrous basal sheaths tinted reddish-purple, these configured into matted patches overlooking the edge of the bank. Sharing this condensed habitat and also representing the monocot camp are Torrey’s melic (Melica torreyana), California brome (Bromus carinatus var. carinatus), nodding brome (Bromus vulgaris), foothill needlegrass (Nasella lepida = Stipa lepida), California wild rye (Elymus glaucus subsp. glaucus) and Douglas’s iris (Iris douglasiana). Contributing a disproportionate share of the botanical bounty, the herbaceous and low center-of-gravity suffrutescent dicots go the extra mile with the following diverse assemblage: poison oak (Toxicodendron diversilobum), sticky monkeyflower (Mimulus aurantiacus), California hedge-nettle (Stachys bullata) and its polymorphic cousin coyote mint (Monardella villosa subsp. villosa) with some plants tending towards subsp. franciscana in foliar outline; hairy honeysuckle (Lonicera hispidula) along with morning glory (Calystegia occidentalis subsp. occidentalis), California blackberry (Rubus ursinus) and Pacific pea (Lathyrus vestitus var. vestitus), scendent in behavior, often leaving traces of past season’s growth covering the understory shrubbery, and gambleweed (Sanicula crassicaulis), possessing a chemical signature somewhat reminiscent of its prized culinary cousin, celery (Apium graveolens); speaking up for the Madder Family (Rubiaceae) are California bedstraw (Galium californicum subsp. californicum) and climbing bedstraw (Galium porrigens var. porrigens), while the Sunflower Family (Asteraceae), extremely variable in gestalt, is exemplified by California aster (Symphyotrichum chilense), Gianone everlasting (Pseudognaphalium gianonei, pro. sp. nov.), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), coyote brush (Baccharis pilularis subsp. consanguinea), and California sagebrush (Artemisia californica); within the Rose Family (Rosaceae), two stature extremes can be observed, one often found growing under the other, these being wood strawberry (Fragaria vesca) and toyon (Heteromeles arbutifolia).

Residing in the moisture-retentive roadside drainage ditch, small-flowered nemophila (Nemophila parviflora var. parviflora) and miner’s lettuce (Claytonia perfoliata subsp. perfoliata) luxuriate, while hairy wood sorrel (Oxalis albicans subsp. pilosa = Oxalis pilosa) holds steadfast to the slope’s near-vertical profile. Not being particularly finicky as to choice of habitat but a fervent forty-niner, California figwort (Scrophularia californica) can be found growing in association with California buckeye (Aesculus californica), California coffeeberry (Frangula californica subsp. californica), blue elderberry (Sambucus nigra subsp. caerulea) and California bay laurel (Umbellularia californica). With foliage variable as to color, size, shape and margins (entire through spinescent), forest live-
oak (*Quercus parvula* var. *shrevei*) dominates the proceedings, **even managing to produce one oracle oak (*Quercus x morehbus*), invisible to all but the most observant.** Rounding out the arboreal contingent, are two Gymnosperms: both being members of the Pine Family (Pinaceae), with Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) ranging widely as to nativity and Monterey pine (*Pinus radiata*) highly localized (Ano Nuevo Population) and possibly reaching the southern limits of its range near the Molino Creek watershed. This northernmost living population of a geographically disjunct endemic conifer is unique in at least two ways: it grows sympatrically, in part, with the related knobcone pine (*Pinus attenuata*) and in the opinion of this author, **represents an ancient hybrid swarm which now appears to be reproductively isolated from its knobcone co-parent but continues to resegregate definable knobcone traits throughout the** Scots Creek population, **demonstrated by growth patterns, branch configurations, foliar and cone morphologies and a high degree of heterosis (hybrid vigor).** Finally, giving the precursors to flowering plants their due, scattered within the canopied slope with its dappled light and acidic duff, goldback fern (*Pentagramma triangularis* subsp. *triangularis*) and wood fern (*Dryopteris arguta*) remain terrestrial while nested polypody (*Polypodium calirhiza*), prefers the vertical topography of live oaks and bay laurels! Upon reaching Little Creek Bridge and looking upstream, a cloistered population of the locally rare candy flower (*Claytonia sibirica*) can barely be seen due to the suffocating nature of the non-native forget-me-not population while shifting our attention to the opposite side of the bridge and looking downstream, a native member of the Ginseng Family (Araliaceae), elk-clover (*Aralia californica*) lends an exotic mien to the riparian corridor.

As with most of the ancillary watersheds emptying into Scots Creek, Little Creek can be accessed via an unpaved but maintained road paralleling the stream course for several miles and giving the alert naturalist an in-depth representation of the residing flora. **Reiterating the underlying premise of this Traversal,** one can explore a substantial part of the Little Creek drainage without leaving the dirt road and witness in excess of **150 native plant species,** several of which are absent from the Swanton Road survey. While exploring the Little Creek Watershed, the following “natives” were encountered roadside, **some of which,** have not been observed along or from Swanton Road: crimson columbine (*Aquilegia formosa*), California harebell (*Campanula pereanitoides = Asyneuma pereanitoides*), redwood violet (*Viola sempervirens*), varied-leaved collomia (*Collonia heterophylla*). . . . a distinctive population of circa **50 plants discovered displaying a circa 5 to 1 ratio of plants with white flowers,** the typical pink-flowered form **definitely in the minority,** straggly gooseberry (*Ribes diversatum* var. *pubiflorum*), black-cap raspberry (*Rubus leucodermis*) sharing locale with thimbleberry (*Rubus parviflorus*) and California blackberry (*Rubus ursinus*), redwood sorrel (*Oxalis oregana*), sneezeweed (*Helenium puberulum*), western burning bush (*Euonymus occidentalis* var. *occidentalis*), trail plant (*Adenocaulon bicolor*), white-tipped clover (*Trifolium variegatum*), five-finger fern (*Adiantum aleuticum*), stephanomeria (*Stephanomeria aff. elata*), California phacelia (*Phacelia californica*) with multiple spreading to erect stems, along with the inflorescences, clothed with stiff pustulate-based eglandular trichomes, the dingy white flowers with hirsute exerted styles, California gilia (*Gilia achilleifolia senu su lato*), mountain iris (*Iris fernaldii*) with narrow grayish-green leaves tannish at base and sister species Douglas’s iris (*Iris douglasiana*) with greenish tinted leaves distinctly pinkish basally, pipestems (*Clematis lasiantha*), California huckleberry (*Vaccinium ovatum*), wax myrtle (*Myrica californica = Morella californica*) and vanilla grass (*Hierochloe occidentalis = Anthoxanthum occidentale*) both possessing foliage that rewards the olfactorially curious, small-flowered melic (*Melica imperfecta*), rancher’s fiddleneck (*Amsinckia menziesii* var. *menziesii*) with corolla pale yellow, 2-3 mm. wide at top, limb without red-orange markings, “kissing cousins” hairy
honesuckle (Lonicera hispida var. pacillans = Lonicera hispida) and snowberry (Symphoricarpus albus var. laevigatus), yerba de selva (Whipplea modesta) a distant cousin of the cultivated Hydrangea (Hydrangea macrophylla), a papilionaceous mimic California milkwort (Polygala californica) and Lupinus sp. (aff., L. propinquus), a putative hybrid derived from yellow bush lupine (Lupinus arbores) x broad-leaved lupine (Lupinus latifolius var. latifolius).

A conspicuous component of the Grass Family (Poaceae) within the Scotts Creek Watershed proper but uncommon throughout the county, Elmer’s fescue (Festuca elmeri), luxuriates roadside in the Little Creek drainage, producing vigorous stands containing individuals 1-2 meters in height and variable both as to number of florets and anther pigmentation! Other native members of the Poaceae, sharing both habitat and a penchant for structural variability, include: western fescue (Festuca occidentalis), California fescue (Festuca californica) with localized colonies persisting high up on the south-facing forested ridge top in proximity to the General Smith Redwood, growing sympatrically with one isolated colony of Harford’s melic (Melica harfordii) that appears to be healthy and well established...... rare county wide, crinkle-awn fescue (Festuca subuliflora), displaying shiny, plane, dark-green leaves at a time when sister species, Elmer’s fescue (Festuca elmeri), is usually defined by sterile inflorescences and basally desiccated foliage.....

The ubiquitous brome duo, California brome (Bromus carinatus), a complex unto itself, and nodding brome (Bromus vulgaris), often growing together and to the botanically informed, representing two distinct sections within the genus Bromus, which ranges worldwide in the temperate climes..... with foliage possessing a scent redolent of vanilla and on a hot summer’s day, smelt before being seen, vanilla grass (Hierochole occidentalis = Anthoxanthum occidentale) rewards the horticulturally inclined with a worthy but rarely seen addition to the native rock garden..... the polymorphic California wild rye (Elymus glaucus subsp. glaucus) sharing habitat with the omnipresent yet imperfectly understood Hall’s bent grass (Agrostis hallii)/leafy bent grass (Agrostis pallens) intergrades, Torrey’s melic (Melica torreyana), chameleon-like in gestalt and along one part of the roadbank, growing sympatrically with small-flowered melic (Melica imperfecta) and possibly exchanging genetic material plus scattered colonies of tall trisetum (Trisetum canescens = Trisetum cernuum subsp. canescens?), Howell’s bluegrass (Poa howellii) and a valuable provider of ground cover, pine grass (Calamagrostis rubescens) round off a diverse assemblage of wind pollinated monocots, waiting to be discovered and appreciated by serious students of both biodiversity and biogeography.

Out of viewing range and perched high above the Little Creek riparian corridor, growing sporadically on west-facing slopes cloaked with mixed coniferous/oak woodlands, three species infrequently encountered within Scotts Creek Watershed occur, namely rayless arnica (Arnica discoidea..... note: more prevalent in chaparral since 2009 Lockheed Fire), windflower (Anemone oregana) and salal (Gaultheria shallon), while across the watershed growing on weathered mudstone within the chaparral zone one can occasionally encounter an uncommon local “borage”, namely Torrey’s cryptantha (Cryptantha torreyana)..... on 08/18/2010, while exploring these steep and fire scarred slopes, another addition to the “native” species inventory for the Little Creek subwatershed was added, namely golden fleece (Ericameria arborescens). Going from the visually obscure to the olfactorally bewitching, one can be led blindfolded on a “scentual” journey into the watershed, brushing against, trodding on, being impaled by and tactually caressing native vegetation that act as chemical factories for oils, resins and terpenes. To experience the natural world through senses other than sight can broaden ones awareness as to the significance of co-evolution in the biodiversity surrounding us even under the most mundane of circumstances and emphatically should be practiced by all budding naturalists. An
abbreviated listing of readily accessible aromatic biota encountered along this mutual exploration
of self and watershed is as follows: sweet-scented bedstraw (Galium triflorum), California hedge-
nettle (Stachys bullata), California bay laurel (Umbellularia californica), vanilla grass (Hierochloe
occidentalis), yerba buena (Satueja douglasii), yarrow (Achillea millefolium), California nutmeg
(Torreya californica), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), wild ginger
(Asarum caudatum), blue blossom (Ceanothus thyrsiflorus), sweet cicely (Osmorhiza heteroii),
California sagebrush (Artemisia californica), Douglas-fir (Pseudotsuga menziesii var. menziesii),
canyon gooseberry (Ribes menziesii), coltsfoot (Petasites frigidus var. palnatus) and pink everlasting
(Pseudognaphalium ramosissimum). A variation on this exercise of non-visual awareness can be
applied to the tactile arena by exploring the various foliar topographies presenting themselves
roadside and familiarizing oneself with the scientific terminology that describes each
characteristic, such as glabrous, coriaceous, spinose, hispid, papillate, chartaceous, pilose,
serrate, pungent, rugose, scabrous and viscid. An introductory sampling of leaves conforming to
the previously mentioned descriptive terms could include thimbleberry (Rubus parviflorus), sticky
monkeyflower (Mimulus aurantiacus), toyon (Heteromeles arbutifolia), round-fruited sedge (Carex
globosa), hazelnut ( Corylus cornuta subsp. californica), Pacific madrone (Arbutus menziesii), tan-oak
(Notholithocarpus densiflorus), Heermann’s trefoil (Lotus heermannii var. orbicularis = Acmispon
heermannii var. orbicularis), coast nettle (Urtica dioica ssp. gracilis), redwood (Sequoia
sempereirens), forest live-oak (Quercus parvula var. shrevei) and California phacelia (Phacelia
california). Groupings of morphologically dissimilar taxa belonging to the same family occur
with some frequency throughout the Scotts Creek Watershed, giving one pause to ponder the
mechanics underlying the ecology of such interactions: one such example observed along the dirt
road traversing the interior of Little Creek included toyon (Heteromeles arbutifolia), thimbleberry
(Rubus parviflorus), ocean spray (Holodiscus discolor), oso berry (Oemleria cerasiformis), wood
strawberry (Fragaria vesca), California blackberry (Rubus ursinus) and wood rose (Rosa
gymnocarpa), all bona fide members of the Rose Family (Rosaceae)..... conspicuously absent from
lower Little Creek’s riparian corridor is salmonberry (Rubus spectabilis) but encountered in
Scotts Creek proper and lower Big and Mill Creeks and whether or not this taxon ever
occurred in the Little Creek Watershed, or during some past extreme flooding event (1955)
which severely scoured the watershed’s lower portion removed the population, remains
unknown.

While not exactly common along Swanton Road proper, the following species contribute to the
150+ checklist of indigenous taxa accessible for viewing along/from the dirt road threading its
way into the heart of the Little Creek sub-watershed: three native representatives of the Family:
Asteraceae, Tribe: Cichorieae..... mountain dandelion (Agoseris grandiflora var. grandiflora),
California chicory (Rafinesquia californica) and stephanomeria (Stephanomeria aff. elata ) sharing a
geologically unstable, seasonally watered hillside, with scattered clumps of sea lettuce (Dudleya
caespitosa)..... corollas colored a greenish-yellow with margins overlapping and apices spreading,
some long established plants with 8-12 rosettes underpinned by elongate caudices, their
replacement seedlings germinating within patches of moss secured to the bare rock surface,
toyon (Heteromeles arbutifolia) sub-trees barely anchored to the near-vertical substrate with their
ashen bark and contorted growth patterns lending an alien air to the proceedings and visually
complemented by the intricate branching patterns of golden yarrow (Eriophyllum confertiflorum
var. confertiflorum), clothed with a cottony tomentum and seasonally terminating in flat-topped
clusters of yellow-orange heads sharing space with fellow perennial sub-shrub sticky
monkeyflower (Mimulus aurantiacus). At the opposite extreme along the same road, several
species which luxuriate along perennial hillside seeps feeding into Little Creek and can also be
found margining Little Creek itself are giant chain fern (*Woodwardia frondosa*), lady fern (*Athyrium filix-femina* var. *cyclosum*), red elderberry (*Sambucus racemosa* var. *racemosa*) and elk clover (*Aralia californica*), these “natives” in concert establishing a “forest primeval” atmosphere particularly when provided with a backdrop of moist vertical banks of fractured mudstone covered with colonies of western sword fern (*Polystichum munitum*) and five-finger fern (*Adiantum aleuticum*) supplemented by our most exotic indigenous willow, velvet willow (*Salix rickettii*), sporting foliage clothed with a silvery indument akin to finely spun aluminum. Since the 2009 Lockhead Fire had a major ecological impact on this sub-watershed, a (05/2010) followup documenting the status of which “native” plant taxa have rebounded along the dirt road (from Swanton Road entrance to gauging station between north and south forks of Little Creek), with the observed taxa grouped by their familial alliances: *Daucus pusillus*, *Heracleum maximum*, *Osmorhiza berteroi*, *Sanicula crassicaulis*, *Carex amplifolia*, *Carex bolanderi*, *Carex globosa*, *Cyperus eragrostis*, *Achillea millefolium*, *Adenocaulon bicolor*, *Agoseris grandiflora*, *Anisocarpus madioides*, *Artemisia californica*, *Artemisia douglasiana*, *Baccharis pilularis*, *Cirsium brevistylum*, *Eriophyllum confertiflorum var. confertiflorum*, *Camoachat ustulata*, *Hieracium alpinum*, *Lavina hieracioides*, *Petasites frigidus var. palmatus*, *Pseudognaphalium californicum*, *Pseudognaphalium ramosissimum*, *Pseudognaphalium stramineum*, *Rafinesquia californica*, *Solidago velutina subsp. californica*, *Stephanomeria aff. elata* (plants 1-2 meters in height, consisting of one central axis with numerous alternate lateral branches, these ascending at circa a 45 degree angle..... stem leaves auriculate and clasping, retorsely toothed basally, sub-entire, linear, attenuate apically..... calyculi with apices spreading/recurved, florets 9-15, cypselae 3-4mm long, faces tuberculate with longitudinal grooves, pappus plumose entire length)..... *Agrostis hallii* pallens intergrades, *Bromus carinatus* var. *carinatus*, *Bromus vulgaris*, *Calamagrostis rubescens*, *Deschampsia elongata*, *Elymus glaucus subsp. glaucus* (one localized population producing inflorescences with racemose/compound branching, branches 4-5cm in length), *Festuca elmeri*, *Festuca occidentalis*, *Hierochloe occidentalis* = *Anthoxanthum occidentale*, *Melica imperfecta*, *Melica subulata*, *Melica torreyana*, *Poa howellii*, *Trisetum canescens*..... *Oxalis pilosa*, *Oxalis oregana*..... *Polygala californica*..... *Viola ocellata*, *Viola sempervirens*..... *Asyneuma prenanthoides*, *Triodanis biflora*..... *Ribes menziesii*..... *Iris douglasiana*, *Iris fernaldii*..... *Calochortus albus*, *Fritillaria affinis*..... *Trillium ovatum*..... *Aralia californica*..... *Torreya californica*..... *Alnus rubra*, *Corylus cornuta* var. *californica*..... *Claytonia perfoliata subsp. perfoliata*, *Claytonia sibirica*..... *Lathyrus vestitus sensu lato*, *Lotus heermannii var. orbicularis*, *Lotus micranthus*, *Lotus scoparius* var. *scoparius*, *Lotus wrangelianus*, *Lupinus aff. propinquus* E. Greene, *Trifolium bifidum var. decipiens*, *Trifolium californicum*, *Trifolium gracilentum var. gracilentum*, *Trifolium microcephalum*, *Trifolium obtusiflorum* (growing roadside overlookin drainage system for small, near vertical gulchlet which feeds into Little Creek and in upper part of gulchlet, adjacent to small waterfall and persisting as an annual longer, due to the presence of continual moisture..... not previously seen locally since 1983, when discovered growing on sandbar below Scotts Creek Bridge and documented via pressing for the Jepson Herbarium), *Trifolium oliganthum*, *Trifolium willdenovii*, *Vicia gigantea*, *Vicia hassei*..... *Chlorogalum pomeridianum* var. *pomeridianum*..... *Callitriche marginata*..... *Corallorhiza striata*..... *Fragaria vesca*, *Heteromeles arbutifolia*, *Holodiscus discolor*, *Oemleria cerasiformis*, *Potentilla glandulosa subsp. glandulosa* = *Drymocallis glandulosa var. glandulosa*, *Rosa gymnocarpa*, *Rubus leucodermis*, *Rubus parviflorus*, *Rubus ursinus*..... *Calystegia purpurata subsp. purpurata*..... *Arbutus menziesii*, *Vaccinium ovatum*..... *Asarum caudatum*..... *Aesculus californica*..... *Hesperocnide tenella*, *Urtica dioica subsp. holosericea*..... *Notholithocarpus densiflorus*, *Quercus agrifolia* var. *agrigolia*, *Quercus parvula* var. *shrevei*..... *Ceanothus thyrsiflorus*, *Frangula california subsp.*
californica..... Sequoia sempervirens..... Pinus radiata (isolated population near southern end of its naturally occurring range, representing an ancient hybrid swarm between Pinus attenuata and Pinus radiata), Pseudotsuga menziesii var. menziesii..... Acer macrophyllum..... Monardella villosa sensu lato, Satureja douglasii = Clinopodium douglasii, Stachys bullata..... Oxalis corniculata subsp. pilosa = Oxalis pilosa..... Collomia heterophylla, Gilia achilleifolia (scattered but concentrated populations, with both subsp. achilleifolia and subsp. multicaulis represented).....

Heuchera micrantha, Lithophragma heterophyllum..... Smilacina racemosa, Smilacina stellata..... Trientalis latifolia..... Aquilegia formosa, Clematis lasiantha, Ranunculus hepaticus..... Asimina menziesii var. intermedia, Cryptantha clevelandii, Cryptantha micromera, Cynoglossum stellata..... Epilobium ciliatum..... Brachystegia penduliflora, Nemophila parviflora var. parviflora, Phacelia aff. californica (stems and herbage clothed with stiff pustulate-based eglandular trichomes, calyx lobes not overlapping and flowers a dingy off-white..... further along on our botanical exploration, a second component of the perennial Phacelia californica complex appears, this time having inflorescences clothed with short, gland-tipped trichomes interspersed amongst the much larger and rigid glandless ones..... the presence of glandular hairs, suggests possible introgression from Phacelia imbricata genes), Phacelia malvifolia..... Morella californica..... Epilobium ciliatum..... Juncus bufonius, Juncus patens..... Galium californicum subsp. californicum, Galium parviflorum var. porrigens, Galium triflorum..... Mimulus aurantiacus, Mimulus guttatus aff. Mimulus nasutus Greene (localized population growing on south facing, moisture saturated banks, of near-vertical streamlet circa 40+ meters above Little Creek..... plants 1(+*) meters in height, nascent inflorescence scorioid with upper calyx-tooth conspicuously exceeding the others in length and lower corolla lip marked centrally with a maroon blotch)...... Dudleya caespitosa (isolated populations persisting on near vertical mudstone outcroppings, with corollas tending towards a greenish-yellow and apices of nascent buds lacking a pinkish suffusion)...... Solanum douglasii, Solanum umbelliferum..... Umbellularia californica..... Collinsia heterophylla..... Salix sitchensis..... Cardamine californica var. californica, Cardamine oligosperma..... Guillenia lasiophylla = Caulanthus lasiophyllus..... Scrophularia californica subsp. californica..... Marah fabaceus..... Lonicera hispidula, Symphoricarpos albus var. laevigatus..... Toxicodendron diversilobum..... Sambucus racemosa var. racemosa (now placed in family Adoxaceae)...... Dryopteris arguta, Polystichum munitum..... Athurium filix-femina var. cyclosum..... Polypodium calirhiza/californicum complex (variable as to substrate preference..... soil, rock or bark, length of lowermost sets of pinna relative to those above, shape and elevation of sori, and as epiphytes, luxuriating on Acer macrophyllum and Umbellularia californica trunks and branches)...... Adiantum aleuticum, Adiantum jordanii, Pentagramma triangularis subsp. triangularis..... Woodwardia fimbriata..... Pteridium aquilinum var. pubescens..... Eschscholzia californica..... Pterostegia drymarioides..... Dichlostemma capitatum subsp. capitatum..... Equisetum telmateia subsp. braunii..... Euonymus occidentalis var. occidentalis..... Silene antirrhina.

Note: Areas of biological/botanical/ecological/reference interest mentioned in this section of the essay, have the following Google Earth coordinates:

Boyer Creek Dam/Reservoir: 37degrees05'50.76"N, 122degrees12'26.10"W, elevation 1224feet

Big Creek Sub-Watershed (a): 37degrees05'34.86"N, 122degrees12'29.48"W, elevation 740feet
Big Creek Sub-Watershed (b): 37°05'13.01"N, 122°12'49.68"W, elevation 425 feet

Big Creek Sub-Watershed (c): 37°04'40.09"N, 122°13'11.21"W, elevation 131 feet

Big Creek Fish Hatchery: 37°04'28.18"N, 122°13'16.87"W, elevation 108 feet

Big Creek Bridge/Lower Big Creek Sub-Watershed: 37°04'01.69"N, 122°13'44.30"W, elevation 47 feet

Upper Mt. Cook Gulch Complex: 37°03'46.55"N, 122°14'09.28"W, elevation 631 feet

Lower Mt. Cook Gulch Complex: 37°03'50.49"N, 122°13'50.73"W, elevation 192 feet

Note: Select herbarium specimens of horticulturally meritorious, locally uncommon, rare county-wide and agency listed *species referred to in this section* of the Traversal, collected and pressed, with noted exceptions, by Roy Buck and/or James West within the Scotts Creek Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:

*Arctostaphylos andersonii*/accession number UCSC4778/Randall Morgan, Jan 4 1977

*Arctostaphylos tomentosa* subsp. *crustacea* = *Arctostaphylos crustacea* subsp. *crustacea*/accession number UCSC6184/R. Morgan, Feb 1977

*Aster subspicatus* = *Symphyotrichum subspicatum*/accession number JEPS83107/West #351

*Bromus carinatus* var. *carinatus*/accession number JEPS83046/West #420

*Bromus carinatus* var. *carinatus*/accession number JEPS83047/West #420

*Calamagrostis rubescens*/accession number JEPS83101/Buck & West #452

*Campanula prenanthoides* = *Asyneuma prenanthoides*/accession number JEPS83048/Buck & West #419

*Claytonia siberica*/accession number UCSC5451/Randall Morgan, Jul 26 2004

*Disporum hookeri* = *Prosartes hookeri*/accession number SJSU9926/M.B. Wood, Oct 4 1964

*Eriophyllum confertiflorum* var. *confertiflorum*/accession number JEPS81513/Buck & West #20

*Eriophyllum confertiflorum* var. *confertiflorum*/accession number JEPS81514/Buck & West #20

*Eriophyllum confertiflorum* var. *confertiflorum*/accession number JEPS81510/Buck & West #18

*Galium californicum* subsp. *californicum*/accession number JEPS83072/Buck & West #426

*Galium californicum* subsp. *californicum*/accession number JEPS82583/West #130

*Galium porrigens* var. *porrigens*/accession number UC1583603/Keil, Holland & Kelly #20608

*Galium sp.* = aff. *Galium porrigens* var. *porrigens*/accession number JEPS83071/West #344

*Galium sp.* = aff. *Galium porrigens* var. *porrigens*/accession number JEPS83073/West #344a

*Gnaphalium ramosissimum* = *Pseudognaphalium ramosissimum*/accession number JEPS81544/Buck & West #113

*Lepechinia calycina*/accession number JEPS83079/Buck & West #427

*Lomatium caruifolium*/accession number UCSC6128/R. Morgan, Apr 27 1995
Lotus scoparius var. scoparius = Acmispon glaber var. glaber/ accession number JEPS82800/Buck & West #295
Melica imperfecta/ accession number JEPS85183/Buck & West #489
Mimulus aurantiacus var. aurantiacus/ accession number UCR67974/Keil #20574
Nemophila parviflora var. parviflora/ accession number JEPS82954/West #41.2
Nemophila parviflora var. parviflora = Nemophila aff. pulchella var. fremontii?/ accession number JEPS85186/Buck & West #173
Nemophila parviflora var. parviflora/ accession number JEPS81538/Buck, West & Stone #470
Nemophila parviflora var. parviflora = Nemophila aff. pulchella var. fremontii?/ accession number JEPS85184/Buck, West & Stone #143
Nemophila parviflora var. parviflora/ accession number JEPS81522/Buck & West #7
Ribes "sp"/ accession number UCSC5358/Randall Morgan, Nov 10 1976
Silene antirrhina/ accession number JEPS85191/Buck & West #517

Between Little Creek and the Southern Edge of the Watershed

Growing on a west facing rocky slope situated between Little Creek and Winter Creek, one of three localized populations within our viewshed of hoary bowlesia (Bowlesia incana), herbage and stems clothed with distinctive stellate hairs, resides with two foliar counterparts: in outline, the (3-5)-lobed leaves of downy buttercup (Ranunculus hebecarpus) and hill star (Lithophragma heterophyllum), when growing intermixed with the previously mentioned member of the Carrot Family (Apiaceae), present a fascinating study of sympatry between unrelated species and variations on a shared leaf pattern. Scattered within and adjacent to this mini-congregation of leafy mimics, California chicory (Rafinesquia californica) displays foliage, that when crushed, exudes an acrid smell reminiscent of domestic lettuce (genus Lactuca), a European cousin. Concentrated within a 10’ x 8’ near-vertical grassy slope and virtually lost from view within the competitive tangle of vegetation, the attentive observer is introduced to a locally uncommon member of the Phlox Family (Polemoniaceae), many-stemmed gilia (Gilia achilleifolia subsp. multicaulis). Restricted to one embankment, an isolated colony of California tea (Rupertia physodes) stands out from other proximal members of the Legume Family (Fabaceae), with punctate-dotted trifoliolate herbage that when rubbed between the fingers releases a distinctive fragrance, while on the opposite side of the road and lost in a welter of bromes and fescues, native and otherwise, tall trisetum (Trisetum canescens = Trisetum cernuum subsp. canescens?) makes a welcome addition to the native grass species check-list.

The relatively short distance between Little Creek Bridge and the entrance to Old Schoolhouse Gulch Road, affords the observant pedestrian an interesting concentration of local flora...... unusual, because one has to visit several different and often not contiguous habitats to observe the taxa in question. All of the following "natives" can be viewed without leaving the tarmac...... growing on the west facing roadbank, the slope above and within the centrally

Upon entering Old Schoolhouse Gulch Road, one encounters topographically, a complex series of ancient landslides.... rotational slumps and pull-aparts, re-activations, water course blockages with their marshy backings, transverse incisings..... all of which create an Escher-like environment that is inordinately rich in native biota. Addressing the botanical component of this equation, immediately upon leaving Swanton Road and proceeding up to where the ancillary Al Smith House driveway begins, the following arboreal and suffrutescent taxa margin our ascending journey: *Torreya californica*, *Aesculus californica*, *Umbellularia californica*, *Pinus radiata*, *Pseudotsuga menziesii* var. *menziesii*, *Notholithocarpus densiflorus*, *Quercus agrifolia* var. *agrifolia*, *Quercus parvula* var. *shrevei*, *Arbutus menziesii*, *Sequoia sempervirens*, *Heteromeles arbutifolia*, *Ceanothus thyrsiflorus*, *Frangula californica* subsp. *californica*, *Vaccinium ovatum*, *Ribes menziesii*, *Sambucus nigra* subsp. *canadensis*, *Holodiscus discolor*, *Baccharis pilularis*, *Toxicodendron diversilobum*, *Rubus parviflorus*, *Mimulus aurantiacus* and *Eriophyllum confertiflorum* var. *confertiflorum*. Complementing their overtopping brethren, the following annuals and herbaceous perennials, plus one quasi-woody vine (*Lonicera hispidula*) and a gravity-defying adventurous
mixed conifer/oak woodlands and inc are a complex series of exposed, interrupted grass dominated slopes, which are bookended by maximum Polystichum discovery of this uncommon forma for the watershed) Scrophularia Stachys Nassella Deschampsia Quercus californica brevistylum triflorum, Cardamine californica var. californica, Cardamine oligosperma, Nemophila parviflora var. parviflora, Satureja douglasii, Artemisia douglasiana, Ranunculus californicus, Ranunculus hebecarpus, Melica torreyana, Melica subulata, Deschampsia elongata, Festuca occidentalis, Bromus carinatus, Bromus vulgaris, Elymus glaucus subsp. glaucus, Solanum douglasii, Iris douglasiana, Marah fabaceus, Juncus patens, Scrophularia californica subsp. californica, Heracleum maximum, Urtica dioica subsp. gracilis, Hesperocnide tenella, Luzula comosa, Anisocarpus madioides, Adiantum jordani, Pteridium aquilinum var. pubescens, Dryopteris arguta, Polystichum munitum, Pentagramma triangularis, Osmorhiza berteroi, Rinesqueua californica, Claytonia perfoliata subsp. perfoliata, Nemophila parviflora var. parviflora, Phacelia malvifolia, Oxalis corniculata subsp. pilosa, Gamochaeta ustulata, Calystegia purpurata subsp. purpurata, Carex aff. subbracteata, Sisyrinchium bellum, Smilacina racemosa, Corallorhiza striata, Dichelostemma capitatum subsp. capitatum and Chlorogalum pomeridianum var. pomeridianum. As a biodiversity control/baseline, note that this lower section of a highly reticulate landslide influenced drainage system, was spared the trauma of the 2009 Lockheed Fire..... but passing thru the CalPoly Games Area, which shows attributes of once being a marsh-like catchbasin, possibly carved out by a debris flow from further upslope and/or the result of a rotational slump and pull apart activity..... we now enter the post-fire zone. Forming an sinuous arc across the face of this slope for circa 100 meters and perpendicular in orientation to the prevailing drainage patterns, is a dirt road whose west-facing upper bank was directly impacted by the fire’s ascending trajectory..... yet, as of 03/15/10, this area is revegetating with a degree of botanical diversity that compares favorably, with the lower and much longer unburned stretch of road! Restricting the heigh of the transect from the dirt road’s inner edge and going directly upslope for 7 meters, yields the following native taxa: Sanicula gianonei, pro.sp.nov., Sanicula crassicaulis, Cynoglossum grande, Arbutus menziesii, Marah fabaceus, Claytonia perfoliata subsp. perfoliata, Claytonia parviflora subsp. parviflora, Trifolium willdenovii, Psilocarpus tenellus var. tenellus, Calystegia purpurata subsp. purpurata, Galium californicum, Galium trilobum, Epilobium ciliatum, Hesperocnide tenella, Anisocarpus madioides, Cirsium brevistylum, Lithophragma heterophyllum, Phacelia malvifolia, Cardamine californica var. californica, Cardamine oligosperma, Ranunculus hebecarpus, Quercus agrifolia var. agrifolia, Quercus parvula var. shrevei, Thalictrum polycarpum, Bromus carinatus var. carinatus, Deschampsia elongata, Elymus glaucus subsp. glaucus, Festuca elmeri, Melica torreyana, Nassella pulchra, Poa howellii, Juncus bufonius sensu lato, Juncus patens, Luzula comosa, Stachys rigida var. quercetorum, Stachys bullata, Holodiscus discolor, Rubus ursinus, Laythrus vestitus var. vestitus, Vicia americana var. americana, Actaea rubra, Smilacina stellata, Dichelostemma capitatum subsp. capitatum, Lonicer a hispidula, Navarretia squarrosa, Scrophularia californica (one specimen with flavistic flowers observed, making it the third such discovery of this uncommon forma for the watershed), Fragra gia vesca, Frangula californica subsp. californica, Oemleria cerasiformis, Mimulus aurantiacus, Dryopteris arguta, Polystichum munitum, Adiantum jordani, Pteridium aquilinum var. pubescens, Heracleum maximum, Toxocodon diversilobum, Nemophila parviflora, Aphanes occidentalis, Rubus ursinus, Heteromeles arbutifolia, Pseudotsuga menziesii and Notholithocarpus densiflorus. Directly above the area encompassing the transect and extending upslope for circa 700(+) meters, are a complex series of exposed, interrupted grass dominated slopes, which are bookended by mixed conifer/oak woodlands and incipient chaparral (with Little Creek sub-watershed to the
west and the upper parts of Winter and Archibald Creek drainage systems to the south). These supporting, in a series of isolated, near-vertical "perched meadows", a concentrated and diverse assemblage of "native" taxa, some of which are listed as rare within Santa Cruz County. These grassland dominated slopes, are plagued with numerous "non-native" species of European origin but still contain remnants of the original pre-european "native" flora, while some of the "hidden-from-view" meadows in counterpoint, go to the other extreme, being populated by a high percentage of "native" species!!! Grouped by families, here is a comprehensive overview of the "native" species found within this area which was completely burned by the 2009 Lockheed Fire: Pacific pea (Lathyrus vestitus sensu lato), short-podded trefoil (Lotus humistratus = Acmispon brachycarpus), small-flowered trefoil (Lotus micranthus = Acmispon parviflorus), strigose trefoil (Lotus strigosus = Acmispon strigosus), Chilean trefoil (Lotus wrangelianus = Acmispon wrangelianus), yellow bush lupine (Lupinus arboreus), miniature lupine (Lupinus bicolor), sky lupine (Lupinus nanus), bearded clover (Trifolium barbigerum var. barbigerum), pinole clover (Trifolium bifidum var. decipiens), purple sack clover (Trifolium depauperatum var. truncatum), pin-point clover (Trifolium gracilentum var. gracilentum), double-headed clover (Trifolium macracrai), maiden clover (Trifolium microphalum), Valparaiso clover (Trifolium microdon), few-flowered clover (Trifolium oliganthum), Santa Cruz clover (Trifolium buckwestiorum)..... a recently described clover species, the TYPE SPECIMEN originating on the lower portion of the Schoolhouse Ridge aka Upper Pozzi Meadow), tomat clover (Trifolium willdenovii), American vetch (Vicia americana var. americana)..... Johnny jump-up (Viola pedunculata)..... California man root (Marah fabaceus)..... morning glory (Calystegia purpurata subsp. purpurata)..... common linanthus (Leptosiphon androsaceus)..... concentrated population of 300-400 plants dominating isolated "mini-meadow" perched on steep west-facing slope)..... owl's clover (Castilleja densiflora sensu lato)..... an intermediate form, between the rose-purple, cinnamon-scented forma typica and the vanilla-scented Orthocarpus noctinus Eastwood analog of the Magic Triangle Ridge, was discovered growing in scattered drifts on the west-facing grass dominated slopes (04/24/10).....the linear-lobed bracts were basically greenish with the apices faintly colored an off-white and circa 1/2 the length of the mature flowers, with the calyces same-colored and the corollas also an off-white, the beak straight, purplish and pubescent..... the post-anthesis flowers colored a pale pink and one potential pollinating vector observed, namely a Bombus sp.) ..... sticky monkeyflower (Mimulus aurantisus) ..... rattlesnake weed (Daucus pusillus), cowparsnip (Heracleum maximum), sweet cicely (Osmorhiza berteroi), footsteps-of-spring (Sanicula arctopoides), gambleweed (Sanicula crassicaulis), Gianone's sanicle (Sanicula gianonei, pro sp. nov.)..... coyote mint (Monardella villosa sensu lato), yerba buena (Satureja douglasii), rigid hedge-nettle (Stachys auigoides var. rigida)...... creeping hearts (Pterostegia drynarioides)..... chamise (Adenostema fasciculatum), western lady's mantle (Aphanes occidentalis), wood strawberry (Fragaria vesca), toyon (Heteromeles arbutifolia), ocean spray (Holodiscus discolor), oso berry (Oemleria cerasiformis), wood rose (Rosa gymnocarpa), California blackberry (Rubus ursinus)..... yarrow (Achillea millefolium), coat dandelion (Agoseris grandiflora), California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), coyote brush (Baccharis pilularis), Indian thistle (Cirsium brevistylum), California aster (Corethrogynge filaginifolia), golden yarrow (Eriophyllum confertiflorum var. confertiflorum), broad-leafed aster (Eurybia radulina), purple cudweed (Goniocheta ustulata), sneezeweed (Helenium puberulum), coast tarplant (Hemizonia corymbosa subsp. corymbosa = Deinandra corymbosa), threadstem madia (Madia exigua), slender tarweed (Madia gracilis), coast tarweed (Madia sativa), green cottonweed (Microps californicus var. subvestitus)..... the second documented population locally for this very rare taxon), Santa Cruz microseris (Microseris decipiens), California cudweed (Pseudognaphalium californicum), pink everlasting (Pseudognaphalium ramosissimum), cotton batting plant (Pseudognaphalium stramineum),
woolly marbles (*Psilocarphus tenellus var. tenellus*), California aster (*Symphyotrichum chilense*)..... red maids (*Calandrinia eliata*)..... California poppy (*Eschscholzia californica*), cream cups (*Platystemon californicus*)..... American winter cress (*Barbara orthoceras*), common milkmaids (*Cardamine californica var. californica*), popweed (*Cardamine oligosperma*), narrow-leaved fringepod (*Thysanocarpus lacinatus*)..... the miner’s lettuce aka *Claytonia perfoliata* complex, is represented within this post-burn environment by a vast array of forms ascribable in varying degrees to: slender miner’s lettuce (*Claytonia parviflora subsp. parviflora*), miner’s lettuce (*Claytonia perfoliata subsp. perfoliata*) and red-stemmed miner’s lettuce (*Claytonia rubra subsp. depressa*)..... hairy honeysuckle (*Lonicera hispidula*), snowberry (*Symphoricarpus albus var. laevigatus*)..... blue elderberry (*Sambucus nigra subsp. canadensis*)..... recently removed from the Caprifoliaceae and placed in the ADOXACEAE..... California verbena (*Verbena lasiostachys var. lasiostachys*). Douglas’s iris (*Iris douglasiana*), blue-eyed grass (*Sisyrinchium bellum*). Pacific madrone (*Arbutus menziesii*), brittle-leaf manzanita (*Arctostaphylos crustacea sensu lato*). California brome (*Bromus carinatus var. carinatus*), pine grass (*Calamagrostis rubescens*). California oat grass (*Danthonia californica sensu lato*). Variable taxon, with forms representing both var. *americana* and var. *californica* present), slender hairgrass (*Deschampsia elongata*). California wild rye (*Elymus glaucus subsp. glaucus*). Junegrass (*Koeleria macrantha*). California melic (*Melica californica*). Torrey’s melic (*Melica torreyana*). foothill needlegrass (*Nassella lepida*). purple needlegrass (*Nassella pulchra*). Pine bluegrass (*Poa secunda subsp. secunda*). tall triisetum (*Triisetum canescens*). Hooker’s fairy bells (*Prosarte hookeri*). soap plant (*Chlorogalum pomeridianum var. pomeridianum*). White globe lily (*Calochortus albus*). dwarf brodiaeia (*Brodiaea terestris subsp. terestris*). blue dicks (*Dichelostemma capitatum subsp. capitatum*). poison oak (*Toxicodendron diversilobum*). Cleveland’s cryptantha (*Cryptantha clevelandii*). minute-flowered cryptantha (*Cryptantha micromeres*). hound’s tongue (*Cynoglossum grande*). whispering bells (*Emmenanthe penduliflora*). white baby-blue-eyes (*Nemophila menziesii var. atomaria*), small-flowered nemophila (*Nemophila parviflora var. parviflora*). Stinging phacelia (*Phacelia malvifolia*). Coast live-oak (*Quercus agrifolia var. agrifolia*). Forest live-oak (*Quercus parvula var. shrevei*). Sun cup (*Camissonia = Taraxia ovata*). Four-spotted godetia (*Clarkia purpurea subsp. quadriplinera*). Farewell-to-spring (*Clarkia rubicunda*). California bedstraw (*Galiunum californicum subsp. californicum*). Climbing bedstraw (*Galiunum porrigens var. porrigens*). Sweet-scented bedstraw (*Galiunum triflorum*). Common wood rush (*Luzula comosa*). Rein orchid (*Piperia sp.*). Shooting star (*Dodecatheon sp.*). Pale plectritis (*Plectritis brachystemon*). At least two forms of this taxon occur within area under discussion and both have flowers measuring between 1.5-3.5 mm in width and are pale pink in coloration: population #1 has achenes winged and population #2 has achenes lacking wings and smaller flowers). Pipe stems (*Clematis lasiantha*). California buttercup (*Ranunculus californicus*). Woodland star (*Lithophragma affine*). Bracken (*Pteridium aquilinum var. pubescens*). California maidenhair (*Adiantum jordanii*). Wood fern (*Dryopteris arguta*). Toad rush (*Luncus bufonius*). Extremely variable as to stature, and how much is due to environmental factors needs to be studied locally). Common rush (*Luncus patens*). Knobcone pine (*Pinus attenuata*). Douglas-fir (*Pseudotsuga menziesii var. menziesii*). Heterocodon (*Heterocodon rariiflorum*). California water starwort (*Callitriche marginata*). Chaffweed (*Anagallis minima*). Now placed in the family MYRSINACEAE). California plantain (*Plantago erecta*). One population growing on post-burn grassy slope producing flowering stems 26 cm in height). Big-leaf maple (*Acer macrophylla*). Dwarf pearlwort (*Sagina apetala*). Fremont’s star lily (*Toxicoscordion fremontii*). While the utilization of terms and phrases like "biodiversity" and "areas of botanical richness" are usually applied to scenarios where the human impact has been minimally felt, just perusing a small section of Swanton Road can yield quite the opposite result..... in this particular case, the
A Rosaceae is a Rosaceae or the case of the ant and the elephant! In terms of stature extremes, it is hard to imagine two more polar opposites, than the western lady’s mantle (Aphanes occidentalis), a diminutive annual whose adult biomass often can fit, with room to spare, on the nail of one’s little finger and the toyon (Heteromeles arbutifolia), a 6+ meters high sub-tree with ash-gray bark and fruiting panicles of luminous scarlet pomes. Even roadside pull-offs can create micro-habitats that concentrate native species within a narrowly defined, repeatedly disturbed area. Depressions left from tire tracks can act as vernal pool facsimiles with the elevated horizontal zones in between functioning as micro-meadows. One such quasi-natural environment within this section of our botanical purview contains the following mélange of locals: bracted popcorn-flower (Plagiobothrys bracteatus), western lady’s mantle (Aphanes occidentalis), woolly marbles (Psilocarpus tenellus var. tenellus), California water starwort (Callitriche marginata), dwarf pearlwort (Sagina apetala) and a variant of toad rush (Juncus bufonius).
with filiform flowering culms.

Within and contiguous to the Scotts Creek Watershed, the genus *Agrostis* (family Poaceae) is represented by several species complexes. These need to have comprehensive studies done to clarify their component taxa, several of which have been given but not currently recognized species, subspecies and varietal status.

The *Agrostis blasdalei* complex:

1. Document all local populations and **collate with the extensive local collections made circa twenty-five years ago and deposited at the Jepson Herbarium, UC Berkeley.**

2. Are the populations south of the Golden Gate sufficiently distinct genetically to warrant subspecies status? Comparative studies on a molecular level need to be undertaken plus a detailed examination (a) on foliar morphology and epidermal coloration, (b) caespitose versus distinctly rhizomatous mode of growth as displayed in seasonally unstable micro-dune habitat, (c) stature: prostrate through erect-ascending, (d) open or closed breeding systems, (e) anther length and color both fresh and dry, (f) palea gestalt and venation or lack thereof plus ratio of palea length to that of lemma, (g) presence or absence of callus-hairs, (h) tardily deciduous or caducous mature spikelet behavior and (i) do statistical analysis of caryopsis morphology and a comparison study with *Agrostis densiflora* and *Agrostis exarata*.

3. **Study sympatric associations with related native species and the putative role of introgressive hybridization in population variability:**

   (A) Coastal headland population designated “Agrostis Rectangle”, southeast of “China Ladder Gulch”, circa twenty-five years ago comprised in excess of 1,000 extremely variable taxa growing intermixed with and proximal to *Agrostis densiflora* and *Agrostis exarata* var. *exarata*.

   (B) The interior grasslands between the east-fork of “Cookhouse Gulch” and the former “H-H Ranch” hay barn, have yielded up four separate sites, where *Agrostis blasdalei* x *Agrostis exarata* var. *monolepis* hybrids have been observed. One site, designated “Sandy-bottom Reservoir”, contained 30-40 prostrate taxa (growing sympatrically with a prostrate *Agrostis blasdalei* and an erect *Agrostis exarata* var. *monolepis*) which due to their superficial resemblance to *Agrostis densiflora*, were given the working name of *Agrostis “pseudo-densiflora”*. These ± stable (persistent) taxa appear to be crossing amongst themselves and possibly backcrossing (receiving genetic material) from an erect *Agrostis exarata* var. *monolepis*.

4. **Endosperm:** liquid or solid at maturity and not only pertaining to *Agrostis blasdalei* but other native species of *Agrostis* in the watershed as well.

5. Is the gene flow principally unidirectional when the growth pattern of one hybrid complex constituent is erect and the other is ± prostrate, with wind being the specific vector for pollen conveyance (anemophily)?

6. Since fertile hybrids are produced with both *Agrostis densiflora* and *Agrostis exarata* var. *monolepis*, a phylogenetic analysis needs to be undertaken. Does *Agrostis blasdalei* share a common ancestor with the *Agrostis densiflora/exarata* alliance, is it derived from one of these two species or does it represent an end product of a parallel relictual line?

7. Where is the evolutionary point of origin, biogeographically speaking for *Agrostis blasdalei*, and what affinities, if any, does it have with *Agrostis breviculmis* Hitchc. of Peru? Chloroplast and other DNA site studies need to be done for the entire disjunctive range of *Agrostis blasdalei*, from Mendocino to Monterey Counties, to see what gene flow and
corresponding mutation rate patterns occur.

Encompassing most of the area viewed within this traversal, including the coastal sage scrub and the mixed evergreen/coniferous woodlands that insinuate themselves into the chaparral, colonies of native bent grass (genus *Agrostis*) occur, which combine key characters (in the literature at least) of both Hall’s bent grass (*Agrostis hallii*) and leafy bent grass (*Agrostis pallens*) and possibly represent a long-term reticulate pattern of hybridization, with each recombination of genetic material stabilized by isolation and asexual (vegetative) colonization. In determining boundaries between naturally occurring variations attributable to each species and the expression of traits resulting from interspecific gene flow, study and compare the various populations using the type descriptions and the following key characters based on “in situ” observations:

(a) **Stature**: culms growing up through shrubbery often display a totally different gestalt than free standing adjacent innovations of the same plant.

(b) **Ligules** (specifically those of upper leaves): 2-3(5) mm. long, sub-entire and ± truncate (*A. pallens* influence) versus 5-7(10+) mm. long, acuminate and often deeply lacerate (*A. hallii* influence).

(c) **Inflorescences**: length, measured from lowest branch to apex, can exceed 30+ cm. in putative intergrades/hybrids.

(d) **Glumes**: length, between the various populations within the watershed tends to be fluid, ranging from (2)2.5-3.0 mm. long (*A. pallens* influence) through 5-6 mm. long (*A. hallii* influence).

(e) **Lemmas**: in the majority of populations studied, they averaged out at 3.0 mm. long.

(f) **Awns**: when present, they ranged in length from 1.5-3+ mm., straight or bent, often conspicuously exceeding the glumes. In some populations, where awned lemmas were present (*A. pallens* influence), all other visible traits reflected *A. hallii* influence. Study placement and point of attachment on back of lemma.

(g) **Callus-hairs**: variable, ranging from 0.5-2.1 mm. in length, but not necessarily correlating with other features used in keys to separate *A. hallii* from *A. pallens*.

(h) **Anthers**: study color and length when fresh and length when dry.

(i) **Palea**: presence/absence, length ratio to lemma, entire or marginally modified, with or without venation.

(j) **Endosperm**: semi-liquid or solid at maturity.

The *Agrostis microphylla* complex:

1. Plants growing on seasonally moist cliff faces overlooking the southern half of Greyhound Rock State Beach (pressed and deposited at the Jepson Herbarium, UC Berkeley), need to be analyzed and carefully compared with the type of *Agrostis microphylla*. Since the taxa in question possess a palea and the overall descriptions for *Agrostis microphylla* state palea wanting/none, what taxonomic value can be assigned to the presence/absence of such an organ? What breeding systems are at play within these isolated populations? Are these obligate selfers, creating in effect, a constellation of “micro-species”, occupying proximal but separate vertical niches?

2. Less than ½ mile due east of the “Greyhound Rock” populations, on the inland side of Highway 1 (growing on exposed mudstone), was a singular colony of what in gross morphology, appeared to be a facsimile of *Agrostis aristiglumis* Swallen. This highly localized member of the *Agrostis microphylla* retinue was described from an isolated population growing on an outcrop of diatomaceous
shale (Monterey Series) in Marin County on the Point Reyes Peninsula. Several pressings of the “aristiglumis” analogue were made and deposited at the Jepson Herbarium, UC Berkeley. The distinctive lateral nerves of the lemma, which are excurrent as conspicuous awns, coupled with the presence of a palea, the overall glumes to lemma length ratio plus awn placement on glumes and back of lemma, makes this biotype along with the “Greyhound Rock” colonies, candidates for an in-depth study of the mechanics underlying speciation, distribution patterns and maintenance of genetic integrity.

A roadside assemblage of intermediate fiddleneck (Amsinckia menziesii var. intermedia), stinging phacelia (Phacelia malvifolia), slender tarweed (Madia gracilis), soap plant (Chlorogalum pomeridianum var. pomeridianum), gambleweed (Sanicula crassicaulis), miner’s lettuce (Claytonia perfoliata subsp. perfoliata) and California man root (Marah fabaceus), could be easily passed by and casually viewed as “more of the same” but within this snapshot of local biodiversity, a concentrated population of Plectritis ciliosa subsp. insignis = Plectritis ciliosa resides. Belonging to the Valerian Family (Valerianaceae), Plectritis ciliosa can be distinguished from other Plectritis species encountered within the watershed, by possessing pink corollas, circa 1.5-3.5 mm long with two reddish spots at the juncture between the upper and lower lips and having a spur shorter than the ovary. Since this species occurrence within Santa Cruz County has not been noted in Randall Morgan’s recent (2005) “An Annotated Checklist of the Vascular Plants of Santa Cruz County, California”, in situ seed collections have been made and deposited at the UCSC Arboretum.

Several species historically documented as occurring within the watershed and its environs, remain to be rediscovered and may still exist in some isolated and overlooked niche: a listing of some of those “neither here nor there” taxa would include alkaline marsh butterweed (Senecio hydrophilus), white-rayed pentachaeta (Pentachaeta bellidiflora), varnish leaf (Ceanothus velutinus var. hookeri), purslane speedwell (Veronica peregrina subsp. xalapensis), marsh trefoil (Lotus oblongifolius var. oblongifolius = Hosackia oblongifolia), Bentham’s trefoil (Lotus benthamii = Acmispon cytisoides), swamp thistle (Cirsium douglasii var. douglasii), San Francisco gumplant (Grindelia hirsutula var. maritima), rough bent grass (Agrostis scabra) and pink sand-verbenas (Abronia umbellata subsp. umbellata).

Between Little Creek Bridge and the ridge separating the Molino Creek drainage, several additional species are visually captured, identified, and added to the checklist of encountered roadside natives. Growing in a sheltered gulchlet, perpendicular to the roadway, ocean spray (Holodiscus discolor) is a member in good standing of a group of local shrubs that when leafless are rendered invisible to the unfocused viewer. Notorious for disrespecting the genetic integrity of its relatives, yellow bush lupine (Lupinus arboreus), has formed discrete alliances in the watershed, with both summer lupine (Lupinus formosus var. formosus) and Lindley’s varied lupine (Lupinus varicolor) and most likely, with broad-leaved lupine (Lupinus latifolius var. latifolius), the last-named resulting in a distinctive local taxon tentatively referable to (Lupinus propinquus) described by E. L. Greene in 1893. Half hidden by the roadside grasses, miniature lupine (Lupinus bicolor) tries valiantly to elevate its flower heads above the competing greenery. Upon closer inspection, the overlooked basal rosettes, with opposite, glabrous, twice ternately dissected leaves featuring petiole bases with expanded hyaline margins and found growing beneath California sagebrush (Artemisia californica), prove to be the locally uncommon wild celery (Apiastrum angustifolium). Accenting the deep drainage ditch, between the roadbank and adjacent
cultivated fields, broad-leaved cattail (*Typha latifolia*) shares its sinuous habitat with various species of waterfowl, the most likely seed conveyors of this cosmopolitan species, which forms extensive colonies in nearby Scotts Creek Marsh. Growing roadside in sandy soil and superficially passing for a narrow-leaved variant of its cousin California aster, western goldenrod (*Euthamia occidentalis*) also aggressively colonizes alluvium-rich areas both within and adjacent to the Scotts Creek Marsh. Shadowing the lower portion of Swanton Road and threading its way through other native and introduced grass species, creeping rye (*Leymus triticoides*), luxuriates within the western confines of the Scotts Creek Marsh and forms diffuse scatterings on the coastal prairie where siliceous terrace deposits (aeolian sand) prevail.

Some seasons, farewell-to-spring (*Clarkia rubicunda*), replaces the chlorophyll saturated vernal lushness with slopes a shimmering wall of mauve, while another representative of the Evening Primrose Family (*Onagraceae*), panicled willow herb (*Epilobium brachycarpum*), nearing the closure of our journey, recedes into the background vegetation with its naked, exfoliating stems, diffuse, attenuate branches, and numerous but diminutive flowers. With linear non-auriculate cauline leaves and delicate inflorescences with filiform pedicels supporting crenulate silicles, narrow-leaved fringepod (*Thysanocarpus laciniatus*), a rare species within the county, is visually lost within a rank population of miner’s lettuce (*Claytonia perfoliata* subsp. *perfoliata*), distinguished from the typical white-flowered forms by its pink tinged flowers. Sporadically occurring California larkspur (*Delphinium californicum* subsp. *californicum*), nestled within and occasionally rising above the hillside shrubbery, has traded eye-catching coloration for inflorescence size and number of flowers, these often exceeding fifty!

With rhizomes precariously embedded in rock outcroppings and often shaded by suffrutescent members of the coastal scrub, coffee fern (*Pellaea andromedifolia*) imparts an exotic impression to a parched, wind-buffeted exposure. Encountering a concentrated population of variable California melic (*Melica californica*), displaying parchment-textured florets akin to miniaturized Japanese paper lanterns, purple needlegrass (*Nasella pulchra* = *Stipa pulchra*), with bent and twisted persistent awns, 7-9 times the lemma length and sister species foothill needlegrass (*Nasella lepida* = *Stipa lepida*), possessing half the stature of its anthocyanic infused sibling species, gives the traveler a cumulative awareness of the richness and diversity of the Grass Family (*Poaceae*) found within the Scotts Creek environs. Adding structural contrast to the vertical array of surrounding vegetation, eleven members of the morphologically diverse Asteraceae.....Bioletti’s cudweed (*Pseudognaphalium biottii*), California cudweed (*Pseudognaphalium californicum*), Gianone everlasting (*Pseudognaphalium gianoni*), pink everlasting (*Pseudognaphalium ramosissimum*), California goldenrod (*Solidago velutina* subsp. *californica*), coyote brush (*Baccharis pilularis*), California sagebrush (* Artemisia californica*), mugwort (*Artemisia douglasiana*), golden yarrow (*Eriophyllum confertiflorum var. *confertiflorum*), California aster (*Symphyotrichum chilense*) and yarrow (*Achillea millefolium*) challenge the passing observer to connect the phylogenetic dots and discern the familial relationship between this native nonet. An aesthetically fascinating, genetically complex and amenable to cultivation succulent, that both greets and bids farewell to us on this eco-tour, is sea lettuce (*Dudleya caespitosa*)..... while variable in leaf morphology, the preponderance of plants encountered share a vibrant, grass-green coloration with a minority colored a dull gray (inherited from diploid ancestor *Dudleya farinosa*), but sharing the base of this ancient landslide with our Poaceae trio and the aforementioned Asteraceae quartet, is a small population with uniformly chalky-gray herbage and eminently worthy of cultivation (both divisions and seed repose up at the UCSC Arboretum). **Getting up close and personal with select taxa growing on this humongous rotational slump/pull apart**
(guiding Swanton Road in a westerly direction then abruptly turning northward) can yield some fascinating results: from a purely olfactory perspective, two plant families offer up a banquet of foliar scents that would be missed from just visually perusing the road bank with a quick drive/walk by..... representing the Asteraceae: Achillea millefolium, Artemisia california, Artemisia douglasiana, Eriophyllum confertiflorum var. confertiflorum, Pseudognaphalium bioletti, Pseudognaphalium californicum, Pseudognaphalium gianonei, pro. sp. nov., Pseudognaphalium ramosissimum and Symphyotrichum chilense..... while fewer numerically, the Lamiaceae’s contributions are no less rewarding, with Monarda villosa sensu lato displaying remarkable variation throughout the watershed, Satureja douglasii = Clinopodium douglasii and Stachys ajugoides var. rigida = Stachys rigida exuding a pungency not to everyone’s liking!

Marching down the steep, topographically irregular slopes of tributary gulches feeding into the flood plain of the lower Scotts Creek and reveling in the alluvium rich bottoms, California buckeye (Aesculus california) rivals the red alder (Alnus rubra) during the dormant season for the intricacy of its branching patterns and easily bests all competition save the Pacific madrone (Arbutus menziesii) in inflorescence presentation and fragrance, not to mention toxicity of nectar! Several long established specimens of Aesculus californica been have observed within the watershed, producing seasonally, a certain percentage of seedlings displaying a chlorophyll deficit, with foliage ranging from a muted gold to off-white with a pinkish cast and like colored veining! Sister species to previously encountered hill star (Lithophragma heterophyllum), with a campanulate, basally truncate hypanthium and axillary bulblets in upper bracts of inflorescence, woodland star (Lithophragma affine), forming scattered colonies along the terminal portion of our traversal, resists the adornment of asexual propagules and sports an obconic hypanthium instead.

Although artificially straightened more than a century ago, Archibald Creek’s original course, based on existing distribution patterns of vegetation, apparently veered sharply in a southwesterly orientation, where water still flows..... overlooking this agriculturally modified drainage system, an extensive population of California buckeye (Aesculus californica) obscures the downslope’s topography, by forming a seamless tapestry of interwoven canopies and taking on the appearance of a gargantuan colony of brain coral. Sheltered within a grove of shining (Salix lucida) subsp. lasiandra = Salix lasiandra var. lasiandra) and arroyo (Salix lasiopelis) willows, red elderberry (Sambucus racemosa var. racemosa), straggly gooseberry (Ribes divaricatum var. pubiflorum), giant vetch (Vicia gigantea), and cow-parsnip (Heracleum lanatum) luxuriate, while the drainage ditch abutting Swanton Road hosts umbrella sedge (Cyperus eragrostis), watercress (Rorippa nasturtium-aquaticum = Nasturtium officinale), flowering quillwort (Lilaeas cilioides) and forming a green skin on the water’s surface, smaller duckweed (Lemma minor) and directly across the tarmac, colonies of California wild rose (Rosa californica) and California aster (Symphyotrichum chilense) weave tapestries tinted mauve and pink against the backdrop of a red alder (Alnus rubra) lined Scotts Creek. The upper portion of the Archibald Creek sub-watershed, is defined in part, by south facing near-vertical cliff faces shaped by landslides, capped with exposed grasslands interfacing with mixed oak/coniferous woodlands and margining manzanita-defined zones of chaparral..... these often spilling downwards, softening the verticality of the slopes, basally being less severe in inclination but treacherous to navigate because of loose rocky debris. Along this narrow strip, when earth and sky abruptly meet, a well-defined example of “disjunctive chaparral” can be found, in full post-fire (03/15/10) botanical display. As with the watershed in general, even this exposed aerie hosts a diverse and in one case, new species for the area, namely
sagebrush more extensively, on the established on the moist county wide! In terms of recently discovered site within the Scotts Creek Watershed for this decidedly uncommon species I will call markedly determines the vegetation patterns present. The gulch closest to Queseria Creek, which coastal prairie between Greyhound Rock and S. creek. From Swanton Road these two neglected areas appear as narrow, d. Between Archibald and Queseria Creeks, two small but botanically diverse west-facing watersheds exist, drained by seasonal streamlets emptying into the bottomland paralleling Scotts Creek. From Swanton Road these two neglected areas appear as narrow, deeply incised gulches flanked by steep, often near-vertical slopes, terminating in broad alluvial fans as they approach the flood plain. As with the complex of gulches perpendicular to Highway 1, which drain the coastal prairie between Greyhound Rock and Scotts Creek Beaches, slope orientation often markedly determines the vegetation patterns present. The gulch closest to Queseria Creek, which I will call George Valentine Gulch after an eccentric hermit who lived there during the post WWII years, hosts an extensive population of bitter cherry (Prunus emarginata), the second recently discovered site within the Scotts Creek Watershed for this decidedly uncommon species county wide! In terms of slope orientation and this drupaceous member of the Rose Family (Rosaceae), the population found growing along the lower portion of Queseria Creek is established on the moist northwest facing slopes (in part, directly overlooking Swanton Road), while the George Valentine Gulch counterpart is growing within the moist gulch bottom and also more extensively, on the wind-buffeted west facing slopes, in association with California sagebrush (Artemisia californica), sticky monkeyflower (Mimulus aurantiacus), stinging phacelia (Phacelia malvifolia), yellow bush lupine (Lupinus arboreus), yarrow (Achillea millefolium), coyote brush (Baccharis pilularis), lizard tail (Eriophyllum staechadifolium), deerweed (Lotus scoparius var.
pomeridianum subsp. (californicum jordanii gianonei) This is an addendum, further elaborating on the native species diversity found within the "micro" of ta berry the gulch, creating a moisture Douglas live (Vaccinium ovatum) the unrelenting forces of the offshore winds californicum (glaucus California brom everlasting (cudweed: Bioletti’s cudweed) often radically reduced through herbivory, (4) (seasonal rosettes held steadfast by slender rhizomes, fragmentary patches of California saxifrage brush and California sagebrush, (2) ado delicate traceries hidden from view within the coastal scrub, often growing at the bases of coyote gestalt. Other species of interest, both uncommon and widespread, that populate the George Valentine Gulch, are: (1) scattered colonies of wild celery (Apiastrum angustifolium), forming delicate traceries hidden from view within the coastal scrub, often growing at the bases of coyote brush and California sagebrush, (2) adorning exposed but moisture retentive rocky slopes, their seasonal rosettes held steadfast by slender rhizomes, fragmentary patches of California saxifrage (Saxifraga californica) plus two cousins….. woodland star (Lithophragma affine) and hill star (Lithophragma heterophyllum), (3) lost in the welter of competing vegetation and fractured mudstone, clusters of sea lettuce (Dudleya caespitosa) approach the year’s end with their biomass often radically reduced through herbivory, (4) four aromatically distinct species of native cudweed: Bioletti’s cudweed (Gnaphalium bicolor = Pseudognaphalium biolettii), California cudweed (Gnaphalium californicum = Pseudognaphalium californicum), pink everlasting (Gnaphalium ramosissimum = Pseudognaphalium ramosissimum) and scattered plants of Gianone everlasting (Gnaphalium gianonei, pro, sp. nov. = Pseudognaphalium gianonei, pro, sp. nov.), (5) grass species galore: Agrostis hallii/pallens intergrades, foothill needlegrass (Nasella lepida), California brome (Bromus carinatus var. carinatus), California fescue (Festuca californica), Howell’s bluegrass (Poa howellii), pine bluegrass (Poa secunda subsp. secunda), California wild rye (Elymus glaucus subsp. glaucus) and Torrey’s melic (Melica torreyana), (6) a ground-hugging sanicle (Sanicula arctopoides) and Paul Bunyanesque larkspur (Delphinium californicum subsp. californicum), while (7) overlooking the upper reaches of this abbreviated gulch and exposed to the unrelenting forces of the offshore winds, isolated specimens of California huckleberry (Vaccinium ovatum) and maidl ak (Quercus chrysolepis) have adjusted by reducing their vertical status, in the maud ak’s case, with one old specimen hugging the hillside with a copycat coast live-oak (Quercus agrifolia var. agrifolia). Acting as an environmental modifier, a wind sculpted Douglas-fir (Pseudotsuga menziesii var. menziesii) colony shades the west facing central portion of the gulch, creating a moisture-retentive habitat favored by ocean spray (Holodiscus discolor), oso berry (Oemleria cerasiformis), arroyo willow (Salix lasiolepis) and, surprisingly, a small population of tan-oak (Lithocarpus densiflorus var. densiflorus = Notholithocarpus densiflorus) with reduced leaves, which from a distance, simulate the nearby coast live-oaks!

This is an addendum, further elaborating on the native species diversity found within the "micro" sub-watershed given the appellation of George Valentine Gulch: Gianone sanicle (Sanicula gianonei, pro, sp. nov.), western lady’s mantle (Aphanes occidentalis), goldback fern (Pentagramma triangularis subsp. triangularis), wood fern (Dryopteris arguta), California maidenhair (Adiantum jordanii), western sword fern (Polystichum munitum), California polypody (aff. Polypodium californicum), morning glory (Calystegia purpurata subsp. purpurata), downy buttercup (Ranunculus helcarpus), tall layia (Layia hieracioides), California bedstraw (Galium californicum subsp. californicum), Douglas’s nightshade (Solanum douglasii), soap plant (Chlorogalum pomeridianum var. pomeridianum), blue dicks (Dickestemma capitatum subsp. capitatum), California...

The "Unnamed Gulch" appearing to the casual traveler along Swanton Road, as: (a) one more over-grazed grassy meadow populated with noxious aliens, (b) backed by precipitously descending brush cloaked slopes with poison-oak appearing to be the principal inhabitant and (c) the principal source (a complex series of feeder gulchlets) of the gulch proper being obscured by a somewhat generic woodland..... *but upon closer examination, reveals quite the opposite, in terms of "native" residents!* This "nameless" drainage system, wedged in between George Valentine Gulch and the expansive lower Archibald Creek sub-watershed, offers the following botanical inventory.....surprisingly diverse in species represented, for so prosaic a setting! As of 03/20/10, here is a preliminary listing of "native" taxa to be found, in an inconspicuous, overlooked and shamefully ignored but hardly remote, part of the Scotts Creek Watershed: *Prunus emarginata* (new population and range extension), *Sanicula crassicaulis, Sanicula gianonei, pro.sp.nov.* (extensive colonies scattered on moist slopes), *Marah fabaceus, Sambucus nigra* subsp. *canadensis, Baccharis pilularis, Toxicodendron diversilobum, Claytonia perfoliata subsp. perfoliata, Fragaria vesca, Sacta bulata, Hesperocnide tenella, Heracleum maximum, Lithophragma affine* (hypanthium conical basally), *Lithophragma heterophyllum* (hypanthium truncate basally), *Plectritis brachystemon, Frangula californica* subsp. *californica, Pseudotsuga menziesii var. menziesii, Scrophularia californica* subsp. *californica, Galium porrigen var. porrigen* var. *californicum, Galium californicum* subsp. *californicum, Trillium chloropetalum* (several color phases present), *Oenothera cerasiformis, Monardella villosa sensu lato, Calystegia purpurata subsp. purpurata, Nasella lepida, Nasella pulchra, Bromus carinatus sensu lato, Festuca californica, Melica torreyana* (extensive colonies scattered throughout micro-watershed), *Pseudognaphalium californicum* (some plants showing influences of *Pseudognaphalium stramineum* = *Pseudognaphalium gianonei, pro.sp.nov.*), *Pseudognaphalium stramineum*, *Holodiscus discolor, Aphanes occidentalis, Lupinus arboreus, Artemisia californica, Artemisia douglasiana, Solanum douglasii, Solanum umbelliferum, Apiastrum angustifolium* (extensive colonies occurring in both shaded and exposed locations), *Bowlesia incana, Nemophila menziesii* (variable but basically var. *atomaria*), *Nemophila parviflora var. parviflora, Cynoglossum grande, Madia gracilis, Solidago velutina* subsp. *californica, Saxifraca californica, Phacelia malvifolia, Chlorogalum pomeridianum var. pomeridianum, Achillea millefolium, Laythus vestitus var. vestitus, Vicia americana var. americana, Fritillaria affinis var. affinis, Clarkia rubicunda, Eschscholzia californica, Adiantum jordani, Polystichum munitum, Pentaphragma triangularis subsp. triangularis, Dryopteris arguta, Pteridium aquilinum var. pubescens, Polypodium californicum* (growing as lithophyte)?, *Polypodium calirhiza* (growing as epiphyte)?, *Minimus aurantiacus, Rubus ursinus, Cirsium brevistylum, Aesculus californica* (one golden-leaved seedling observed), *Osmorhiza berteroii, Smilacina stellata, Quercus agrifolia var. agrifolia, Umbellularia californica, Corylus cornuta var. californica, Cardamine californica var. californica, Cardamine dolichocarpa, Anaphalis margaritacea, Cryptantha micromeres, Urtica dioica* subsp. *gracilis, Symphoytrichum chilense, Satureja douglasii = (Clinopodium douglasii), Angelica tomentosa* (second population discovered within watershed), *Erigeron foliosus var. franciscensis* (second population discovered within watershed), *Pinus attenuata, Arbutus menziesii, Juncus bufonius, Juncus occidentalis, Juncus patens, Ceanothus thrirsflorus, Agrostis thyriflora, Claytonia parviflora var. parviflora, Vicia narbonensis var. narbonensis, Stokesia laevis, Smilacina stellata, Monardella villosa sensu lato, Calystegia purpurata subsp. purpurata, Nasella lepida, Nasella pulchra, Bromus carinatus sensu lato, Festuca californica, Melica torreyana* (extensive colonies scattered throughout micro-watershed),
As the last major sub-watershed entering into the Scotts Creek riparian corridor before fresh and salt water comingle, Queseria Creek drains a complex series of gulches and gulchlets, where primary and secondary bifurcation create both an access nightmare and a botanically diverse series of habitats. Whether ingressing Queseria Creek from Swanton Road adjacent to the stone cheese house or the ridgetop forming the Molino Creek divide to provide just two reference points.....rare, uncommon and widespread native species abound, often in unusual and surprising juxtapositions. Two rare taxa for Santa Cruz County, Prunus emarginata and Clarkia purpurea subsp. purpurea, can be said to represent the alpha and omega of species as to habitat elevation.....the bitter cherry is firmly established on the w-facing slopes within a stone’s throw of Swanton Road and the Cheese House while the purple godetia holds court on an ancient eolian sand deposit, 500+ feet above the drupe producing member of the Rosaceae and bookended between the upper s-fork of Queseria Creek and the ridge which acts as the Molino Creek divide. The Clarkia purpurea subsp. purpurea population was only recently discovered [10/10/2011] and due to its size, 300+ plants, displayed considerable variation as to overall gestalt with the following patterns observed.....(a) unbranched virgate stems topped with a dense capitulum of flowers, (b) erect multi-branched stems with lateral branches greatly reduced creating a series of glomerate flower clusters along the stem’s main axis, (c) erect in mode of growth and stems thick and woody [one example studied in situ, had a 1 centimeter diameter stem 10 centimeters above ground level], with numerous branches from near ground level upwards perpendicular to the axis of the main stem, (d) elongate stems that may begin erect but terminate in a decumbent alignment and numerous variations/combinations of these four basic patterns. The rigid, almost woody, nature of the stems and mature capsules allows the plants to structurally persist long after the seed has been shed and perhaps, due to the hygroscopic nature of the stems, vegetative growth [leaves and flowers] occasionally continues after the main root system has apparently ceased functioning. Perhaps this is a co-evolved mechanism, where dry summer/fall weather conditions are mitigated by the maritime influence of fog and nocturnal condensation? Several years ago, I gave Harry Wain an envelope containing 40-50 seeds from the Clarkia purpurea subsp. purpurea population overlooking Lasher Marsh Gulch and when raised out that first season, revealed a degree of variability, both as to inflorescence configuration and color/patterning, that far exceeded the parent population from which the seed was collected. Every year for a total of five seasons, the established ex situ population reseeded itself and produced an ever more complex series of resegregates.....these, often paralleling in coloration, the various color forms of sister subspecies Clarkia purpurea subsp. quadriruwnera, of which the closest population within the Scotts Creek Watershed was more than two miles away. During the last two seasons, a new and most distinctive form appeared, in which the reduced in size flowers were tubular in profile and increased numerically forming a dense capitulum of 20-30+ flowers.....possibly reflecting a recessive tendency towards autogamy.
All of the native taxa included in the following overview for the Queseria Creek sub-watershed are defined as occurring above the bottomless culvert zone which crosses under Swanton Road.... due to the current restoration efforts and historical land use/modification of the floodplain which comprises the present lower portion of Queseria Creek, the original vegetation pattern is more inferential than observable.

Arranged by families, a preliminary/ongoing documentation of the Queseria Creek sub-watershed [10/15/2011] includes the following native taxa: *Pinus radiata* (the southernmost natural population for this endemic population, an ancient hybrid swarm in the opinion of this author, extends at least to the Molino Creek Divide, where it shares habitat with *Quercus agrifolia* var. *agrifolia*, *Pseudotsuga menziesii* var. *menziesii* and the upper edge of a *Sequoia sempervirens* population, and may also have outliers further southeast in the upper Molino Creek drainage and possibly on a ridge overlooking San Vicente Creek), *Pseudotsuga menziesii* var. *menziesii*.... *Corylus cornuta* subsp. *californica* (extensive populations are found growing, not only on the w-facing slopes overlooking/margining the lower drainage as Queseria Creek approaches Swanton Road, but are equally represented in the upper parts of the watershed where the redwoods dominate and even into the drier habitats of the coast live-oak woodlands).... *Ceanothus thyrsiflorus*, *Frangula californica* subsp. *californica*.... *Toxicodendron diversilobum*.... *Fragaria vesca*, *Heteromeles arbutifolia*, *Oemleria cerasiformis*, *Prunus emarginata* (this rare taxon for Santa Cruz County, occurs in three parallel drainage systems.... the "Unnamed Gulch", "George Valentine Gulch" and the Queseria Creek Sub-Watershed), *Rubus parviflorus*, *Rubus ursinus*.... *Arbutus menziesii*.... *Quercus agrifolia* var. *agrifolia*, *Notholithocarpus densiflorus* var. *densiflorus*.... *Euphorbus occidentalis* var. *occidentalis*.... *Salix lasiolepis*.... *Sequoia sempervirens*.... *Umbellularia californica*.... *Climopodium douglasii*, *Monardella villosa* aff. var. *villosa* (leaves cuneate to truncate basally, thin in texture), *Stachys bullata*.... *Scrophularia californica*.... *Marah fabaceus*.... *Urtica dioica* subsp. *gracilis*.... *Achillea millefolium*, *Artemisia californica*, *Artemisia douglasiana*, *Baccharis pilularis* subsp. *consanguinea*, *Cirsium brevistylum*, *Corethrogynne filaginifolia* (var. *filaginifolia*), *Deinandra corymbosa*, *Erigeron canadensis* (phyllaries with resinous midvein, which turns brown as capitulum ages), *Eriophyllum staechadifolium*, *Heterotheca sessiliflora* aff. subsp. *echioides*, *Layia hieracioides*, *Pseudognaphalium benseolens*, *Pseudognaphalium biolletii*, *Pseudognaphalium californicum*, *Pseudognaphalium aff. gianonei*, *pro sp. nov.*, *Pseudogouaphalium ramossissum*, *Pseudognaphalium stramineum*, *Solidago velutina* subsp. *californica*, *Symphyotrichum chilense*.... *Juncus patens*.... *Agrostis hallii/pallens* intergrades, *Bromus carinatus*, *Elymus glaucus* subsp. *glaucus*, *Melica torreyana*, *Stipa lepida*, *Stipa pulchra*.... *Carex densa*, *Carex subbracteata*.... *Heracleum maximum*, *Sanicula crassicaulis*.... *Ribes menziesii*.... *Sambucus nigra* subsp. *caerulea*, *Sambucus racemosa* var. *racemosa*.... *Acmispon glaber* var. *glaber*, *Lathyrus vestitus* var. *vestitus*, *Lupinus arboreus*, *Vicia gigantea*.... *Clarkia purpurea* subsp. *purpurea*, *Epilobium canum subsp. canum* (growing on s-facing grassy knoll above Strawberry Shack with *Heterotheca sessiliflora* aff. subsp. *echioides*), *Epilobium ciliatum* subsp. *ciliatum*.... *Veronica americana*.... *Delphinium californicum* subsp. *californicum*.... *Amsinckia menziesii*, *Phacelia malvifolia*.... *Lonicera hispidula*.... *Mimulus aurantius*.... *Oxalis pilosa*.... *Verbena lasiostachys* var. *lasiostachys*.... *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens*.... *Eschscholzia californica*.... *Calystegia purpurata* subsp. *purpurata*.... *Cornus sericea* subsp. *sericea*.... *Solanum douglasii*.... *Maianthemum stellatum*.... *Iris douglasiana*.... *Chlorogalum pomeridianum* var. *pomeridianum*.... *Eriogonum nudum*, *Rumex transitorius* (callus grains 3 per flower, ranging from subequal to unequal in size).... *Nasturtium officinale*....
Dryopteris arguta, Polystichum munitum, Pteridium aquilinum var. pubescens, Pellaea andromedifolia, Pentagramma triangularis subsp. triangularis, Athyrium filix-femina var. cyclosorum.

As our botanical exploration through the Scotts Creek Watershed draws to a close and we approach the ridge that defines the lower Molino Creek drainage, an amazing visual recapitulation takes place: the hydrologically active, landslide benched slopes overlooking Swanton Road from Queseria Creek to the terminus of our traversal, *support conservatively 28% of the flora noted since beginning our tour. Only recently discovered and behaving more like a malodorous dwarf willow, bitter cherry (*Prunus emarginata*) resists easy detection by being deciduous part of the year and growing intermixed, if not wholly engulfed, by the surrounding suffrutescent vegetation. On these west-facing slopes, rare San Francisco collinsia (*Collinsia multicolor*) gives its last hurrah while California saxifrage (*Saxifraga californica = Micranthes californica*) graces the moist recesses with nascent rosettes simulating a hairy sundew (genus *Drosera*) and willow dock (*Rumex salicifolius var. transitorius = Rumex transitorius*), with three callous grains per flower, resides contentedly in the ditch between slope base and road edge, unless pummeled and buried by mudstone debris. Staking out the wettest portion of the drainage ditch and conspicuous by virtue of its anthocyanin pigmented stems and foliage, Watson’s willow herb (*Epilobium ciliatum subsp. watsonii*) generously rewards the viewer with flowers colored an intense reddish-purple, worthy of a selective breeding program to enhance that permanently moist section of the wild garden. Growing in close proximity to its pestiferous European relatives, Pacific fescue (*Vulpia microstachys var. pauciflora = Festuca microstachys*) is readily identifiable by the lower glume being more than half the length of the upper, florets less than five and spikelets subglabrous with lowest branches reflexed, while the densely cespitose clumps of fellow Poaceae traveler, California fescue (*Festuca californica*), visually define the moist parts of the hillside with their grayish culms and stramineous mature inflorescences.

Ensconced within a moist, west-facing slope dominated by coastal scrub and concealed from all but the most observant eyes, California angelica (*Angelica tomentosa*) or a reasonable facsimile thereof, makes a welcome addition to the watershed’s ongoing native species check list. Rankly odorous, fistulose stems and glaucous foliage clothed with both simple and forked hairs, readily separate this taxon from all other sympatric Apiaceae, which includes California hedge-parsley (*Yabea microcarpa*), a species rare county wide. A scattered population of pine bluegrass (*Poa secunda subsp. secunda*), with purple suffused spikelets and like colored anthers, holds steadfast to a less than stable mudstone perch, while a small colony growing on the lower portion of the Schoolhouse Ridge has green spikelets with yellow anthers. Adding color, with a purplish-maroon sunscreen, and making up through visual contrast what it lacks in stature, dwarf orthocarpus (*Triphysaria pusilla*), occupies the roadside edges, caught between tire burn and suffocation from displaced shale. With yellow ligules 5-6 mm long, disk fruit with circa 20 pappus bristles and herbage distinctively scented, a variable population of tall layia (*Layia hieracioides*) boosts the number of rare/uncommon/widely scattered “natives” concentrated within this zone of plant diversity at the southern edge of the watershed.

*Forming, in part, a vertical tapestry of concentrated “natives”, so closely integrated that they appear as one organic continuum... the following taxa reveal themselves through closer examination: woodland star (*Lithophragma affine*), intermediate fiddleneck (*Amsinckia menziesii*)
var. intermedia = *Amsinckia menziesii*, climbing bedstraw (*Galium porggens var. porrigens*), California man root (*Marah fabaceus*), coast buckwheat (*Eriogonum latifolium sensu lato*), yellow bush lupine (*Lupinus arboresus*), California figwort (*Scrophularia californica*), lizzard tail (*Eriophyllum stachchadifolium*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis* = *Baccharis pilularis subsp. consanguinea*), stinging phacelia (*Phacelia malvifolia*), yarrow (*Achillea millefolium*), California blackberry (*Rubus ursinus*), soap plant (*Chlorogalum pomeridianum var. pomeridianum*), California poppy (*Eschscholzia californica*), gambleweed (*Sanicula crassicaulis*), California coffeeberry (*Frangula californica subsp. californica*), mountain dandelion (*Agoseris grandiflora*), miner’s lettuce (*Claytonia perfoliata subsp. perfoliata*), California hedge nettle (*Stachys bullata*), slim Solomon’s seal (*Smilacina stellata* = *Maianthemum stellatum*), wood fern (*Dryopteris arguta*), goldback fern (*Pentagramma triangularis subsp. triangularis*), California maidenhair (*Adiantum jordanii*), California poppy (*Polypodium californicum*), in part approaching var. kaulfussii.... with some of the lowermost pinna shorter than the succeeding ones and in spite of growing as a lithophyte, perhaps this taxon should be treated as *Polypodium calirhiza*, western sword fern (*Polystichum munitum*), bracken (*Pteridium aquilinum var. pubescens*), California brome (*Bromus carinatus var. carinatus*), California wild rye (*Elymus glaucus subsp. glaucus*), Torrey’s melic (*Melica torreyana*), sea lettuce (*Dudleya caespitosa*), arroyo willow (*Salix lasiolepis*), blue witch (*Solanoella umbelliferum*), coyote mint (*Monardella villosa sensu lato*), Pacific pea (*Lathyrus vestitus var. vestitus*), coast nettle (*Urtica dioica subsp. gracilis*), blue elderberry (*Sambucus nigra subsp. canadensis*), California aster (*Symphyotrichum chilense*), western lady’s mantle (*Aphanes occidentalis*), oso berry (*Oemleria cerasiformis*), Douglas-fir (*Pseudotsuga menziesii var. menziesii*), mugwort (*Artemisia douglasiana*), poison oak (*Toxicodendron diversilobum*), brown bog-rush (*Juncus hesperus*), common wood rush (*Luzula comosa*), sticky monkeyflower (*Mimulus aurantiacus*), popweed (*Cardamine oligosperma*), paniced willow herb (*Epilobium brachycarpum*) and creeping hearts (*Pterostegia drymarioides*).

Ending our traversal with a subtle but noteworthy native, California goosefoot (*Chenopodium californicu*), a relative of the culinary beet (*Beta vulgaris*), positions itself within a remnant portion of coastal scrub overlooking the southern limits of the watershed which encompasses the Scotts Creek Marsh, and when viewed from Swanton Road in a westerly arc, takes on the attributes of an abstract Diebenkorn landscape. Each chromatic zone can be defined botanically by a particular plant species or the interdigitation of one taxon into a long established colony of another. Centrally positioned within the marsh proper is pickleweed (*Salicornia virginica* = *Salicornia pacifica*), a salt tolerant native changing color from grayish-green through pink and as the season progresses becoming a vibrant reddish orange, and like its cousin California goosefoot, once belonging to the Goosefoot Family (*Chenopodiaceae*, now placed in *Amaranthaceae*). Sharing habitat with pickleweed, are fleshy jaumea (*Jaumea carnosa*), a representative of the Sunflower Family (*Asteraceae*) superficially passing for a non-native member of the Fig-Marigold Family (*Aizoaceae*) with succulent foliage bedecked with orange flowers, Pacific oenanthe (*Oenanthe sarmentosa*) a locally common member of the Apiaceae of unknown toxicity, western yellow cress (*Rorippa curvisiliqua*), fat hen (*Atriplex triangularis*), like *Chenopodium* and *Salicornia*, formerly registered as a member of the goosefoot alliance, Pacific cinquefoil (*Potentilla anserina subsp. pacifica*) and alkali heath (*Frankenia salina*), displaying grayish-green foliage and lavender flowers often growing intermixed with two native grass constituents of the marsh, saltgrass (*Distichlis spicata*) and creeping wild rye (*Leymus triticoides* = *Elymus triticoides subsp. triticoides*), colonies of both species forming distinctive textural patterns when viewed from afar. In terms of height and density, three species in particular characterize the vertical components of the marsh: broad-leaved cattail (*Typha latifolia*), possibly
forming hybrids with sister species narrow-leaved cattail (Typha angustifolia) and California tule (Scirpus californicus = Schoenoplectus californicus), imposing in stature with distinguishing deltoid apices and paniculate inflorescences overtopping all competing vegetation; while subordinate to but yielding nothing in the way of structural contrast, salt rush (Juncus lescurii.... or possibly of hybrid derivation with Juncus brevifolius as the other parent), its tortile-compressed dark green culms 1-2 meters in height with condensed or open inflorescences, some branches 15+ cm. in length, bearing dark brown nitid flowers, forms dark-green ribbons, these free standing or commingling with western goldenrod (Euthamia occidentalis), which adds a dusting of yellow when in full flower and three additional, lower in stature, members of the Sedge Family (Cyperaceae), three square (Scirpus americanus = Schoenoplectus americanus), panicked bulrush (Scirpus microcarpus) and umbrella sedge (Cyperus eragrostis). Within the seasonally inundated northwestern portion of the marsh, two native species of Polygonum grow sympatriically, both taxa now placed in the genus Persicaria: widespread throughout the watershed, water smartweed (Polygonum punctatum = Persicaria punctata) with its gland-stippled foliage exuding a fragrance of freshly cut green apples dramatically contrasts with sister species, swamp knotweed (Polygonum amphibium var. emersum = Persicaria amphibia), the latter apparently restricted only to this section of the marsh, a perennial with terrestrial stems nodally clothed with a membranous ocrea displaying a combination of short gland-tipped and longer eglanular trichomes, terminating in a conspicuous bristly collar spreading at an oblique angle. Along the transitional zone between grassland and marsh proper, growing in amongst poison oak (Toxicodendron diversilobum) and California blackberry (Rubus ursinus), adjacent populations of Santa Barbara sedge (Carex barbara), and slough sedge (Carex obturata) occur, sharing space with a dissimilar sibling duo, marsh baccharis (Baccharis douglasii = Baccharis glutinosa) and coyote brush (Baccharis pilularis subsp. consanguinea). An Asteraceae foursome also contributes to the diversity of marsh inhabitants, one enjoying wet feet, another flexible as to soil saturation while the remaining two preferring the higher and drier banks: in the order stated, the quartet consisting of sneezeweed (Helenium puberulum), California aster (Aster chilensis = Symphyotrichum chilense), lizard tail (Eriophyllum staechadifolium) and pink everlasting (Pseudognaphalium ramosissimum). Further back on the southward facing benched slopes which overlook the marsh, are two hydrologically active zones (seeps) which spill out onto the drier adjacent habitat, providing a optimal niche for extensive colonies of the Gianone's sedge complex/Carex harfordii matrix (Carex gianonei, pro. sp. nov.) which can be observed, growing up through the rushes and coyote brush. Where the formerly cultivated fields abut the vertical walls of coyote brush (Baccharis pilularis), scattered plants of Carex “imperfecta” occur, lending further support to the correlation between periodically disturbed habitat and the intersectional broaching of reproductive isolating mechanisms within the local carices.

Note: The two "benched" seeps, besides supporting a substantial population of the morphologically variable Carex gianonei syngameon, also host a varied series of associate "native" taxa, which the following listing by families, is a good indicator of the prevailing biodiversity present..... even within an area, that for more than a century, has sustained a high degree of disturbance from assorted agricultural practices. The following "natives" are found growing within and circumscribing the two hydrologically connected "micro-marshes": Pacific cinquefoil (Potentilla anserina subsp. pacifica), California wild rose (Rosa californica), California blackberry (Rubus ursinus).... yarrow (Achillea millefolium), California sagebrush (Artemisia californica), mugwort (Artemisia douglasiana), marsh baccharis (Baccharis glutinosa), coyote brush (Baccharis pilularis subsp. consanguinea), purple cudweed (Gamochaeta ustulata), sneezeweed (Helenium puberulum), Douglas’ aster (Symphyotrichum subspicatum.... all phyllaries acute
apically, the outermost conspicuously foliaceous and equalling/overtopping the inner)..... western sword fern (*Polystichum munitum*). Douglas's nightshade (*Solanum douglasii*). dense sedge (*Carex densa*), Gianone Carex complex (*Carex gianonei*). pro sp. nov. / *Carex harfordii* matrix, in part..... producing nodal proliferations on scendent brush supported stems, some inflorescences with lower 1-5(+) spikelets compound-congested, these being gynaecandrous, andrognynous and/or mixed). umbrella sedge (*Cyperus eragrostis*), low club rush (*Issolepis cernua*). perennial phase, forming dense micro-tussocks, common tule (*Schoenoplectus acutus* var. *occidentalis*). apices of flowering culms deltoid in outline)..... toad rush (*Juncus bufonius* var. *bufonius*), Pacific bog-rush (*Juncus effusus* var. *pacificus*), brown bog-rush (*Juncus hesperius*), Mexican rush (*Juncus aff. mexicanus*). dk green culms, smooth to the touch, semi-terete to tortile-compressed with NO blades on basal sheaths, variable as to heigh [5-1+ m] and diameter [2-5+ mm], inflorescences compact to open-spenging. perianth parts sub-equal as to length [5-7mm]..... forming an extensive colony [possibly clonal] on slopes and possibly part of hybrid complex with *Juncus lescurii* and *Juncus breweri*, which dominates the west side of the adjacent Scotts Creek Marsh), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus* var. *phaecephalus*). common monkeyflower (*Mimulus guttatus*). *var. grandis* / subs. *litoralis*, with honey-scented flowers). water smartweed (*Persicaria punctata*). hairy wood sorrel (*Oxalis pilosa*). watercress (*Nasturtium officinale*). floating pennywort (*Hydrocotyle ranunculoides*). yerba buena (*Clinopodium douglasii*), bugle hedge-nettle (aff. *Stachys ajugoides*). leaf-bases truncate/cuneate, inflorescences with soft, spreading hairs). overall gestalt, including chemical signature, intermediate between *Stachys ajugoides* and *Stachys rigida* var. *quercetorum*), California hedge nettle (*Stachys bullata*). California figwort (*Scrophularia californica*). yellow bush lupine (*Lupinus arboresus*). California coffeeberry (*Frangula californica* subs. *californica*). slender hairgrass (*Deschampsia elongata*). California wild rye (*Elymus glaucus* subs. *glaucus*). red fescue (*Festuca rubra*). coast nettle (*Urtica dioica* subs. *gracilis*). some plants tending towards subs. *holosericea*, with proportionally fewer stingint trichomes and more softer to the touch, non-stinging trichomes on abaxial surface of leaves and stems). Watson's willow herb (*Epilobium ciliatum* subs. *watsonii*). inflorescence dense with flowers subtended by foliaceous bracts). Pacific oenanthe (*Oenanthe sarmentosa*).

Note: The Scotts Creek Marsh as now constituted, consists of two main components separated by Scotts Creek proper..... to the west, the seasonally inundated wetland is a botanical treasure throw of salt-water tolerant taxa (halophytes), while dominating the eastern, south-eastern flank, are remnant fresh-water marsh constituents which appear to be supported by a series of springs and in all probability, represent part of the original drainage course of Queseria Creek. Both halves of the marsh have ancillary gulchlets emptying into them, which historically may have contributed supplemental water but are now more or less inactive save for a particularly intense El Nino driven rainy season. In counterpoint to the previously discussed salt tolerant native flora dominating the western half of the marsh proper, here is a botanical overview itemizing some of the key floristic elements defining the fragmented fresh water marsh complex to the east and the brush covered near vertical slopes margeing them: yarrow (*Achillea millefolium*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subs. *consanguinea*), lizard tail (*Eriophyllum staechadifolium*), western goldenrod (*Euthamia occidentalis*), purple cudweed (*Gamochaeta ustulata*), California cudweed (*Pseudognaphalium californicum*), California aster (*Symphyotrichum chilense*). creek dogwood (*Cornus sericea* subs. *sericea*). western lady's mantle (*Aphanes occidentalis*), oso berry (*Oemleria cerasiformis*), Pacific cinquefoil (*Potentilla anserina* subs. *pacific*), California wild rose (*Rosa californica*), thimbleberry (*Rubus parviflorus*), California blackberry (*Rubus ursinus*). California

As a botanical denouement for the entire watershed, the perpetually exfoliating mudstone cliff faces, with their perennial seepages overlooking the south end of Scotts Creek Beach, act as vertical mini-refugia for an assortment of rare, unique and outright ubiquitous native species. Concentrated in these hanging or perched gardens, an uncommon member of the Pink Family (*Caryophyllaceae*), beach pearwort (*Sagina maxima* subsp. *crassicaulis*) threads its way through three rosette forming species, which when not in flower, look ever so much like exotic relatives of the sea lettuce (*Dudleya caespitosa*): making up this triad of mimics, are cotton batting plant (*Gnaphalium stramineum*). seaside plantain (*Plantago maritima*) and with a little stretching of the imagination, seaside daisy (*Erigeron glaucus*). While beach pearwort is the rarity in this gathering, a unique form of California bent grass (*Agrostis densiflora*) definitely holds center stage for being visually striking. This distinctive ecotype, growing on permanently moist near-vertical shale outcroppings has leaves 20+ cm. long and 2.5+ cm. wide, pigmented an intense blue-green with a glaucous overlay; the inflorescences are 20-25+ cm. in length, 3-5+ cm. in width, golden in hue, and in overall gestalt mimicking Powell’s amaranth (*Amaranthus powelli*). From a diagnostic perspective, the florets possess a distinctly lacerate palea; pressings were
made and deposited some two decades ago with the Jepson Herbarium, UC Berkeley and collections of both mature caryopsis and living plants have been deposited with the UCSC Arboretum.

Note: Areas of biological/botanical/ecological/reference interest mentioned in this section of the essay, have the following Google Earth coordinates:

Archibald Creek Sub-Watershed (a): 37degrees03'44.63"N, 122degrees13'13.71"W, elevation 804feet

Archibald Creek Sub-Watershed (b): 37degrees03'05.28"N, 122degrees13'30.57"W, elevation 41feet

"George Valentine Gulch" (a): 37degrees02'50.10"N, 122degrees13'09.84"W, elevation 252feet

"George Valentine Gulch" (b): 37degrees02'46.86"N, 122degrees13'16.68"W, elevation 90feet

Lower Old Schoolhouse Road: 37degrees03'46.16"N, 122degrees13'32.20"W, elevation 138feet

Queseria Creek Sub-Watershed (a): 37degrees02'46.38"N, 122degrees12'58.96"W, elevation 162feet

Queseria Creek Sub-Watershed (b): 37degrees02'47.03"N, 122degrees12'33.89"W, elevation 474feet

Queseria Creek Sub-Watershed (c): 37degrees02'36.86"N, 122degrees13'12.74"W, elevation 78feet

Scotts Creek Beach (s-end): 37degrees02'01.06"N, 122degrees13'37.72"W, elevation 44feet

Scotts Creek Marsh (w-side of Scotts Creek): 37degrees02'33.12"N, 122degrees13'43.25"W, elevation 28feet

Scotts Creek Marsh (e-side of Scotts Creek): 37degrees02'27.45"N, 122degrees13'37.89"W, elevation 25feet

"Unnamed Gulch" (a): 37degrees03'04.44"N, 122degrees13'00.77"W, elevation 398feet

"Unnamed Gulch" (b): 37degrees02'57.49"N, 122degrees13'17.93"W, elevation 81feet

Note: Select herbarium specimens of horticulturally meritorious, locally uncommon, rare county wide and agency listed species referred to in this section of the Traversal, collected and pressed, with noted exceptions, by Roy Buck and James West within the Scotts Creek Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:
Achillea millefolium var. californicum/accession number UCSC5700/M.F. Wilson, Apr 26 1985
Aesculus californica/accession number JEPS85125/Buck & West #521
Agrostis blasdalei/accession number JEPS81559/Buck & West #102
Agrostis blasdalei/accession number JEPS82919/Buck & West #369
Agrostis blasdalei/accession number JEPS82920/Buck & West #368
Agrostis blasdalei/accession number JEPS82926/Buck & West #182
Agrostis blasdalei/accession number JEPS82936/West #264
Agrostis densiflora/accession number JEPS82595/West #170
Agrostis densiflora/accession number JEPS82899/Buck & West #371
Agrostis microphylla/accession number JEPS82598/West #218
Agrostis microphylla/accession number JEPS82606/West #210
Apiastrum angustifolium/accession number JEPS85193/Buck & West #519
Bowlesia incana/accession number JEPS81913/Buck & West #203
Carex gianonei, pro. sp. nov./accession number JEPS82895/West #48.1
Carex gianonei, pro. sp. nov./accession number JEPS82939/West #11.2
Carex gianonei, pro. sp. nov./accession number JEPS82944/West #23.1
Carex gianonei, pro. sp. nov./accession number JEPS82945/West #26.1
Carex gianonei, pro. sp. nov./accession number JEPS82950/West #34.1
Carex gianonei, pro. sp. nov./accession number JEPS83089/West #328
Carex obnupta/accession number UC1561094/Taylor, Buck, West & Clifton #9679
Chenopodium californicum/accession number JEPS85151/Buck & West #520
Clarkia rubicunda/accession number JEPS83076/Buck & West #422
Clarkia rubicunda/accession number JEPS82779/Buck & West #326
Clarkia rubicunda/accession number JEPS81511/Buck & West #19
Clarkia rubicunda/accession number JEPS90016/Taylor, Buck, West & Clifton #9655
Collinsia multicolor/accession number SBBG95535/Keil #20619
Delphinium californicum subsp. californicum/accession number JEPS81497/Buck & West #28
Delphinium californicum subsp. californicum/accession number JEPS81498/Buck & West #28
Festuca californica/accession number JEPS81997/Buck & West #175
Festuca californica/accession number JEPS81912/Buck, West & Stone #196
Gilia achilleifolia subsp. multicaulis/accession number JEPS82621/Buck & West #245
Gilia achilleifolia subsp. multicaulis/accession number UC1561076/Taylor, Buck, West & Clifton #9657
Juncus lescueuri = Juncus lescuerii/accession number JEPS81547/Buck & West #112
Juncus lescueuri = Juncus lescuerii/accession number JEPS81563/West #83
Lilaea scilloides = Triglochin scilloides/accession number JEPS80156/Buck & West #13
Lupinus arboreus/accession number JEPS81495/Buck, West & Stone #40
Lupinus arboreus/accession number JEPS82783/Buck & West #315
Lupinus bicolor/accession number JEPS82655/Buck & West #209
Lupinus bicolor/accession number JEPS82656/Buck & West #209
Lupinus formosus var. formosus/accession number JEPS83096/Buck & West #437
Lupinus varicolumn/accession number JEPS82804/Buck & West #291
Melica californica/accession number JEPS81995/Buck & West #181
Nasella lepidua = Stipa lepida/accession number JEPS83471/Buck & West #476
Nasella pulchra = Stipa pulchra/accession number JEPS83470/Buck & West #477
Here is a recapitulation of the extraordinary depth and diversity of the native flora, both current and historical, defining the Scotts Creek Watershed and its environs, this time by enumerating those genera represented by 5 or more documented species and their current nomenclatural changes.


The genus *Carex*, excluding the *C. gianonei/C. nitidicarpa* complexes and an undetermined taxon simulating *C. vulpinoida*, with 15+ species: *C. amplifolia*, *C. barbarea*, *C. bolanderi*, *C. brevicaulis*, *C. densa*, *C. dudleyi*, *C. globosa*, *C. gracilior*, *C. harfordii*, *C. nudata*, *C. obnupta*, *C. subbracteata*, *C. subfuscus*, *C. tumulicola* and *C. vesicaria* var. major = *Carex exsiccata*.

The genus *Lupinus* with 11+ species, excluding documented hybrids between (*L. arboreus* x *L. formosus*) and (*L. arboreus* x *L. varicolor*): *L. albifrons* var. *albifrons*, *L. arboreus*, *L. bicolor*, *L. chamissonis* (according to J.H. Thomas: Flora of the Santa Cruz Mountains), *L. formosus* var. *formosus*, *L. hirsutissimus*, *L. latifolius* var. *latifolius*, *L. nanus*, *L. propinquus*, *L. succulentus* and *L. varicolor*.

The genus *Acmispon* with 10+ species: *A. americanus* var. *americanus*, *A. brachycarpus*, *A. cytisoides* (Flora of the Santa Cruz Mountains by J. H. Thomas places this taxon in Swanton), *A. glaber* var. *glaber*, *A. heermannii* var. *orbicularis*, *A. junceus* var. *juncus* and var. *bioletti*, *A. maritimus* var. *maritimus*, *A. parviflorus*, *A. strigosus* and *A. wrangelianus*.

The genus *Juncus* with 10+ species, not counting documented hybrids between (*J. patens* x *J. hesperius*): *J. acuminatus*, *J. bufonius*, *J. effusus* var. *pacificus*, *J. hesperius*, *J. lescurii*, *J. mexicanus* and *J. secunda*. 

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Accession Number</th>
<th>Location/Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acmispon</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Carex</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lupinus</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Trifolium</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Vicia gigantea</em></td>
<td>UCR67982</td>
<td>Keil #20570</td>
</tr>
<tr>
<td><em>Vulpia microstachys var. pauciflora</em></td>
<td>JEPS82628</td>
<td>Buck, West &amp; Hawke #238</td>
</tr>
<tr>
<td><em>Yabea microcarpa</em></td>
<td>JEPS81910</td>
<td>Buck &amp; West #202</td>
</tr>
<tr>
<td><em>Pellaea andromedifolia</em></td>
<td>JEPS85189</td>
<td>Buck &amp; West #514</td>
</tr>
<tr>
<td><em>Pentachaeta bellidiflora</em></td>
<td>JEPS21642</td>
<td>Thomas #4031</td>
</tr>
<tr>
<td><em>Piperia michaelii</em></td>
<td>UCSC4699</td>
<td>Randall Morgan, Jan 6 1981</td>
</tr>
<tr>
<td><em>Poa secunda subsp. secunda</em></td>
<td>JEPS82650</td>
<td>Buck &amp; West #204</td>
</tr>
<tr>
<td><em>Potentilla anserina subsp. pacifica</em></td>
<td>JEPS83095</td>
<td>Buck &amp; West #401</td>
</tr>
<tr>
<td><em>Psilocarphus tenellus var. tenellus</em></td>
<td>JEPS83111</td>
<td>Buck &amp; West #347</td>
</tr>
<tr>
<td><em>Rafinesquia californica</em></td>
<td>JEPS83078</td>
<td>Buck &amp; West #425</td>
</tr>
<tr>
<td><em>Ramunculus hebecarpus</em></td>
<td>JEPS81919</td>
<td>Buck &amp; West #197</td>
</tr>
<tr>
<td><em>Rhibes divaricatum var. pubiflorum</em></td>
<td>JEPS81920</td>
<td>Buck &amp; West #195</td>
</tr>
<tr>
<td><em>Rhibes divaricatum var. pubiflorum</em></td>
<td>JEPS81923</td>
<td>Buck &amp; West #166</td>
</tr>
<tr>
<td><em>Saxifraga californica</em></td>
<td>JEPS81990</td>
<td>Buck &amp; West #174</td>
</tr>
<tr>
<td><em>Thysanocarpus laciniatus</em></td>
<td>JEPS81985</td>
<td>Buck &amp; West #183</td>
</tr>
<tr>
<td><em>Trisetum canescens</em> = <em>Trisetum cernuum subsp. canescens?</em></td>
<td>JEPS82810</td>
<td>Buck &amp; West #285</td>
</tr>
<tr>
<td><em>Vicia gigantea</em></td>
<td>UCR67982</td>
<td>Keil #20570</td>
</tr>
<tr>
<td><em>Vulpia microstachys var. pauciflora</em></td>
<td>JEPS82628</td>
<td>Buck, West &amp; Hawke #238</td>
</tr>
<tr>
<td><em>Yabea microcarpa</em></td>
<td>JEPS81910</td>
<td>Buck &amp; West #202</td>
</tr>
</tbody>
</table>
occidentalis, J. patens, J. phaeocaphalus sensu lato and J. xiphioides.

Note: A species related to and possibly confused with J. lescurii, J. breweri may also occur within the Scotts Creek Watershed, two of the criteria used to distinguish it, being inflorescence configuration and placement plus terete versus tortile-compressed culms.

The genus Gnaphalium with 7+ species, excluding G. gianonei, pro. sp. nov., a putative hybrid between G. californicum x G. stramineum; G. bicolor, G. californicum, G. canescens subsp. beneolens, G. palustre, G. purpureum, G. ramosissimum and G. stramineum.

Note: With the exception of Gnaphalium palustre and Gnaphalium purpureum = Gamochaeta ustulata, the remaining species of Gnaphalium have been transferred to the genus Pseudognaphalium.

Note: Gnaphalium bicolor = Pseudognaphalium biolettii, Gnaphalium californicum = Pseudognaphalium californicum, Gnaphalium canescens subsp. beneolens = Pseudognaphalium beneolens, Gnaphalium gianonei, pro. sp. nov. = Pseudognaphalium gianonei, pro. sp. nov., Gnaphalium ramosissimum = Pseudognaphalium ramosissimum and Gnaphalium stramineum = Pseudognaphalium stramineum.

The genus Castilleja with 7+ species, not including the Orthocarpus noctuinus analog: Castilleja affinis subsp. affinis, C. attenuata, C. densiflora subsp. densiflora, C. exserta subsp. latifolia, C. foliolosa, C. subinclusa subsp. franciscana and C. wightii.

The genus Mimulus with 7+ species: M. aurantiacus, M. cardinalis, M. florigentus, M. guttatus complex, M. moschatus, M. nasutus (valid species in own right versus component of Mimulus guttatus complex) and M. pilosus.

The genus Agrostis with 7+ species, not including documented hybrids between (A. blasdalei x A. densiflora) and (A. blasdalei x A. exarata) plus the A. hallii/pallens intergrades: A. blasdalei, A. densiflora, A. exarata, A. hallii, A. microphylla, A. pallens and A. scabra.

The genus Festuca with 6 possibly 7 species found in the watershed: F. californica, F. elmeri, F. occidentalis, F. roemer, F. rubra, F. subulata* and F. subuliflora.

Note: An herbarium pressing, Buck & West #307, from the Scotts Creek riparian corridor and designated Festuca subulata*, was made on 05/29/83 and deposited in the Jepson Herbarium at UC Berkeley with the accession number, JEPS82787. F. subulata* differs from related F. elmeri by having a lemma which is sparsely scabrous, the awn terminal, not from a bifid apex and differs from F. subuliflora, in having florets sessile not long-stipitate. Within the watershed, F. elmeri is variable as to stature, number of florets and anther color--- whether the latter two traits, separate or combined, have taxonomic significance above the forma designation is an issue worth investigating!

The genus Delphinium with 5 species: D. californicum subsp. californicum, D. decorum subsp. decorum, D. hesperium subsp. hesperium, D. nudicaule and D. patens subsp. patens.
The genus **Viola** with 5 species: **Viola adunca**, **V. glabella**, **V. ocellata**, **V. pedunculata** and **V. sempervirens**.

Supplementing the extensive herbarium documentation found throughout this essay, is a partial listing of the seed (achene, cypsela, nutlet, et al) and inflorescence collections, representing rare, uncommon, taxonomically problematic and horticulturally valuable native taxa, that have been deposited with and accessioned by the UCSC Arboretum:

**Acaena pinnatifida var. californica** (population growing on coastal prairie in sandy soil overlooking lower Big Willow Gulch, documented with mature fruits aka fruiting hypanthium..... growing sympatriically with **Armeria maritima** subsp. **californica**, **Clarkia aff. prostrata**, **Heterotheca sessiliflora** subsp. **bolanderi** and **Horkelia cuneata** var. **cuneata**)

**Agoseris apargioides var. eastwoodiae** = **Agoseris apargioides var. apargioides** (one population documented..... from coastal bluff overlooking s-end of Greyhound Rock Beach)

**Agoseris grandiflora** var. **grandiflora** (several putative ecotypes documented, including robust form with large capitulas, growing on nw-facing roadbank overlooking s-end of Swanton Road above the Casa Verde)

**Agoseris heterophylla** var. **heterophylla** (isolated population growing on w-facing slope which overlooks ancillary gulchlet draining Upper Pozzi Meadow..... sympatric with **Agoseris grandiflora** var. **grandiflora**, **Microseris bigelovii** and **Stebbinsoseris decipiens**)

**Agrostis blasdalei** (comprehensive collections representing all local morphological variants of this rare coastal California endemic, including putative hybrids with both **Agrostis densiflora** and **Agrostis exarata**..... supplemental collections [08/18/2011] from coastal prairie of southern San Mateo County recently added)

**Agrostis exarata** (several distinct components of this species exist within and proximal to the Scotts Creek Watershed...... a form with glomerate/verticillate inflorescences on culms often 2+ meters in height and apparently restricted to "old" marshes [Beaver Flat, West Spring, Marti’s Park and Harry Wain’s Arroyo] has been documented with several collections of mature inflorescences/fertile caryopsis and in the case of the Beaver Flat populations, the plants found growing in the upper half of the marsh are characterized by having awnless lemmas while their counterparts growing in the lower half of the marsh, possess awned lemmas. Growing within and adjacent to the Sandy-bottom Reservoir another **Agrostis exarata** related taxon occurs which has flowering culms ranging from ascending to prostrate and simulates the gestalt of related **Agrostis densiflora** but without the glaucous-blue adaxial foliar surfaces..... this distinctive taxon was given the working name of **Agrostis pseudo-densiflora** when pressings were made some thirty years ago and may reflect introgressive hybridization with sympatric **Agrostis blasdalei**)

**Agrostis densiflora** (between Scotts Creek Beach and Greyhound Rock Beach, several populations growing on the Santa Cruz Terrace documented with mature inflorescences + several collections of the gigas phase from s-end of Scotts Creek Beach)
**Agrostis hallii/pallens intergrades** (collections documenting this "variable" complex made for the Schoolhouse Ridge, north and south ends of Swanton Road and several populations on the coastal component of this botanical survey, both sides of the synform [**inner grassland and coastal prairie aka Western Terrace**] between Big Willow Gulch and the Scotts Creek Marsh)

**Agrostis microphylla** (concentrated populations on seasonal waterfall faces, which drain water from Western Terrace, under Highway 1, to the south end of Greyhound Rock Beach)

**Amelanchier utahensis** (one population documented from w-facing brushy slope overlooking lower Big Willow Gulch)

**Amsinckia lunaris** (nutlets collected from isolated population growing on w-facing slope overlooking Prairie Overlook Gulch)

**Anaphalis margaritacea** (cypselae collected from scattered populations growing on w-facing brushy slopes overlooking lower Big Willow Gulch and other coastal gulches perpendicular to Highway 1 and aligned in a south-easterly direction towards Scotts Creek Marsh)

**Antirrhinum kelloggii** (several collections made, before and after 2009 Lockheed Fire, from the Schoolhouse Ridge complex and both Scotts and Mill Creek sides of upper Seymore Hill/"Chalks" chaparral)

**Apiastrum angustifolium** (several collections made, usually growing in maritime chaparral/**Artemisia californica** understory..... upper las Trancas Arroyo, s-facing edge of Western Terrace overlooking lower China Ladder Gulch and lower portion of Swanton Road, between Archibald Creek and "The Unnamed Gulch")

**Aquilegia formosa** (scattered population, growing primarily on decomposed "granitics", margining dirt road in upper Little Creek sub-watershed)

**Arabis glabra** = **Turritis glabra** (one collection made circa 30 years ago, from brush covered slope overlooking Purdy Road, between Squirrel Flat and the "Slide Area"..... this taxon has not been seen in the watershed since original discoverey and the collected seed is no longer viable)

**Arctostaphylos glutinosa** (several collections made of mature drupes/stones, including "green glut" of Schoolhouse Ridge)

**Arctostaphylos crustacea subsp. subcordata** (one population documented with mature drupes/stones from Schoolhouse Ridge)

**Armeria maritima subsp. californica** (scattered populations growing in sandy soil on coastal headlands, between w-fork of Big Willow Gulch and Gulch #5, documented with seed collections)

**Arnica discoidea** (cypselae collected from plants growing in two separate locales..... on Last Chance Ridge, near origins of Laird Gulch, and the Mill Creek sub-watershed, above confluence of Spillway Gulch with Mill Creek proper)
**Astragalus gambelianus** (two populations documented with seed collections..... (a) along recently constructed access fire road above Purdy Aluminum Barn/"Bowl Area" and (b) concentrated population on ridge top/synform, overlooking central portion of Big Willow Gulch and Western Terrace/coastal prairie, between Big Willow Gulch and edge of Pumpkin Field Marsh)

**Athysanus pusillus** (one population documented from w-facing ridge overlooking Purdy Road cattleguard)

**Bowlesia incana** (population growing on w-facing roadbank, between Old Schoolhouse Road and Big Creek Fire Station, documented with schizocarp collection)

**Boykinia occidentalis** (seed collected from populations in upper Scotts, Mill and Big Creeks)

**Bromus carinatus var. carinatus** (comprehensive documentation of the distinctive ecotypes found within watershed)

**Bromus carinatus var. maritimus** = **Bromus maritimus**? (coastal bluff ecotype, along maritime edge of Santa Cruz Terrace between Scotts Creek and Waddell Beaches..... inflorescences prostrate-ascending, with panicle branches often shortened/overlapping and overall gestalt consistent throughout area under discussion..... perhaps a genetically fixed phase of *Bromus carinatus*, adapted to the prevailing wind patterns and oceanic influences

**Calandrinia breweri** (one population documented pre-Lockheed 2009 fire, several subsequent...... mainly from chaparral habitat between Mill and Scotts Creeks including road cut above "Bowl Area", which connects Bettencourt Gulch overview with Seymore Hill)

**Carex barbarae** (only known population for the Scotts Creek Watershed occurs within the Scotts Creek Marsh and is documented with several envelopes of mature inflorescences..... for [1] structural analysis, [2] DNA extraction and [3] possible extraction of viable achenes)

**Carex bolanderi** (form with lowermost 1-5 spikelets compound-congested, can be gynaeandrous, androgynous and/or mixed, with occasional basal spikelets produced on filiform stalks..... mature inflorescences collected from plants growing along the Scotts Creek riparian corridor and the Big Creek sub-watershed, between the Fish Hatchery and the lower falls)

**Carex gianonei** [C. harfordii matrix] **complex** (comprehensive documentation of this polymorphic syngameon with perigynia collections made for Beaver Flat, West Spring Marsh, Marti’s Park Marsh, Gianone Barn Gulch Marsh, Laguna de las Trancas, Lasher Marsh, and much of the Western Terrace, from Allium Marsh down to Scotts Creek Marsh...... see pages 10-11, 32-36 and 39-40 of this essay)

**Carex “imperfecta”** (comprehensive documentation via inflorescences for structural analysis and DNA extraction..... 80+ plants sampled with at least 10 inflorescences per sample, these collected from Beaver Flat Marsh, s-end of Laguna de las Trancas, West Spring Marsh, Marti’s Park Marsh, area overlooking the Sandy-bottom Reservoir, the Pumpkin Field Marsh, the s-facing monocot rich site below Grey Hayes’ test plots and coastal prairie between Big Willow Gulch and Morehus Arroyo..... of major importance, showing a genetic link via hybridization, connecting sections Multiflorae [*Carex densa*] and Ovales [*Carex subbracteata*] and potential for
unidirectional/staminate gene flow back into parental populations)

Carex nitidicarpa complex (comprehensive documentation via perigynia from w-facing grassland across Last Chance Road from Laguna de las Trancas, which drains down into e-fork of Las Trancas Arroyo and in depth collections also made from “Bulb Field”, coastal prairie between Pumpkin Field and China Ladder Marshes and sw-facing slope below Grey Hayes’ study plots..... all of these sites have Carex densa and Carex subbracteata present and with the exception of the slope draining into the Arroyo de las Trancas, Carex “imperfecta” is also present)

Carex nudata (localized population growing literally in Mill Creek, with rhizomes and root systems threaded between granitic/quartz diorite rocks, documented with mature inflorescences which act as voucher material)

Castilleja exserta subsp. latifolia (seed collected from population in lower Big Willow Gulch..... rare and one of the few populations of this subspecies documented, with both herbarium pressings and seed collections, for Santa Cruz County)

Castilleja foliolosa (seed collected from extensive population growing in association with Adenostema fasciculatum on exposed siliceous mudstone, between the upper Seymore Field and the Mill Creek riparian corridor)

Chenopodium californicum (seed collected from localized population growing on w-facing roadbank overlooking Swanton Road below Molino Creek divide)

Chlorogalum pomeridianum var. divaricatum (seed collected from scattered population growing along Western Terrace side of Magic Triangle ridge/synform and isolated population overlooking Arroyo de las Trancas)

Cirsium occidentale var. venustum (scattered population on steep brushy slope overlooking Purdy Road cattleguard documented with cypselae..... growing with Layia gaillardiioides)

Cirsium quercetorum (cypselae collected from small population growing on e-facing grassy slope overlooking Laguna de las Trancas)

Clarkia aff. davyi (all local populations documented..... besides Western Terrace/coastal prairie populations, seed also collected from localized colonies growing: [1] on grassy slope overlooking Washout Turn, [2] grassy understory of mixed oak/coniferous woodland paralleling upper portion of Las Trancas Arroyo and [3] w-facing sandy slope overlooking Laguna de las Trancas..... all populations are erect in mode of growth, have bicolored flowers and gray encrusted seeds)

Clarkia aff. prostrata (all local populations documented..... principally found on Western Terrace/coastal prairie, between Lasher Marsh Gulch and Cowboy Shack Gulch..... mode of growth usually prostrate/decumbent, flowers concolor with yellowish-white base and seeds lacking grey encrustations and are dark are brown)

Clarkia purpurea subsp. quadriculrena (several local populations with differing flower color/patterning and growing within the Schoolhouse Ridge complex documented with seed
collections...[a] sw-facing grassy slope overlooking the Harvey Field, [b] w-facing grassy slope on Beehive Hill above Purdy Road, [c] w-facing hillside overlooking nameless gulchlet which has its origins on the Upper Pozzi Meadow and drains in a se-direction down into Mill Creek, [d] sw-facing woodland dominated ridge which overlooks the lower section of Schoolhouse Gulch and [e] isolated population growing on near vertical grassy slope above Purdy Road cattleguard

Clarkia purpurea subsp. purpurea (five local populations of this rare taxon documented..... [1] original population discovered in the early 1970's and growing on eolian sand deposits along edge of Western Terrace overlooking lower Lasher Marsh Gulch, [2] isolated population growing on w- and s-facing grassy slopes overlooking "Bowl Area", [3] Scotts Creek side of Seymore Hill, w-facing grassy slope proximal to upper Calf Gulch and also home to Microps californicus var. subvestitus and first discovered population of Sanicula "pseudo-lacinia", [4] most recently discovered population, 10/10/2011, growing on w-facing slope derived from ancient eolian sand deposits, elevation circa 567 feet, adjacent to upper reach of Querseria Creek's s-fork..... population size 150+ individuals and [5] no longer extant representation growing sympatrically with Clarkia aff. davyi along eastern edge of Laguna de las Trancas)

Clarkia rubicunda (seed collections made for both the robust form growing on "slide area" overlooking Purdy Road and low growing type on coastal headland overlooking China Ladder Gulch/Highway 1)

Claytonia perfoliata subsp. perfoliata (seed was collected from a concentrated population growing on slope overlooking Purdy Road across from Squirrel Flat, with stems, foliage and calyces intensely viniferous in coloration and corollas tinged pink, and meriting possible horticultural use in a rock garden setting)

Claytonia sibirica (several collections from Little Creek population..... which to date, is the only area within the Scotts Creek Watershed, that this uncommon native component of the Montiaceae is know to occur)

Clintonia andrewsiana (seed collected from ripe azure berries of scattered population growing on near vertical ne-facing slope, overlooking mouth of Gianone Barn Gulch...... habitat principally second growth coast redwood [Sequoia sempervirens] intermixed with California nutmeg [Torreya californica] and Douglas-fir [Pseudotsuga menziesii var. menziesii]..... populations often localized within the Scotts Creek Watershed and confined to very specific sites, but where occurring, usually represented by 30-40+ individual plants)

Collinsia heterophylla (seed collected from concentrated population on both sides of Swanton Road adjacent to Mountain Lion Gulch, which while generally pale-flowered in coloration also produces plants with darker corolla pigmentation/patterning on both upper and lower lips..... the flowers are subsessile in verticels differing markedly from sympatric Collinsia multicolor)

Collinsia multicolor (several populations documented for watershed, including representatives from north and south ends of Swanton Road)

Corethogyne filaginifolia var. californica (alba form from lower Big Willow Gulch [five separate plants] documented with cypselae collections)
**Cryptantha torreyana** (nutlet collections made in upper Little Creek [s-facing ridgetop below General Smith Tree] and ridge separating Seymore Field from the Mill Creek sub-watershed)

**Delphinium californicum** subsp. *californicum* (scattered populations growing on w-facing brushy slopes overlooking Swanton Road, between Winter Creek and Molino Creek Divide, documented with seed collections)

**Deschampsia cespitosa** subsp. *holciformis* (several populations from coastal prairie of both northern Santa Cruz and southern San Mateo Counties documented with mature inflorescences/caryopses)

**Dichondra donelliana** (one population documented from Seymore Field area..... seeds and divisions of several plants [collected one day before 2009 Lockheed Fire] and in situ photographs taken two days following official declaration of fire's end)

**Dodecatheon clevelandii** subsp. *sanctarum* (vulnerable to herbivory, due to ease of shallow rootstocks being pulled up and scapes being eaten, resulting in diminished population size and genetic variability plus subsequent recruitment failure through potential seed loss..... isolated population growing in the upper Pozzi Meadow, where grassland and mixed conifer/oak woodland interface, documented by a seed collection prior to the 2009 Lockheed Fire)

**Dudleya caespitosa** (an isolated population of 100+ plants growing on siliceous mudstone “The Chalks”, between the Upper Seymore Field and the Mill Creek sub-watershed, may prove to be the furthest inland from the immediate coast for this polyploid taxon. Growing on the bare substrate and fully exposed to the desiccating effects of solar rays and wind, the inflorescences of this colony range from 12cm to 50+cm in height and are usually virgate in gestalt.... the lateral branches can exceed 16cm in length. Seeds collected from circa 80% of observable population have been deposited at UCSC Arboretum for study..... the variable, as to foliar, inflorescence and floral gestalts, populations growing on the Santa Cruz Terrace, between Greyhound Rock and Scotts Creek Beaches, have also been documented extensively with seed collections)

**Drymocallis (Potentilla) glandulosa** var. *glandulosa* (achenes collected from robust plants growing roadside in the upper Little Creek sub-watershed, between 1st and 2nd railroad bridges)

**Elymus californicus** (comprehensive collections from within the Scotts Creek Watershed..... principally those populations found in [a] area above Beaver Flat, [b] along Scotts Creek between confluences of Mill and Big Creeks with Scotts Creek and [c] complex n, nw-facing drainage system between Cookhouse and Mt. Cook sub-watersheds)

**Elymus glaucus** subsp. *glaucus* (type with racemose/compound inflorescences, from along lower Little Creek dirt road access and Swanton Road, between Old seaside School and Harry Wain’s Arroyo, documented with mature inflorescences..... both for structural analysis and raising out)

**Elymus glaucus** subsp. *virescens* (coastal bluff ecotype, from area overlooking n-end of Greyhound Rock State Beach..... possibly a new subspecies)

**Epilobium hallianum** (recollected from Beaver Flat in 2009, plus collections from West’s Spring and Marti’s Park Marshes)
*Epilobium minutum* (mature inflorescences and seed collected from localized population growing on ridge between Upper Seymore Field and Mill Creek sub-watershed..... growing on moss covering vertical sides of incised "gulchlets", which drain water during the rainy season but are bone dry Summer thru Fall. The leaves of *Epilobium minutum* are plane [flat] and the seeds are netted)

*Erigeron foliosus var. franciscensis* (isolated population growing on w-facing top of slope overlooking alluvial fan/weed infested field, which drains "No Name Gulch" and during rainy season often spills out onto Swanton Road..... one of two highly restricted populations of this locally rare taxon, the other growing in the upper reaches of the "Solar Panel Hotspot" but not seen for several years..... the population proximal to "No Name Gulch" documented with inflorescences and mature seed heads)

*Eryngium armatum* (schizocarps collected from only known population for Swanton area..... the inner prairie/seasonal wetland forming the source of Big Willow Gulch)

*Erysimum franciscanum [var. crassifolium]* (collections made documenting isolated coastal bluff populations between Waddell and Scotts Creek Beaches)

*Euonymus occidentalis var. occidentalis* (seed collections made from shrubs growing within Scotts Creek riparian corridor, between Scotts Creek and Big Creek Bridges)

*Euphorbia crenulata* (population along Purdy Road, between cattle guard/slide area and Squirrel Flat, documented with seed collection)

*Festuca californica* (several collections made within watershed and from slopes overlooking gulches perpendicular to Highway 1, which drain the Western Terrace/coastal prairie between Scotts Creek Marsh and the north end of Swanton Road..... a robust form, with glaucous-blue foliage and intensely golden inflorescences growing in the upper Little Creek sub-watershed below the General Smith Redwood, was documented with several envelopes of caryopses)

*Festuca elmeri* (comprehensive collections from within the Scotts Creek Watershed)

*Festuca idahoensis subsp. roemer = Festuca roemer var. klamathensis* (mature caryopsis collections taken from long established population, growing on exposed grassy slope overlooking n-end of Swanton Road, above Washout Turn)

*Festuca subuliflora* (several collections made of this locally uncommon fescue, usually found growing in association within *Sequoia sempervirens* but is also found locally sharing habitat with an aboreal mixture comprising *Notholithocarpus densiflorus, Pseudotsuga menziesii* and *Quercus parvula var. shrevei*)

*Filago californica = Logfia filaginoides* (mature inflorescences collected from ocean side of Highway 1, between Greyhound Rock State Beach and China Ladder Gulch)

*Galium trifidum var. pacificum = Galium trifidum subsp. columbianum* (mature nutlets collected from scattered population growing within *Juncus effusus var. pacificus* tussocks margining the
Laguna de las Trancas and an isolated population growing on e-edge of West's Spring Marsh

*Garrya elliptica* (mature seeds collected from pistillate shrubs growing on lower Buckeye Grove Ridge)

*Gilia achilleifolia subsp. multicaulis* (seed collections made for isolated population growing on w-facing roadbank, between entrance to Old Schoolhouse Gulch Road and Big Creek Fire Station)

*Gilia clivorum* (comprehensive collections made over past 30+ years..... one inland population found growing on Beehive Hill, overlooking Purdy Road and several others, restricted to exposed siliceous mudstone overlooking Western Terrace, documented during both 2010 and 2011)

*Gnaphalium palustre* (mature cypselae collected along dirt road, which crosses central portion of Gianone Haybarn Gulch and stays wet during Winter/Spring months)

*Guillenia lasiophylla = Caulanthus lasiophyllus* (seed collected from scattered population growing along access road, connecting Scotts Creek side of Seymoe Hill with "chaks"..... above and overlooking "Bowl Area")

*Heterotheca sessiliflora subsp. bolanderi* (comprehensive collections, including Seymoe Hill populations, which approach subsp. *echioides* in bristly indument and herbage exuding scent of camphor..... variable taxon as to chemical signature, foliar color and indument, stature and even color of pappus. With the exceptions of the [1] Seymoe Hill, [2] w-facing ridge, between the Little and Archibald Creeks drainages and the [3] upper slopes drained by the north fork of Queseria Creek, all other documentation via cypselae was collected from populations growing on the Western Terrace..... between Lasher Marsh and Cowboy Shack Gulches)

*Heuchera micrantha* (seed collected from several populations displaying foliar variations of ornamental value, growing on n, ne-facing banks along Swanton Road, between Last Chance Road and Old Seaside School)

*Hippuris vulgaris* (seed collections from Laguna de la Trancas..... one of two documented populations for Santa Cruz County)

*Horkelia californica var. californica* (seed collected from long-established plant, circa 1.5m across, growing on w-facing upper edge of roadbank overlooking Swanton Road, just below entrance to Last Chance Road)

*Horkelia cuneata aff. var. sericea* (seed collections from concentrated population growing on s-facing stabilized eolian sand deposits overlooking lower Lasher Marsh Gulch and sympatric with *Clarkia purpurea* subsp. purpurea)

*Hydrocotyle verticillata* (isolated population from s-end of West Spring Marsh documented with mature schizocarps)

*Isolepis carinata* (one collection from area of concentrated biodiversity overlooking "Frog Pond", central section of Big Willow Gulch..... growing sympatrically with *Deschampsia cespitosa* subsp.
holciformis, Hosackia gracilis, Hypericum anagalloides, Isolepis cernua, Juncus occidentalis, Perideridia gairdneri subsp. gairdneri, Wyethia angustifolia, to name just a few associate "natives")

**Juncus acuminatus** (one collection of mature inflorescences, with capsules containing viable seed, from sandbar below confluence of Mill and Scotts Creeks)

**Juncus hesperius x Juncus patens hybrids** (an in depth sampling of this rarely collected hybrid, documented with mature inflorescences from more than a dozen plants..... for structural analysis, DNA extraction and potential seed extraction)

**Juncus breweri x lescurii** (complex mix of several related taxa.... Juncus breweri, Juncus mexicanus, Juncus lescurii and possibly, Juncus balticus var. ater, occur within the Scotts Creek Watershed and adjacent environs, both margining old marshes and seasonally watered zones within the coastal prairie..... the Scotts Creek Marsh populations are variable, both as to stature and inflorescence gestalt, and have been documented with several envelopes of mature inflorescences)

**Juncus patens** (in the early 1970s, a gigas form of *Juncus patens* was observed growing on sandbars within the upper part of the Scotts Creek riparian corridor and from a gestalt/stature/biomass perspective, was an analog of *Juncus effusus var. pacificus*. After the 1981-82 storms scoured and almost totally obliterated the sandbars [mini-islands of biodiversity], the "robust" phase of *Juncus patens* vanished completely. While exploring the upper Scotts Creek Watershed during the 2007 season, the author of this text found a few fruiting plants approximating this taxon and managed to collect some seed which was then deposited with the UCSC Arboretum for study..... subsequent to this seed collection, another collection/deposit has been made [2011], this time documenting the mature seeds embedded in the unique gelatinous now hardened matrix, for analysis [see pages 11-12 of this essay] and a physical validation of this post-anthesis behavior that seems to have escaped the authors of various floras dealing with this species)

**Lasthenia californica complex** (types with/without pappus and possibly including *Lasthenia gracilis*.... cypselae collected from three separate sites within the Big Willow Gulch drainage system and growing on exposed/weathered Santa Cruz mudstone)

**Layia gaillardioides** (one scattered population from near-vertical grassy slopes above Purdy Road cattleguard, with concolor yellow rays..... a small percentage [1-2%] displaying pale yellow flowers)

**Lepechinia calycina** (collections made from populations growing on the Schoolhouse Ridge complex)

**Ligusticum apiifolium** (scattered populations, principally w-facing, along synform between upper Mt. Cook Gulch west to Magic Triangle..... documented with schizocarp collections)

**Lilium pardalinum subsp. pardalinum** (seed collected from a robust specimen, circa 7.5-8 feet in heigth, growing in alluvium adjacent to Big Creek, between fish hatchery and old power station)

**Lomatium caruifolium var. caruifolium** (populations documented via schizocarp collections, from lower Schoolhouse Ridge and top of synform overlooking Pumpkin Field Marsh)
*Lotus salsuginosus var. salsuginosus* = *Acmispon maritimus var. maritimus* (rare in the Scotts Creek Watershed prior to the 2009 Lockheed Fire but extensively represented in the chaparral the following Spring..... forming mats of several hundred plants along upper Schoolhouse Ridge/Seymore Hill transition zone)

*Lotus stipularis aff. Lotus balsamiferus* = *Hosackia stipularis var. stipularis* (one scattered population documented along ridge separating Lair Gulch from Scotts Creek riparian corridor)

*Lupinus arboresus* x *Lupinus varicolor* (one sub-shrub of this hybrid overlooking Pumpkin Field Marsh studied for several seasons..... documented with collected seed)

*Lupinus formosus var. formosus* (only three populations known for Scotts Creek Watershed..... all within circa 300 meters of each other but occupying different drainage systems: (1) s-facing slope comprising uppermost portion of China Ladder Gulch, (2) ne-facing grassy knoll overlooking w-fork of Cookhouse Gulch and (3) n-facing exposed grassland overlooking Bulb Field)

*Lupinus hirsutissimus* (seed collections made, pre- and post- 2009 Lockheed Fire, from Schoolhouse Ridge)

*Lupinus aff. propinquus* (upper Little Creek populations documented via seed collections)

*Lupinus succulentus* (rare in the Swanton area..... long observed scattered population growing on the coastal prairie adjacent to the western edge of China Ladder Marsh, documented with seed collections)

*Madia* (cypselae collected from a small cluster of plants growing on new access road, between former Purdy Aluminum Barn and top of Seymore Hill, overlooking "Bowl Area"..... which combine characters of *Madia sativa* [inflorescences and stems down to base, clothed with glandular trichomes], *Madia gracilis* [inflorescences with small capitula and distinctly open-paniculate] and *Madia exigua* [chemical signature from stalked glands distinctly exuding a cherry syrup odor]. This same distinctive combination of observable traits also defined a localized population growing on the upper ridge, between the Little Creek and Archibald Creek drainages..... collected cypselae from both of these "cherry-scented" populations, when raised out, should provide valuable material to study these much maligned taxa from a morphological, biochemical and molecular perspective)

*Madia exigua* (a small population growing on a seasonally moist, w-facing slope overlooking the central portion of Big Willow Gulch and redolent of "cherry syrup", was documented with plant material and mature cypselae)

*Malacothrix floccifera* (cypselae collected from isolated population growing on w-facing interface between near-vertical grassland and oak/conifer woodland intermixed with chaparral components [*Adenostema fasciculatum* and *Arctostaphylos crustacea* sensu latu] overlooking Purdy Road and Squirrel Flat..... growing sympatrically with largest concentration of *Stebbinsoseris decipiens* in watershed)

*Melica californica* (collections made for several different ecotypes, including reduced/nanistic
form found growing in coastal sage scrub overlooking lower Big Willow Gulch

*Melica harfordii* (collections from population growing on s-facing edge of chaparral, upper Little Creek Watershed..... down slope from General Smith redwood)

*Melica imperfecta* (collections from ridge complex separating Big and Little Creek sub-watersheds variable and possibly reflecting introgression of *Melica torreyana* genes)

*Melica subulata* (several populations documented with caryopsis collections)

*Melica torreyana* (one of the most morphologically plastic native grass species in the watershed...... several phases documented with caryopsis collections)

*Micropus amphibolus* (several populations documented with cypselae collections..... between Big Willow Gulch and China Ladder Marsh Gulch and growing principally on weathered siliceous mudstone )

*Micropus Californicus var. subsessilis* (rare within watershed..... two populations documented, one from upper Seymour Hill/Calf Gulch area and the other from above Old Schoolhouse Road/Cal Poly logging games area)

*Microseris paludosa* (Arroyo de las Trancas population documented with cypselae collections)

*Mimulus cardinalis* (several color variants, orange through red, documented by seed collections..... from Big and Scotts Creeks)

*Mimulus floribundus* (several populations of this locally uncommon annual, documented growing on/proximal to sandbars along the Scotts and Big Creek drainage systems..... often sympatric with but genetically isolated from the perennial *Mimulus moschatus*)

*Mimulus guttatus complex* (extensive documentation via seed of key reproductively isolated types found within the Scotts Creek Watershed and its environs..... see pages 10, 22-24 of this essay)

*Monardella villosa subsp. franciscana* (the extensive and polymorphic populations of this taxon, growing in both lower Big Willow and Morehus Arroyo Gulches, have been documented with comprehensive seed collections and supplemental material from lower Prairie Overlook Gulch and Arroyo de las Trancas plus various populations of *subsp. aff. villosa*, possessing thin leaves which are often truncate basally and have impressed veins on their adaxial surfaces, these distributed along the length of Swanton Road, the section of Purdy Road between the "slide area" and Old Seaside School and the Schoolhouse Ridge/Seymore Hill complex..... the variability in capitula size and presentment is somewhat extreme with flower "heads" ranging from 1 to 4 centimeters across, solitary on naked stalks or paniculate, occasionally with a second/third "stalked" capitulum arising out of the center of the main one, making the inflorescence "verticillate" in appearance or the capitulum comprising several small condensed capitula which act like a greatly reduced panicle..... the leaves are usually thick in texture, with impressed/sunken venation, broadly deltoid/ovate with truncate bases, both surfaces clothed with a tomentum and exuding a range of chemical signatures within a given population)
**Monardella villosa, aff. subsp. villosa** (scattered populations growing along Swanton Road, between Scotts and Big Creek Bridges, tend towards this subspecies..... with thin, subglabrous leaves with cuneate/obtuse bases)

**Navarretia squarrosa** (an extensive population of several hundred plants, occupying the margins and elevated central portion of the dirt road connecting Solar Panel Gate access to the Mt. Cook area [traversing the inner prairie along a nw/se axis]..... circa 40% of the *Navarretia* population consistently produce white flowers, season after season, as observed for the past 30 years. Intraspecific hybrids also occur, between the forma typica and the alba form, producing pale lilac flowers. Extensive sampling via seed of this atypical population of skunkweed was made during the 2011 season. Less extreme examples of flower color variability have been observed locally within certain Lupinus nanus populations but never with the disproportionate numbers of atypical flower coloration that occurs seasonally within this *Navarretia squarrosa* population)

**Nemophila menziesii sensu lato** (within the Scotts Creek Watershed, several isolated populations of this wide spread species exist that are not only variable as to coloration [with some plants tending towards var. *menziesii*] but have gynodioecious components, that often result in plants with normal sized flowers but missing some/all stamens or with flowers greatly reduced in size and looking more like *Nemophila parviflora* var. *parviflora*. Three populations have been documented over the past two decades by seed collections..... [a] on the slide area overlooking Purdy Road, [b] east facing down sloped woodland overlooked by the lower portion of Buckeye Grove Ridge and [c] the perched meadow topping a narrow section of Schoolhouse Ridge which separates Squirrel Flat from the lower section of Schoolhouse Gulch)

**Nemophila pedunculata** (variable species as to floral coloration and patterning..... several disjunct populations within watershed documented with seed collections: [a] lower Schoolhouse Gulch, growing sympatriically with *Nemophila parviflora*, [b] along Swanton Road, between Mill Creek bridge and entrance to old Miller Ranch, also growing intermixed with *Nemophila parviflora* and [c] lower Gianone Barn Gulch, where it enters flood plain/alluvial fan adjacent to Scotts Creek and this time, growing in association with *Nemophila aff. pulchella* var. *fremontii* and *Nemophila parviflora*)

**Nemophila aff. pulchella var. fremontii** (comprehensive collections of this rare disjunct of an interior taxon or local endemic..... needs molecular work done to determine true identity. Where Gianone Barn Gulch empties out into the Scotts Creek riparian corridor, this distinctive taxon grows sympatriically with two other species of *Nemophila*..... namely, *Nemophila parviflora* var. *parviflora* and *Nemophila pedunculata*)

**Perideridia gairdneri subsp. gairdneri** (two populations documented with mature schizocarps..... both restricted to localized sites on the Western Terrace/coastal prairie, flanking the central portion of Big Willow Gulch)

**Perideridia kelloggii** (schizocarps collected from population growing on Upper Pozzi Meadow/Schoolhouse Ridge)

**Phacelia californica complex** (extensive populations growing on both sides of dirt road access into Little Creek..... the plants are generally eglandular and have post anthesis calyces spreading
not overlapping. Occasionally, some plants manifest shorter gland-tipped trichomes in amongst the more prominent glandless ones, which may be the result of past hybridization with *Phacelia imbricata* subsp. *imbricata*. Seed collections, post-2009 Lockheed Fire, targeted several contiguous sub-populations)

**Plagiobothrys bracteatus** (several populations documented..... all need to have nutlets studied under high magnification, to determine if some of populations may be *Plagiobothrys hispidulus*)

**Plagiobothrys chorisianus var. chorisianus** (comprehensive collections from Beavers Flat, Rosetta Stone Pine, West Spring, Marti’s Park and Gianone Barn Gulch Marshes plus population growing on coastal headland, in seasonally moist zone, overlooking n-end of Greyhound Rock State Beach)

**Plagiobothrys diffusus** (over the past thirty years, herbarium pressings and collections of mature nutlets have been made for all the known populations of this uncommon taxon residing within the Scotts Creek Watershed, including the recently discovered population on the lower Calf Gulch side of the Seymore Hill, growing sympatrically with *Plagiobothrys bracteatus)*

**Plantago elongata** (isolated population growing on original Highway 1 siliceous mudstone roadbed, which overlooks the north end of Swanton Road/Washout Turn"..... a population was discovered in the early 1970’s growing behind the primary dunes of Greyhound Rock State Beach [south end] but was wiped out during the 1981-82 storms)

**Plantago erecta** (exceedingly robust ecotype from exposed headlands overlooking s-end of Greyhound Rock State Beach..... may have horticultural merit in a rock garden setting)

**Plantago maritima** (a large, isolated population growing in a horizontal mudflat environment along with *Agrostis densiflora*, on coastal headland above s-end of Scotts Creek Beach and looking akin to a “new” species of Dudleya, in terms of foliar gestalt. This *Agrostis/Plantago* duo, also repeats itself but in a vertical alignment, on the moist cliff faces along the southerly end of Scotts Creek Beach)

**Plantago subnuda** (one inland population from Marti’s Park Marsh documented with mature inflorescences and seed, plus several collections made from colonies growing on the moist bases of sea cliffs along n-half of Greyhound Rock State Beach)

**Plectritis ciliosa** [subsp. *insignis*] (one population documented, along Swanton Road between Little and Winter Creeks)

**Poa unilateralis** subsp. *unilateralis* (several populations between north end of Swanton Road down to Scotts Creek Marsh documented, from both the immediate coastal bluffs and the rocky slopes overlooking the Western Terrace)

**Pseudognaphalium biolettii** (cypsela collected from one large plant growing on se dipping grassy slope dominated by mixed conifer/oak woodland and which overlooks the upper portion of Las Trancas Arroyo’s east fork)

**Pseudognaphalium gianonei**, **pro.sp.nov.** (several populations documented, e.g., s-facing
mudstone bank overlooking n-end of Swanton Road beyond entrance to Last Chance and w-facing mudstone bank overlooking Swanton Road between Purdy Road and Harvey Field)

_Quercus x morehus_ (comprehensive documentation, via leaves for DNA extraction, made for 10 juvenile examples of this putative non-F1 derived hybrid. All specimens of this taxon studied within the watershed and its environs, are slow growing [some examples observed in situ for 30+ years] and none have exceeded 3 meters in height or displayed any tendency towards flowering/fruiting. See pages 4, 50-51, 94, 98-99, 150 and 152 of this essay)

_Rafinesquia californica_ (several populations documented with cypselae collections, notably roadbanks along Purdy Road, the Little Creek access road and Swanton Road, between entrance to Old Schoolhouse Road and Fire Station..... the last mentioned location also supporting a long established population of _Bowlesia incana_)

_Ranunculus aquatilis var. capillaceus_ (achenes collected from plants growing in Laguna de las Trancas)

_Ranunculus uncinatus_ (recently discovered native taxon [2011] for Scotts Creek Watershed, growing along riparian corridor between the confluences of Mill and Big Creeks with Scotts Creek..... documented with spent inflorescences and achene collections)

_Ribes menziesii sensu lato_ (copious amount of seed extracted from ripe berries of large shrub, 2-2.5m high, growing in Scotts Creek riparian corridor along horse trail, between Scotts Creek Bridge and mouth of Cookhouse Gulch)

_Rosa californica_ (a superior form, with up to 40 flowers per truss [aggregate inflorescence] found growing within the central section of Big Willow Gulch and creating a virtual wall proximal to the Frog Pond, was documented with both ripe "hips" and extracted achenes)

_Rosa spithamea_ (three localized populations known for the watershed to date..... chaparral/oak woodland population where n-edge of Seymore Hill and "chalks" interface, documented with ripe "hips" and extracted achenes)

_Rorippa curvisiliqua_ (scattered population from south end of Laguna de las Trancas documented..... growing between tussocks of _Juncus effusus var. pacificus_)

_Rorippa palustris var. occidentalis_ (seed collected from population growing in marsh at head of Gianone Barn Gulch)

_Rubus spectabilis_ (collections of achenes made documenting populations growing in the lower portion of the Mill Creek subwatershed and along the Scotts Creek riparian corridor, between Scotts and Big Creek Bridges)

_Rumex occidentalis_ (comprehensive documentation, from Beaver Flat Marsh, West Spring Marsh, Marti’s Park Marsh, Laguna de las Trancas, Lasher Marsh and China Ladder Marsh)

_Rumex salicifolius complex [Rumex californicus, Rumex crassus and Rumex transitorius]_ (various populations within the watershed of all three taxa, which in the case of _Rumex crassus,
extends down to the s-end of Scotts Creek Beach, have been documented with mature inflorescences and achenes)

*Sagina maxima* subsp. *crassicalis* (seed collection made from one population growing on moist cliff face overlooking s-end of Scotts Creek Beach)

*Salvia columbariae* (localized population growing in e-facing maritime chaparral, overlooking w-fork of lower Big Willow Gulch)

*Sanicula gianonei, pro.sp.nov.* (several populations documented, both within the Scotts Creek Watershed and its adjacent maritime draining gulch systems)

*Sanicula hoffmannii* (comprehensive documentation, including two recently [2011] discovered populations growing on coastal side of the Scotts Creek riparian corridor, flanking the Mt. Cook Gulch drainage system)

*Sanicula "pseudo-lacinia"* (one population documented from Seymore Hill/Calf Gulch area...raised at UCSC Arboretum [2011] and plants identical to in situ population from which they were collected)

*Scrophularia californica* (flavistic form.....seed collected from one large plant growing banksid along north end of Swanton Road overlooking Lasher Marsh and Harry Wain's Arroyo)

*Silene antirrhina* (localized population growing on near-vertical slope overlooking Squirrel Flat documented.....growing sympatrically with *Phacelia distans* and *Stebbinsoseris decipiens*)

*Silene verecunda [subsp. verecunda]* (comprehensive documentation.....scattered populations growing out of fractured siliceous mudstone, between north end of Swanton Road and China Ladder Marsh, on inland side of Highway 1)

*Stachys chamissonis* (one population documented from China Ladder Marsh.....the flowering stems often reaching 2.5+ meters in heigth)

*Stebbinsoseris decipiens* (12+ separate populations documented.....each population variable as to presence/absence of either parent, overall growth pattern and cypselae coloration)

*Stellaria nitens* (two seed collections made for this virtually "invisible" native.....one from near-vertical mudstone roadbank overlooking Swanton Road, midway between West's mailbox and Scotts Creek Bridge and the other, also growing on a mudstone outcropping, circa 200 feet above Purdy Road cattleguard along with *Athyranus pusillus* and *Layia gaillardioides*. Since this species appears to be, at least locally, self-pollinating.....it would be interesting to determine, if each of these isolated populations show any differences on a molecular level.)

*Stephanomeria elata* (for many years, scattered populations of this taxon found growing throughout the Scotts Creek Watershed have been assigned the name *Stephanomeria virgata* but with recent molecular studies coupled with observable structural differences, the cypselae and pappi in particular, a nomenclatural revision has taken place. To date, populations documented with cypselae from the Little Creek sub-watershed, lower Buckeye Grove Ridge, lower
Schoolhouse Ridge and "chalks" between the upper Seymore Field and Mill Creek riparian corridor have all proven to be *Stephanomeria elata*..... with a longitudinal groove flanked by two rows of tubercules on the cypselae faces and pappi plumose their entire length)

*Tellima grandiflora* (seed collected from scattered populations growing along Scotts creek riparian corridor, between Scotts Creek and Big Creek Bridges)

*Thysanocarpus laciniatus var. laciniatus* (scattered population growing on windswept w-facing steep grassy slope overlooking Prairie Overlook Gulch..... a variable population found growing on "slide area" overlooking Purdy Road near cattleguard, may represent a mixing area, with both *Thysanocarpus curvipes* and *Thysanocarpus laciniatus* present and some plants showing hybrid intermediacy)

*Tiarella trifoliata var. unifoliata* (seed collections made from localized population growing in the Big Creek sub-watershed, below the confluence of Berry and Big Creeks)

*Trifolium albopurpureum var. albopurpureum* (collection made along access road thru chaparral, above "Bowl Area" on Scotts Creek side of Seymore Hill, prior to 2009 Lockheed Fire)

*Trifolium buckwestiorum* (several collections made of whole plants [for detailed structural analysis] with mature inflorescences and ripe seed, including the *originally discovered population* from the central portion of the "Old Road"..... *TYPE COLLECTION*, on Schoolhouse Ridge, no longer extant)

*Trifolium obtusiflorum* (localized population found post-2009 Lockheed Fire, growing adjacent to seasonally wet, near-vertical streamlet, which drains under the Little Creek dirt access road and after a percipitous drop, enters Little Creek...... several robust plants also margined the outer [creek side] road bank and spilled over, circa 3 meters, downslope. Seed collections representing more than 50% of the population were made)

*Trifolium oliganthum* (collections made, pre and post-2009 Lockheed Fire, in the Little Creek sub-watershed..... concentrated/localized population observed over several years, growing on creekside of dirt access road, circa midway between Swanton Road entrance and Old Boy Scout Camp)

*Triphysaria eriantha subsp. rosea* (scattered population growing in grassland between Sandy-bottom Reservoir and Big Willow Gulch..... along eastward dipping synform)

*Trisetum canescens* (distinctive reduced-in-stature population from coastal bluffs overlooking Greyhound Rock State Beach and south facing slope population overlooking north end of Swanton Road documented, plus several other populations within the watershed, often showing intermediacy between *Trisetum canescens* and *Trisetum cernuum*)

*Vicia hassei* (one population documented growing on e-facing siliceous mudstone derived hillside, overlooking Swanton Road between Mountain Lion Gulch and Old Seaside School)

*Wyethia angustifolia* (three populations documented, all from inland side of Highway 1, either overlooking or growing on coastal prairie aka Western Terrace..... two populations bookending
the central portion of Big Willow Gulch and the third population growing on section of the coastal prairie margined by Gulches #3 & #4

**Wyethia glabra** (only known population in watershed..... Scotts Creek side of upper Seymore Hill and apparently lost in 2009 Lockheed Fire)

**Yabea microcarpa** (three geographically separate populations documented with inflorescences and mature schizocarps..... (1) slide area overlooking Purdy Road, (2) w-facing roadbank paralleling central section of Big Willow Gulch and (3) nw-oriented slope, above Swanton Road and overlooking Swanton PAC Ranch Headquarters aka Casa Verde and the Gianone Cheesehouse)

Note: Several hundred additional envelopes, representing more than a quarter century of collecting by the author of this text within the Scotts Creek Watershed and its environs, beginning in the early 1970s, have also been deposited with the UCSC Arboretum. The majority of these collections are valuable, either for diagnostic/DNA extraction purposes or act as voucher material for taxa never pressed for institutional herbarium collections or which are no longer extant in situ.

Regardless of which direction one takes the Swanton Road Botanical Journey, the in depth representation, of “natives” via genera and species of key families, is remarkable. Without leaving the tarmac, here are some of the families with the largest numerical representation within viewing range:

**Asteraceae...** *Achillea millefolium, Agoseris grandiflora, Anisocarpus madioides, Artemisia californica, Artemisia douglasiana, Baccharis glutinosa, Baccharis pilularis, Cirsiurn brevistylum, Corethrogyn filaginifolia (var. californica), Deinandra corymbosa, Eriophyllum confertiflorum var. confertiflorum, Eriophyllum stachadifolium, Euthamia occidentalis, Gamochaeta ustulata, Grindelia hirsutula var. hirsutula, Hieracium albiforum, Layia hieracioides, Madia gracilis, Madia sativa, Microseris bigelowii, Petasites frigidus var. palmatus, Psilocarphus tenellus, Pseudognaphalium bielettii, Pseudognaphalium californicum, Pseudognaphalium x gianonei, pro-sp.nov. (P. californicum x P. stramineum), Pseudognaphalium ramosissimum, Pseudognaphalium stramineum, Rafinesquia californica, Solidago elongata, Solidago velutina subsp. californica, Stebbinsoseris (Microseris) decipiens and *Uropappus lindleyi*.

**Poaceae...** *Agrostis exarata (var. exarata), Agrostis hallii, Agrostis pallens (plus a complex series of hybrid resegregates between *A. hallii* and *A. pallens*), Bromus carinatus var. carinatus (several forms of this exceedingly variable taxon exist within viewing range of the tarmac), Bromus vulgaris, Calamagrostis nutkaensis, Calamagrostis rubescens, Danthonia californica sensu lato, Deschampsia elongata, Elymus glaucus subsp. glaucus (exceedingly variable as to overall gestalt, with occasional plants seasonally producing branched inflorescences), Festuca californica, Festuca elmeri, Festuca occidentalis, Festuca roemer i = Festuca idahoensis subsp. roemer i = Festuca roemer i var. klamathensis, Festuca rubra (diffuse mode-of-growth ecotype growing proximal to Harry Wain’s pine grove), Festuca subuliflora, Hordeum brachyantherum subsp. brachyantherum, Koeleria macrantha, Leymus triticiodes = Elymus triticiodes subsp. triticiodes, Melica californica, Melica subulata, Melica torreyana, Nassella lepida = Stipa lepida, Nassella pulchra = Stipa pulchra, Phalaris californica, Poa howellii, Poa secunda subsp. secunda, Trisetum aff. canescens, Vulpia...


Rosaceae..... *Aphanes occidentalis*, *Fragaria chiloensis*, *Fragaria vesca*, *Heteromeles arbutifolia*, *Holodiscus discolor*, *Horkelia californica* var. *californica*, *Horkelia cuneata* var. *cuneata*, *Oemleria cerasiformis*, *Potentilla glandulosa* subsp. *glandulosa* = *Drymocallis glandulosa* var. *glandulosa*, *Prunus emarginata* (rare in Santa Cruz County..... three populations in southern half of watershed, with one observable from the tarmac, this overlooking the Casa Verde), *Rosa californica*, *Rosa gymnocarpa*, *Rosa spithamea*, *Rubus parviflorus*, *Rubus spectabilis* and *Rubus ursinus*.

Apiaceae..... *Angelica tomentosa*, *Apiastrum angustifolium*, *Bowlesia incana*, *Daucus pusillus*, *Heracleum maximum*, *Osmorhiza berteroi*, *Sanicula arctopoides*, *Sanicula crassicaulis*, *Sanicula gianonei* pro sp nov, and *Yabnea microcarpa*.

Boraginaceae..... *Amsinckia menziesii* var. *intermedia* = *Amsinckia menziesii*, *Cryptantha clevelandii*, *Cryptantha micromeres*, *Cryptantha torreyana* (one population occurred along Swanton Road but was lost during a severe El Nino weather system in the early 1980's), *Cynoglossum gianonei*, *Nemophila parviflora* var. *parviflora*, *Nemophila pedunculata*, *Phacelia malvifolia* and *Plagiobothrys bracteatus*.

By way of an ecological epilogue, here are 14 native species that welcomed us during the first 100 meters of our circa 6-mile traversal and bid us farewell exiting the final 100 meters: lizard tail (*Eriophyllum confertiflorum* var. *confertiflorum*), cow-parsnip (*Heracleum lanatum* = *Heracleum maximum*), sticky monkeyflower (*Mimulus aurantiacus*), California figwort (*Scrophularia californica*), California sagebrush (*Artemisia californica*), stinging phacelia (*Phacelia malvifolia*), poison oak (*Toxicodendron diversilobum*), oso berry (*Oemleria cerasiformis*), California wild rye (*Elymus glaucescens* subsp. *glaucescens*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California aster (*Symphyotrichum chilense*), common rush (*Juncus patens*), California blackberry (*Rubus ursinus*), and mugwort (*Artemisia douglasiana*).

**Note:** The author, over the past 30+ years, has personally observed examples of all underlined taxa in this text without leaving the tarmac, which defines Swanton Road!

For additional data and photos pertaining to the Scotts Creek Watershed and its environs,
go to www.spranch.org