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Traversing Swanton Road

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Abstract: Situated at the northwest end of Santa Cruz County and occupying circa **30 square miles** of sharply contrasted terrain, the **Scott 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.

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Although synthetic in origin, Swanton Road, like its fluid counterpart Scott 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 Scott 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, ranched/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 pollinators /dispersers of seeds and the co-evolutionary mechanisms involved..... **[a] which plant species are generalists when pollinating vectors are concerned and which species have co-evolved with specific vectors: e.g., *Castilleja subinclusa* subsp. *franciscana* with hummingbirds but *Castilleja affinis* sensu lato generally being bee pollinated even though this polyploid/polyphyletic complex shows evidence of *Castilleja subinclusa* subsp. *franciscana* in its ancestry?..... [b] where flower color and scent are present: e.g., *Lupinus arboreus* and its hybrids with *Lupinus variicolor*, do both of these traits have equal value in the formation of the fertile hybrid or does one of these two attractants, visual/olfactory, exert a greater influence in the hybrid formation?.....** **(#4)** chemical signatures (**foliage and/or floral scents**) as taxonomic markers, used in conjunction with other morphological features, to **differentiate locally problematic species/hybrid complexes of *Castilleja (densiflora* aff. *Orthocarpus noctuinus* Eastw.), *Layia (L. gaillardiioides* and *L. hieracioides)*, *Madia (M. exigua, M. gracilis* and *M. sativa)*, *Mimulus = Erythranthe (guttata* complex), *Monardella (villosa* complex), *Pseudognaphalium (gianonei, pro.sp.nov.)*, *Sanicula (gianonei, pro.sp.nov. and pseudo-laciniata, pro.sp.nov.)*, *Trillium (chloropetalum* complex, see pages 177-178 of this essay) and *Stachys* (evolutionary/phylogenetic relationships between *S. ajugoides*, *S. bullata*, *S. chamissonis* and *S. rigida* var. *quercetorum* based on a comparative analysis of their chemical signatures)..... **(#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: e.g., n/ne slopes overlooking Scott Creek, between Scott Creek and Little Creek Bridges, with particular emphasis on the forested slopes overlooking Swanton Pacific/Calpoly orchard down to Mill Creek confluence with Scott Creek and the e-facing slopes overlooking Swanton Valley, between the confluences of Big and Little Creeks with Scott Creek..... (#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, using Lidar mapping to define these areas of concentrated biodiversity coupled with in situ digital photography and biota inventories, generating a baseline for in depth research projects..... (#9) **slope orientation** and the resulting changes in vegetation patterns (**mesic versus xeric**) within the same drainage system and **one of the underlying mechanisms needed** to establish localized biodiversity, **using the ocean draining gulch systems between the Lasher Marsh Gulch and Scott Creek Marsh, as examples..... (#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?, (d) study the local Monardella villosa complex as a series of overlapping "micro-species", originally formed by the fragmentation of larger populations and through isolation and inbreeding, forming several distinct [on biochemical and morphological levels] sub-populations and where two or more of the "isolates" reconnect [through some disturbance regime], intraspecific hybridization may have taken place, possibly explaining the foliar and chemical signature complexity displayed within some of the larger populations, (e) are there any chromosomal differences between the two subspecies as they occur within the Scott Creek Watershed/environs and within the two subspecies themselves, are the populations uniform as to the base number of n=20?, (f) with the majority of species comprising the genus Monardella possessing the base chromosome****

number of $n=21$ and *M. villosa* recorded as having $n=20$ with subsp. *obispoensis* a tetraploid with the count of $2n=80$, how do the base differences in chromosome numbers and example of polyploidy define *M. villosa sensu lato* within the phylogeny of the genus?, (g) how do the local populations of both subsp. *villosa* and subsp. *franciscana* compare with the type circumscriptions for both taxa?, (h) are the thicker leaves with their deeply impressed veins and complex capitula, comprising multiple "heads" with their subtending folial bracts aggregated into one large capitulum or arranged in whorls and verticillate in appearance, indicative of higher ploidy levels and are these "manifestations" restricted to the subsp. *franciscana*? [see pages 246-247 of this essay], (i) along Swanton Road [between the entrance to Purdy Road down to the Casa Verde], are a series of disjunct populations of *Monardella villosa* aff. *villosa*, more or less within the same elevational range..... do these micro-populations constitute a cline, moving from subsp. *villosa* into subsp. *franciscana* at the mouth of the Queseria gulch system or are they separately derived, from populations elevationally above them which currently exist or are no longer extant?..... (#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 arboreus* with *Lupinus formosus* and *Lupinus variicolor* and the relationship of the stabilized taxon tentatively designated *Lupinus propinquus* to both *Lupinus arboreus* 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 micro-habitat for seed germination, (b) creating a buffer zone between exposed rock or bark 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 concolored 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 Scott 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* (e.g., **A. crustacea complex**, **being polyphyletic in derivation aka genetic sponges**), 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 parvula* var. *shrevei* populations) and (e) **being non-F1 hybrids** (see **pages 70, 118-119, 125, 188, 191 and 250 of this essay** in reference to the thesis that the Scott 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 crustaceae* 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?, (g) study and compare the sub-populations of this hybrid swarm derived taxon growing in the decidedly mesic riparian corridor and often proximal to Scott Creek, with those found "higher and drier" up on the 3rd and 4th terraces..... as to age/longevity, overall health/disease resistance, through ring counts on dead specimens, rate of growth in dissimilar habitats and reproductive/recruitment success..... (#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* [n-end of Swanton Road across from Washout Turn]..... *Epilobium ciliatum* and *Epilobium hallianum* [Beaver Flat Marsh and Marti's Park Marsh]..... *Trillium chloropetalum* and *Trillium ovatum*..... *Smilacina racemosa* = *Maianthemum racemosum* and *Smilacina stellata* = *Maianthemum stellatum*..... *Festuca elmeri* and *Festuca occidentalis* [along Purdy Road, across from Squirrel Flat]..... *Cryptantha clevelandii* var. *florosa* and *Cryptantha micromeres*..... *Plagiobothrys bracteatus* and *Plagiobothrys diffusus* [grassy slope margining dirt road between Purdy Road and Seymore Hill, see page 87-89 of this essay]..... *Plantago elongata* and *Plantago erecta* [original Highway 1 roadbed overlooking Washout Turn]..... *Juncus effusus* var. *pacificus* and *Juncus hesperius*..... *Isolepis carinata* and *Isolepis cernua* [Old Coast Road weathered mudstone roadbed above Washout Turn]..... *Stipa lepida* and *Stipa pulchra* [se-facing bank below last Chance Road/Swanton Road interface]..... *Nemophila parviflora* var. *parviflora* and *Nemophila pedunculata* [along Swanton Road, proximal to Old Miller Ranch Road entrance]..... *Rubus parviflorus* and *Rubus spectabilis*..... *Mimulus floribundus* = *Erythranthe floribunda* and *Mimulus moschatus* = *Erythranthe inodora*..... *Collinsia heterophylla* and *Collinsia multicolor*..... *Bromus carinatus* var. *carinatus* and *Bromus vulgaris*..... *Acmispon glaber* var. *glaber* and *Acmispon junceus*..... *Sanicula crassicaulis* and *Sanicula gianonei*, pro.sp.nov..... *Sanicula crassicaulis* and *Sanicula hoffmannii* [at least 4 sympatric associations documented for Scott Creek Watershed]..... *Equisetum arvense* and *Equisetum telmateia* subsp. *braunii* [Scott Creek riparian corridor]..... *Ribes divaricatum* var. *pubiflorum* and *Ribes menziesii*..... *Galium californicum* subsp. *californicum* and *Galium porrigens* var. *porrigens*..... *Piperia elongata* and *Piperia transversa* [this combo found on the west facing hillside overlooking Squirrel Flat/Purdy Road]..... *Claytonia perfoliata* subsp. *perfoliata* and *Claytonia sibirica* [margins of dirt road entering lower/central portion of Little Creek sub-watershed]..... *Hydrocotyle ranunculoides* and *Hydrocotyle verticillata* [Laguna de las Trancas]..... *Artemisia californica* and *Artemisia douglasiana*..... *Rumex californicus* and *Rumex transitarius* [margining Swanton Road, proximal to Mill Creek Bridge and above/below Queseria Creek interface with Swanton Road]..... (#28) with a substantial representation of both native (*Agoseris*, *Hieracium*, *Malacothrix*, *Microseris*, *Rafinesquia*, *Stebbinsoseris*, *Stephanomeria* and *Uropappus*) and introduced (*Crepis*, *Hedypnois*, *Hypochaeris*, *Latuca*, *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 brevistylum*), 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 beneolens*), Bioletti's cudweed (*Pseudognaphalium biolettii*), 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*, pro.sp.nov. (*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 heights/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 category 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

Lockheed and historical (if possible) fire responses and subsequent regenerative capabilities, (d) since this taxon is exceedingly long-lived and can perpetuate itself both sexually and asexually, map the genetic diversity within and between populations, clarifying what proportion is clonal versus seed derived in origin, (e) study the number of male to female adults in any given area and see what ratio is needed to establish successful fruit set, (f) do the resinous components found in the aril enclosing the seed, change from protective (when seed is developing) to palatable (when seed is mature and ready for dispersal) and are the clues cueing in the dispersing vector(s), visual (color change) and/or olfactory?, (g) does the aril protect the seed from desiccation until suitable germinating conditions occur, does the aril have to be ruptured first to allow the mature seed to imbibe the necessary water to initiate germination and is darkness or light needed to initiate germination? and (h) since the majority of seedlings and immature adults are found growing as understory constituents, under shaded or dappled light conditions..... **is the reduction of aerial stature offset by the establishment of an extensive root system**, which when a break in the canopy cover by storm damage or the senescence of adjacent trees occurs, **allows the "waiting-in-the-wings" young adults to quickly take advantage of the change in light regime and "bolt"?**..... (#34) Distribution patterns and ecological constraints: (a) Why does crinkle-awn fescue (*Festuca subuliflora*) follow the coast redwood (*Sequoia sempervirens*) downstream of the Scott Creek Bridge (albeit sporadically), while associate species further upstream..... red clintonia (*Clintonia andrewsiana*), slink pod (*Scoliopus bigelovii*), brook foam (*Boykinia occidentalis*), sugar-scoop (*Tiarella trifoliata* var. *unifoliata*), vanilla grass (*Hierochloa 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 Scott 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 Scott Creek Watershed and the in situ documentation for those areas found within this essay**..... **area #1:** Schoolhouse Ridge complex, between Scott and Mill Creeks, extending from Swanton Road up to the "Chalks" (WGS84: 37.088990, -122.242582), **area #2:** Old Schoolhouse Road, between Little and Winters Creek drainages, from Swanton Road to top of ridge/Cemex property boundary (WGS84: 37.061610, -122.222376), **area #3:** Lair Gulch complex, from Last Chance Road down to entrance into Scott Creek (WGS84: 37.100929, -122.263216), **area #4:** Magic Triangle Ridge/Synform drainage complex and the attendant 7+ "gulchlets" which coalesce into one narrow stem that enters Scott Creek just below the Scott Creek Bridge (WGS84: 37.079273, -122.252304), **area #5:** the e/ne oriented drainage system, beginning near the Mt. Cook area and entering into Scott Creek, between the confluences of Big and Little Creeks..... **also contains isolated chaparral disjunct, worthy of a study unto itself!** (WGS84: 37.063116, -122.234336), **area #6:** the complex series of landslide derived, hydrologically active, benched spring-fed marshes, beginning with "Beaver Flat" and stepwise, descending southward down to the "Marti's Park Marsh" (WGS84: 37.094725, -122.257051; 37.091305, -122.257729; 37.089902, -122.255998; 37.087975, -122.254115), **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 (WGS84: 37.099931, -122.245089) 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*)..... **further expanding on the above premise, is there a correlation between a high degree of floristic diversity within a given area and a corresponding diversification in the number of pollinating/seed dispersal vectors?** (WGS84: 37.073114, -122.240433)..... (#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 crypsis (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*) and (c) do populations of the 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 Scott 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 preceding 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 height 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 drupelets, 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 Scott 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 fruiting bodies possessing varying degrees 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. *caerulea*), (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 (*Oemleria cerasiformis*), (7) fruit an aggregate of blackish-purple drupelets, 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 Scott 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 Scott 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 miles) 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 Scott 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 Scott 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 persistent/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 versus densely congested inflorescence dimorphism of *Juncus occidentalis* is another Juncaceae constituent and Scott Creek Watershed botanical component, *Luzula comosa* [see page 145-146]. 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* = *Erythranthe guttata* complex [ERYTHRANTHE SECT. *SIMIOLA*] represented within the Scott Creek Watershed and its environs [see pages 31-32, 37, 42-44, 195 and 246 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* = *Erythranthe guttata* complex, such as seed gestalt, that are consistent enough to warrant form, varietal or species 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* = *Erythranthe nasuta*] growing on sandbars within the Scott Creek riparian corridor, (f) do controlled artificial breeding studies with the various members of the *Mimulus guttatus* = *Erythranthe guttata* 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 Scott 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 (erect-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 intra-populational 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 Scott Creek Watershed, to determine if the (non-functioning pistillate) *Carex "imperfecta"* and (fertile) *Carex nitidicarpa* can occur in the absence of either/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 both a structural and ecological perspective [at least two distinct forms of *C. x imperfecta* occur on a consistent basis, with form #1 stramineous/shiny in coloration, often with an elongate rachis displaying 4 or more compound-congested spikelets and on rare occasions with perigynial scales apically awned, while form #2 can have inflos with either simple or compound-congested spikelets, are dk brown/dull in coloration and the overall gestalt is often stiff/rigid or elongate and flexuous, (k) where populations of both *Carex densa* and *Carex subbracteata* occur sympatrically, DOES THE DIRECTION OF GENE FLOW BETWEEN THE TWO SPECIES, DETERMINE WHETHER THE HYBRID OFFSPRING BECOME *CAREX X NITIDICARPA* OR *CAREX X IMPERFECTA*?..... (#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** [also see pages 48-49 and 241-242 of this Essay]: (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-existent 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 [*J. hesperius*, in particular, as well as **higher fertile seed count**], **could some of this morphological plasticity be due to backcrossing with 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?**, (h) **is the mucilaginous encasement that uniquely defines the mature/opened capsules of *Juncus patens*, when exposed to moisture, a recessive trait or does it carry on into the F1 and higher hybrid generations?.....** (#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. breweri*, *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? **note: on 12/11/2012, while studying the *Juncus* populations growing along the n-end of Swanton Road, I came across a *Juncus patens* with mature opened capsules not only encased in a mucilaginous "bubble" but on several inflorescences, some of the embedded seeds were germinating, with the seedlings averaging 3-4mm in length!!! The weight of the globular mass, specifically with those culms which are unsupported, bends them downward and in this particular case, they were resting on the ground. Does the gelatinous encasement of the seeds act as an alternate substrate, analogous to**

the agar-agar used in the germination of orchid seeds and are there two germination strategies at work... if the ripening of the capsules coincides with the rainy season, then instant recruitment while the seeds in those capsules maturing without seasonal hydration, may enter a state of dormancy, fall to the ground and remain viable but inactive for an unknown period of time?..... (#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 metabolic 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 Scott 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 development 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] **height 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 Scott 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.** Several *Bromus carinatus* populations within the Scott Creek Watershed exhibit a consistent and distinctive trait of **having the lowermost branches of the inflorescence conspicuously elongate/pendant with the spikelets concentrated apically and is this a reflection of ancient hybridization with *Bromus sitchensis* and could a DNA analysis validate this hypothesis?** (#50) *Toxicodendron diversilobum* aka poison oak has two basic growth

patterns within the watershed: a **free standing, low growing to sub-arboreal shrub** and a **tree supported woody vine, which can exceed 20m in height 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 height 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, develop one or the other growth patterns or is this behavior genetically determined and environmentally reinforced? With long established poison oak vines observed growing on *Aesculus*, *Pinus*, *Pseudotsuga*, *Quercus*, *Sequoia*, *Torreya* and *Umbellularia* species, are there specific requirements, such as bark topography, durability and moisture retentiveness, that have to be met before the attachment process begins? 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 some of the largest, both in terms of stem diameter and height reached, 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? Is there a difference in rate of growth, at least initially, between the free standing and supported individuals..... with the reflected light and radiant heat through convection from the bark of the arboreal support, being potential factors?..... (#51) Paralleling the previous research suggestion, is another subject worthy of study: As a bonafide temperate epiphyte, *Polypodium calirhiza* is found throughout the watershed on a variety of arboreal hosts, in some cases forming extensive/long established colonies while in other situations, poorly represented by a barely surviving remnant. With both evergreen [*Pinus radiata*, *Pseudotsuga menziesii* var. *menziesii*, *Quercus agrifolia* var. *agrifolia*, *Quercus parvula* var. *shrevei*, *Sequoia sempervirens*, *Torreya californica*, *Umbellularia californica*] and deciduous [*Acer macrophyllum*, *Acer negundo*, *Aesculus californica*, *Alnus rubra*, *Sambucus nigra* subsp. *caerulea*, *Salix lasiolepis*] trees observed serving, in varying degrees, as aerial habitats..... **is one factor for successful colonization**, the bark's capacity to sustain healthy bryophyte (moss species) populations, with their hygroscopic nature and potential for creating "nurseries" for the wind born spores to develop into gametophytes, the fern's alternate generation phase? **Inventory** the arboreal and sub-arboreal taxa found in and around the Scott Creek Watershed, categorizing the various "host" species as to suitability for **Polypodium colonization**, ranging from optimal through inhospitable..... in one notable instance, a dead, very old and massive as to still extant woody infrastructure, hybrid pine [*Pinus radiata* complex] along Swanton Road, had some 40+ feet above ground level, **developed on the horizontally aligned upper branches**, "moss pads" hosting *Polypodium calirhiza* colonies. What other conditions have to be met for successful colonization, **even if the tree's bark topography has existing "moss pads"** and can trees with seasonally exfoliating bark such as the Pacific madrone [*Arbutus menziesii*], due to the structural integrity of its wood, become "hosts" after-the-fact, when the subject in question dies but continues to exist for an indefinite period of time? Of all the tree species studied to date with persisting *Polypodium calirhiza* colonies, the most successful as to longevity of occupancy and areas on the tree's surface, both vertically and horizontally, covered has been the California bay laurel [*Umbellularia californica*]..... what

characteristics, be they bark structure, biochemical makeup, branching patterns and canopy configuration, ecological preferences, proximity to riparian corridor, etc., allow this particular taxon to consistently, when colonized, be a more effective host? With *Polypodium calirhiza* being an allotetraploid, derived via hybridization from *Polypodium californicum* and *Polypodium glycyrrhiza* and its ecological preferences ranging from terrestrial through epiphytic, are all the arboreal colonizers in the Scott Creek Watershed *Polypodium calirhiza* or could some of the populations be comprised of both *Polypodium calirhiza* and *Polypodium glycyrrhiza* and possibly *Polypodium californicum*, even though the latter is not considered an epiphyte? Since the *Polypodium calirhiza* populations growing on the California bay laurel often reach heights of 25+ meters, does this confer an advantage in the distribution of spores via air movement to adjacent trees or at this elevation, do the air flow patterns have a desiccating effect, resulting in the higher reach "moss pads" drying out and being less conducive for the spores to develop into the gametophyte generation? Can one ascertain the age of a given *Polypodium calirhiza* colony from the branching patterns and lengths of the rhizomes and **what is the genetic make-up of long established plants covering a substantial portion of a given host.....** are all the scattered "micro-colonies" [a] clonally derived, [b] the by products of the original "colonizer" being selfed and/or [c] a combination of selfings and out-breeding between the various "micro-colonies" and **with wind being the primary spore delivery vector**, can any pattern of genetic change between these "micro-colonies" be correlated with their distribution along a vertical/horizontal axis of the host tree's bark topography?..... (#52) As discussed on **pages 118-121** of this essay, the local woodlands often consist of a dozen or more arboreal and sub-arboreal native taxa with varying growth patterns and foliar configurations..... **initiate a study on the inter-relationships between multi-layered canopy complexity, sunlight distribution patterns and understory biodiversity.** Within this comprehensive overview, examine the following conditions: (a) slope orientation, degree of inclination, evidence of recent and/or prehistoric mass wasting..... (b) comparing height, trunk alignment, branching patterns and bark topography [surface conductivity/absorbency of rainfall/fog condensation] characterizing the arboreal components of the woodland being studied..... (c) examine the variations in foliage, whether deciduous or persisting for several seasons, fasciculate [*Pinus*] or solitary in arrangement/attachment, adaxial surface modifications such as impressed/elevated veins, varying types of trichomes, a waxy bloom or glossy and reflective like a mirror [*Arbutus menziesii*] and redirecting sunlight back up into the upper canopy levels..... (d) the foliar chemistry [Phenolics, Nitrogenous compounds, Terpenes] and the corresponding behavior of the species specific leaf litter as to breakdown rate, pH influence of current leaf drop and the buffering influences of previous litter accumulation, microbial/fungal interaction, inhibition of seed germination [allelopathy] and concentration/displacement of rainfall derived water and leaching out/subsurface transport of the chemical constituents of the freshly shed foliage..... (e) study the air movement patterns within the above described woodlands and the impact they have seasonally as to pollen distribution [*Pinus*, *Pseudotsuga*, *Sequoia*], evaporative loss both within the multilevel canopy and ground cover constituents, accelerating the shedding of arboreal foliage and moving/mixing of differing leaf litter types away from their primary sources..... (f) within the mixed conifer/oak woodland sensu lato, are there ecological subsets based on species specific taxa with their distinctive foliar characteristics [e.g., *Sequoia sempervirens*, *Pinus radiata*, *Quercus agrifolia* var. *agrifolia*], that create zones hosting differing suites of understory species as well as sharing certain native vegetative components? (f) when a mature arboreal specimen [e.g., *Umbellularia californica*, *Pinus radiata*, *Quercus parvula* var. *shrevei*] with an extensive biomass [crown/trunk] and horizontal subsurface root system topples within this complex woodland ecosystem, from either age/disease related or storm induced causes..... does

this disturbance regime, have a cascading/rippling effect on the surrounding woodland, due to change in sunlight distribution patterns, air movement corridors and disruption of the understory's O, A and B soil horizons, to cite just three separate but related events and how does this singular event impact/alter the woodland's biodiversity?..... (#53) Several native taxa occur within the Scott Creek Watershed and its environs that are disjuncts relative to the area of their typification: *Agrostis blasdalei*, *Amelanchier utahensis*, *Arctostaphylos crustacea* subsp. *subcordata*, *Clarkia* aff. *prostrata*, *Clarkia purpurea* subsp. *purpurea*, *Hippuris vulgaris*, *Prunus emarginata*, *Quercus x morehus*, *Nemophila* aff. *pulchella* var. *fremontii* and *Sanicula hoffmannii*..... [1] do a genetic profiling of the local representatives of these "displaced" taxa, comparing them, where possible, with representatives from the type localities and seeing if geographical isolation has produced any changes on a molecular level, [2] From an ecological perspective, what are the similarities/differences in habitat preferences, if any, between the species occurring in the "type" site and the Swanton area populations?, [3] Are there any differences in the pollination vectors, between the "type" population and the "extended range" colonies found locally and in the case of long-lived rhizomatous taxa, is colonial expansion solely sexual via seed dispersal or/and clonal?, [4] Where closely related sympatric taxa occur, either at the originally described population's locality or the one(s) documented for the Scott Creek Watershed..... is there any evidence validating the exchange of genetic material? [5] Within the local watershed and its environs, are the "disjuncts" in question..... **(a) expanding their range, (b) holding their own or (c) is their foothold within the area shrinking?..... (#54)** Within the area covered by this essay, polyploid *Dudleya caespitosa* ranges from the ocean edge of the Santa Cruz Terrace up to the "Chalks", which separates the Scott and Mill Creek drainages. The **isolated inland populations are usually localized/relictual as to habitat** [see pages 86, 194, 208, 216 and 235-236 of this Essay] and considerably more homogeneous as to rosette/leaf gestalt with corollas often paler in coloration, thinner in texture and more elongate than the polymorphic coastal headland populations with their intensely colored, shorter in stature and thicker in texture, corollas. Do a study, mapping the various populations as they range elevationally, from the coastal bluffs [**circa 70 feet elevation**] up to the "Chalks" [**circa 700 feet elevation**] and see if there are changes in ploidy levels as one progresses further inland, with the highest numbers being on the immediate coast [**where the populations exhibit an extreme degree of foliar/rosette plasticity and are ecologically versatile, readily establishing themselves on both the horizontal grass/coastal scrub dominated terrace tops and near vertical cliff faces, the latter including seasonally wet waterfalls**] and the lowest numbers belonging to the inland "isolates"..... which possibly represent earlier evolutionary stages of this species complex and being physically removed [**out of pollination range**] from the exchange of genetic material with the dynamic and still evolving coastal populations, **are literally trapped in time!** Analyze the corolla pigments and see if there are differences between the **interior and coastal headland populations** and if any correlation can be made between ploidy levels, floral pigments and overall corolla structuring [**including presence/absence of multi-branched inflorescences and pedicel lengths**]. Compare the various "isolate" populations [**Schoolhouse Ridge, "Chalks", upper Little Creek**] with each other and where clines albeit fragmented ones occur [**Schoolhouse Ridge**], is there an overarching uniformity or do each of these "micro" populations represent a stabilized variant of the original genome? Examine length of corolla and whether the diameter remains constant or narrows towards apex and how this along with coloration, delimits the potential pollinating vectors..... even between two different members of the Hymenoptera, e.g., *Apis mellifera* and *Bombus* sp. [**has corolla shape..... the apex diameter in particular and pigmentation..... greenish-yellow thru red, been important mechanisms in the speciation of the genus, with hummingbirds and various hymenoptera as the co-evolutionary agents?**] Are the

Dudleyas self-fertile or are they obligate out-breeders and how does this translate out in the uniformity of some populations and the variability as to rosette patterns and inflorescence complexity of other populations? **Documentation via seed collections has been done for the majority of populations relative to the areas discussed in this essay and all of these with pertinent Google Earth coordinates, have been deposited with the UCSC Arboretum. Note: Prior to the 1981-82 El Nino storm impacts on the Scott Creek Watershed, an isolated population of the *Dudleya caespitosa* complex existed above the lower Big Creek Falls, growing streamside on the moss-covered granitics..... if it still exists, a molecular work-up of this definitely isolated taxon may yield some valuable data as to this polyploid's evolutionary history/while revisiting the Big Creek subwatershed on 05/31/2012 and scoping out the granitic, sandstone capped cliffs directly above the old quarry, I spotted several clumps of *Dudleya caespitosa*, circa 25+ meters above me and for the moment out of reach but validating the continued existence of this complex taxon in this ancillary drainage system within the Scott Creek Watershed proper..... (#55)** The carices found within the Scott Creek Watershed and environs, present several unresolved, misunderstood and inherently significant issues, that offer the student of evolution and speciation an opportunity to make a valuable contribution..... not only towards clarification of several key diagnostic problems but creating a base line that brings in to focus the significance that disturbance regimes, both natural and anthropogenic, have in broaching reproductive isolating mechanisms and allowing the exchange of genetic material that otherwise would not occur. [see Query # 45, pages 13-14 of this essay]. The taxon which I have designated *Carex x imperfecta*, is a potential Rosetta Stone, in understanding the possible origins of both the *Carex x gianonei* [*Carex harfordii* matrix with lower 1-5+ spikelets compound-congested, spikelets androgynous and/or gynaeandrous] and *Carex x nitidicarpa* [*Carex subbracteata* matrix reflecting *Carex densa* traits and fertile as to reproductive capacity]. By focusing on *Carex x imperfecta*, with its complex inflorescences displaying very specific traits that link two distantly related sections, the **Multiflorae** and **Ovales**, an important contribution can be made to the ongoing research being done relevant to this very difficult genus and in the specific case of *Carex x imperfecta*, is a taxon **that has no validated existence in either the historical or current literature**. As an entity unto itself independent of its evolutionary relationships with *C. x gianonei* and *C. x nitidicarpa*, *Carex x imperfecta* is represented by at least 200 separate plants, occurring on the coastal prairie between the Pumpkin Field Marsh and the China Ladder Marsh with localized populations documented for Beaver Flat, West's Spring and Marti's Park Marshes. See pages 13-14, 51-56, 59-61, 64-65, 95, 99, 103-104 and 231 of this Essay for the specifics regarding *Carex x imperfecta* and various lines of research that could be developed resulting in seminal papers being published. As of this writing 05/29/2012, more than 30 envelopes containing 1, 200+ *Carex x imperfecta* inflorescences have been deposited with the UCSC Arboretum and at least two dozen living representatives of this taxon are also ensconced in the new California section with future collections/deposits planned. Relative to *Carex x imperfecta*'s pistillately non-functional inflorescences, is another observation that may have both a structural and evolutionary bearing of this yet-to-be fully diagnosed taxon..... on many of the inflorescences, post shedding of pollen and failure of the ovules to develop, a white fungus appears to invade the spikelet(s) between the inner face of the perigynial sac and the rachis. Does the presence of this pathogen correlate with the "imperfect" nature of this hybrid taxon, aneuploidy and the resulting incompatibility factors between two distantly related species and/or is the habitat, with its proximity to protracted air-borne oceanic moisture at a time when seasonal rains are over and terrestrial moisture is minimal a relevant factor? The fungal pathogen invading the mature inflorescences does not appear to affect the vigor of the plant or its overall biomass and several of the *Carex x imperfectas* have been continually

observed/studied for more than three decades! Using the coastal prairie/Western Terrace between Scott Creek Marsh and the Lasher Marsh Gulch as a living laboratory for the study of the Carices, determine if the inflorescence invading fungus is restricted to the *Carex x imperfectas* (and are all or only some plants colonized) or are other *Carex* species so afflicted? With many of the *Carex x imperfectas* producing/shedding pollen, [a] what is the fertility of said pollen and does it vary from plant to plant?, [b] what role does/has the hybrid pollen play(ed) in backcrossing/outcrossing with related taxa, members of the Ovales section in particular and [c] does the inflorescence contaminating fungus affect the pollen development/viability of the *Carex x imperfectas* or does the onset of this pathogen take place after the pollen has been shed and the ovules within the perigynial sac fail to develop properly?..... (#56) Clarify the taxonomic status of *Sanicula gianonei*, **pro. sp. nov.**, by comparing/analyzing the consistent differences between this potentially undescribed taxon and the species it has been subsumed under/confused with, namely *Sanicula crassicaulis*. Define the overall range of *Sanicula gianonei* and within that geographic circumscription, examine the following issues: [1] habitat preference/ecology/range of tolerance within a mesic to xeric context since this taxon, with rare exceptions, prefers seasonally moist shaded bottomlands within riparian corridors or their equivalent habitat found in semi-shaded transitional zones, between mixed conifer/oak woodland and grassland, usually growing as a Baccharis/Toxicodendron understory component; [2] Do a detailed work-up of this "species" **chemical signature** throughout its range, defining its consistency relative to that range and what constituent chemical components does it share with *Sanicula crassicaulis* and which biochemical properties are unique to it; [3] Examine the stems and petioles, as to shared or distinct pigments and their patterning plus structural characteristics..... such as **fistulose** versus **stems filled with pith** and external ribbing..... also below ground root stocks and **potential differences** in their average life expectancy; [4] A comparison between *S. crassicaulis* and *S. gianonei* as to foliar topography is critical, for the major differences are both consistent and distinctive..... thickness of epidermis, its pigmentation and veinal patterning and **MOST IMPORTANT, the type of marginal trichomes and their behavior as the leaf ages**; [5] Parenthetical to the previous lines of analysis, is the need to do a chromosomal study to see if *S. crassicaulis* and *S. gianonei* are both tetraploids and if so, are there still significant differences between these two taxa on a DNA level?; [6] Study the flowers and their coloration and the epigynous discs, as to **unblemished** versus a **scurfy** coating; [7] Follow the development of the schizocarps, noting the placement/organization of the "bristles", from the base to the apex of the fruit and whether they are **in a graduate or fairly uniform series**..... also, the color and ultimate configuration of the schizocarp body post-anthesis..... (#57) Is there a correlation between low fertile cypsela [achene] production within the following "native" perennial **Asteraceae**..... *Eurybia radulina*, *Solidago elongata* and *Symphotrichum chilense* and their capacity to form long-lived rhizomatous colonies with the principal emphasis on vegetative expansion and/or the seasonal impact of diurnal lepidoptera and their larval stage using the developing cypsela as a primary food source? **What impacts on the population's overall genetic diversity does this have, if many of the "established colonies" are possibly clonal? Do some of these pistillately non or poorly functioning "populations" act as males, passing on some of their genetic material via Hymenopteran vectors to other populations which have fully functional reproductive parts? Is this compromised gene-flow pattern a permanent condition or does it vary throughout the flowering season and from year to year? Is it a physiological response to a set of environmental conditions that are site specific and do not necessarily reflect the aforementioned taxa throughout the Scott Creek Watershed and its environs? *Solidago elongata*, an uncommon species countywide, tends to frequent old marshes in the Swanton area (e.g., Beaver Flat, West's Spring, China Ladder) and all the**

populations studied to date, follow the pattern of **low viable cypselae/achene counts and extensive asexual/vegetative colonization**. Map this species within the watershed/environs and determine, if some/all of the "populations" are principally **clonal with little genetic variability and examine the mature capitula for evidence of larval activity**. This same methodology should also be applied to the far more ubiquitous *Symphotrichum chilense* populations, which exhibit the same pattern of poor "seed set" and form extensive "colonies" via rhizomes..... (#58) The Schoolhouse Ridge Complex, unique not only from an ecological/botanical perspective but a geomorphological one as well, was severely impacted by the 2009 Lockheed Fire. Two days following the fire as being defined "officially under control", I spent five consecutive days [documenting with 1,000+ digital images] all aspects of this anthropomorphic induced holocaust, showing the after effects on this previously designated botanical "hotspot". While, both the pre- and post-fire "native" plant inventories have been meticulously recorded in this Essay, no follow-up series of photos, paralleling my original 5 sets have been done. With a before/after botanical overview of this complex and diverse ridge/gulch/grassland/riparian corridor series of interconnected ecosystems already in place, a second series of digital photos, four+ years later, would create an important baseline from a successional perspective..... (#59) With the Scott Creek Watershed and its adjacent environs hosting multiple populations of *Clarkia* aff. *davyi*, *Clarkia* aff. *prostrata* and *Clarkia purpurea* subsp. *purpurea*, all three taxa of rare or uncommon status within Santa Cruz County, an in depth study is in order..... (a) To clarify their taxonomic status relative to the original typification, (b) If the aff. *Clarkia prostrata* is found to possess a chromosome number of $n=26$, is this the result of hybridization between *C. speciosa* [$n=9$] and *C. davyi* [$n=17$] or is this local taxon distinct from the putative hybrid described from San Luis Obispo County and a valid/undescribed species in its own right?, (c) Since most of the populations of these three *Clarkia* species are self-contained and isolated from each other, are there inter-population differences genetically or are they remnant fragments of a once more continuous distribution pattern?, (d) With Andrenid Bees being the principal pollinating vector for the local *Clarkias* and no intermediates/hybrids found where populations of *Clarkia* aff. *davyi* and *Clarkia* aff. *prostrata* overlap and their phenologies being concurrent, is the difference in chromosome numbers the principal reproduction isolating mechanism?, (e) With the UCSC Arboretum custodian of 50+ in situ seed/capsule collections for *C. aff. davyi*, 30+ in situ seed/capsule collections for *C. aff. prostrata* and 30+ in situ seed/capsule collections for *C. purpurea* subsp. *purpurea* plus several dozen ex situ raised collections drawn from populations within the overview of this Essay, it is very important to consider that several of these populations are no longer extant or accessible and the recruitment of those still in existence are subject to the vagaries of seasonal weather patterns, competition from fellow travelers of the non-native variety and various challenges from indiscriminate herbivores. **See pages 41-42, 102-103, 213 and 233 of this Essay for supplemental information and also check out the data included on each of the 100+ seed containing envelopes, covering a span of some thirty years.....** (#60) Several genera within the Asteraceae, while producing sexually functioning capitula, **are repeatedly targeted by what appears to be species of diurnal lepidoptera [or some other members of the Class Insecta]**, whose larval stage often destroys substantial portions of the developing ovules, rendering the mature "inflos" with a minimal amount, if any, of viable "seed". Within the Scott Creek Watershed and its environs, the following taxa over the course of several seasons, have been observed bearing the ravaging effects of this yet to be determined "spoiler": Bolander's golden aster [*Heterotheca sessiliflora* subsp. *bolanderi*], Bioletti's cudweed [*Pseudognaphalium biolettii*], California cudweed [*Pseudognaphalium californicum*], Gianone everlasting [*Pseudognaphalium gianonei*, pro.sp.nov.], pink everlasting [*Pseudognaphalium ramosissimum*],

cotton batting plant [*Pseudognaphalium stramineum*], Canada goldenrod [*Solidago elongata*], California aster [*Symphotrichum chilense*] and Douglas' Aster [*Symphotrichum subspicatum*].

(a) Determine the family/genus/species of insect that is causing the damage to the developing ovules and is the species a generalist in choice of host plant or are there more than one egg-laying species involved, each specializing in a specific taxon possibly due to the host plant's distinguishing chemical signature?, (b) With the *Pseudognaphalium* relatively short-lived non-rhizomatous perennials, how does the substantial ovule destruction effect the host species recruitment capacity and the subsequent resegregation of genetic material?, (c) Since the *Solidago* and *Symphotrichum* species create extensive "clonal" populations via rhizomes and are exceedingly long-lived and if the ovule destroying larvae infestation is cyclical, does the longevity of the rhizome forming species offset the short-term loss of sexual reproductive capacity? and (d) Within a given area, are all representatives of the aforementioned **Asteraceae** members targeted by the egg laying "insects" or is there a co-evolving interplay between "predator and prey", where those taxa previously attacked make genetically transmitted changes in their biochemistry, rendering future generations less palatable to predation..... (#61) **With the current circumscription of *Arctostaphylos crustacea* subsp. *crinita* at variance with the polymorphic populations found within the Scott Creek Watershed, revisit the subspecies from a molecular perspective and determine if this taxon is a "genetic sponge":** (a) Are both clades represented in the Scott Creek Watershed genome of *Arctostaphylos crustacea* subsp. *crinita*, with *Arctostaphylos andersonii*, *Arctostaphylos glutinosa* [referencing both *Arctostaphylos andersonii* and *Arctostaphylos canescens* genes], *Arctostaphylos sensitiva* and the ancestral influence of *Arctostaphylos uva-ursi* and the current association with *Arctostaphylos crustacea* subsp. *subcordata* [where the inferred presence of the former and documented existence of the latter occur sympatrically on the Schoolhouse Ridge] morphological fingerprints appearing throughout the population? (b) Leaving the Scott Creek "Chalks", where tetraploid *Arctostaphylos crustacea* subsp. *crinita* co-exists with at least four diploid species, do a genetic profiling of the lower elevation, isolate *Arctostaphylos crustacea* subsp. *crinita* populations occurring within several disjunct chaparral communities and see if they possess less complex parentages and earlier speciation patterns [see pages 49, 92-93, 98-99, 186, 187-188 and 209 of this essay]. (c) As one progresses up the Schoolhouse Ridge towards the "Chalks", the overall gestalt/physical profile of individual *A. crustacea* subsp. *crinita* plants is so variable, that one can take fewer than 30 steps and observe what appears to be two or three dozen distinct taxa, all linked by a basal burl. Are all these "phases" of *Arctostaphylos crustacea* subsp. *crinita* basically the same on a molecular level or are some of the more extreme [divergent from the type] foliar/floral patterns, supported by equally distinct genetic fingerprints? (d) Is pollen fertility lower in this taxon due to its polyphyletic origin, which incorporates species from two different clades?..... (#62) Examine the putative polyphyletic nature of the ***Castilleja affinis* complex** residing within the Scott Creek Watershed and its environs, to determine: if *Castilleja subinclusa* subsp. *franciscana* (upswept apices of calyx/exserted galea from below lower lip, pedicellate flowers), *Castilleja applegatei* (combination of glandular herbage with wavy leaf margins), *Castilleja latifolia* (leaves and bracts oblong/sub-entire and thick), *Castilleja foliolosa* (occasional forked trichomes) and *Castilleja wightii* (bracts/calyces yellowish in coloration, galea barely exserted, inflorescences congested and along with multi-branched stems and herbage, sticky-glandular) genes, in varying degrees, are represented within this exceedingly variable taxon's genome. In the early 1980s, comprehensive collections/pressings were made from the Swanton area and deposited with the Jepson Herbarium for study/diagnostic usage and incorporated into Dr. Lawrence Heckard's ongoing *Castilleja* studies. **All of the above described characteristics, in various combinations, were found in the specimens collected..... some as**

solitary examples, while others reappeared throughout the watershed..... (#63) Within the area defined by this essay, there are several native taxa or related sets of taxa that need relationship clarification on a molecular level, which could provide thesis material for interested students. Some of these problematic areas, which could provide lines of research in systematics, speciation, co-evolution and reproductive isolating mechanisms, are as follows: [1] **The relationship between *Luzula comosa* var. *comosa* and *Luzula subsessilis*, which have overlapping seed size/shape and style lengths;** [2] ***Triteleia laxa* (the widespread forma typica) versus the distinctive coastal headland form, as to habitat, stature, flower shape/color, filament/anther presentation and breeding behavior;** [3] **The relationship of the localized *Brodiaea* aff. *elegans* complex (growing across the exposed grass covered crest of the Seymore Hill) relative to the *Brodiaea terrestris* subsp. *terrestris* populations, scattered throughout the lower elevation grasslands within the Scott Creek Watershed and the coastal prairie aka Western Terrace;** [4] **Revisiting the *Fritillaria affinis* complex locally, from both an ecological and molecular perspective and elucidating the status of the distinctive coastal bluff isolate, which shows affinities to the taxon found north of San Francisco Bay formerly classified as *Fritillaria lanceolata* var. *tristulis*;** [5] **On the n-end of Swanton Road, growing on the seasonally moist bedding planes which constitute the original Highway 1 (above and overlooking Washout Turn), are populations of *Isolepis carinata* and *Isolepis cernua* (locally rare annual form) growing so intermixed, that one could easily mistake the two taxa as one polymorphic entity..... (a) With a shared phenology and physical proximity, is there any exchange of genetic material and is it even possible or are these two related taxa reproductively isolated? (b) With the principal form of *Isolepis cernua* locally, being perennial and primarily restricted to year round moist edges of the coastal prairie and near-vertical cliffs proximal to the ocean and the locally rare annual form found in seasonally wet habitats, are there differences on a molecular level between these two forms that are co-evolved with the underlying hydrology..... and is this annual/perennial dimorphism analogous to the local behavior of *Erythranthe grandis*, which can have what purports to be annual growth status growing on seasonally wet waterfall/cliff faces overlooking the gulchlets draining under Highway 1, while a perennial rhizomed form grows locally in continually moist ditches and coastal marshes?..... (#64) The Scott Creek Watershed and its environs plays host to two genera within the Family Asteraceae/Tribe Astereae, that have elevationally differing forms that parallel each other, namely: *Corethrogyne filaginifolia* var. *filaginifolia*/*Corethrogyne filaginifolia* var. *californica* and *Heterotheca sessiliflora* subsp. *bolanderi*/*Heterotheca sessiliflora* subsp. *echioides*: (a) What are the evolutionary advantages/selection pressures, in having the immediate coastal forms being low growing in stature and with few or single flowered inflorescences compared with the more interior/higher elevation relatives, with often rigidly erect growth patterns and inflorescences with numerous, smaller in stature, flowers?..... (b) Are both forms of each taxon, independently derived from a previously existing species or is one of the two existing forms older and the other form derived from it?..... (c) Within a given locale, even if the two forms are interfertile should their ranges overlap, if one of the two forms were to disappear, is the other form genotypically stable enough, that it would breed true to its type even if it were the derived form?..... (d) Following up on the previous question, what constitutes a species, if closely related taxa capable of gene exchange when occurring sympatrically but show no intermediacy when geographically separated? (e) Factoring in the different chemical signatures of the two *Heterotheca* subspecies, what other differences exist on a molecular level, between these two sets of related taxa, that allow for exchange of genetic material where both types occur sympatrically but when isolated over time, could theoretically result in speciation?..... (#65) **Expanding on Query #62, part 5:** On the ocean side of the Santa Cruz Syncline, mainly on what is termed the**

Western Terrace, two taxa lumped as one species (*Isolepis cernua*) occur but not sympatrically. The perennial phase of *Isolepis cernua* occurs mainly on wet seeps/cliff faces overlooking the ocean with a few isolate populations growing in hydrologically unique "lens" along the edge of the Western Terrace, while the singularly uncommon annual form, has been found only twice.... growing intermixed with *Isolepis carinata* on exposed, seasonally moist bedding planes that constituted the original Highway 1 (n-end of Swanton Road above Washout Turn) **and** growing without the companionship of *Isolepis carinata* along a seasonally moist dirt road, between Big Willow Marsh and the Frog Pond. Are these two phases of *Isolepis cernua* one and the same species or are two separate entities, which if studied from a molecular perspective, would both prove to be valid but distinct taxa in their own right? Where *Isolepis carinata* and *Isolepis cernua* occur intermixed on the original Highway 1 roadbed, is there any gene flow between these two related taxa and what are the ecological underpinnings, that allow two related annual species, one uncommon and the other rare (*I. carinata* and *I. cernua*), to co-exist in such proximity, while the two "forms" of *I. cernua*, at least in the area covered by this essay, display no evidence of sympatry? **Is the local annual form of *I. cernua*, in actuality, an undescribed but related taxon?..... (#66)** With three members of the *Rumex salicifolius* complex occurring within the area circumscribed by this essay, namely *Rumex californicus*, *Rumex crassus* and *Rumex transitorius*, and two of these taxa found growing sympatrically, several taxonomic issues need to be addressed: (a) On a molecular level, are each of these three taxa sufficiently distinct to warrant species status?, (b) what vectors [wind, insects or autogamy/self-fertilization] act as pollinating mechanisms?, (c) where these taxa occur sympatrically, as with *R. californicus* and *R. transitorius* along Swanton Road, is gene flow [reciprocal or unilateral] possible or are these two "species", reproductively isolated?, (d) two non-native *Rumex* species, [*R. conglomeratus* and *R. crispus*], both vertically aligned taxa, are also growing sympatrically with *R. californicus* and *R. transitorius*..... is gene exchange possible, and if so, is there any evidence of such hybridization in the Swanton Road populations? and (e) if a large sampling of achenes from the sympatric plants of *R. californicus* and *R. transitorius* growing along Swanton Road were raised out, would the offspring of both taxa come true to type?..... (#67) Do a comparative study of the climbing (scandent) native taxa within the Scott Creek Watershed from an engineering perspective and the structural efficiency of the various solutions each species has arrived at. Differing strategies being as follows: *Antirrhinum kelloggii* (aerial stems supported by elongate, filiform pedicels); *Calystegia purpurata* subsp. *purpurata* (aerial stems twining); *Lathyrus vestitus* subsp. *puberulus* (tendrils derived from rachis), *Lonicera hispidula* (aerial stems long lived, sub-ligneous with age and bearing a strong resemblance to the lianas of the tropics), *Toxicodendron diversilobum* (aerial stems often reaching 15-20+ meters and attached to tree trunks by adventitious rootlets), *Clematis lasiantha* (climbing stems subligneous and anchored by petioles of the opposite compound leaves), *Galium porrigens* var. *porrigens* (scandent, multi-branching aerial stems retrorse-scabrous along stem edges) and *Marah fabacea* (usually branched tendrils, emerging out of stems opposite leaves). **Recently observing the California man-root in situ, I noticed that the usually trichotomous tendrils behaved in two concurrent patterns..... when the tendril branch was not in contact with any surface, it remained +/- straight without any coiling, while a sister tendril branch in direct contact with any supporting structure, immediately started coiling around said anchor and ultimately the entire tendril branch formed a spring like coil, giving both stability when no air motion was present but flexibility during peak periods of turbulence..... (#68)** Starting with the documented existence of *Juncus hesperius* x *Juncus patens* hybrids and the raising from in situ collected seed, an F2 generation (see pages 14-15, 48-49 and 241-242 of this Essay)..... **is the variability of the local parental populations wholly the result of intraspecific gene flow or do the sympatric occurring F1 hybrids (due to**

their longevity/potential for selfing, outbreeding and apomixis), have some influence on either or both parents? [1] Do DNA profiling of both parents growing proximal to any given hybrid and look for hybrid genes or fragments thereof, within the parental genomes. [2] Do some or all hybrid inflos begin with pollen/stigmas maturing at differing times with the gradual development of the inflos shifting to a self-pollinating mode and ultimately some flowers displaying apomictic behavior or in sequential terms, possibly mixing it up?.... (#69) As a weed suppressor, atmospheric nitrogen collector, annual in duration, relatively low growing in stature, food source for pollinating bees, minimally dependent on Summer water and native in origin, *Lotus purshianus* = *Acmispon americanus* offers managers of orchards and similar agricultural venues, a local taxon relatively easy to obtain seed from and once established, self sowing. This is a research project eminently worthy of consideration, with the in situ behavior of said taxon easily observed from Swanton Road and the adaptation from a naturally occurring environment to orchard use presenting few if any ecological problems.... (#70) Do an ecological, morphological and molecular review of the reduced-in-stature coastal headland/bluffs (between Greyhound Rock and Scott Creek Beaches) taxon (see page 236 of this Essay), tentatively placed within the *Elymus glaucus* subsp. *virescens* circumscription and compare with: (a) the type from the Olympic Mountains; (b) coastal headland populations north of San Francisco Bay (e.g. Bodega Bay, Sonoma County); (c) is absence or presence of an awn (1-7mm) on glumes and lemmas, the principal character used to distinguish subsp. *virescens* from subsp. *glaucus*, and if so, does the gross difference in overall stature between the the immediate coastal bluff taxon and the circa one mile inland form (separable from subsp. *glaucus*, not in stature but reduced to absent awns on glumes/lemmas) represent ecological rather than genetic imposed differences? (d) if the coastal bluff taxon is a genetically stable and separable from subsp. *glaucus* on either a species or subspecies level, are the populations (looking like short awned to awnless *Elymus glaucus* subsp. *glaucus* plants) between the north end of Swanton Road and the Last Chance Road, the result of introgressive hybridization between these two taxa?.... (#71) In Santa Cruz County, *Triphysaria micrantha* is documented by only two herbarium pressings [see page 136 of this Essay] and these represent this locally rare taxon, as found within the Scott Creek Watershed, in a very localized area on the Magic Triangle Ridge. From an ecological perspective, it is noteworthy that *Triphysaria micrantha* was discovered growing in amongst populations of two other members of the *Triphysaria* genus, namely *Triphysaria eriantha* sensu lato [the sympatric colonies displayed a mixture of both subsp. *eriantha* and subsp. *rosea* traits] and *Triphysaria pusilla*. Showing some degree of intermediacy/shared characters, is *Triphysaria micrantha* phylogenetically distinct from its two sympatric relatives or is it of hybrid origin, the parents being *Triphysaria eriantha* and *Triphysaria pusilla*?.... (#72) With 2,500+ envelopes of seed [achenes, cypselae, nutlets, etc.] and dried plant material [for DNA extraction] documenting the "native" flora of the Scott Creek Watershed/environs and several of the taxa considered endangered, locally rare, imperfectly understood from a taxonomic perspective or principally known from herbarium sheets with fragmentary ecological data, a vast amount of research material now awaits the intrepid scholar looking for both masters and doctoral theses themes, principally dealing within the area of California floristics [see pages 227-256 of this Essay]. For example, there are 20+ separate populations of 1B.2 listed *Stebbinsoseris decipiens* now documented via comprehensive cypselae collections, with several of said populations lacking the presence of one or both diploid parents [*Microseris bigelovii* and *Uropappus lindleyi*] and often showing morphological dissimilarities between each other. Raising out ex situ populations of this rare allopolyploid derivative, from each of the in situ documented populations, could yield valuable data as to population formation, whether through

hybridization via the diploid parents, intra specific crosses within the population, via selfing or where two separate populations are proximal to each other, inter-population gene flow. As with any of the aforementioned collections documenting the Scott Creek Flora, herbarium pressings taken from the ex situ raised populations would contribute a valuable data base for further research and take collecting pressures off of the in situ populations..... (#73) Initiate an ecological study, showing how genetic diversity of a given taxon thru asexual/vegetative means, can distribute its particular genome away from the parental stock via elevated stream activity or some similar disruptive agency. Example #1: Salix stems and branches moved down stream during a storm event and lodging/captured on a sandbar; Example #2: Rubus ursinus canes, after having overhanging tips immersed streamside and developing clusters of roots apically, detaching from mother plant and moving via water action further downstream and reestablishing itself after being partially buried streamside.

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 Scott 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 listed and locally rare, 123+ are known to have occurred or currently reside within the watershed and its surroundings.

The second edition (2013) of the aforementioned Annotated Checklist, now authored by Dylan Neubauer, lists 1,594 vascular plant taxa (1,038 native and 556 non-native, naturalized) documented from Santa Cruz County. The percentage of taxa, both native and introduced for the Scott Creek Watershed/environs, has not appreciably changed since the 2005 edition came out. Itemized below, are those native taxa found (currently or historically) within the area covered by this Essay, that fall under the designation of Listed Taxa and their present status:

Agrostis blasdalei/Blasdale's bent grass [1B.2/Sen] [S/NC] (*/**)

Amsinckia lunaris/bent-flowered fiddleneck [1B.2/Sen] [S/NC] (**/**)

Arctostaphylos andersonii/Anderson's manzanita [1B.2] [S] (*)

Arctostaphylos glutinosa/Schreiber's manzanita [1B.2] [S] (**/**)

Arctostaphylos ohloneana/Ohlone manzanita [1B.1] [S]

Calandrinia breweri/Brewer's calandrinia [4.2] [S] (**)

Collinsia multicolor/San Francisco collinsia [1B.2] [S/NC] (**/**)

Elymus californicus/California bottle-brush grass [4.3] [S] (**/**)

Erysimum franciscanum/San Francisco wallflower [4.2] [Dylan's Garden] [NC] (**/**)

Horkelia cuneata var. *sericea*/Kellogg's horkelia [1B.1] [NC] (**/**)

Hosackia gracilis/harlequin lotus [4.2] [NC] (**/**)

Micropus amphibolus/Mt. Diablo Cottonweed [3.2] [S/NC] (**/**)

Microseris paludosa/marsh microseris [1B.2] [S/NC] (**/**)

Pentachaeta bellidiflora/white-rayed pentachaeta [FE/CE/1B.1 X] [S] (*)

Perideridia gairdneri subsp. *gairdneri*/Gairdner's yampah [4.2] [[NC] (**/**)

Pinus radiata/Monterey pine [1B.1] [S/NC] (*)

Piperia michaelii/Michael's rein orchid [4.2] [NC] (*)

Plagiobothrys chorisianus var. *chorisianus*/Choris's popcorn-flower [1B.2] [S/NC] (**/**)

Plagiobothrys diffusus/San Francisco popcorn-flower [CE/1B.1] [S] (**/**)

Sanicula hoffmannii/Hoffmann's sanicle [4.3] [S] (**/**)

Silene verecunda subsp. *verecunda*/San Francisco campion [1B.2] [NC] (**/**)

Stebbinsoseris decipiens/Santa Cruz microseris [1B.2] [S/NC] (**/**)

Trifolium buckwestiorum/Santa Cruz clover [1B.1/Sen] [S] (**/**)

Below, is a partial overview of those native taxa documented as currently occurring or previously documented for the Scott Creek Watershed sensu strictu [S] and its immediate environs [NC], between s-end Scott Creek Beach and n-end of Greyhound Rock Beach/Post Rock, which currently have no agency listed status but are considered rare/uncommon within Santa Cruz County, some of which, may warrant listed status in the future:

Abronia latifolia/yellow sand-verbena [NC] (*)

Acmispon cytisoides/Bentham's trefoil [NC]

Acmispon maritimus var. *maritimus*/coastal trefoil [S] (**)

Agoseris apargioides var. *apargioides*/seaside agoseris [Dylan's Garden][NC] (**/**)

Agoseris heterophylla var. *heterophylla*/annual agoseris [S] (**/**)

Agoseris hirsuta/Coast Range agoseris [S] (*)

Agrostis densiflora/California bent grass [NC] (**/**)

Agrostis exarata/robust, awned_awnless old marsh occurring form/spike bent grass [S] (**)

Agrostis microphylla/small-leaf bent grass [S/NC] (**/**)

Agrostis scabra/rough bent grass [S] (*)

Allophyllum divaricatum/straggling gilia [S] (*)

Amelanchier utahensis/Utah service-berry [NC] (**/**)

Angelica tomentosa/woolly angelica [S] (**)

Apiastrum angustifolium/wild celery [S/NC] (**/**)

Arctostaphylos crustacea subsp. *subcordata* [S] (**/**)

Aspidotis californica/California lace fern [S] (*)

Astragalus gambelianus/Gambel's milkvetch [S/NC] (**/**)

Atriplex leucophylla/beach saltbush [NC]

Athysanus pusillus/dwarf athysanus [S] (**/**)

Berberis nervosa/Cascades barberry [S]

Berberis pinnata subsp. *pinnata*/coast barberry [S/NC] (*)
Blechnum spicant/deer fern [S]
Bowlesia incana/hoary bowlesia [S] (**)
Calamagrostis nutkaensis/Pacific reed grass [S/NC] (**)
Calypso bulbosa var. *occidentalis*/calypso orchid [S/NC]
Calystegia subcaulis subsp. *subcaulis*/hill morning-glory [Dylan's Garden] [NC]
Cardamine californica/California milk-maids [var. *integrifolia*] [S] (*)
Carex exsiccata (*C. vesicaria* var. *major*)/western inflated sedge [S]
Carex gracilior/slender sedge [S] (**)
Castilleja attenuata/Valley tassels [S] (**)
Castilleja densiflora subsp. *densiflora*/owl's-clover [*O. densiflorus* var. *noctuinus*] [S] (**)
Castilleja exserta subsp. *latifolia*/banded owl's-clover [NC] (**)
Castilleja subinclusa subsp. *franciscana*/Franciscan paintbrush [S] (*)
Caulanthus lasiophyllus/California mustard [*T. lasiophyllum* var. *inalienum*] [NC] (*)
Cirsium quercetorum/brownie thistle [S/NC] (**)
Clarkia aff. *davyi*/Davy's clarkia [S/NC] (**)
Clarkia aff. *prostrata*/prostrate clarkia [NC] (**)
Clarkia purpurea subsp. *purpurea*/godetia [S/NC] (**)
Claytonia exigua subsp. *exigua* [S/NC] (**)
Claytonia siberica/candy flower [S] (**)
Clematis lasiantha/chaparral clematis [S] (**)
Crassula aquatica/water pygmy-weed [S] (*)
Cryptantha flaccida/nievitas [S] (*)
Cryptantha torreyana var. *pumila*/dwarf cryptantha [S] (**)
Delphinium californicum subsp. *californicum*/California larkspur [S] (**)
Delphinium decorum subsp. *decorum*/coast larkspur [NC] (**)
Delphinium hesperium subsp. *hesperium*/western larkspur [S] (*)
Deschampsia cespitosa subsp. *holciformis*/California hair grass [S/NC] (**)
Deschampsia danthonioides/annual hair grass [S] (*)
Dichondra donelliana/dichondra [S] (**)
Epilobium hallianum/Hall's willow herb [S/NC] (**)
Erythranthe arenicola [NC] (*)
Erythranthe arvensis/blunt-calyxed monkeyflower [S/NC] (**)
Festuca elmeri/Elmer's fescue [S] (**)
Festuca roemerii var. *klamathensis*/Roemer's fescue [NC] (**)
Festuca subulata/bearded fescue [S] (*)
Festuca subuliflora/crinkle-awn fescue [S] (**)
Galium trifidum subsp. *columbianum*/trifid debstraw [S] (**)
Gilia achilleifolia subsp. *multicaulis*/many-stemmed gilia [S] (**)
Gilia clivorum/grassland gilia [S/NC] (**)
Goodyera oblongifolia/rattlesnake plantain [S]
Heterotheca sessiliflora subsp. *bolanderi*/Bolander's sunflower [S/NC] (**)
Hippuris vulgaris/mare's-tail [S] (**)
Isolopis carinata/dwarf club rush [NC] (**)
Isolopis cernua/low club rush [annual form] [NC] (**)
Juncus acuminatus/sharp-fruited rush [S] (**)
Lasthenia glaberrima/smooth goldfields [S] (*)
Lasthenia gracilis/common goldfields [NC] (**)

Layia guillardoides/woodland layia [S] (*/**)
Leptosiphon bicolor/bicolored leptosiphon [S]
Ligusticum apiifolium/celery-leaved licorice-root [S/NC] (*/**)
Lupinus formosus var. *formosus*/summer lupine [S] (*/**)
Lomatium caruifolium var. *caruifolium*/caraway-leaved lomatium [S/NC] (*/**)
Luzula subsessilis/short-stalked wood rush [S/NC] (*/**)
Malacothrix floccifera/woolly malacothrix [S] (*/**)
Micropus californicus var. *subvestitus*/green cottonweed [S/NC] (*/**)
Microseris bigelovii/Bigelow's microseris [S/NC] (*/**)
Mimetanthe pilosa/downy monkeyflower [S]
Myosurus minimus/common mouse tail [S] (*)
Nemophila menziesii var. *menziesii*/baby blue-eyes [S]
Nemophila pedunculata/meadow nemophila [S] (*/**)
Nemophila aff. *pulchella* var. *fremontii*/Fremont's nemophila [S] (*/**)
Pentachaeta alsinoides/tiny pentachaeta [NC]
Phacelia suaveolens/sweet-scented phacelia [S]
Phalaris angusta/timothy canary grass [S]
Piperia unalascensis/Alaska rein orchid [NC] (*)
Plagiobothrys bracteatus/bracted popcornflower [S] (*/**)
Plantago elongata/California coast plantain [NC] (*/**)
Plectritis ciliosa/long-spurred plectritis [S] (**)
Poa unilateralis subsp. *unilateralis*/San Francisco bluegrass [NC] (*/**)
Polypodium scouleri/leather-leaf fern [S] (*)
Prunus emarginata/bitter cherry [S]
Ranunculus uncinatus/barbed buttercup [S] (**)
Rubus spectabilis/salmonberry [S] (*/**)
Rumex californicus/California dock [S] (*/**)
Rumex occidentalis/western dock [S/NC] (*/**)
Rumex transitorius/willow dock [S] (*/**)
Sagina maxima subsp. *crassicaulis*/thick-stemmed pearlwort [NC] (*/**)
Spiranthes romanzoffiana/hooded lady's-tresses [S/NC] (*)
Stachys chamissonis/swamp stachys [NC] (*/**)
Thysanocarpus laciniatus/narrow-leaved fringedpod [S/NC] (*/**)
Trifolium grayi/Gray's clover [S] (*/**)
Trifolium obtusiflorum(+ var. *cruzense*) /clammy clover [S] (*/**)
Trifolium wormskioldii/cow clover [NC] (*)
Triphysaria eriantha subsp. *eriantha*/butter-and-eggs [intermixed/sympatric with subsp. *rosea* populations] [S/NC] (*/**)
Triphysaria micrantha/purple-beaked owl's clover [S] (*)
Vicia hassei/slender vetch [S] (*/**)
Wyethia angustifolia/narrow-leaved mule's-ears [NC] (*/**)
Wyethia glabra/Coast Range mule's-ears [S] (**)
Xerophyllum tenax/bear-grass [S] (one plant collected/deposited with UCSC Arboretum)
Yabea microcarpa/California hedge-parsley [S/NC] (*/**)

Note: Taxa included in the above two listings followed by (*), have been documented with herbarium pressings, while the (**) designation, denotes seed collections.

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 Scott 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*, *Ericameria*, *Erigeron*, *Eriophyllum*, *Euthamia*, *Filago**, *Gnaphalium**, *Grindelia*, *Helenium*, *Hemizonia**, *Heterotheca*, *Hieracium*, *Jaumea*, *Lasthenia*, *Layia*, *Lessingia**, *Madia**, *Malacothrix*, *Micropus*, *Microseris*, *Pentachaeta*, *Petasites*, *Psilocarphus*, *Rafinesquia*, *Senecio*, *Solidago**, *Stebbinsoseris**, *Stephanomeria*, *Symphiotrichum*, *Uropappus*, *Wyethia* and *Xanthium*).

- **Aster chilense* = ***Symphiotrichum chilense***
- **Aster subspicatus* = ***Symphiotrichum subspicatum***
- **Aster radulinus* = ***Eurybia radulina***
- **Filago californica* = ***Logfia filaginoides***
- **Gnaphalium bicolor* = ***Pseudognaphalium biolettii***
- **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* = ***Gamochoaeta 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 **Themidaceae

Chlorogalum* placed in **Agavaceae

Prosartes (Disporum)* placed in **Colchicaceae

Smilacina* moved to *Maianthemum* and placed in **Ruscaceae

Toxicoscordion (Zigadenus)*, **Trillium* and **Xerophyllum* placed in **Melanthiaceae

**Hierochloe occidentalis* = *Anthoxanthum occidentale*

**Leymus triticoides* = *Elymus triticoides* subsp. *triticoides*

**Leymus xancouverensis* = *Elymus xancouverensis*

**Nassella lepida* = *Stipa lepida*

**Nassella pulchra* = *Stipa pulchra*

**Vulpia microstachys* var. *pauciflora* = *Festuca microstachys*

**Vulpia octoflora* vars. *hirtella/octoflora* = *Festuca octoflora*

Lemna placed in the **Araceae**

Sparganium placed in the **Typhaceae**

The Apiaceae contributes **15** genera: *Angelica*, *Apiastrum*, *Bowlesia*, *Cicuta*, *Daucus*, *Eryngium*, *Heracleum*, *Hydrocotyle**, *Ligusticum*, *Lomatium*, *Oenanthe*, *Osmorhiza*, *Perideridia*, *Sanicula* and *Yabea*.

Hydrocotyle* now placed in the family **Araliaceae

The Rosaceae contributes **13** genera: *Acaena*, *Adenostema*, *Amelanchier*, *Aphanes*, *Fragaria*, *Heteromeles*, *Holodiscus*, *Horkelia*, *Oemleria*, *Potentilla**, *Prunus*, *Rosa* and *Rubus*.

**Potentilla glandulosa* = *Drymocallis glandulosa* var. *glandulosa*

The Fabaceae contributes **11** genera: *Acmispon**, *Astragalus*, *Hoita*, *Hosackia**, *Lathyrus*, *Lupinus*, *Pickeringia*, *Rupertia*, *Thermopsis*, *Trifolium* and *Vicia*.

*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. *biolettii* = *Acmispon junceus* var. *junceus* and var. *biolettii*, *Lotus micranthus* = *Acmispon parviflorus*, *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 balsamic scented glands, fall within the circumscription of *Hosackia balsamifera* Kell.).

The Scrophulariaceae formerly contributed **10** genera: *Antirrhinum**, *Castilleja**, *Collinsia**, *Keckiella**, *Linaria**, *Mimulus**, *Pedicularis**, *Scrophularia*, *Triphysaria** and *Veronica*.*

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

Within the Phrymaceae, several local taxa originally called *Mimulus*, now have been placed within a new genus, namely *Erythranthe*. The following members of the *Mimulus guttatus* alliance are now called *E. arenicola*, *E. arvensis*, *E. grandis*, *E. guttata*, *E. microphylla* and *E. nasuta*, while the annual/perennial duo of *Mimulus floribundus*/*Mimulus moschatus* will be known as *E. floribunda*/*E. inodora*. Rounding out the nomenclatural changes for related taxa within the Scott Creek Watershed, *Mimulus cardinalis* is now *Erythranthe cardinalis* and *Mimulus aurantiacus* becomes *Diplacus aurantiacus*.

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*, *Emmenanthe*, *Eriodictyon*, *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*.

The Plantaginaceae contributes **7** genera: *Antirrhinum*, *Collinsia*, *Hippuris*, *Keckiella*, *Linaria**, *Plantago* and *Veronica*.

Linaria canadensis* = *Nuttallanthus texanus***

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

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!**

Within the Primulaceae, the following nomenclatural changes for two local taxa have taken place: *Dodecatheon clevelandii* subsp. *sanctarum* = *Primula clevelandii* var. *gracilis* and *Dodecatheon hendersonii* = *Primula hendersonii*

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 scouleriana*), 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. While current [2013] treatment of this taxon, place it within the circumscription of *Trifolium barbigerum*, more work from both a molecular and biogeographical approach, needs to be done. It is fortunate, that ex situ populations have been raised and their seed collected, for the original Old H-H Ranch populations have been extirpated.**

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 Scott Creek Watershed! A third taxon, *Arctostaphylos andersonii* Gray, endemic to central and southern portion of the Santa Cruz Mountains, occurs in the upper reaches of the Scott Creek Watershed, both as a species and a component of the burl-forming**

"genetic sponge" know as *Arctostaphylos crustaceae* subsp. *crinita* and co-parent to *Arctostaphylos glutinosa*.

Note: An insular disjunct or reasonable facsimile thereof, *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 noctuinus* 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 phyanthum*)***, 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 Scott 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 Scott 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 [as of the 08/2014, the number now approaches 3,000] 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 four 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 Scott 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. Acting as a very important custodial support to the contributions made by the aforementioned UCSC trio, is Brett Hall..... also a UCSC graduate and current director of the UCSC Arboretum, which as 11/2013, houses more than 2,600 envelopes containing seeds and extensive in situ collected diagnostic material, validating the biodiversity of the Scott Creek Watershed and complimenting the equally extensive herbarium documentation housed in the Jepson Herbarium, UC Berkeley. Equally important in the ongoing clarification of the watershed's natural history, have been the contributions of six established scientists/teachers with broadbased research backgrounds, namely Roberta Smith, Ph.D./geologist (the geomorphology of the watershed), Ronald Taskey, Ph.D./soil scientist (soils, past and present, their origins and ongoing evolution), 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). During the 2013 school year, an immensely gifted young CalPoly graduate student of Dr. Matt Ritter, Taylor Crow, defended his Master's Thesis dealing with the *Monardella villosa* complex (TESTING SUBSPECIES LIMITS IN *MONARDELLA VILLOSA*) and with equally penetrating insight, Mark Gormley produced a Masters Thesis of seminal importance, titled "The Influence of Hydrogeomorphology, Soil Redox Reactions, and Salinity on the Spatial Zoning of *Typha latifolia* L., *Distichlis spicata* (L.)Greene, and *Juncus lesueurii* Boland In Scott's Creek Marsh, Swanton Pacific Ranch, CA". One can only hope that these will be the first of many such research endeavors focusing on the Scott Creek Watershed's biodiversity. 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 Scott 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!

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

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* = *Calandrinia menziesii*) 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. Growing bankside and with inflorescences comprising several reduced-in-scale capitula, a lone plant of California-aster (*Corethrogyne filaginifolia* var. *filaginifolia*) leapfrogs over its more coastal sister, var. *california*, which occurs further along Swanton Road adjacent to Harry Wain’s Arroyo. Offering companionship, also solitary in representation, sticky cinquefoil (*Drymocallis glandulosa* var. *wrangelliana*) makes sporadic appearances as our journey progresses. 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*, *Corethrogyne filaginifolia* (var. *filaginifolia*), *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* = *Diplacus aurantiacus*, *Stachys bullata*, *Drymocallis glandulosa* var. *glandulosa*, *Castilleja affinis* subsp. *affinis*, *Pteridium aquilinum* var. *pubescens*, *Symphytotrichum 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 subsessilis*, *Piperia michaelii*, *Galium porrigens* var. *porrigens*, *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 (*Carex harfordii* matrix), *Juncus occidentalis*, *Dudleya caespitosa*, *Eschscholzia californica*, *Eriogonum latifolium* (closer to coastal bluff form than more inland *Eriogonum nudum* phase), *Pseudognaphalium biolettii*, *Carex brevicaulis*, *Acmispon glaber* var. *glaber* (along this section of Swanton Road, some plants are definitely prostrate in mode of growth and worth studying, to determine if this growth pattern is genetically fixed), *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 lasiolepis* (both species of *Salix* growing side by side where Washout Turn Gulch goes under Swanton Road), *Polypodium calirhiza* (lowermost pinna shorter than succeeding ones), *Delphinium decorum* subsp. *decorum*, *Festuca roemerii* var. *klamathensis* (one cespitose tussock perched at edge of grassland/road bank interface, overlooking Swanton Road), *Triteleia laxa*, *Mimulus guttatus* (aff. var. *arvensis*. = *Erythranthe microphylla*?....annual, truncate calyces, open corolla with suppressed folds/ridges in throat, inodorus), *Pterostegia drymarioides*, *Silene verecunda* (subsp. *verecunda*), *Stebbinsoseris decipiens* (due to road work....extensive grading in preparation for resurfacing, only one spent plant was observed for the 2011 season), *Sidalcea malviflora* subsp. *laciniata* (robust plant with ascending inflorescences circa 50+ centimeters in height and displaying mature fruiting bodies, clothed with gland-tipped trichomes), *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 Scott 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 centaury (*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* = *Erythranthe arvensis*(?) distinctive annual form found growing on seasonally moist mudstone banks, with calyces subtruncate and glabrous, corollas inodorous and compressed along a dorsal/ventral axis and when growing proximal to *Mimulus guttatus* var. *grandis* = *Erythranthe grandis*, no intermediates found). Revisiting, in 05/2012, this ribbon-like zone with its juxtaposing common and locally rare related species, a second duo of natives was documented..... this time, *Isolepis carinata* and *Isolepis cernua*, were in several instances, growing so intertwined that some clumps appeared to have polymorphic spikelets! While perusing the *Plantago* and *Isolepis* pairings, a lone alba form of *Zeltnera davyi* was observed, giving rise to speculative thoughts as to the horticultural value of this uncommon find and if raised from collected seed and those offspring selfed, what percentage would be white? During the month of May, 2014, extensive documentation via both herbarium pressings and achene collections, was undertaken for both sympatric *Isolepis* taxa. This material, when raised out and/or used for DNA extraction, may clarify: (a) are the annual and perennial forms of *Isolepis cernua*, one and the same species or two separate, genetically distinct, species and (b) is there any gene flow between *Isolepis carinata* and *Isolepis cernua* (annual or perennial forms) when growing sympatrically?

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..... *Lupinus nanus*, *Pseudognaphalium gianonei*, *pro.sp.nov.*, *Eschscholzia californica*, *Diplacus aurantiacus*, *Cardionema ramosissimum*, *Artemisia californica*, *Toxicodendron diversilobum*, *Acmispon glaber* var. *glaber*, *Calystegia purpurata* subsp. *purpurata*, *Plantago erecta*, *Juncus bufonius* var. *bufonius*, *Trifolium willdenovii*, *Eriogonum latifolium/nudum intergrades* (the further one gets from the coastal strand/headlands, the more reduced in stature the flower heads become), *Microseris bigelovii*, *Dudleya caespitosa*, *Marah fabaceus*, *Pinus radiata* (ancient hybrid swarm with a complex reticulate pattern of gene re-segregation..... referenced in growth patterns, needle morphology and ovulate cone gestalt), *Corethrogyne filaginifolia* (var. *californica*, large capitula born singly), *Artemisia douglasiana*, *Eriophyllum staechadifolium*, *Stipa pulchra*, *Cyperus eragrostis*, *Baccharis pilularis* subsp. *consanguinea*, *Horkelia cuneata sensu lato* (some plants with a cinereous indument on adaxial foliar surface tending towards var. *sericea*, which has been documented growing on the adjacent Lasher Marsh bluffs), *Pseudognaphalium biolettii*, *Frangula californica* subsp. *californica*, *Rosa californica*, *Mimulus guttatus* (perennial, var. *grandis*/subsp. *litoralis* = *Erythranthe grandis*, flowers honey scented), *Carex gianonei complex* (TYPE AREA, drainage ditch emptying into Harry Wain's Arroyo), *Lonicera hispidula*, *Juncus patens*, *Juncus hesperius*, *Rubus ursinus*, *Juncus effusus* subsp. *pacificus*, *Persicaria punctata*,

Pteridium aquilinum var. *pubescens*, *Juncus phaeocephalus* var. *phaeocephalus*, *Lupinus variicolor*, *Drymocallis glandulosa* var. *glandulosa*, *Epilobium ciliatum* subsp. *watsonii* (inflorescences dense, flowers subtended by foliaceous bracts), *Helenium puberulum*, *Symphyotrichum chilense*, *Salix lasiolepis* (both this small localized population and its analog, established roadside above the next hairpin turn, may represent *Salix hookeriana* or *Salix hookeriana/lasiolepis* intergrades..... with low-growing, shrub-like gestalt and foliage often broadly ovate [4+ cm wide], with adaxial surface mirror-like in its reflective gloss and the abaxial surface glaucous, the apices rounded to acuminate) , *Veronica americana*, *Hypericum anagalloides*, *Scrophularia californica*, *Plantago subnuda*, *Lupinus arboreus*, *Carex obnupta*, *Solidago velutina* subsp. *californica*, *Stachys bullata*, *Elymus glaucus* subsp. *glaucus*, *Piperia elegans* subsp. *elegans*, *Claytonia perfoliata* subsp. *perfoliata*, *Pentagramma triangularis* subsp. *triangularis*, *Polypodium calirhiza*, *Dryopteris arguta*, *Festuca rubra* (form with diffuse, virtually invisible, distinctly rhizomatous mode of growth), *Adiantum jordanii*, *Melica torreyana*, *Quercus parvula* var. *shrevei*, *Laythrus vestitus* (subsp. *puberulus*), *Agrostis hallii/pallens* intergrades, *Phalaris californica*, *Baccharis glutinosa*, *Barbarea orthoceras*, *Heteromeles arbutifolia*, *Clinopodium douglasii*, *Arbutus menziesii*, *Dichelostemma capitatum* subsp. *capitatum*, *Galium porrigens* var. *porrigens*, *Quercus agrifolia* var. *agrifolia*, *Stachys rigida* var. *quercetorum*, *Solanum douglasii* (forms with both white and lavender tinted corollas occur along this stretch of roadway), *Achillea millefolium*, *Chlorogalum pomeridianum* var. *pomeridianum*, *Sisyrinchium bellum*, *Amsinckia menziesii*, *Sambucus racemosa* var. *racemosa*, *Carex densa*, *Carex subbracteata*, *Pseudognaphalium californicum*, *Pseudognaphalium ramosissimum*, *Agrostis exarata* (var. *exarata*, lemmas awnless..... as one approaches the entrance to the late Harry Wain's residence, both awned and awnless forms grow sympatrically), *Bromus carinatus* var. *carinatus*, *Grindelia hirsutula*, *Madia sativa* (robust, glandular throughout and somewhat acrid in chemical signature..... neither citrus based nor cherry syrup scented), *Fragaria vesca*, *Stipa lepida*, *Vicia americana* subsp. *americana*, *Polygala californica*, *Notholithocarpus densiflorus* var. *densiflorus*, *Urtica dioica* subsp. *gracilis*, *Solanum umbelliferum*, *Cirsium brevistylum*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Symphyotrichum* (aff. *subspicatum*..... involucre bracts foliaceous, sub-equal in length and acute distally in first-to-flower capitula, at least one 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!!!

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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* ($2n=18$) \times *Uropappus lindleyi* ($2n=18$), is the gene flow between the diploid species uni- or bi-directional? Can *S. decipiens* arise equally from *M. bigelovii* \times *U. lindleyi* and *U. lindleyi* \times *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/ \pm persistent 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, successional 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 decumbent 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, subsessile 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. **[Note: Since *Clarkia prostrata* has a chromosome number of n=26, theorized to have arisen from hybridization between *C. davyi* n=17 and *C. speciosa* n=9, is the local albeit rare prostrate taxon with concolored flowers and dk brown non-encrusted seeds, the true *C. davyi* and the erect taxon, assumed to be *C. davyi*, in reality a new species?]** 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. *quadrivulnera*) 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 population, mega-population on upper ridge separating Queseria/Molino drainages [see page 213 of this essay] and inland Seymore Hill populations. The Lasher Marsh and Queseria/Molino Ridge populations are growing on siliceous terrace deposits [possibly eolian in origin], while the Seymore Hill population is established on mudstone derived soil.**

Two distinct components of the *Mimulus guttatus* = *Erythranthe guttata* (for current nomenclature, see page 31 of this essay) complex occupy moist zones above and below the southeast-facing hairpin turn overlooking Harry Wain’s Arroyo. First, is a reduced, inodorous form of var. *arvensis* = *Erythranthe microphylla*(?), with truncate calyces and a deep, open throat with suppressed longitudinal folds that can be found growing on seasonally moist rock faces. **Second, is a rare, immaculate variant of var. *grandis* = *Erythranthe 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. *brunneus* = *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*), sneezeweed (*Helenium puberulum*), unique amongst our native Asteraceae by having a hemispherical receptacle studded with disc flowers and a basal ring of ray-flower ligules, 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* = *Erythranthe guttata* (for current nomenclature, see page 31-32 of this essay) 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 aff. 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* = *Erythranthe nasuta*: 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 \pm 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 possible *E. nasuta* affinities, 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* = *Erythranthe nasuta*: 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. Quadratic 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* = *Erythranthe guttata* 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 (*Erythranthe floribunda*). This localized population is characterized by having..... (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! This population and a parallel one growing in a very localized habitat in the Little Creek sub-watershed, need to be raised out and a comparative analysis done, on ecological, structural and molecular levels.

- (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 three decades ago growing on a sandbar in the upper Scott Creek Watershed, indicating a possible affinity with *Mimulus glaucescens*.
- (e) In Gulch #1 (next gulch southeast of Lasher Marsh Gulch), at least three related taxa belonging to the *Mimulus guttatus* = *Erythranthe guttata* complex [ERYTHRANTHE SECT. SIMIOLA] were observed, studied and/or documented with pressings, in the early 1980s..... growing under the coastal scrub, in seasonally moist areas, was (1) a low in stature annual with truncate calyces, widely opened corollas, scentless and without stolons, while on the waterfall face, (2) a pendant, mat-forming taxon with affinities to a reduced-in-stature *E. grandis*, had established a substantial colony on a waterfall face, and in the lower portion of the gulch, on moss covered exposed mudstone, (3) a cleistogamous form [greatly reduced in stature and showing affinities with *Mimulus guttatus* var. *gracilis* = *Mimulus nasutus* = *Erythranthe nasuta*] 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 lacinate-serrate. As of 11/2014, three of Gulch #1's taxa have been annotated by Guy Nesom, as *Erythranthe arenicola*, *Erythranthe microphylla* and *Erythranthe nasuta*..... a remarkable example of sympatry, between a trio of related taxa growing within a relatively small but topographically complex coastal gulchlet!

Several years ago, while studying the behavior and breeding potential of *Mimulus guttatus* var. *grandis* = *Erythranthe grandis*, I decided to see how my emasculated plants would react when pollen from sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*), scarlet monkeyflower (*Mimulus cardinalis* = *Erythranthe cardinalis*), floriferous monkeyflower (*Mimulus floribundus* = *Erythranthe floribunda*) and musk monkeyflower (*Mimulus moschatus* = *Erythranthe inodorata*) 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* = *Erythranthe grandis* parent. Apparently the placement of foreign pollen on the stigmas of my *Mimulus guttatus* var. *grandis* = *Erythranthe 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* = **the very rare *Erythranthe arenicola*, in part, with the variable as to overall stature and common taxon, *Erythranthe grandis*, usually found growing near base of cliffs and often proximal to beach proper**) cloaks the weathered face of the dampened mudstone, displaying sun drenched corollas redolent of honey. Vying for attention on the precarious wind-buffeted 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 answering: **(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 bougainvillea, yellow sand-verbena (*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* or ***Stephanomeria elata***) **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* = ***Diplacus 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 lasiolepis*), 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 scrub, 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 (*Oemleria cerasiformis*), bracken (*Pteridium aquilinum* var. *pubescens*), Cleveland's cryptantha (*Cryptantha clevelandii* var. *florosa*) and Monterey pine (*Pinus radiata*).

In spite of human activity, encompassing both vehicular and foot traffic, numerous micro-habitats, 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, parasitizes 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-stature 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* or possibly *F. ritteri*), 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 height, 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. **The aforementioned aggregation of rare and locally uncommon taxa are circumscribed in part, by a unique habitat comprising elements of both coastal scrub and a remnant benched marsh, which hosts an extensive population of slough sedge (*Carex obnupta*) and arroyo willow (*Salix lasiolepis*).**

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 wrangelianus* = *Acmispon wrangelianus*), Lindley's varied lupine (*Lupinus variicolor*), 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, Bioletti'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*, **sensu lato**) 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 **subsp. 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 [**usually 6, especially in F2 generation ex situ raised plants**], and the capsules, while \pm 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! Several hybrid taxa have been observed, which due to their expansive "footprint", may be of considerable age [50+ years] and like some other long-lived "native" monocots (e.g., *Calamagrostis rubescens* and *Carex obnupta*), **may expend more energy in asexual vegetative expansion rather than seasonal flowering with copious fruiting! Incompatibility, partial or otherwise, on a chromosomal level may not be the only cause of low viable seed production with this hybrid taxon.** After spending several months [2011-2012] collecting mature inflorescences, placing them in a metal mesh strainers of varying grid sizes and applying a pressure/grinding protocol, viable seeds were sifted thru the cross-hatch apertures and deposited with some chaff into data notated envelopes. In the course of examining the end product under magnification, it became apparent that some fully formed and potentially viable seed often remained attached to the capsule wall, usually near the basal portion!

Prostrate in growth patterns and forming sympatric horizontal patches subject to vehicular and foot-traffic abuse, sand mat (*Cardionema ramosissimum*) and California aster (*Lessingia filaginifolia* var. *californica* = *Corethrogyne filaginifolia*), are two exceedingly long lived and resilient prospects for innovative xeriscaping. Cosmopolitan toad rush (*Juncus bufonius*) is often found in a depauperate state, circumscribing the fluid boundaries of roadside ditches, tinged red and adhering to the desiccative edges like a monoculture of alien moss. Eyeballing each other across 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 (*Symphotrichum 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 involucreal 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 (*Symphotrichum chilense*) as co-participant in the production of a polymorphic hybrid complex or is California aster (*Symphotrichum 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* = *Symphotrichum subspicatum*, has been retrieved from synonymy under *Symphotrichum 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 romanoffiana*) 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** (*Pseudognaphalium gianonei*, **pro. sp. nov.**) is the putative result of hybridization between California cudweed (*Pseudognaphalium californicum*) and cotton batting plant (*Pseudognaphalium 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 androgynous 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 pronounced 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. Montanae) 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 exerted 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 resegmentation 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 1st 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 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 POLYPHYLETIC CAREX GIANONEI GENOME AND IF VIEWED IN TOTO, DO THESE STRUCTURALLY DIFFERING INFLORESCENCES REPRESENT A POTENTIAL POPULATION PASSING FOR AN INDIVIDUAL TAXON?**

Within the Scott 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, gynaeandrous 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 tumulicola*), 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 pallens*), 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..... also along this section of Swanton Road, scattered plants of *Elymus glaucus* subsp. *virescens* occur, differing from the distinctive taxon found growing on the coastal bluffs, overlooking the north and south ends of Greyhound Rock Beach and superficially mimicing subsp. *glaucus* but lacking or possessing lemma awns 1-4mm in length)**, 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* = *Festuca perennis*), 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* subsp. *purpurea*) to the California sagebrush (*Artemisia californica*) 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 muhlenbergii*), 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 wormskioldii*) 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 herbarium pressing (Roy E. Buck, James A. West, 325, Jun 5 1983/JEPS 82780), taken from a population of *Mimulus guttatus* subsp. *littoralis*, growing on a seasonal waterfall face in the s-fork of "Gulch #1", was annotated as *Mimulus guttatus* subsp. *arenicola* in 2011 by Guy Nesom and subsequently transferred by him in 2012, to the newly erected genus *Erythranthe*, as *Erythranthe arenicola* (Pennell) Nesom.

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 Ouales 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 obnupta*), foothill sedge (*Carex tumulicola*)..... salt rush complex (aff. *Juncus breweri*, 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 phaeocephalus* var. *phaeocephalus*)..... coyote brush (*Baccharis pilularis* subsp. *consanguinea*), Canada goldenrod (*Solidago elongata*), California aster (*Symphotrichum chilense*)..... harlequin lotus (*Lotus formosissimus* = *Hosackia gracilis*), Lindley's varied lupine (*Lupinus variicolor*)..... 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*)..... yerba buena (*Clinopodium douglasii*), rigid hedge-nettle (*Stachys rigida* 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* = *Diplacus aurantiacus*) two blooming plants of one-leaved onion (*Allium unifolium*), namesake for this palustrine zone which defines the upper watershed for Gulch #2..... bracken (*Pteridium aquilinum* var. *pubescens*)..... blue-eyed grass (*Sisyrinchium bellum*)..... California buttercup (*Ranunculus californicus* var. *californicus*)..... canyon gooseberry (*Ribes menziesii*)..... slim Solomon's seal (*Maianthemum stellatum*)..... climbing bedstraw (*Galium porrigens* var. *porrigens*)..... poison oak (*Toxicodendron diversilobum*).

Note: Some native species locally, become taxonomic yo-yos, bouncing back and forth either from one genus to another or being subsumed entirely within the circumscription of a more high profile taxon. Such is the case of *Symphotrichum subspicatum*, being moved into then removed from, the locally widespread *Symphotrichum chilensis*, plus the transference from the genus *Aster* to the genus *Symphotrichum*. My herbarium specimen, residing within the Jepson herbarium and collected from the Allium Marsh, is just such a case. The documentation via pressing validating the existence of this chameleon-like taxon within the area being discussed is as follows: *Symphotrichum subspicatum*/JEPS83107/West#351, JUN 11

1983.

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 rigida* 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 elsewhere within the county, can be observed..... Bolander's golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*), narrow-leaved mule ears (*Wyethia angustifolia*), checkerbloom (*Sidalcea malviflora* subsp. *malviflora*), 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 obnupta*), 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 staechadifolium*), purple cudweed (*Gamochaeta ustulata*), California aster (*Symphotrichum chilense*)..... poison oak (*Toxicodendron diversilobum*)..... sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*)..... hairy wood sorrel (*Oxalis pilosa*)..... coast nettle (*Urtica dioica* subsp. *gracilis*)..... California man root (*Marah fabaceus*).....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 capitate 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-scabridulous margins and inflorescences with lower 1-5(+) spikelets compound-congested and occasionally androgynous. 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 Scott 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 within and peripheral to 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 davayi*), Blasdale's bent grass (*Agrostis blasdalei*), western bent grass (*Agrostis exarata*..... var. *monolepis/pacifica*), Blasdale's bent grass x western bent grass hybrids (= *Agrostis "pseudo-densiflora"*..... pressings made and deposited with the Jepson Herbarium, UC Berkeley), toad rush (*Juncus bufonius*..... variable as to stature and inflorescence configuration/pigmentation), brown bog-rush (*Juncus hesperius*), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), brown-headed

rush (*Juncus phaeocephalus* var. *phaeocephalus*), (*Juncus hesperius* x *Juncus patens* hybrids..... several examples of this overlooked/mis-identified hybrid have been found in the Scott Creek Watershed proper and adjacent Western Terrace..... these have been either pressed and sent to the Jepson Herbarium or deposited as living material with the UCSC Arboretum..... the Sandy-bottom Reservoir specimens, were amongst the first examples to be discovered and studied some 30 years ago and at least one of the long established hybrids has yielded some viable seed), short-stalked wood rush (*Luzula* aff. *subsessilis*..... forma typica found on coastal prairie/adjacent headlands, with capitate-congested inflorescences. In need of detailed study, starting with analysis of seed size and configuration, comparing overall range of variability with that found in the more interior *L. comosa* var. *comosa* populations), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), poison oak (*Toxicodendron diversilobum*), California blackberry (*Rubus ursinus*), California figwort (*Scrophularia californica*), California aster (*Symphotrichum chilense*), timwort (*Cicendia quadrangularis*..... a diminutive member of the Gentianaceae, in flower gestalt mimicking a dwarf Brassicaceae, and when observed on 05/21/2011, shorter in height than its latin name is in length!), short-stemmed sedge (*Carex brevicaulis*), dense sedge (*Carex densa*), Gianone sedge (*Carex* x *gianonei* complex..... *Carex harfordii* matrix, with lower 1-5(+) spikelets compound-congested, some spikelets gynaeandrous, androgynous and/or mixed), small-bracted sedge (*Carex subbracteata*..... where growing proximal to *Carex densa*, various phases of *Carex* x *nitidicarpa* have been observed over the past 30+ years, these manifesting more robust, triquetrous flowering culms with scabridulous margins and lowermost 1-5(+) spikelets, usually proportionally larger in scale than those found on *Carex subbracteata* and compound-congested, some of which are androgynous), "imperfect" sedge (*Carex* x *imperfecta*..... growing within/adjacent to the concentrated patch of native monocots above and due east of the Sandy-bottom Reservoir, at least 10 examples of this putative intersectional [Multiflorae x Ovale] cross have been documented/monitored for the past 30 years), foothill sedge (*Carex tumulicola*), dwarf club rush (*Isolepis carinata*), low club rush (*Isolepis cernua*), California brome complex (*Bromus carinatus* aff. *Bromus maritimus*..... lowest glume 3-veined, second glume 5-7 veined, with inflorescence branches appressed-ascending to arcuate and equal to or shorter than the spikelets), California oat grass (*Danthonia californica*), California hairgrass (*Deschampsia cespitosa* subsp. *holciformis*), chaffweed (*Anagallis minima*) and blue-eyed grass (*Sisyrinchium bellum*).

Still within the confines of the coastal prairie and more or less midway between Greyhound Rock and Scott Creek Beaches, **Big Willow Gulch** meanders down from the inner grassland, crosses the prairie/Western Terrace and drains into a bifurcate canyon (west fork draining Pumpkin Field Marsh and surrounding area), **creating a watershed which is home to more than 200 species, sub-species, varieties and forms of native plants, several of extreme rarity.** The best way to describe **Big Willow Gulch** ecologically, is as follows: imagine taking floristic elements from all of the habitats within the Scott Creek Watershed, place them in a giant blender, add water, liquefy, then spill the contents randomly throughout the entire drainage area. Here is an introduction to some of the key players participating in this botanical drama and the unusual juxtapositions in which they present themselves: favoring seasonally wet depressions, coyote thistle (*Eryngium armatum*) and bugle hedge-nettle (*Stachys ajugoides*) thrive amongst hybrids between **Blasdale's bent grass** (*Agrostis blasdalei*) x **western bent grass** (*Agrostis exarata*) and **common rush** (*Juncus patens*) x **brown bog-rush** (*Juncus effusus* var. *brunneus* = *Juncus hesperius*); hidden deep within the *Juncus* clumps that define Big Willow Marsh and further obscured from view by California blackberry (*Rubus ursinus*) canes, one-leaved onion (*Allium unifolium*) and Canada goldenrod (*Solidago canadensis* subsp. *elongata* = *Solidago elongata*) add contrasting color

to the prevailing shades of green, while in a seasonally filled pond within the shadow of the “**Big Willow**” (*Salix lasiolepis*), California water starwort (*Callitriche marginata*), mat-forming with pedicellate fruit often buried deep within the moist substrate, Bolander's water starwort (*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 mimicing sympatric Mexican rush (*Juncus mexicanus*) with rhizomatous, tortile-compressed culms and is joined by another lookalike (at least from a distance), flowering 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: Circmscribed 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. *brunneus* = *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 gairdneri* 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 [compound umbel]..... on 07/20/2011, 6+ plants observed in various stages of floral developement 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 (*Corethrogyne filaginifolia* var. *californica*) soften the harshness of their exposed surroundings with shared canescent herbage but as to flowers, contrasting muted lilac daisy facsimilies 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 *Corethrogyne 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 inflorescences [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* = *Erythranthe grandis*) 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 to near vertical slopes overlooking colonies of thimbleberry (*Rubus parviflorus*) and fraternize with pearly 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 ornamentally 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 darkly 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, which may prove to be the true *Clarkia davyi*?)**, 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 verecunda* subsp. *verecunda* = *Silene verecunda*?); 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 noctuinus*)** and the myriad polychromatic forms of Indian paint-brush (*Castilleja affinis* subsp. *affinis*), red alder (*Alnus rubra*), creek dogwood (*Cornus sericea* subsp. *occidentalis*), 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 common goldfields (*Lasthenia gracilis*?).**

Note: Within the Big Willow Gulch drainage system, goldfields (*Lasthenia* sp.) 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 analagous 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 more than likely, that *Lasthenia gracilis* may occur within this area and one or all 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* aff. *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 Seymore 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!**

Note: During 08/2012, an established but localized colony of *Perideridia kelloggii* was discovered, growing in the transitional zone where the **Pumpkin Field Marsh drains into the w-fork of Big Willow Gulch.**

The section of the Western Terrace aka coastal prairie given the appellation **Pumpkin Field Marsh**, while historically utilized for agriculture during the middle part of the 20th century, presently sustains a remarkable number of native monocots..... **some, as in the case of the *Carex x imperfecta* complex, of potential evolutionary significance providing validation for the thesis of ecological disruption, reproductive isolating mechanisms broached and species formation.** Basically a rectangle the size of a football field and while not a true marsh but a seasonally inundated wetland, the Pumpkin Field Marsh acts as a very valuable repository for several key elements/building blocks in the *Carex x gianonei* (*C. harfordii* matrix) and *Carex x nitidicarpa* syngameon. With more than 100 documented examples of *Carex x imperfecta* found within the circumscription of Pumpkin Field Marsh, some clustered in aggregations of 7+ distinct taxa and others scattered throughout the area as solitary specimens..... a living laboratory presents itself to study some of the following issues: (1) aside from being pistillately non-functional, how morphologically variable are the 100+ hybrid taxa from each other and do they fall into repeatable patterns?, (2) do all the documented *Carex x imperfecta* plants produce functional stamens and are all the flowering culms on any given plant uniform in their behavior?, (3) does the pollen fertility of the functional stamens vary from plant to plant and flowering culms within a given plant?, (4) are the chromosome numbers uniform throughout the 100+ hybrids or do they display a high degree of aneuploidy, knowing the chromosome numbers for the respective parents..... *Carex densa* and *Carex subbracteata*?, (5) can evidence of the hybrid *Carex x imperfecta* genes entering into the sympatric *Carex x gianonei* [*C. harfordii* matrix] and *Carex x nitidicarpa* [*Carex subbracteata* matrix] populations be determined through both visually observable and molecular protocols? Besides the already stated players in the Carices hanky panky, here are some of the associate monocots that give ecological character to this anthropogenically modified section of coastal prairie..... [Juncaceae] *Juncus hesperius*, *Juncus occidentalis*, *Juncus patens*, *Juncus phaeocephalus*; [Cyperaceae] *Carex obnupta*, *Carex tumulicola*; [Poaceae] *Agrostis exarata*, *Agrostis aff. hallii*, *Danthonia californica*, *Deschampsia cespitosa* subsp. *holciformis*, *Elymus glaucus* subsp. *glaucus*, *Hordeum brachyantherum* subsp. *brachyantherum*.

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. *pubiflorum*), California vervain (*Verbena lasiostachys* var. *lasiostachys*), tiny pentachaeta (*Pentachaeta alsinoides*), threadstem madia (*Madia exigua*), dwarf locoweed (*Astragalus gambelianus*), purple sack clover (*Trifolium depauperatum* var. *truncatum*), double-headed clover (*Trifolium macraei*), slough sedge (*Carex obnupta*), foothill sedge (*Carex tumulicola*), small-bracted sedge (*Carex subbracteata*), dense sedge (*Carex densa*), umbrella sedge (*Cyperus eragrostis*), panicked bulrush (*Scirpus microcarpus*), Pacific oenanthe (*Oenanthe sarmentosa*), 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* = *Diplacus aurantiacus*), California hedge-parsley (*Yabea 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), dwarf orthocarpus (*Triphysaria pusilla*), blue-eyed grass (*Sisyrinchium bellum*), snowberry (*Symphoricarpos albus* var. *laevigatus*), hairy wood sorrel (*Oxalis corniculata* subsp. *pilosa* = *Oxalis pilosa*), sweet cicely (*Osmorhiza berteroi*), shining peppergrass (*Lepidium nitidum*), Watson's willow herb (*Epilobium ciliatum* subsp. *watsonii*), giant horsetail (*Equisetum telmateia* subsp. *braunii*), oso berry (*Oemleria cerasiformis*), sneezeweed (*Helenium puberulum*), yarrow (*Achillea millefolium*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), lizard tail (*Eriophyllum staechadifolium*), California maidenhair (*Adiantum jordanii*), coffee fern (*Pellaea andromedifolia*), California polypody (*Polypodium californicum* aff. var. *kaulfussii*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), wood fern (*Dryopteris arguta*), western sword fern (*Polystichum munitum*), lady fern (*Athyrium felix-femina* var. *cyclosorum*), bracken (*Pteridium aquilinum* var. *pubescens*), Davy's clarkia (aff. *Clarkia davyi*? or new, yet to be named taxon.... **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 pogogyne (*Pogogyne serpylloides*), checkerbloom (*Sidalcea malvaeflora* subsp. *malvaeflora*), blue witch (*Solanum 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 biolettii*), 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 brevistylum*), wood strawberry (*Fragaria vesca*), sticky cinquefoil (*Potentilla glandulosa* subsp. *glandulosa* = *Drymocallis glandulosa* var. *glandulosa*), coast buckwheat (*Eriogonum latifolium*), creeping hearts (*Pterostegia drymarioides*), 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 variicolor*), woolly marbles (*Psilocarphus tenellus* var. *tenellus*), western nettle (*Hesperocnide tenella*), coast nettle (*Urtica dioica* subsp. *gracilis*), sun cup (*Camissonia ovata* = *Taraxia ovata*), California milkwort (*Polygala 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 than 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/nitidicarpa* 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* = *Erythranthe grandis* complex), hugging the moist ground 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 facsimile of the other, paniced 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 tapestries 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 cross-section 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 shortened 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 variicolor*), two sanicles, gambleweed (*Sanicula crassicaulis*) and footsteps-of-spring (*Sanicula arctopoides*), California plantain (*Plantago erecta*), tomcat clover (*Trifolium willdenovii*), 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, sympatry and reproductive isolating mechanisms within the genus *Trillium*, and with perhaps more forms present within the Scott 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. *californica*)..... Monterey pine (*Pinus radiata*)..... forest live-oak (*Quercus parvula* var. *shrevei*)..... bracken (*Pteridium aquilinum* var. *pubescens*)..... California maidenhair (*Adiantum jordanii*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*)..... wood fern (*Dryopteris arguta*)..... giant chain fern (*Woodwardia fimbriata*)..... lady fern (*Athyrium 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*), common goldfields (*Lasthenia* aff. *gracilis*), Mt. Diablo cottonweed (*Micropus amphibolus*), Bioletti's cudweed (*Pseudognaphalium biolettii*), California cudweed (*Pseudognaphalium californicum*), pink everlasting (*Pseudognaphalium ramosissimum*), slender woolly marbles (*Psilocarphus tenellus*), Canada goldenrod (*Solidago elongata*), California aster (*Symphotrichum 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* = *Diplacus aurantiacus*)..... California poppy (*Eschscholzia californica*)..... minute-flowered cryptantha (*Cryptantha micromeres*)..... willow herb (*Epilobium 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 (*Galium porrigens* var. *porrigens*)..... checker lily (*Fritillaria affinis*)..... coast buckwheat (*Eriogonum latifolium*)..... California goosefoot (*Chenopodium californicum*)..... California man root (*Marah fabaceus*)..... San Francisco campion (*Silene verecunda* subsp. *verecunda*)..... California vervain (*Verbena lasiostachys* var. *lasiostachys*)..... coast nettle (*Urtica dioica* subsp. *gracilis*)..... blue witch (*Solanum 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 counterpoint 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 lescurii* 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 breweri*, *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* = *Erythranthe 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. *cyclosorum*), 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 puberulum*), formed 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 (*Diplacus 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 (*Corethrogyne filaginifolia* var. *californica*), lizard tail (*Eriophyllum staechadifolium*), purple cudweed (*Gamochaeta ustulata*), Bioletti's cudweed (*Pseudognaphalium biolettii*), California cudweed (*Pseudognaphalium californicum*), Gianone everlasting (*Pseudognaphalium gianonei*, pro.sp.nov.), slender woolly marbles (*Psilocarphus tenellus*), California aster (*Symphotrichum 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*)..... farewell-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 (*Navarretia 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 (*Lemna minuscula*)..... water fern (*Azolla filiculoides*)..... rattlesnake weed (*Daucus pusillus*), floating pennywort (*Hydrocotyle ranunculoides*), footsteps-of-spring (*Sanicula arctopoides*), 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 arboreus*), arroyo lupine (*Lupinus succulentus*), Lindley's varied lupine (*Lupinus variicolor*)..... 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 staechadifolium*), California figwort (*Scrophularia californica*)..... **including one of three known specimens for the watershed, of the flavistic form, with greenish-yellow flowers**), California manroot (*Marah fabaceus*), climbing bedstraw (*Galium porrigens* var. *porrigens*), California hedge-nettle (*Stachys bullata*), foothill sedge (*Carex tumulicola*), rattlesnake weed (*Daucus pusillus*), 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*). As with the commingling of golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*) and lizard tail (*Eriophyllum staechadifolium*) witnessed earlier on our "native species" exploration, approaching the entrance to Last Chance Road yields a second pairing of related taxa..... growing intermixed on the se-facing fractured mudstone roadbank, are foothill needlegrass (*Stipa lepida*) and purple needlegrass (*Stipa pulchra*)!

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 (*Navarretia squarrosa*), footsteps-of-spring (*Sanicula arctopoides*), slender woolly 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/proximal to 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* with erect mode of growth, bicolored flowers and gray-

encrusted seeds or a new taxon mistakenly attributed to *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.

Note: Here is an ongoing checklist of native taxa found growing within the Lasher Marsh Watershed grouped by families: Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... shining willow (*Salix lasiandra* var. *lasiandra*), arroyo willow (*Salix lasiolepis*)..... California acaena (*Acaena pinnatifida* var. *californica*), beach strawberry (*Fragaria chiloensis*), wood strawberry (*Fragaria vesca*), California blackberry (*Rubus ursinus*)..... wax myrtle (*Morella californica*)..... yarrow (*Achillea millefolium*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis* subsp. *pilularis* and *consanguinea*), California aster (*Corethrogyne filaginifolia*, **single flowered phase = former var. californica**), hirsute gumplant (*Grindelia hirsutula*, **flower heads subtended by foliaceous bracts showing possible affinity with *Grindelia stricta* var. *platyphylla***), mock heather (*Ericameria ericoides*), seaside daisy (*Erigeron glaucus*), lizard tail (*Eriophyllum staechadifolium*), purple cudweed (*Gamochaeta ustulata*), sneezeweed (*Helenium puberulum*), common goldfields (*Lasthenia gracilis*?..... **receptacle conical, cypselae epappose**), Bioletti's cudweed (*Pseudognaphalium biolettii*), pink everlasting (*Pseudognaphalium ramosissimum*), California goldenrod (*Solidago velutina* subsp. *californica*), California aster (*Symphotrichum chilense*)..... California coffeeberry (*Frangula californica* subsp. *californica*)..... California figwort (*Scrophularia californica*)..... leafy bent grass (aff. *Agrostis pallens*), California brome (*Bromus carinatus*), California oat grass (*Danthonia californica*), California fescue (*Festuca californica*), (*Festuca roemeri* var. *klamathensis*), red fescue (*Festuca rubra*, **form with filiform culms and diffuse mode of growth**), junegrass (*Koeleria macrantha*), Torrey's melic (*Melica torreyana*), ocean-bluff bluegrass (*Poa unilateralis* subsp. *unilateralis*), purple needlegrass (*Stipa pulchra*)..... short-stemmed sedge (*Carex brevicaulis*), (*Carex gianonei* complex..... ***Carex harfordii* matrix, some plants with compound-congested lower 1-5 spikelets and basal spikelets on filiform stalks**), slough sedge (*Carex obnupta*), paniced bulrush (*Scirpus microcarpus*)..... California vervain (*Verbena lasiostachys* var. *lasiostachys*)..... checkerbloom (*Sidalcea malviflora* subsp. *malviflora*)..... sea lettuce (*Dudleya caespitosa*)..... hairy wood sorrel (*Oxalis pilosa*)..... Douglas's iris (*Iris douglasiana*), blue-eyed grass (*Sisyrinchium bellum*)..... salt rush (*Juncus breweri/lescurii* intergrades: **rhizomatous, stems thick, dark green, tortile and laterally compressed, inflorescence open to compact, upper sheaths without blades**), Pacific bog-rush (*Juncus effusus* subsp. *pacificus*), brown bog-rush (*Juncus hesperius*), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*), common wood rush (*Luzula comosa* var. *comosa*)..... Indian paintbrush (*Castilleja affinis* subsp. *affinis*)..... deerweed (*Acmispon glaber* var. *prostratus*), harlequin lotus (*Hosackia gracilis*), yellow bush lupine (*Lupinus arboreus*), sky lupine (*Lupinus nanus*), tomcat clover (*Trifolium willdenovii*)..... white globe lily (*Calochortus albus*), checker lily (*Fritillaria affinis*)..... California maidenhair (*Adiantum jordanii*)..... bracken (*Pteridium aquilinum* var. *pubescens*)..... farewell-to-spring (*Clarkia rubicunda*), sun cup (*Taraxia ovata*)..... blue dicks (*Dichelostemma capitatum* subsp. *capitatum*)..... sticky monkeyflower (*Mimulus aurantiacus* = ***Diplacus aurantiacus***)..... coast buckwheat (*Eriogonum latifolium*)..... poison oak (*Toxicodendron diversilobum*)..... California poppy (*Eschscholzia californica*)..... soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*)..... cow-parsnip (*Heracleum maximum*), footsteps-of-spring (*Sanicula arctopoides*)..... common milkmaids (*Cardamine californica*)..... climbing bedstraw (*Galium porrigens* var. *porrigens*)..... 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:

North Entrance to Swanton Road: WGS84: 37.084593, -122.268127, elevation 154ft

Allium Marsh/Gulch #2: WGS84: 37.077741, -122.259583, elevation 384ft/37.077603, -122.261577, elevation 249ft

Benched Marsh overlooking n-end of Greyhound Rock Beach: WGS84: 37.080793, -122.266602, elevation 132ft

Upper Big Willow Gulch/Marsh: WGS84: 37.073082, -122.250120, elevation 446ft

Central Big Willow Gulch/"Frog Pond": WGS84: 37.071415, -122.252842, elevation 356ft

Lower Big Willow Gulch: WGS84: 37.070878, -122.256895, elevation 198ft

Big Willow Gulch, w-fork: WGS84: 37.071852, -122.256437, elevation 265ft

Botanical "Hotspot", overlooking n-end of Greyhound Rock State Beach:
WGS84: 37.080087, -122.267029, elevation 124ft

Botanical "Hotspot"/"Dylan's Garden", overlooking s-end of Greyhound Rock State Beach:
WGS84: 37.073907, -122.262174, elevation 161ft

China Ladder Marsh: WGS84: 37.066795, -122.251181, elevation 337ft

***Festuca roemerii* grassland:** WGS84: 37.082547, -122.263667, elevation 328ft

Greyhound Rock State Beach, n-end: WGS84: 37.083533, -122.268966, elevation 11ft

Greyhound Rock State Beach, s-end: WGS84: 37.075226, -122.262945, elevation 9ft

Gulch #1: WGS84: 37.078380, -122.262187, elevation 231ft

Gulch #3: WGS84: 37.076857, -122.261110, elevation 304ft

Gulch #4: WGS84: 37.075373, -122.260144, elevation 232ft

Gulch #5: WGS84: 37.074159, -122.259397, elevation 281ft

Gulch #6: WGS84: 37.073165, -122.259035, elevation 262ft

Gulch #7: WGS84: 37.072653, -122.258093, elevation 276ft

Harry Wain's Arroyo: WGS84: 37.081194, -122.262567, elevation 300ft

Lasher Marsh: WGS84: 37.080723, -122.260660, elevation 392ft

Morehus Arroyo/Marsh: WGS84: 37.068847, -122.253729, elevation 319ft

Original Highway 1 above "Washout Turn": WGS84: 37.083594, -122.263980,
elevation 329ft

Pumpkin Field Marsh: WGS84: 37.073441, -122.255435, elevation 387ft

"refugium"(w/nw of Frog Pond): WGS84: 37.071828, -122.253153, elevation 382ft

Sandy-bottom Reservoir: WGS84: 37.074079, -122.252892, elevation 462ft

Type Area for *Carex x gianonei*: WGS84: 37.081684, -122.262772, elevation 340ft

"Washout Turn": WGS84: 37.083278, -122.263911, elevation 267ft

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 Scott 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

Agoseris heterophylla var. *heterophylla*/accession number **JEPS82558**/James A. West #166

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 **JEPS82595**/James A. West #170, Jul 21 1983
Agrostis densiflora/accession number **JEPS82925**/Buck & West #179
Agrostis densiflora/accession number **JEPS100289**/Dean Wm. Taylor #9305, Aug 20 1987
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
Antirrhinum kelloggii/accession number **JEPS85163**/Buck & West #516, Mar 31 1985
Armeria maritima/accession number **UCSC7098**/Randall Morgan, s.n., 27 March 1983
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
Calystegia soldanella/accession number **UCSC6434**/R. Morgan, #3555, 8 Jun 1999
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 **JEPS81564**/Buck and West #82, Jul 11 1982
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
Chenopodium californicum/accession number **JEPS85151**/Buck & West #520, Mar 31 1985
Clarkia davyi/accession number **JEPS97593**/Stone #679
Clarkia davyi/accession number **UCSC8889**/Dylan Neubauer (via James A. West) #80, 28 May 2014
Clarkia aff. *davyi*/accession number **UCSC7217**/J. West, s.n., 4 Jun 1982
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
Clarkia rubicunda/accession number **JEPS83076**/Buck & West #422, Jul 10 1983
Claytonia parviflora subsp. *parviflora*/accession number **JEPS82772**/James A. West, #39,
 Apr 5 1983
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 **JEPS81983**/Buck & West #186
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 staechadifolium/accession number **JEPS81488**/Buck & West #60
Eryngium armatum/accession number **JEPS83074**/Buck & West # 403, Jul 3 1983
Euphorbia spathulata/accession number **JEPS82654**/Buck & West #207
Festuca roemerii 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 **JEPS85190**/Buck & West #515
Gilia achilleifolia subsp. *multicaulis*/accession number **JEPS82621**/Buck & West #245
Gilia clivorum/accession number **JEPS82958**/West #51.1
Gilia clivorum/accession number **JEPS81535**/Buck, West & Stone #463.1
Gilia clivorum/accession number **JEPS81982**/Buck, West & Morgan #187
Gnaphalium bicolor = *Pseudognaphalium biolettii*/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
Gnaphalium gianonei, pro. sp. nov. = *Pseudognaphalium gianonei*, pro. sp. nov./accession
 number **UCSC7622**/Randall Morgan, 4770, 16 May 2007
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

Isolepis carinata/accession number **JEPS81526**/Roy E. Buck, et al #3, May 24 1982

Isolepis cernua/accession numbers **UCSC8882, 8883, 8884, 8885**/Dylan Neubauer (via James A. West) #77a, #77b, #77c, #77d/28 May 2014

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 = *Lasthenia gracilis*?/accession number **JEPS82917**/Buck & West #242

Layia hieracioides/accession number **UCSC6964**/Randall Morgan, 3557, 8 Jun 1999

Linaria canadensis = *Nuttallanthus texanus*/accession number **JEPS82661**/Buck & West #268

Leymus (Elymus)/accession number **UCSC6798**/R. Morgan #3559, 8 Jun 1999

Leymus (Elymus)/accession number **UCSC6801**/R. Morgan #3389, 11 Mar 1999

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

Luzula comosa/accession number **RSA769174**/P. F. Zika, #24801, 05 03 2010

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

Mimulus guttatus = *Erythranthe nasuta*/accession number **JEPS82966**/West #79

Mimulus guttatus = *Erythranthe nasuta*/accession number **JEPS82565**/West #200

Mimulus guttatus = *Erythranthe nasuta*/accession number **JEPS82564**/West #201

Mimulus guttatus subsp. *arenicola* = *Erythranthe arenicola*/accession number **JEPS82780**/Buck & West #325

Mimulus microphyllus = *Erythranthe microphylla*/accession number **JEPS82622**/Buck & West #244

Monardella villosa subsp. *franciscana*/accession number **OBI77172**/Taylor Crow

Monardella villosa subsp. *franciscana*/accession number **OBI77173**/Taylor Crow

Monardella villosa subsp. *franciscana*/accession number **OBI77174**/Jim West

Monardella villosa subsp. *franciscana*/accession number **OBI77176**/Jim West

Montia fontana/accession number **JEPS89199**/Buck & West #329

Navarretia atractyloides/accession number **JEPS82577**/James A. West #163, Jul 14, 1983

Navarretia atractyloides/accession number **RSA479484**/James West #164, Jul 14, 1983

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
Piperia unalascensis/accession number **UCSC8331**/James A. West, 17 May 1981
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. Beedle #189, May 4 1964
Prunella vulgaris var. *lanceolata*/accession number **JEPS83109**/Buck & West #349
Pterostegia drymarioides/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
Stebbinsoseris decipiens/accession number **UCSC7406**/R. Morgan #5016, 16 May 2010
Trifolium barbigerum var. *andrewsii* = *Trifolium grayi*/accession number **JEPS101723**/Dean Wm.
Taylor, Roy Buck, Jim West, Glenn Clifton #9671, May 22 1988
Trifolium macraei/accession number **UCSC6131**/R. Morgan, Apr 27 1995
Trifolium "pseudo-barbigerum"/accession number **JEPS85165**/Buck & West #270
Trifolium "pseudo-barbigerum"/accession number **JEPS85166**/Buck & West #223
Trifolium variegatum (= *T. dianthum?*)/accession numbers **UCSC8988, 8989, 8990**/Dylan
Neubauer (via James A. West) #76a, #76b, #76c/28 May 2014
Trifolium willdenovii/accession number **JEPS82613**/Buck & West #253
Trifolium wormskioldii/accession number **JEPS83115**/Buck & West #342
Triodanus 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 Scott 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 Sub-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* = *Thermopsis californica* var. *californica*), white-rayed pentachaeta (*Pentachaeta bellidiflora*), Pacific marsh purslane (*Ludwigia palustris*), Harford's melic (*Melica harfordii*), rush rose (*Helianthemum scoparium* = *Crocanthemum scoparium* var. *vulgare*), 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 Scott 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 Scott 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 crustacea* subsp. *crinita* (the circumscription of this subspecies needs to be expanded, to accommodate the morphological complexity exhibited throughout the Scott Creek Watershed and its environs), was resprouting vigorously throughout the area under study and even more impressive, was the sympatric association of the two endemics, *Arctostaphylos glutinosa* and *Arctostaphylos ohloneana*, 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, aff. *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: (a) hirsute gumplant (*Grindelia hirsutula* var. *hirsutula*); (b) a glandular taxon with hispid foliage and erect paniculate inflorescences, morphologically distinct from the coastal Bolander's golden aster (*Heterotheca sessiliflora* subsp. *bolanderi*) and which approaches ssp. *echioides*, exuding an odor of camphor; (c) California goldenrod (*Solidago velutina* subsp. *californica*); (d) coyote brush (*Baccharis pilularis*) and (e) California aster (*Lessingia filaginifolia* var. *filaginifolia* = *Corethrogyne filaginifolia*..... an interesting taxonomic parallel, is that both *Heterotheca sessiliflora* and *Corethrogyne filaginifolia* have coastal headland/prairie representatives, which are low growing with few flowers while the inland ecotypes of each species, show consistent differences in growth patterns and the possession of +/- erect inflorescences which are multiflowered/paniculate. With the *Heterotheca* duo, there are also major differences in both

stem/foliar indument and biochemical signatures. Also worth noting, is that neither the *Heterotheca* nor the *Corethrogyne* inland populations produce intrapopulation examples of their coastal headland/prairie relatives and visa versa!!!. 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 [revisiting this wind-swept ridge top on 04/16/2013, yielded at least five separate plants of *Wyethia glabra*, with two individuals already initiating partially opened capitula and setting the stage for an ongoing expansion of the pre-2009 Lockheed Fire population]. 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 (aff. *Brodiaea elegans* subsp. *elegans*) 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 *Brodiaea elegans* subsp. *elegans* or *Brodiaea 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* = *Acmispon brachycarpus*, *Lotus junceus* var. *junceus* = *Acmispon junceus* var. *junceus*, *Lotus micranthus* = *Acmispon parviflorus*, *Lotus purshianus* var. *purshianus* = *Acmispon americanus* var. *americanus*, ***Lotus salsuginosus* var. *salsuginosus* = *Acmispon maritimus* var. *maritimus*, *Lotus scoparius* = *Acmispon glaber* var. *glaber*, *Lotus strigosus* = *Acmispon strigosus*, *Lotus wrangelianus* = *Acmispon wrangelianus*, *Lupinus albifrons* var. *albifrons*, *Lupinus bicolor*, *Lupinus latifolius* var. *latifolius*, *Lupinus nanus*, *Lupinus succulentus*, *Pickeringia montana* var. *montana*, *Trifolium albopurpureum* var. *albopurpureum*? [member of the *T. macraei* complex], *Trifolium ciliolatum*, *Trifolium 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-laciniata"*..... *Eriogonum nudum sensu lato*, *Pterostegia drymarioides*..... *Achillea millefolium*, *Agoseris grandiflora*, *Anaphalis margaritacea*, *Anisocarpus madioides*, *Artemisia douglasiana*, *Baccharis pilularis*, *Cirsium occidentale* var. *venustum*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Gamochaeta ustulata*, *Grindelia hirsutula* var. *hirsutula*, *Madia gracilis*, *Madia sativa*, *Malacothrix floccifera*, *Pseudognaphalium ramosissimum*, *Rafinesquia californica*, *Solidago velutina* subsp. *californica*, *Symphytotrichum chilense*, *Uropappus lindleyi*..... *Delphinium hesperium* subsp. *hesperium*, *Delphinium patens*..... *Castilleja affinis* subsp. *affinis*, *Castilleja foliolosa*..... *Polygala californica*..... *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens*..... *Adiantum jordanii*, *Pentagramma triangularis* subsp. *triangularis*..... *Polypodium californicum*..... *Pteridium aquilinum* var. *pubescens*..... *Dryopteris arguta*..... *Toxicodendron diversilobum*..... *Sequoia sempervirens*..... *Pinus attenuata*, *Pseudotsuga menziesii* var. *menziesii*..... *Marah fabaceus*..... *Caulanthus lasiophyllus*, *Thysanocarpus curvipes*..... *Bromus carinatus* var. *carinatus*, *Calamagrostis rubescens*, *Melica californica*, *Melica torreyana*, *Nassella lepida*, *Poa howellii*..... *Arbutus menziesii*, *Arctostaphylos crustacea sensu lato*, *Vaccinium ovatum*..... *Oxalis corniculata* subsp. *pilosa* = *Oxalis pilosa*..... *Mimulus aurantiacus* = *Diplacus aurantiacus*..... *Iris douglasiana*, *Sisyrinchium bellum*..... *Umbellularia californica*..... *Chrysolepis chrysophylla* var. *minor*, *Quercus agrifolia*, *Quercus chrysolepis*..... *Adenostema fasciculatum*, *Fragaria vesca*, *Heteromeles arbutifolia*, *Rosa spithamea* (NEW ADDITION TO WATERSHED'S NATIVE SPECIES ROSTER..... growing within exposed ridgetop/chaparral

interface, dwarf stature circa 30cm in height, rhizomatous, stems prickles straight and viniferous in coloration, hypanthium clothed with stalked glands, sepals persistent and pistils 10+), *Rubus ursinus*..... *Verbena lasiostachys* var. *lasiostachys*..... *Sambucus nigra* subsp. *canadensis*..... *Camissonia ovata* = *Taraxia ovata*, *Clarkia rubicunda*, *Epilobium brachycarpum*, *Epilobium minutum*..... *Monardella villosa sensu lato*, *Satureja douglasii* = *Clinopodium douglasii*, *Stachys ajugoides* var. *rigida*, *Stachys bullata*..... *Solanum umbelliferum*..... *Carex tumulicola*..... *Juncus patens*..... *Toxicoscordion fremontii*, *Trillium chloropetalum*, *Trillium ovatum*..... *Smilacina stellata* = *Maianthemum stellatum*..... *Chlorogalum pomeridianum* var. *pomeridianum*..... *Cryptantha clevelandii* var. *florosa*, *Cryptantha micromeres*, *Emmenanthe penduliflora*, *Eriodictyon californicum*, *Nemophila parviflora* var. *parviflora*, *Plagiobothrys nothofulvus*..... *Antirrhinum kelloggii*..... *Euphorbia crenulata*..... *Dendromecon rigida*, *Eschscholzia californica*..... *Urtica dioica* subsp. *holosericea*..... *Claytonia perfoliata* subsp. *perfoliata*..... *Calochortus albus*..... *Dichelostemma capitatum* subsp. *capitatum*..... *Gilia achilleifolia sensu lato*, *Leptosiphon androsaceus*..... *Calystegia purpurata* subsp. *purpurata*..... *Scrophularia californica*..... *Frangula californica* subsp. *californica*..... *Lithophragma heterophyllum*..... and *Lonicera hispidula*.

***Lotus salsuginosus* var. *salsuginosus* = *Acmispon maritimus* var. *maritimus*..... the Spring of 2010, following the 2009 Lockheed Fire, yielded an unanticipated botanical surprise with a population of the rare to the watershed, coastal trefoil, numbering in the low hundreds. At the interface of the upper portion of Schoolhouse Ridge (Mill Creek side) with the Seymore Hill and occupying the eastern margin of the previously created landing for Big Creek Lumber's helicopter logging, a carpet of interlocking plants covered an area of circa 4 meters x 10 meters! My only previous experience with this locally uncommon legume, was a collection I documented several decades previous, on a sandbar proximal to the confluences of Mill and Scott Creeks. Concurrent with the post-fire/upper Schoolhouse Ridge discovery, a second population growing with a disjunct *Arctostaphylos crustacea sensu lato* colony, was discovered on the ridge connecting the Upper Pozzi Meadow with the Mill Creek riparian corridor.

Separating the Seymore Field from the Mill Creek riparian corridor is an intricate series of south-facing ridges, given the site name **Arctostaphylos Chalks**, 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 Scott 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* = *Hosackia 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 *Arctostaphylos* Chalks, an 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 height, 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.** [On 02/26/2012, I revisited the "Chalks" collecting cypselae from a population of *Eriophyllum confertiflorum* var. *confertiflorum* growing out of the unconsolidated siliceous mudstone, which due to its low growing stature, variable foliar and inflorescence gestalt and intensely colored golden florets, may have great potential in "native" xeriscaping..... after finishing the cypselae collecting from circa 60 *Eriophyllum* plants, I journeyed over to that part of the ridge complex occupied by the *Arctostaphylos glutinosa* population which was literally devastated by the 2009 Lockheed Fire and checked out the partially burned but with some cambium still intact survivors and was pleasantly surprised, to find basically the same damaged individuals observed the previous year with healthy new growth and displaying

both developing and flowering inflorescences. As an ecological bonus, scattered throughout the arid hillside was a substantially larger and healthier seedling recruitment population, which was far more varied in branching patterns and foliar morphology than witnessed during the Summer of 2011]. [Following up on the previous post-2009 Lockheed Fire impact observations for this region of *Arctostaphylos* diversity, a two hour exploration of the ridge on 12/30/2013 confirmed what was evident in early 2012..... namely, that successful seedling recruitment for the endemic *Arctostaphylos glutinosa* population was still in effect, in spite of a drier than usual Fall/early Winter season]. 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*), woolly 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* var. *florosa*), minute-flowered cryptantha (*Cryptantha micromeres*), bush poppy (*Dendromecon rigida*), twining snapdragon (*Antirrhinum kelloggii*), California mustard (*Caulanthus lasiophyllus*), rush trefoil (*Acmispon junceus* sensu lato), California huckleberry (*Vaccinium ovatum*), canyon live-oak (*Quercus chrysolepis*), chamise (*Adenostema fasciculatum*), brittle-leaf manzanita (*Arctostaphylos crustacea* sensu lato), deerweed (*Acmispon glaber* var. *glaber*), woolly Indian paintbrush (*Castilleja foliolosa*), sleepy catchfly (*Silene antirrhina*..... **observed sharing this habitat, was *Silene multinervia*, 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 (*Helianthemum scoparium* = *Crocyanthemum scoparium* var. *vulgare*), morning glory (*Calystegia purpurata* subsp. *purpurata*), Brewer's calandrinia (*Calandrinia breweri*), blue toadflax (*Linaria canadensis* = *Nuttallanthus texanus*), 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 longitudinally, pappus plumose throughout**). Other native taxa growing sympatrically with the emergent fire-followers, are as follows: Bioletti's cudweed (*Pseudognaphalium biolettii*), 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* = *Diplacus 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* var. *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 on the Schoolhouse Ridge, in the Big and Little Creek drainages and on the coastal bluffs/Agrostis Rectangle area.**

Topographically complex and botanically diverse, the Scott 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 gambleweed (*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 distinctly different 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 *Mimulus guttatus* complex, with fugacious cleistogamous flowers readily passing for pale yellow miniaturized sausage casings (JEPS82565/WEST#200) = *Erythranthe nasuta***. 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 crinkle-awn fescue (*Festuca subuliflora*)..... its inflorescences, delicate tracteries 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 popcorn-flower (*Plagiobothrys diffusus*) and favoring moisture-retentive pockets roadside, our very own FSC/1B listed Santa Cruz clover (*Trifolium buckwestiorum*)! 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 Area", 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 Scott 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 bed 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* var. *florosa*) 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* = *Festuca octoflora*) sharing a horizontal alignment with Gambel's milkvetch (*Astragalus gambelianus*), miniature lupine (*Lupinus bicolor*) and rancheria clover (**aff. *Trifolium albopurpureum* var. *albopurpureum*..... possibly part of *T. macraei* complex**) 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* var. *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* var. *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, noticeable 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* usually but not always, 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.

Note: At least one documented population of *Plagiobothrys hispidulus* [David J. Keil, V.L. Holland and Larry Kelly, 20636, May 7, 1988, CalPoly Herbarium] has been made for the Scott Creek Watershed and if not mis-identified, would represent a new range extension for that species. The herbarium sheets should be re-examined to see if the taxon in question, may actually be *Plagiobothrys bracteatus* var. *aculeolatus*. Comprehensive nutlet collections have been made for seven separate populations of *Plagiobothrys* aff. *bracteatus* within the Swanton area, plus herbarium sheets documenting four distinct populations, two of which, are not included in the aforementioned group of seven. Are all of the *Plagiobothrys* aff. *bracteatus* populations in the Scott Creek Watershed/environs the same taxa or is there more than one species involved, possibly cryptic ones which differ on a molecular level, or is there more than one variety of *Plagiobothrys bracteatus* present?

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 Scott Creek. Like its oceanside analog, Big Willow Gulch, what it lacks in length is compensated for by a complex topography, much of which is vertical in orientation. While the final count for native species has yet to be achieved, the current (04/2010) in situ documentation, strongly suggests a biodiversity comparable to that found within the Big Willow Gulch. 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 lato*, *Vaccinium ovatum*..... *Amsinckia menziesii* var. *intermedia*, *Cryptantha clevelandii* var. *florosa*, *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*, *Polypodium calirhiza*, *Pteridium aquilinum* var. *pubescens*,
Adiantum jordanii, *Woodwardia fimbriata*, *Pentagramma triangularis* subsp. *triangularis*..... *Sequoia sempervirens*..... *Umbellularia californica*.....
Calystegia purpurata subsp. *purpurata*, *Dichondra donnelliana* (stems 2+ mm in diameter, growing in lower portion of gulch where meadow interfaces with redwood groves as per Seymore Field population)..... *Laythrus vestitus* **sensu lato**, *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 involucre 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*.....
Verbena lasiostachys var. *lasiostachys*..... *Adenocaulon bicolor*, *Anisocarpus madioides*,
Artemisia douglasiana, *Baccharis pilularis*, *Cirsium brevistylum*, *Deinandra corymbosa*,
Eriophyllum confertiflorum var. *confertiflorum*, *Eurybia radulina*, *Gamochaeta ustulata*,
Hieracium albiflorum, *Layia platyglossa*, *Madia gracilis* (gland-tipped trichomes from midway up stem to apex of inflorescence emitting a cherry-syrup scent), *Madia 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 bigelovii, *Micropus californicus* var. *subvestitus*, *Pseudognaphalium ramosissimum*,
Pseudognaphalium stramineum, *Psilocarphus tenellus* var. *tenellus*, *Rafinesquia californica*..... *Iris douglasiana*, *Sisyrinchium bellum*.....
Ceanothus thyrsiflorus, *Frangula californica* subsp. *californica*..... *Marah fabaceus*..... *Heuchera micrantha*,
Lithophragma affine, *Lithophragma heterophyllum*..... *Actaea rubra*, *Clematis lasiantha*,
Ranunculus californicus, *Ranunculus hebecarpus*, *Thalictrum polycarpum*..... *Adenostema fasciculatum*,
Fragaria vesca, *Heteromeles arbutifolia*, *Holodiscus discolor*, *Oemleria cerasiformis*,
Potentilla glandulosa subsp. *glandulosa* = *Drymocallis glandulosa* var. *glandulosa*,
Rosa gymnocarpa, *Rubus parviflorus*, *Rubus ursinus*..... *Calandrinia breweri*, *Calandrinia ciliata*,
Claytonia parviflora subsp. *parviflora*, *Claytonia perfoliata* subsp. *perfoliata*..... *Lonicera hispidula*,
Symphoricarpos albus var. *laevigatus*..... *Sambucus nigra* subsp. *canadensis*.....
Hesperocnide tenella, *Urtica dioica* subsp. *holosericea*..... *Alnus rubra*, *Corylus cornuta* var. *californica*.....
Monardella villosa **sensu lato**, *Prunella vulgaris* var. *lanceolata*, *Satureja douglasii*,
Stachys bullata..... *Juncus bufonius* **sensu lato**, *Juncus hesperius*, *Juncus patens*,
Luzula comosa..... *Carex bolanderi*..... *Scrophularia californica* subsp. *californica*.....
Diplacus aurantiacus..... *Solanum douglasii*, *Solanum umbelliferum*..... *Cardamine californica* var. *californica*,
Cardamine oligosperma, *Caulanthus lasiophyllus*, *Nasturtium officinale*..... *Lysimachia latifolia*.....
Chlorogalum pomeridianum var. *pomeridianum*..... *Calamagrostis rubescens*,
Festuca californica, *Melica subulata*, *Melica torreyana*, *Nasella pulchra* = *Stipa pulchra*.....
Calochortus albus, *Fritillaria affinis*..... *Castilleja attenuata*, *Triphysaria pusilla*.....
Smilacina racemosa = *Maianthemum racemosum*, *Smilacina stellata* = *Maianthemum stellatum*.....
Taraxia ovata, *Clarkia rubicunda*..... *Galium californicum* subsp. *californicum*,

Galium triflorum..... *Cornus sericea* subsp. *sericea*..... *Toxicoscordion fremontii*, *Trillium chloropetalum*..... *Dendromecon rigida*, *Eschscholzia californica*.....*Collomia heterophylla*, *Leptosiphon androsaceus*..... *Ribes divaricatum* var. *pubiflorum*..... *Prosartes hookeri*..... *Dichelostemma capitatum* subsp. *capitatum*..... *Antirrhinum kelloggii*..... *Polygala californica* and *Pterostegia drymarioides*.

Demarcated by Last Chance Road, **Lair Gulch**, the Scott Creek riparian corridor and Gianone Barn Gulch, a series of hydrologically active, landslide derived “marshes”, beginning topographically at **Beaver Flat** and terminating with **Marti’s Park**, act as repositories for rare, often localized species. Associated with old bogs and marsh-like habitats, **Hall’s willow herb** (*Epilobium hallianum*), a locally rare turion-forming species, was discovered in **Beaver Flat** in the mid-1970s. Growing sympatrically with two relatives, willow herb (*Epilobium ciliatum* subsp. *ciliatum*, with some plants tending towards subsp. *watsonii*) and dense-flowered boisduvalia (*Epilobium densiflorum*), this serendipitous discovery was documented with several pressings that now reside in the Jepson Herbarium at UC Berkeley. Gaining structural support from the sympatric poison oak (*Toxicodendron diversilobum*), an isolated colony of California fescue (*Elymus californicus*) with flowering culms approaching 2.5 meters in height, thrives upslope in a more mesic environment..... while tracing the perennial streamlet that defines the marsh proper, **two robust forms** of western bent grass (*Agrostis exarata*) co-exist: **a distinctly verticillate form lacking awns, secures the upper reaches and its mirror albeit awned twin, has established itself down in the bottoms**..... whether these two morphologically self-maintaining taxa are **reproductively isolated**, is a subject worth exploring!!!

Note: Comprehensive collections documenting both "phases" of *Agrostis exarata* with mature inflorescences/ripe caryopsis from Beaver Flat, have been deposited with the UCSC Arboretum. [see page 224 of this essay]

Growing under three different ecological regimes, albeit proximal to each other, the genus *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. *ixioides*). 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* = *Erythranthe 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/species)..... 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 hesperius*, *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*..... *Oxalis 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*..... *Cynoglossum 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. *cyclosorum*..... *Diplacus aurantiacus*..... *Persicaria punctata*..... *Carex obnupta*..... *Sidalcea malviflora* subsp. *malviflora*..... *Ranunculus californicus* var. *californicus*..... *Heracleum maximum*, *Oenanthe sarmentosa*, *Osmorhiza berteroi*, *Sanicula gianonei*, pro. sp. nov..... *Ceanothus thyrsiflorus* var. *thyrsiflorus*, *Frangula californica* subsp. *californica*..... *Calystegia purpurata* subsp. *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

Note: Beaver Flat Marsh drains into Scott Creek via a relatively short but deep and narrow gulch, flanked on its north facing side with a mesic assemblage of mixed conifer/oak woodland dominated in biomass by the coast redwood (*Sequoia sempervirens*) and on the upper/central portion of the opposite/south facing slope, an isolated/remnant Arctostaphylos dominated chaparral. As a recurring ecological leitmotiv, this pattern of disjunct (trapped-in-time through succession) chaparral, principally populated with the burl-forming polyploid/polyphyletic *Arctostaphylos crustacea* sensu lato, occurs on both sides of the lower portion of Schoolhouse Ridge, the central portion of Mt. Cook gulch, the Arroyo de las Trancas ridge above Highway 1 and the exposed south facing ridge overlooking lower Archibald Creek. A study could be initiated, comparing these ecological "isolates" as to elevation, proximity to "true" chaparral, shared/differing associate taxa, genetic makeup relative to both other "isolates" and related populations occupying the chaparral proper, edaphic profiles and relative health as to recruitment via replacement seedlings or senescence due to changes in canopy cover from encroaching oak/conifer woodlands and lack of disturbance such as fire or mass wasting (landslides). Upon leaving Beaver Flat Marsh proper and descending the ridge separating lower Lair Gulch from Beaver Flat Gulch, one abruptly encounters a graveyard of *Arctostaphylos crustacea* sensu lato skeletons, overtopped by *Quercus agrifolia* var. *agrifolia* and *Quercus parvula* var. *shrevei* canopies and surrounded/infiltrated with *Pseudotsuga menziesii* var. *menziesii* acting as a post-disturbance ruderal. Leaving the funereal and proceeding downwards fifty or so meters, an abrupt change occurs with a zone of long established and healthy, as to foliar display and inflorescence/mature fruit output, manzanitas..... the major factor separating this aged but still vital population of 100+ individuals from their previously encountered deceased relatives, was a total lack of light hoarding canopy from the adjacent but not overtopping mixed oak/conifer woodland! Growing sympatrically with these sun worshipping ericaceous shrubs, are two signature taxa that define the "true" chaparral in the upper Scott Creek Watershed, namely chamise (*Adenostoma fasciculatum* var. *fasciculatum*) and California yerba santa (*Eriodictyon californicum*). Rounding out the vegetative tapestry, giving ecological support to these morphologically variable cousins of the proximal stands of Pacific madrone (*Arbutus menziesii*), are the following native taxa arranged by families: knobcone pine (*Pinus attenuata*) and Monterey pine (*Pinus radiata*); coast live oak (*Quercus agrifolia* var. *agrifolia*) and Shreve oak (*Quercus parvula* var. *shrevei*); toyon (*Heteromeles arbutifolia*); California bay (*Umbellularia californica*); sticky monkeyflower (*Diplacus aurantiacus*); blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*) and California coffeeberry (*Frangula californica* subsp. *californica*); California brome (*Bromus carinatus* var. *carinatus*) and nodding brome (*Bromus vulgaris*); goldback fern (*Pentagramma triangularis* subsp. *triangularis*); woodland tarweed (*Anisocarpus madioides*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*) and California cudweed (*Pseudognaphalium californicum*); California bedstraw (*Galium californicum* subsp. *californicum*) and climbing bedstraw (*Galium porrigens* var. *porrigens*); coastal wood fern (*Dryopteris arguta*) and western sword fern (*Polystichum munitum*); from a ground cover perspective and acting as a natural weed abater, tying all of the previously noted taxa together with a stabilizing organic skin, pine reed grass (*Calamagrostis rubescens*) carpets

the understory in expansive drifts, sharing its fluid edges with western fescue (*Festuca occidentalis*), blue wild rye (*Elymus glaucus* subsp. *glaucus*), Torrey's melic (*Melica torreyana*) and foothill needlegrass (*Stipa lepida*).

Lair Gulch, like several other morphologically complex sub-watersheds draining into Scott 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 (*Adenostema 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 junceus* var. *biolettii* = *Acmispon junceus* var. *biolettii*)..... 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 (*Hierochloa occidentalis* = *Anthoxanthum occidentale*), Alaska onion grass (*Melica subulata*), 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 leucodermis*), 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* var. *grandiflora*), woodland madia (*Anisocarpus madioides*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), Indian thistle (*Cirsium brevistylum*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), broad-leaved aster (*Eurybia radulina*), purple cudweed (*Gamochaeta ustulata*), white hawkweed (*Hieracium albiflorum*), California cudweed (*Pseudognaphalium californicum*), pink everlasting (*Pseudognaphalium ramosissimum*), woolly marbles (*Psilocarphus tenellus* var. *tenellus*), California chicory (*Rafinesquia californica*)..... cow-parsnip (*Heracleum maximum*), sweet cicely (*Osmorhiza berteroi*), 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 (*Torreya californica*)..... bush poppy (*Dendromecon*

rigida)..... Pacific starflower (*Trientalis latifolia* = *Lysimachia latifolia*, and now place in the **Myrsinaceae**)..... morning glory (*Calystegia purpurata* subsp. *purpurata*)..... Douglas's nightshade (*Solanum douglasii*), blue witch (*Solanum umbelliferum*)..... brown bog-rush (*Juncus hesperius*), common rush (*Juncus patens*), common wood rush (*Luzula comosa*)..... Pacific pea (*Lathyrus vestitus sensu lato*), rush trefoil (*Lotus junceus sensu lato* = *Acmispon junceus*..... erect to prostrate in mode of growth, with peduncles abbreviated to conspicuously elongate), small-flowered trefoil (*Lotus micranthus* = *Acmispon parviflorus*), deerweed (*Lotus scoparius* var. *scoparius* = *Acmispon glaber* var. *glaber*), stipulate trefoil (*Lotus stipularis*, aff. *Lotus balsamiferus* = *Hosackia stipularis* var. *stipularis*), strigose trefoil (*Lotus strigosus* = *Acmispon 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 (*Athyrium filix-femina* var. *cyclosorum*), 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 calirhiza*..... 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 umbos, 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* = *Corallorhiza maculata* var. *occidentalis*), 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 californica*)..... hound's tongue (*Cynoglossum grande*), yerba santa (*Eriodictyon californicum*), small-flowered nemophila (*Nemophila parviflora* var. *parviflora*)..... Fremont's star lily (*Toxicoscordion fremontii*), western trillium (*Trillium ovatum* subsp. *ovatum*)..... blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*), California coffeeberry (*Frangula californica* subsp. *californica*)..... fat Solomon's seal (*Maianthemum racemosum*), slim Solomon's seal (*Maianthemum stellatum*)..... canyon gooseberry (*Ribes menziesii* var. *menziesii*), pink-flowering currant (*Ribes sanguineum* var. *glutinosum*..... **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 (*Dichelostemma 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 crustacea sensu 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 hispidula*)..... sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus 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 (n=33) 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 uniformly hexaploid (n=33), (2) where these two putatively different, **in ecological preferences if not 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 **vigorously coppicing**, converted to ploidy levels higher than hexaploid or are they, in part due to the 1948 fire, resprouting 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 chorisianus* var. *chorisianus*) 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 trifold 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 halleianum*), 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 airborne 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 gigas 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 height 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. As of 2015, the West's Spring Marsh has to share the presence of *Hydrocotyle verticillata* with the Laguna de las Trancas aka Last Chance Lagoon, where it grows sympatrically with and slightly above its sister species, *Hydrocotyle ranunculoides*. Herbarium pressings were made for this locally rare taxon and deposited with the UCSC Natural History Museum.

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 encroachment 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. *bufonius*, *Juncus effusus* var. *pacificus*, *Juncus hesperius*, *Juncus patens*..... *Persicaria punctata*, *Rumex occidentalis*..... *Toxicodendron diversilobum*..... *Scrophularia californica*..... *Fragaria vesca*, *Heteromeles arbutifolia*, *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 anagaloides*..... *Ribes divaricatum* var. *pubiflorum*..... *Iris douglasiana*, *Sisyrinchium bellum*..... *Carex x gianonei* [*Carex harfordii* matrix], *Carex "imperfecta"*, *Carex obnupta*, *Carex subbracteata*, *Cyperus eragrostis*..... *Mimulus aurantiacus* = *Diplacus aurantiacus*..... *Lonicera hispidula*..... *Maianthemum stellatum*..... *Notholithocarpus densiflorus* var. *densiflorus*, *Quercus agrifolia* var. *agrifolia*, *Quercus parvula* var. *shrevei*..... *Galium porrigens* var. *porrigens*..... *Heracleum maximum*, *Oenanthe sarmentosa*, *Osmorhiza berteroi*, *Sanicula crassicaulis*..... *Mimulus guttatus* = *Erythranthe grandis?*..... *Sambucus nigra* subsp. *caerulea*..... *Marah fabaceus*..... *Veronica americana*..... *Arbutus menziesii*..... *Lathyrus vestitus* aff. var. *vestitus* [variable as to indument, some plants referable to what was formerly considered as subsp. *puberulus*], *Vicia gigantea*.....

Note: Marti's Park Marsh, nestled 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 Scott 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 anagaloides..... *Plantago subnuda*, *Veronica americana*..... *Juncus bufonius* var. *bufonius*, *Juncus effusus* var. *pacificus*, *Juncus hesperius*, *Juncus occidentalis*, *Juncus patens*, *Juncus phaeocephalus* var. *phaeocephalus*..... *Carex densa*, *Carex gianonei* syngameon, *Carex "imperfecta"* (**concentrated population, 20+ plants, lower east end of marsh**), *Carex obnupta*, *Cyperus eragrostis*, *Scirpus microcarpus*..... *Diplacus aurantiacus*, *Mimulus guttatus* (var. *grandis*/subsp. *litoralis* = *Erythranthe grandis?*, 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*, *Oemleria cerasiformis*, *Rubus parviflorus*, *Rubus ursinus*..... *Pinus radiata*, *Pseudotsuga menziesii* var. *menziesii*..... *Notholithocarpus densiflorus* var. *densiflorus*, *Quercus agrifolia* var. *agrifolia*, *Quercus parvula* var. *shrevei*..... *Ceanothus thyrsiflorus*, *Frangula californica* subsp. *californica*..... *Arbutus menziesii*..... *Anisocarpus madioides*, *Artemisia douglasiana*, *Baccharis glutinosa*, *Baccharis pilularis* subsp. *consanguinea*, *Cirsium brevistylum*, *Gamochaeta ustulata*, *Madia sativa*, *Pseudognaphalium 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* (aff. 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 chorisianus* var. *chorisianus*..... *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 bifurcate drainage system, historically given the appellation, Arroyo de las Trancas. In reality two parallel sub-watersheds, divided by an elevated maritime chaparral cloaked mudstone ridge, which ultimately converge forming a relatively narrow stem draining out under Highway 1. 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 crustacea*, **sensu lato**, cloaks the weathered, exfoliating mudstone. In keeping with the expected polymorphism displayed by the Scott 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/absence of glands to perplex all but the most seasoned taxonomist and several plants referencing sensitive manzanita (*Arctostaphylos nummularia* = *Arctostaphylos sensitiva*) genes, with sub-quadrangle, 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* = *Camissoniopsis 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* = *Stebbinsoseris decipiens*) and distant cousin, mountain dandelion (*Agoseris grandiflora* var. *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 davayi*)..... 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 westernmost 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. *breweri* (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), short-stalked wood rush (*Luzula subsessilis*)..... yarrow (*Achillea millefolium*), pearly everlasting (*Anaphalis margaritacea*), woodland madia (*Anisocarpus madioides*), California sagebrush (*Artemisia californica*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California corethrogyne (*Corethrogyne filaginifolia* var. *californica*), common corethrogyne (*Corethrogyne filaginifolia* var. *filaginifolia*), lizard tail (*Eriophyllum staechadifolium*), broad-leaved aster (*Eurybia radulina*), hirsute gumplant (*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 biolettii*), 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 (*Oemleria cerasiformis*), wood rose (*Rosa gymnocarpa*), thimbleberry (*Rubus parviflorus*), California blackberry (*Rubus ursinus*)..... Hall's/leafy bentgrass intergrades (*Agrostis hallii* x *pallens*..... throughout the Scott 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 (*Danthonia 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* = *Stipa lepida*), California canary grass (*Phalaris californica*), tall trisetum (*Trisetum canescens*..... reduced in stature form, morphologically akin to taxon found growing on Santa Cruz Terrace overlooking south end of Greyhound Rock State Beach)..... hairy honeysuckle (*Lonicera hispidula*), snowberry (*Symphoricarpos albus* var. *laevigatus*)..... sticky monkeyflower (*Diplacus 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. *biolettii*), deerweed (*Acmispon glaber* var.

glaber), Pacific pea (*Lathyrus vestitus* var. *vestitus*), yellow bush lupine (*Lupinus arboreus*), 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 fimbriata*)..... California maidenhair (*Adiantum jordanii*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*)..... Douglas's nightshade (*Solanum douglasii*)..... Pacific starflower (*Trientalis latifolia* = *Lysimachia 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 crassicaulis*), Hoffmann's sanicle (*Sanicula hoffmannii*)..... a recently [03/25/2013] discovered colony of this rare sanicle, numbering in excess of 20 plants, was located within an oak grove perched above a gulchlet which drains into the eastern fork of the Arroyo. The localized colony was growing sympatrically with its putative polyploid offspring, Pacific sanicle (*Sanicula crassicaulis*), and within the same maritime influenced exposed coastal terrace grassland, purple sanicle (*Sanicula bipinnatifida*) and occurring due south along the same arcuate synform, the uncommon caraway-leaved lomatium (*Lomatium caruifolium* var. *caruifolium*) and footsteps-of-spring (*Sanicula arctopoides*)..... blue blossom (*Ceanothus thyrsiflorus*), California coffeeberry (*Frangula californica* subsp. *californica*)..... blue dicks (*Dichelostemma capitatum* subsp. *capitatum*), Ithuriel'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 (*Maianthemum stellatum*)..... 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 Scott Creek watershed sensu lato, AND THE ONLY POPULATIONS, to date, documented for Santa Cruz County.....** farewell-to-spring (*Clarkia rubicunda*)..... stinging phacelia (*Phacelia malvifolia*).

Note: While only a north/south aligned sliver of siliceous mudstone, the divide separating the two principal drainage systems comprising the Arroyo de Las Trancas is remarkable, in that it is a displaced/isolated fragment of chaparral closer to the ocean than its higher elevation counterpart aka "The Chalks". The floristic components of this maritime influenced ecosystem are fascinating..... in part, due to their less than 1/4 mile distance from the Pacific Ocean and the sympatric mixture of both mesic and xeric taxa. A cursory overview of the native flora occupying the upper margins/crest of this ridge is as follows and arranged by families: *Quercus agrifolia* var. *agrifolia*, *Quercus chrysolepis*, *Quercus parvula* var. *shrevei*..... *Arbutus menziesii*, *Arctostaphylos crustacea* sensu lato, *Vaccinium ovatum*..... *Pinus radiata*, *Pseudotsuga menziesii* var. *menziesii*..... *Sequoia sempervirens*..... *Heteromeles arbutifolia*..... *Ceanothus thyrsiflorus* var. *thyrsiflorus*..... *Adenostema fasciculatum*..... *Diplacus aurantiacus*..... *Acmispon junceus* var. *junceus*..... *Hieracium albiflorum*..... *Polygala californica*..... *Lysimachia latifolia*..... *Sanicula crassicaulis*..... *Lonicera hispidula*.... *Iris douglasiana*..... *Calamagrostis rubescens*..... *Dryopteris arguta*..... *Polypodium californicum*.

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 in full view of the Post Rock..... 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 (*Schoenoplectus 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 (*Isolepis cernua*), common monkeyflower (*Mimulus guttatus* = *Erythranthe grandis*) 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 Scott 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. Tephrochronological 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 exsiccata*)..... 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 trifold 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 marsh pennywort (*Hydrocotyle ranunculoides*) and locally uncommon sister species, whorled pennywort (*Hydrocotyle verticillata*), occupying higher and drier ground, 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.... **both phases with sessile fruit sporting styles double its body length**, common spikerush (*Eleocharis macrostachya*), inconspicuous patches of water buttercup (*Ranunculus aquatilis* var. *capillaceus* = *Ranunculus aquatilis* var. *diffusus*) 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*, with flowering culm terete in cross-section) 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. *brunneus* = *Juncus hesperius*) × 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*), aff. prostrate clarkia (*Clarkia prostrata*) and an erect growing "species" with bicolored flowers and gray-encrusted seeds, aff. Davy's clarkia (*Clarkia davayi*), 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 bicolored 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 variicolor*), 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* = *Diplacus aurantiacus*), coast monkeyflower (*Mimulus guttatus* var. *grandis* = *Erythranthe grandis*?), tinker's penny (*Hypericum anagalloides*), miniscule duckweed (*Lemna*

minuscula), California coffeeberry (*Frangula 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 aneuploid 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 (*Barbarea 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 (LC micro-marsh #1), 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*..... *Solanum douglasii*..... *Verbena lasiostachys* var. *lasiostachys*..... *Diplacus 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 to or **possible hybrid derivation with *Juncus breweri* 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 koilolepis* = *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, a displaced specimen of knobcone pine (*Pinus attenuata*) looking woefully out of place, the closest chaparral some distance away but genuine knobcone, none the less..... **with the thickened/flattened incurved prickles of the elevated cone scales aligned apically [one very large, old and contorted in overall gestalt specimen, growing within touching distance to a mature but considerably more orthodox in growth habit, *Pinus radiata*]**; an amazing number of tree species and arboreal wannabes defines this abbreviated but hydrologically complex sub-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*) and 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 Scott Creek riparian corridor and paralleling Swanton Road in a southerly direction for circa 200 meters as a seasonally wet marsh [**Lower Gianone Barn Gulch 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. *brunneus* = *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 (cattle grazing)..... the drainage course of the lower section is deflected eastward into Scott 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 Lower Gianone Barn Gulch enters the flood plain: the sympatric trio consisting of small-flowered nemophila (*Nemophila parviflora* var. *parviflora*), 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: A supplemental native species inventory (2011-12) for the Upper Gianone Barn Gulch Marsh, its environs and Juncus bordered drainage down to the displaced Pinus attenuata [which abuts the lower section of the overflow route from Laguna de las Trancas] is as follows, with the taxa arranged by families: smaller duckweed (*Lemna minor*)..... flowering quillwort (*Triglochin scilloides*)..... water smartweed (*Persicaria punctata*)..... poison oak (*Toxicodendron diversilobum*)..... floating pennywort (*Hydrocotyle ranunculoides*)..... Watson's willow herb (*Epilobium ciliatum* subsp. *watsonii*), sun cup (*Taraxia ovata*)..... common monkeyflower (*Mimulus guttatus* = *Erythranthe grandis*?)..... coast nettle (*Urtica dioica* subsp. *gracilis*)..... Bolander's water starwort (*Callitriche heterophylla* var. *bolanderi*), American brooklime (*Veronica americana*)..... Pacific oenanthe (*Oenanthe sarmentosa*)..... marsh baccharis (*Baccharis glutinosa*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), lowland cudweed (*Gnaphalium palustre*), pink everlasting (*Pseudognaphalium ramosissimum*), California aster (*Symphotrichum chilense*)..... water fern (*Azolla filiculoides*)..... lady fern (*Athyrium filix-femina* var. *cyclosum*), California sword fern (*Polystichum munitum*)..... California figwort (*Scrophularia californica*)..... oso berry (*Oemleria cerasiformis*), California blackberry (*Rubus ursinus*)..... gianone sedge (*Carex x gianonei*, *Carex harfordii* matrix), small-bracted sedge (*Carex subbracteata*), umbrella sedge (*Cyperus eragrostis*)..... tinker's penny (*Hypericum anagaloides*)..... goldback fern (*Pentagramma triangularis* subsp. *triangularis*)..... giant chain fern (*Woodwardia fimbriata*)..... California vervain (*Verbena lasiostachys* var. *lasiostachys*)..... Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... coast live-oak (*Quercus agrifolia* var. *agrifolia*)..... blue elderberry (*Sambucus nigra* subsp. *caerulea*)..... straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*)..... western bent grass (*Agrostis exarata* var. *pacifica*, with awned lemmas), California wild rye (*Elymus glaucus* subsp. *glaucus*), meadow barley (*Hordeum brachyantherum* subsp. *brachyantherum*)..... yerba buena (*Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*)..... Lindley's varied lupine (*Lupinus variicolor*).

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*, *Corylus 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*..... *Oenothera 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*.

Note: Growing on either side of the se drainage (Mountain Lion Gulch) portion of the Lower Gianone Barn Gulch, *Carex gracilior* occurs. This county wide uncommon sedge, has been documented by herbarium pressings, living divisions taken from the in situ colony and comprehensive collections of inflos with mature achenes, freed from or still encased within their taxonomically distinctive perigynia.

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 Scott 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 Scott 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 Scott 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 apiifolium*) 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 laciniatus*), 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 (*Pseudognaphalium 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 cinerous 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 davayi*..... **or an undescribed taxon with mode of growth erect, flowers bicolored 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 seeps/marshes on the exposed coastal headlands**, sun cup (*Taraxia ovata*)..... Blasdale's bent grass (*Agrostis blasdalei*), Hall's/leafy bent grass intergrades (*Agrostis hallii*/*Agrostis pallens*..... **throughout Scott 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 (*Leymus triticoides* = *Elymus triticoides* **subsp. *triticoides***..... **prevalent on Western Terrace, where eolian sand deposits define the coastal prairie soil composition**), Torrey's melic (*Melica torreyana*), foothill needlegrass (*Nassella lepida* = *Stipa lepida*), California canary grass (*Phalaris californica*), ocean-bluff bluegrass (*Poa unilateralis*)..... white globe lily (*Calochortus albus*)..... pearly everlasting (*Anaphalis margaritacea*), California sagebrush (*Artemisia californica*), mugwort (*Artemisia douglasiana*), marsh baccharis (*Baccharis glutinosa*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California corethrogyne (*Corethrogyne filaginifolia* **var. *californica***), golden yarrow (*Eriophyllum confertiflorum* **var. *confertiflorum***), lizard tail (*Eriophyllum staechadifolium*), 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*), wooly marbles (*Psilocarphus tenellus*), California aster (*Symphotrichum chilense*)..... wild celery (*Apiastrum angustifolium*), cow-parsnip (*Heracleum maximum*), floating pennywort (*Hydrocotyle ranunculoides*..... **now placed in the Araliaceae**), lovage (*Ligusticum apiifolium*), Pacific oenanthe (*Oenanthe sarmentosa*), sweet cicely (*Osmorhiza berteroi*), gambleweed (*Sanicula crassicaulis*)..... blue blossom (*Ceanothus thyrsiflorus* **var. *thyrsiflorus***), California coffeeberry (*Frangula californica* subsp. *californica*)..... checkerbloom (*Sidalcea malviflora* subsp. *malviflora*)..... downy buttercup (*Ranunculus hebecarpus*)..... 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*)..... blue elderberry (*Sambucus nigra* subsp. *caerulea*), red elderberry (*Sambucus racemosa* **var. *racemosa***)..... deerweed (*Acmispon glaber* **var. *glaber***), Pacific pea (*Laythrus 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(+) spikelets, gynaeandrous, androgynous and/or mixed**, *Carex nitidicarpa* complex, slough sedge (*Carex obnupta*), small-bracted sedge (*Carex subbracteata*), umbrella sedge (*Cyperus eragrostis*), dwarf club rush (*Isolepis carinata*), low club rush (*Isolepis cernua*), California tule (*Schoenoplectus californicus*, **flowering culms deltoid in cross-section**), 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*)..... western lady's mantle (*Aphanes occidentalis*), wood strawberry (*Fragaria vesca*), ocean spray (*Holodiscus discolor* var. *discolor*), California horkelia (*Horkelia californica* var. *californica*), 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*)..... California figwort (*Scrophularia californica* subsp. *californica*)..... rancher's fiddleneck (*Amsinckia menziesii*), stinging phacelia (*Phacelia malvifolia*)..... miniscule duckweed (*Lemna minuscula* = *Lemna minuta*)..... tinker's penny (*Hypericum anagalloides*)..... Douglas's nightshade (*Solanum douglasii*)..... California vervain (*Verbena lasiostachys* var. *lasiostachys*)..... sticky monkeyflower (*Diplacus aurantiacus*), common monkeyflower (*Mimulus guttatus* var. *grandis* = *Erythranthe grandis?*)..... yerba buena (*Satureja douglasii* = *Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*)..... California saxifrage (*Micranthes californica*)..... California bedstraw (*Galium californicum* subsp. *californicum*), climbing bedstraw (*Galium porrigens* var. *porrigens*)..... snowberry (*Symphoricarpos albus* var. *laevigatus*)..... western sword fern (*Polystichum munitum*)..... lady fern (*Athyrium filix-femina* var. *cyclosorum*)..... bracken (*Pteridium aquilinum* var. *pubescens*)..... watercress (*Nasturtium officinale*)..... coast nettle (*Urtica dioica* subsp. *gracilis*)..... **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*)..... poison oak (*Toxicodendron diversilobum*)..... coast buckwheat (*Eriogonum latifolium/nudum* intergrades)..... red elderberry (*Sambucus racemosa* var. *racemosa*)..... coast live-oak (*Quercus agrifolia* var. *agrifolia*), forest live-oak (*Quercus parvula* var. *shrevei*)..... Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*).

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 of and overlooking 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 polycarpum*, a quartet of Rosaceae members growing intermixed.....*Rosa gymnocarpa* var. *gymnocarpa*, *Fragaria vesca*, *Potentilla glandulosa* subsp. *glandulosa* = *Drymocallis glandulosa* var. *glandulosa* and *Aphanes occidentalis*, **polyphyletic** *Castilleja affinis* subsp. *affinis* with a scattered population **displaying extreme ancestral resegregation and looking ever-so-much like a dozen different species**, *Dudleya caespitosa*, *Berberis pinnata* subsp. *pinnata*, *Sambucus nigra* subsp. *caerulea*, an inodorous *Dichelostemma 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 olfactorally 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 hassei*, *Phacelia malvifolia*, a grassland favorite which has undergone **three** (*Oenothera* = *Camissonia* = *Taraxia*) name changes in as many decades *Taraxia ovata*, *Carex subbracteata*, *Carex tumulicola*, *Cyperus eragrostis*, *Plantago subnuda*, *Sisyrinchium bellum*, *Triphysaria pusilla*, *Baccharis douglasi* = *Baccharis glutinosa*, *Holodiscus discolor* var. *discolor*, *Oenanthe sarmentosa*, *Sanicula arctopoides*, a ubiquitous native *Pseudognaphalium californicum* and its localized putative hybrid offspring *Pseudognaphalium gianonei*, pro.sp.nov., *Polypodium californicum* aff. var. *kaulfussii*, *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 torreyana*, *Claytonia parviflora* subsp. *parviflora*, *Saxifraga californica* = *Micranthes californica*..... sadly, the sole representative of this ornamentally valuable genus in the watershed (**now bereft of even its genus tag**), *Juncus bufonius*, *Juncus hesperius*, *Juncus phaeocephalus* var. *phaeocephalus*, *Luzula comosa* var. *comosa*, *Galium porrigens* var. *porrigens*, *Calystegia purpurata* subsp. *purpurata*.....climbing 10(+) feet into a robust *Frangula californica* subsp. *californica*, *Barbarea orthoceras*, *Stachys ajugoides* var. *rigida* = *Stachys rigida* var. *quercetorum*, *Stachys bullata*, *Verbena lasiostachys* var. *lasiostachys*, *Gamochaeta ustulata*, *Mimulus guttatus* var. *grandis* = *Erythranthe grandis*, *Layia hieracioides*, *Pterostegia drymarioides*, an Apiaceae trio..... *Apiastrum angustifolium*, *Daucus pusillus*, *Yabea microcarpa* and *Oxalis corniculata* subsp. *pilosa* = *Oxalis pilosa*.

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 Scott 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 staechadifolium*, *Sanicula crassicaulis*, *Baccharis pilularis* subsp. *consanguinea*, *Diplacus aurantiacus*, *Cardamine oligosperma*, *Chlorogalum pomeridianum sensu lato*, *Toxicodendron diversilobum*, *Claytonia parviflora* var. *parviflora*, *Claytonia perfoliata sensu lato*, *Rubus ursinus*, *Clinopodium 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*, *Scrophularia californica* subsp. *californica*, *Daucus pusillus*, *Adiantum jordanii*, *Phacelia malvifolia*, *Crassula connata*, *Cryptantha micromeres*, *Artemisia douglasiana*, *Pseudognaphalium californicum*, *Piperia michaelii*, *Solidago velutina* subsp.

californica, *Achillea millefolium*, *Oemleria cerasiformis*, *Deschampsia elongata*, *Nasella lepida* = *Stipa lepida*, *Sagina apetala* (native status uncertain), *Trifolium microdon*, *Trifolium willdenovii* (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*, *Maianthemum stellatum*, *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*, *Symphotrichum 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. *intermedia* = *Amsinckia menziesii*, *Salix lasiolepis*, *Acmispon junceus* var. *biolettii* (peduncles of mature inflorescences 15-25 mm long), *Acmispon wrangelianus* 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 aka "**Mesita #1**", 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 rocall 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 (*Corethrogyne filaginifolia*..... var. *californica*), miner's lettuce (*Claytonia perfoliata*, sensu lato), grassland gilia (*Gilia clivorum*), California hedge-nettle (*Stachys bullata*), stinging phacelia (*Phacelia malvifolia*), lizard tail (*Eriophyllum staechadifolium*), hoary bowlesia (*Bowlesia incana*), rattlesnake weed (*Daucus pusillus*), seaside daisy (*Erigeron glaucus*), popweed (*Cardamine oligosperma*), dwarf orthocarpus (*Triphysaria pusilla*), yellow bush lupine (*Lupinus arboreus*), 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* = *Acmispon glaber* var. *glaber*), 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..... **on 06/05/2012, a small patch of this locally uncommon member of the Astereae/Aster Tribe was observed growing up through the near basal foliage of a shrubby *Quercus parvula* var. *shrevei*.** 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 connata*)[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 height!!! 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 crassicaulis*)[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 incana*)[13], further compounds its taxonomic status by superficially mimicing a sympatric non-relative, downy buttercup (*Ranunculus hebecarpus*)[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. *californicum*)[15] and climbing bedstraw (*Galium porrigens* var. *porrigens*)[16] and complementing this duo and raising the ante by adding olfactory stimulation to the mix, California hedge-nettle (*Stachys bullata*)[17] and yerba buena (*Satureja douglasii* = *Clinopodium douglasii*)[18], 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 noticeable fragrance, Pacific pea (*Lathyrus vestitus* var. *vestitus*)[19] and American vetch (*Vicia americana* subsp. *americana*)[20], 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 representationto 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* = *Corethrogyne 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], Ithuriel's spear (*Triteleia laxa*..... **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*..... **growing on the exposed and relatively level grass cloaked top of this "island of biodiversity", is a reduced in stature analog of var. *divaricatum*, with inflorescences under 20cm in height and lateral branches at right angles to main stem**)[36], wild celery (*Apiastrum angustifolium*)[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 roemerii* = *Festuca roemerii* var. *klamathensis*)[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 (*Eriophyllum confertiflorum* var. *confertiflorum*)[63], California man root (*Marah fabaceus*)[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* subsps. *gracilis*/*holosericea* intergrades..... proportion 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 (*Symphytotrichum chilense*)[75], sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*)[76], slim Solomon's seal (*Smilacina stellata* = *Maianthemum stellatum*)[77], checker lily (*Fritillaria affinis*)[78], American winter cress (*Barbarea 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* = *Drymocallis glandulosa* var. *glandulosa*)[82], wood strawberry (*Fragaria vesca*)[83], Bioletti's cudweed (*Pseudognaphalium biolettii*)[84], California cudweed (*Pseudognaphalium californicum*)[85], Gianone everlasting (*Pseudognaphalium gianonei*, pro.sp.nov.)[86], pink everlasting (*Pseudognaphalium ramosissimum*)[87], cotton batting plant (*Pseudognaphalium stramineum*)[88], purple cudweed (*Gamochaeta ustulata*)[89], creeping hearts (*Pterostegia drymarioides*)[90], poison oak (*Toxicodendron diversilobum*)[91], Chilean trefoil (*Lotus wrangelianus* = *Acmispon wrangelianus*)[92], small-flowered trefoil (*Lotus micranthus* = *Acmispon parviflorus*)[93], Cleveland's cryptantha (*Cryptantha clevelandii* var. *florosa*)[94], minute-flowered cryptantha (*Cryptantha micromeres*)[95], tall layia (*Layia hieracioides*)[96], California filago (*Filago californica* = *Logfia filaginoides*)[97], California blackberry (*Rubus ursinus*)[98], straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*..... eglandular form)[99], snowberry (*Symphoricarpos albus* var. *laevigatus*)[100], slender hairgrass (*Deschampsia elongata*)[101], goldback fern (*Pentagramma triangularis* subsp. *triangularis*)[102], bracken (*Pteridium aquilinum* var. *pubescens*)[103], purple sack clover (*Trifolium depauperatum* var. *truncatum*)[104], Valparaiso clover (*Trifolium microdon*)[105], tomcat clover (*Trifolium willdenovii*..... a distinctive, reduced in stature population, which also differs in seed color from robust form growing on "slide area" overlooking Purdy Road. Both taxa documented via spent inflorescences and mature seed collections)[106], dense sedge (*Carex densa*)[107], small-bracted sedge (aff. *Carex subbracteata*)[108], umbrella sedge (*Cyperus eragrostis*)[109], short-stalked wood rush (*Luzula subsessilis*)[110], brown bog-rush (*Juncus hesperius*)[111], common rush (*Juncus patens*)[112], brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*)[113], yarrow (*Achillea millefolium*)[114], coyote mint (*Monardella villosa* sensu lato..... foliage variable as to indument and overall gestalt, with some plants tending towards subsp. *franciscana*)[115], California brome (*Bromus carinatus* var. *carinatus*)[116], double-headed clover (*Trifolium macraei*)[117], common horseweed (*Erigeron canadensis*)[118], serpentine miner's lettuce (*Claytonia exigua* subsp. *exigua*)[119]..... discovered on 04/29/2013, one plant pressed and deposited with the UCSC Arboretum and paniced willow herb (*Epilobium brachycarpum*)[120]..... two plants discovered and added to the list on 10/17/2015.

Visible from Swanton Road, the “**Magic Triangle**” is a deltoid near-vertical refugium for 120+ native taxa, **one of which constituted the only known documentation for the county of Franciscan paintbrush (*Castilleja subinclusa* subsp. *franciscana*), discovered circa 30 years ago and specimens later pressed and deposited in the Jepson Herbarium (UC Berkeley)**. This isolated population was different from the type in that the inflorescences were covered with gland-tipped trichomes. A hummingbird pollinated paintbrush species of great beauty, with flowers superficially resembling a tropical Heliconia, it was growing sympatrically with another co-evolved taxon, this time with pendant orange nectareous flowers, crimson columbine (*Aquilegia formosa*). Concurrent with the documentation of the two hummingbird pollinated taxa was the discovery of the allo-tetraploid Santa Cruz microseris (*Stebbinsoseris decipiens*) and both of its diploid parents, namely coast microseris (*Microseris bigelovii*) and silver puffs (*Uropappus lindleyi*) plus the less common 4-merous flower variant of mosquito bills (*Dodecatheon hendersonii* subsp. *cruciatum* = *Dodecatheon hendersonii*). **Leaving the upper edge of the “Magic Triangle” and heading in a southward bearing along the grass-cloaked synform, one encounters a nonet of native clovers:** long-keeled clover (*Trifolium appendiculatum* = *Trifolium rostratum*), bearded clover (*Trifolium barbigerum* var. *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*) and tomcat clover (*Trifolium willdenovii*). This constellation of clover species was sharing habitat with unrelated owl’s clover (*Castilleja densiflora*, aff. *Orthocarpus noctuinus*), the coastal headland race displaying cream-colored vanilla scented flowers, Johnny jump-up (*Viola pedunculata*), with a subterranean root system that would seem commensurate with an adult oak rather than an herbaceous perennial circa 10-20 cm. in height, an isolated colony of coast dandelion (*Agoseris apargioides* var. *apargioides* = *Agoseris hirsuta*) and distantly related sky lupine (*Lupinus nanus*), exhibiting flowers ranging in color from white fading tan through pink, lavender, pale blue and finally the traditional dark blue. Adding visual spice to the proceedings, a trio of paintbrush relatives and a sporadic natural hybrid between two of them: butter-and-eggs (*Triphysaria eriantha* subsp. *eriantha*), dwarf orthocarpus (*Triphysaria pusilla*) and purple-beaked owl’s clover (*Triphysaria micrantha*..... **herbarium pressings made [1984] and only documentation for Santa Cruz County of this species**); 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* sp., possibly *Luzula subsessilis*?..... **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 apiifolium*..... **a rare native, apparently restricted in Santa Cruz County, to a narrow zone within the Scott 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* var. *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 corethrogyne (*Corethrogyne filaginifolia* var. *californica*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), lizard tail (*Eriophyllum staechadifolium*), tidytips (*Layia platyglossa*), coast microseris (*Microseris bigelovii*), California cudweed (*Pseudognaphalium californicum*), Gianone everlasting (*Pseudognaphalium gianonei*, pro.sp.nov.), pink everlasting (*Pseudognaphalium ramosissimum*), California aster (*Symphotrichum chilense*)..... California bay laurel (*Umbellularia californica*)..... California bedstraw (*Galium californicum* subsp. *californicum*), climbing bedstraw (*Galium porrigens* var. *porrigens*)..... 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 (*Platystemon californicus*)..... California brome (*Bromus carinatus* var. *carinatus*), seaside brome (aff. *Bromus maritimus*..... **inflorescences with apressed-ascending branches**), California oat grass (*Danthonia californica*), slender hairgrass (*Deschampsia elongata*), California wild rye (*Elymus glaucus* subsp. *glaucus*), California fescue (*Festuca californica*), Roemer's fescue (aff. *Festuca roemeri* var. *klamathensis*), red fescue (*Festuca rubra*..... **type with diffuse growth pattern**), junegrass (*Koeleria macrantha*), California melic (*Melica californica*), Torrey's melic (*Melica torreyana*), pine bluegrass (*Poa secunda* subsp. *secunda*), ocean-bluff bluegrass (*Poa unilateralis* subsp. *unilateralis*), foothill needlegrass (*Stipa lepida*), purple needlegrass (*Stipa pulchra*)..... sticky monkeyflower (*Diplacus aurantiacus*)..... dwarf brodiaea (*Brodiaea terrestris* subsp. *terrestris*), blue dicks (*Dichelostemma capitatum* subsp. *capitatum*)..... Lindley's varied lupine (*Lupinus variicolor*), pinole clover (*Trifolium bifidum* var. *decipiens*), double-headed clover (*Trifolium macraei*), tomcat clover (*Trifolium willdenovii*), American vetch (*Vicia americana* subsp. *americana*)..... crimson columbine (*Aquilegia formosa*), coast larkspur (*Delphinium decorum* subsp. *decorum*), California buttercup (*Ranunculus californicus*), downy buttercup (*Ranunculus hebecarpus*)..... white globe lily (*Calochortus albus*), checker lily (*Fritillaria affinis*)..... blue-eyed grass (*Sisyrinchium bellum*)..... slim Solomon's seal (*Maianthemum stellatum*)..... sun cup

(*Taraxia ovata*)..... checkerbloom (*Sidalcea malviflora* subsp. *malviflora*)..... sea lettuce (*Dudleya caespitosa*)..... sea blush (*Plectritis congesta* subsp. *congesta*..... **variable populations, intermediate between subsp. *congesta* and subsp. *brachystemon*, with corollas pale to dark pink, 3(+)mm across face and bilabiate**)..... poison oak (*Toxicodendron diversilobum*)..... California figwort (*Scrophularia californica*)..... snowberry (*Symphoricarpos albus* var. *laevigatus*)..... Johnny jump-up (*Viola pedunculata*)..... popweed (*Cardamine oligosperma*)..... slender miner's lettuce (*Claytonia parviflora* subsp. *parviflora*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*)..... Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... forest live-oak (*Quercus parvula* var. *shrevei*)..... coast buckwheat (*Eriogonum latifolium/nudum* intergrades)..... rein orchid (*Piperia* species..... **when observed, still in foliar stage without inflorescence**)..... California maidenhair (*Adiantum jordanii*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*)..... wood fern (*Dryopteris arguta*), western sword fern (*Polystichum munitum*)..... polypody (aff. *Polypodium californicum*..... **growing as a lithophyte**)..... yerba buena (*Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*)..... soap plant (*Chlorogalum pomeridianum* var. *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 (*Quercus agrifolia* var. *agrifolia*) and forest live-oak (*Quercus parvula* var. *shrevei*), plus related tan-oak (*Lithocarpus densiflorus* var. *densiflorus* = *Notholithocarpus densiflorus*), grow side by side..... their differences in branching patterns, leaf morphologies, fruit maturation times, and bark topographies are easily observed. Still staying within the Fagaceae but cryptic as to origins and virtually indistinguishable from the other oaks overlooking this portion of our downhill jaunt, scattered representatives of the non-F1 oracle oak aka *Quercus x morehus* can be discerned with a careful bit of sleuthing and foreknowledge. While examining a well established specimen of ground rose (*Rosa spithamea*) growing along this stretch of road, my eye was drawn upwards towards several dried leaves with pronounced lobulations blanketing the steep slide prone slope and immediately recognized the oracle oak's foliar calling card..... once my eyes adjusted to the dappled light and shadow impacted greenery some 30 feet above the now ignored ground rose, a semi-deciduous juvenile specimen of *Quercus x morehus* appeared, looking from my perspective, far more like an immature red alder than any self-respecting oak. A quartet of gymnosperms enrich this arboreal pageant, not only with differing gestalts but foliar aromas as well..... making up this foursome are Monterey pine (*Pinus radiata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), California nutmeg (*Torreya californica*) and coast redwood (*Sequoia sempervirens*). Presenting a fall display in gold, big-leaf maple (*Acer macrophyllum*) brightens the deep canyon recesses as the shorter days herald the onset of winter, while sister species, box elder (*Acer negundo* var. *californicum* = *Acer negundo*), 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 (*Umbellularia californica*), country cousin to the domestic avocado (*Persea americana*) and offers olfactory counterpoint to the overpowering sweetness released by the California buckeye (*Aesculus californica*..... whose pollen is toxic to European honeybees aka *Apis mellifera*, causing crippled/malformed offspring but along with its nectar, provides sustenance for our native bees, hummingbirds and butterflies!). Sharing familial connections with such local natives as the inimitably fragrant western azalea (*Rhododendron occidentale*..... another horticulturally desirable native with all plant parts poisonous!), the endemic Schreiber's manzanita (*Arctostaphylos glutinosa*), and the delectable California huckleberry (*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* var. *thyrsiflorus*), are each represented along this particular segment of our walk by **individuals exceeding five meters in height and in the case of the *Ceanothus*, one example may approach/exceed 10 meters .** 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 Scott 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 sympatry, are a substantial number of hybrids destined to be trapped in a limbo between being potentially fertile and unable to secure a 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 (*Frangula californica* subsp. *californica*), forest live-oak (*Quercus parvula* var. *shrevei*), California bay laurel (*Umbellularia californica*), nodding brome (*Bromus vulgaris*), coast live-oak (*Quercus agrifolia* var. *agrifolia*), oracle oak (*Quercus x morehus*..... **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 (*Lonicera hispidula*), sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*), California hedge nettle (*Stachys bullata*), tan-oak (*Notholithocarpus densiflorus* var. *densiflorus*), Alaska onion grass (*Melica subulata*), Pacific pea (*Lathyrus vestitus* var. *vestitus*), Douglas's iris (*Iris douglasiana*), sweet cicely (*Osmorhiza berteroi*), California maidenhair (*Adiantum jordanii*), spotted coralroot (*Corallorhiza maculata* sensu lato..... **the taxon in question lacks any spotting on the labellum, 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* subsp. *consanguinea*), mugwort (*Artemisia douglasiana*), American vetch (*Vicia americana* var. *americana*), hound's tongue (*Cynoglossum grande*), Gianone sedge complex (*Carex gianonei*, pro.sp.nov.), California aster (*Symphotrichum chilense*), pine grass (*Calamagrostis rubescens*), broad-leaved aster (*Eurybia radulina*), Hall's/leafy bent grass intergrades (*Agrostis hallii/pallens* complex), foothill needlegrass (*Nassella lepida* = *Stipa 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 12+" 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 (*Corylus cornuta* subsp. *californica*), Pacific starflower (*Trientalis latifolia* = *Lysimachia 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 (*Solanum umbelliferum*), coast tarweed (*Madia sativa*), coyote mint (*Monardella villosa* subsp. *villosa*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), California figwort (*Scrophularia californica* subsp. *californica*), climbing bedstraw (*Galium porrigens* var. *porrigens*), bracken (*Pteridium aquilinum* var. *pubescens*), straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*), slim Solomon's seal (*Smilacina stellata* = *Maianthemum stellatum*), fat Solomon's seal (*Smilacina racemosa* = *Maianthemum racemosum*), nested polypody (*Polypodium calirhiza*..... **lowest sets of pinna shorter than succeeding ones**), white hawkweed (*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 (*Triteleia 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 Scott 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*), Douglas'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 berteroi*), woodland madia (*Madia madioides* = *Anisocarpus madioides*), wood strawberry (*Fragaria vesca*), the "fat" and "slim" Solomon's seals (*Smilacina racemosa* = *Maianthemum racemosum* and *Smilacina stellata* = *Maianthemum stellatum*), white hawkweed (*Hieracium albiflorum*), 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 hispidula* var. *vacillans* = *Lonicera hispidula*) 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 (*Diplacus 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, upthrust calyces and distinctly pedicellate flowers), *Castilleja wightii* (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 Scott 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!
- (c) A Rosaceae is a Rosaceae is a Rosaceae, or the case of the ant and the elephant! In terms of stature extremes, it is hard imagining two more polar opposites than western lady's mantle (*Aphanes occidentalis*), a diminutive annual whose adult biomass 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..... yet both are bonafide members of the rose family and native to boot!

***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 \pm 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 breweri* 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/short-stalked wood rush (*Luzula comosa* var. *comosa*/*Luzula subsessilis*) enter 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 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.

Expanding on the preceding fern discourse, is a repeating pattern or a botanical leitmotiv, which I term the "cluster of five". This aggregation of fern species, growing sympatrically in several separate locations along Swanton Road, is notable both for its reoccurrence along our "exploratory jaunt" and the consistency of all five players being found together. Borrowing further from the lexicon of classical music, this quintet of Filicineae, is comprised of the following taxa grouped by familial relationships: *Dryopteris arguta* and *Polystichum californicum*; *Adiantum jordanii* and *Pentagramma triangularis* subsp. *triangularis*; *Polypodium* aff. *calirhiza*, with the lowermost 1-3 pinnae shorter than the succeeding ones.

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), *Coffea* (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 exerted). 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 usually 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* = *Lysimachia 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* subsp. *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 Scott 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 tenella*), canyon gooseberry (*Ribes menziesii* var. *menziesii*), Pacific pea (*Lathyrus vestitus* var. *vestitus*), ground rose (***Rosa spithamea*, new addition to Scott Creek Watershed native species checklist**)), Hooker's fairy bells (*Disporum hookeri* = ***Prosartes hookeri***), bleeding heart (*Dicentra formosa*), Douglas's iris (*Iris douglasiana*), intermediate fiddleneck (*Amsinckia menziesii* var. *intermedia* = ***Amsinckia menziesii***), Pacific starflower (*Trientalis latifolia* = ***Lysimachia latifolia***), willow herb (*Epilobium ciliatum* sensu lato), hazelnut (*Corylus cornuta* var. *californica*), hill star (*Lithophragma heterophyllum*), California canary grass (*Phalaris californica*), gambleweed (*Sanicula crassicaulis*), giant trillium (*Trillium chloropetalum*), broad-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 Scott 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 Complex** 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 Scott 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. *intermedia* = ***Amsinckia intermedia***), 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 Scott 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 chorisianus* var. *chorisianus*, 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 Scott 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 divaricatum* var. *pubiflorum*), canyon gooseberry (*Ribes menziesii*).... creek dogwood (*Cornus sericea* subsp. *sericea*).... arroyo willow (*Salix lasiolepis*), Scouler's willow (*Salix scouleriana*).... **one small tree with conspicuously oblanceolate 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 (*Eschscholzia californica*).... California nutmeg (*Torreya californica*).... silk tassel (*Garrya 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 specuarioides*).... hoary bowlesia (*Bowlesia incana*), rattlesnake weed (*Daucus pusillus*), cow-parsnip (*Heracleum maximum*), lovage (*Ligusticum apiifolium*).... **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 berteroi*), footsteps-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* = *Maianthemum racemosum*), slim Solomon's seal (*Smilacina stellata* = *Maianthemum stellatum*).... Hooker's fairy bells (*Prosartes hookeri*).... Pacific starflower (*Trientalis latifolia* = *Lysimachia latifolia*).... western trillium (*Trillium ovatum* subsp. *ovatum*).... sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*), musk monkeyflower (*Mimulus moschatus* = *Erythranthe inodora*).... **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 arguta*), 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 (*Lonicera 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 (*Danthonia 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 discolor*), 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* var. *grandiflora*), coast dandelion (*Agoseris hirsuta*), woodland madia (*Anisocarpus madioides*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis* var. *consanguinea*), Indian thistle (*Cirsium brevistylum*), California aster (*Corethrogyne filaginifolia*..... **var. californica**), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), broad-leaved aster (*Eurybia radulina*), purple cudweed (*Gamochaeta ustulata*), sneezeweed (*Helenium puberulum*), white hawkweed (*Hieracium albiflorum*), 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 paludosa*..... **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 analagous 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 (*Symphotrichum chilense*)..... small-flowered alum root (*Heuchera micrantha*)..... white globe lily (*Calochortus albus*), checker lily (*Fritillaria affinis* var. *affinis*)..... giant horsetail (*Equisetum telmateia* subsp. *braunii*)..... blue elderberry (*Sambucus nigra* subsp. *caerulea*), 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* var. *thyrsiflorus*), California coffeeberry (*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 perigynia often hosting a whitish fungus, while some plants have functioning stamens which produce pollen and other plants are apparently, wholly sterile), "super subbracteata" (*Carex nitidicarpa*, pro.sp.nov..... this taxon represents a *Carex subbracteata* matrix displaying *Carex densa* characteristics, such as flowering culms deltoid in cross-section with scabrous margins, the lower 1-5+ spiklets often compound-congested and gynaeandrous, androgynous and/or mixed, with the mature inflorescences prostrate through ascending), slough sedge (*Carex obnupta*), small-bracted sedge (*Carex subbracteata*), foothill sedge (*Carex tumulicola*)..... dwarf brodiaea (*Brodiaea terrestris* subsp. *terrestris*), blue dicks (*Dichelostemma 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* = *Acmispon parviflorus*), yellow bush lupine (*Lupinus arboreus*), sky lupine (*Lupinus nanus*), Lindley's varied lupine (*Lupinus variicolor*), long-keeled clover (*Trifolium appendiculatum* = *Trifolium rostratum*), bearded clover (*Trifolium barbigerum*), Santa Cruz clover (*Trifolium buckwestiorum*)..... **original population, discovered in late 1950s, still extant and extremely localized along central portion of Old Road, below "Bowl Area" and documented with herbarium pressings in 2014**, 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 noctuinus*, 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 bullata*), rigid hedge-nettle (*Stachys rigida* var. *quercetorum*)..... toad rush (*Juncus bufonius* sensu lato), brown bog-rush (*Juncus hesperius*), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), common wood rush (*Luzula comosa*, some plants upon closer examination of seed size may prove to be *Luzula subsessilis*)..... crimson columbine (*Aquilegia formosa*..... 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 latifolium/nudum* intergrades), creeping hearts (*Pterostegia drymarioides*)..... 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 spithamea*) 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:

Arctostaphylos Chalks (a): WGS84: 37.106009, -122.232181, elevation 1232ft

Arctostaphylos Chalks (b): WGS84: 37.099227, -122.231456, elevation 945ft

Arctostaphylos Chalks (c): WGS84: 37.090941, -122.239469, elevation 723ft

Arroyo de Las Trancas, upper east fork: WGS84: 37.087747, -122.263314, elevation 527ft

Arroyo de Las Trancas, lower east fork: WGS84: 37.086481, -122.267067, elevation 198ft

Arroyo de Las Trancas, upper west fork: WGS84: 37.091679, -122.263286, elevation 641ft

Arroyo de Las Trancas, lower west fork: WGS84: 37.088522, -122.267258, elevation 193ft

Arroyo de las Trancas, Post Rock Beach Waterfall: WGS84: 37.086405, -122.271851, elevation 42ft

Arroyo de Las Trancas, Post Rock Beach: WGS84: 37.086374, -122.272263, elevation 10ft

Arroyo de Las Trancas, isolated *Quercus chrysolepis* population: WGS84: 37.088802, -122.264246, elevation 624ft

Beaver Flat: WGS84: 37.094829, -122.257389, elevation 650ft

Upper Calf Gulch (a): WGS84: 37.099130, -122.243789, elevation 578ft

Upper Calf Gulch (b): WGS84: 37.096828, -122.241859, elevation 731ft

Lower Calf Gulch: WGS84: 37.095706, -122.248281, elevation 205ft

Upper Cowboy Shack Gulch: WGS84: 37.064627, -122.240363, elevation 617ft

Lower Cowboy Shack Gulch: WGS84: 37.060430, -122.247498, elevation 239ft

Gianone Barn Gulch/Upper Spring and Marsh: WGS84: 37.085812, -122.260555,
elevation 553ft

Gianone Barn Gulch/central portion: WGS84: 37.085981, -122.253917, elevation 354ft

Gianone Barn Gulch/Mountain Lion Gulch Marsh (shared drainage): WGS84: 37.086188,
-122.250379, elevation 125ft

Laguna de Las Trancas: WGS84: 37.088458, -122.258682, elevation 586ft

Last Chance Road Micro-Marsh #1: WGS84: 37.084651, -122.261353, elevation 526ft

Upper Lair Gulch Complex: WGS84: 37.109931, -122.259732, elevation 971ft

Central Lair Gulch Complex: WGS84: 37.102251, -122.262310, elevation 710ft

Lower Lair Gulch Complex: WGS84: 37.096094, -122.255829, elevation 577ft

Magic Triangle: WGS84: 37.080517, -122.257795, elevation 544ft

Magic Triangle Synform Complex/Old Road Gulch: WGS84: 37.081883, -122.252279,
elevation 327ft

Magic Triangle Synform Complex/Magic Triangle Gulch: WGS84: 37.080167,
-122.255062, elevation 458ft

Magic Triangle Synform Complex/Bifurcate Gulch: WGS84: 37.078804, -122.254572,
elevation 398ft

Magic Triangle Synform Complex/Dump Gulch: WGS84: 37.077528, -122.253799,
elevation 394ft

Magic Triangle Synform Complex/Haybarn Gulch: WGS84: 37.077107, -122.252849,
elevation 348ft

Magic Triangle Synform Complex/Buckeye Grove Gulch: WGS84: 37.077691,
-122.249780, elevation 242ft

Magic Triangle Synform Complex/Bulb Field Gulch: WGS84: 37.076666, -122.249124,
elevation 288ft

Magic Triangle Synform Complex/Scott Creek entering terminus: WGS84: 37.079870,

-122.247489, elevation 107ft

Marti's Park Marsh: WGS84: 37.087881, -122.253929, elevation 369ft

Mesita #1: WGS84: 37.059140, -122.247765, elevation 267ft

Mesita #2: WGS84: 37.058194, -122.246461, elevation 270ft

Mesita #3: WGS84: 37.057337, -122.245362, elevation 292ft

Mesita #4: WGS84: 37.055737, -122.242872, elevation 303ft

Mesita #5: WGS84: 37.053079, -122.240622, elevation 284ft

Mesita #6: WGS84: 37.049917, -122.237418, elevation 250ft

Upper Mountain Lion Gulch: WGS84: 37.084381, -122.251563. elevation 356ft

Lower Mountain Lion Gulch: WGS84: 37.084639, -122.249960, elevation 241ft

Upper Prairie Overlook Gulch: WGS84: 37.058568, -122.236122. elevation 602ft

Central Prairie Overlook Gulch: WGS84: 37.055995, -122.237954. elevation 381ft

Lower Prairie Overlook Gulch: WGS84: 37.054526, -122.241816, elevation 229ft

Rosetta Stone Pine Marsh: WGS84: 37.091305, -122.257830, elevation 592ft

Upper Seymore Field: WGS84: 37.097837, -122.235438, elevation 650ft

Lower Seymore Field: WGS84: 37.092671, -122.234957, elevation 465ft

Seymore Hill(a): WGS84: 37.095035, -122.239762, elevation 979ft

Seymore Hill(b): WGS84: 37.097882, -122.238440, elevation 1007ft

Seymore Hill/"Bowl Area": WGS84: 37.101049, -122.241069, elevation 702ft

Solar-panel Hotspot: WGS84: 37.066470, -122.244725, elevation 550ft

Squirrel Flat: WGS84: 37.084297, -122.247014, elevation 122ft

West's Spring Marsh: WGS84: 37.089936, -122.256083, elevation 499ft

Vertical Grasslands [e-facing] above Upper Seymore Field (a): WGS84: 37.096839,
-122.237204, elevation 871ft

Vertical Grasslands [e-facing] above Upper Seymore Field (b): WGS84: 37.098342,

-122.236763, elevation 866ft

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 Scott Creek Watershed and environs**, then deposited in the Jepson Herbarium, U.C. Berkeley, **are as follows:**

Adiatum jordanii/accession number **OBI45564**/David Keil, et al., 20631, 5/7/88
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/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 **JEPS82936**/West #264
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 "*glandulosa*"/accession number **UCSC5811**/R. Morgan, Jan 17 1977
Arctostaphylos glutinosa/accession number **JEPS81979**/Buck & West #153
Arctostaphylos glutinosa/accession number **JEPS81980**/Buck & West #152
Arctostaphylos sensitiva/accession number **UCSC5566**/Randall Morgan, 1000, 22 Dec 1976
Arctostaphylos sensitiva/accession number **UCSC5559**/Randall Morgan, 1065, 25 Jan 1977
Arctostaphylos tomentosa subsp. *crinita* = *Arctostaphylos crustacea* subsp. *crinita*/accession number **UCSC4775**/Randall Morgan, Dec 26 1976
Arctostaphylos tomentosa subsp. *crinita* = *Arctostaphylos crustacea* subsp. *crinita*/accession number **UCSC4776**/Randall Morgan, Dec 21 1976
Arctostaphylos tomentosa subsp. *crinita* = *Arctostaphylos crustacea* subsp. *crinita*/accession number **UCSC4779**/Randall Morgan, Feb 1 1977
Arctostaphylos tomentosa subsp. *crinita* = *Arctostaphylos crustacea* subsp. *crinita*/accession number **UCSC4789**/Randall Morgan, Mar 1 1977
Barbarea orthoceras/accession number **UCSC3123**/Randall Morgan, Apr 9 2002
Brodiaea elegans subsp. *elegans*/accession numbers **UCSC8897, 8924, 8926**/Dylan Neubauer (via James A. West) #88a, #88b, #88c/08 June 2014
Cardamine californica var. *integrifolia*/accession number **UCSC3529**/Randall Morgan, Apr 9 2002
Carex gianonei, **pro. sp. nov.**/accession number **JEPS82955**/West #42.2
Carex gianonei, **pro. sp. nov.**/accession number **JEPS82968**/West #207.1
Carex gianonei, **pro. sp. nov.**/accession number **JEPS82969**/West #213.1
Carex gianonei, **pro. sp. nov.**/accession number **JEPS82970**/West #216.1
Carex gracilior/accession numbers **UCSC8861, 8862, 8863 and 8930**/Dylan Neubauer #66a-1, 66b, 66c and 66a-2/10 May 2014

Castilleja affinis subsp. *affinis*/accession number **JEPS82898**/Buck & West #377
Castilleja affinis subsp. *affinis*/accession number **JEPS81908**/Buck & West #(?)
Castilleja affinis subsp. *affinis*/accession number **JEPS82585**/West #109
Castilleja attenuata/accession number **JEPS82768**/West #74
Castilleja densiflora subsp. *densiflora*/accession number **UCSC6161**/R. Morgan, May 7 1981
Castilleja densiflora subsp. *densiflora*/accession number **JEPS82563**/West #94
Castilleja densiflora subsp. *densiflora*/accession number **JEPS82962**/West #55
Castilleja densiflora subsp. *densiflora*/accession number **JEPS82396**/Buck & West #264
Castilleja densiflora subsp. *densiflora*/accession number **JEPS82561**/Buck & West #231
Castilleja densiflora subsp. *densiflora*/accession number **JEPS82562**/Buck & West #230
Castilleja densiflora subsp. *densiflora*/accession number **JEPS81529**/Buck, West & Stone #465
Castilleja densiflora subsp. *densiflora*/accession number **JEPS90563**/Taylor #9465
Castilleja subinclusa subsp. *franciscana*/accession number **JEPS83086**/West #372
Castilleja subinclusa subsp. *franciscana*/accession number **JEPS81530**/Stone, Buck & West #458
Castilleja subinclusa subsp. *franciscana*/accession number **UCSC6143**/Randall Morgan, s.n., 12 Jun 1978
Ceanothus thyrsiflorus/accession number **JEPS82636**/Buck & West #226
Cirsium occidentale var. *occidentale*/accession number **JEPS83125**/Buck & West #373
Clarkia rubicunda/accession numbers **JEPS81511, 81512**/Buck & West #19, Jun 16 1982
Collinsia heterophylla/accession number **JEPS82803**/Buck & West #492
Collinsia heterophylla/accession number **JEPS85161**/Buck & West #492
Collinsia heterophylla/accession number **SBBG95540**/Keil #20618
Collinsia heterophylla/accession number **OBI45577**/David J. Keil, et al., 20619, May 7, 1988
Collinsia franciscana = *Collinsia multicolor*/accession number **OBI45576**/David J. Keil, et al., 20619, May 7, 1988
Collinsia multicolor/accession number **JEPS81542**/Stone & West #467
Collinsia multicolor/accession number **SJSU9542**/Myatt, 05/02/81
Corethrogyne filaginifolia/accession number **JEPS83605**/Buck & West #444, Jul 17 1983
Corethrogyne filaginifolia/accession number **UCSC7237**/Randall Morgan s.n., Jun 26 1991
Cryptantha flaccida/accession number **JEPS82587**/West #97
Daucus pusillus/accession number **JEPS81518**/Buck & West #11
Delphinium decorum subsp. *decorum*/accession number **JEPS81921**/Roy E. Buck, James A. West, and R. Doug Stone, #193, April 10, 1983
Delphinium hesperium subsp. *hesperium*/accession number **JEPS82604**/West #98
Delphinium patens subsp. *patens*/accession number **JEPS82765**/West #63
Delphinium patens subsp. *patens*/accession number **JEPS82642**/Buck & West #218
Deschampsia danthonioides/accession number **JEPS82589**/West #99
Deschampsia danthonioides/accession number **JEPS82590**/West #99.1
Deschampsia elongata/accession number **UCR67855**/Keil #20601
Deschampsia elongata/accession number **OBI45356**/David J. Keil, et al., 20601-1, May 7, 1988
Dicentra formosa/accession number **JEPS81502**/Buck & West #24
Disporum hookeri = *Prosartes hookeri*/accession number **JEPS83469**/Buck & West #478
Dodecatheon hendersonii = *Primula hendersonii*/accession number **JEPS83088**/West #347
Dryopteris arguta/accession number **UCSC7149**/R. Morgan, Nov 1976
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
Gilia achilleifolia subsp. *achilleifolia*/accession number **JEPS82761**/West #60
Githopsis specularioides/accession number **JEPS83465**/Buck & West #528
Hesperocnide tenella/accession number **JEPS81501**/Buck & West #25
Heuchera micrantha/accession number **UCR67971**/Keil #20573
Juncus mexicanus/accession number **JEPS81506**/Buck & West #15
Juncus xiphioides/accession number **JEPS83061**/Buck & West #453
Lasthenia glaberrima/accession number **JEPS82599**/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 latifolius var. *latifolius*/accession number **OBI45703**/David J. Keil, et al., 20655,
 May 7, 1988
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
Monardella villosa/accession number **OBI77175**/Jim West
Monardella villosa subsp. *franciscana*/accession number **OBI77170**/Jim West
Monardella villosa subsp. *franciscana*/accession number **OBI77178**/Jim West
Monardella villosa subsp. *franciscana*/accession number **OBI77165**/Taylor Crow
Monardella villosa subsp. *franciscana*/accession number **OBI77166**/Taylor Crow
Monardella villosa subsp. *franciscana*/accession number **OBI77168**/Taylor Crow
Monardella villosa subsp. *franciscana*/accession number **OBI77179**/Taylor Crow
Montia fontana/accession number **UCSC3458**/Randall Morgan, Apr 9 2002
Nemophila parviflora var. *parviflora* = *Nemophila* aff. *pulchella* var. *fremontii*?/accession
 number **JEPS85186**/Buck & West #173
Nemophila parviflora var. *parviflora* = *Nemophila* aff. *pulchella* var. *fremontii*?/accession
 number **JEPS81539**/Buck, West & Stone #470
Nemophila parviflora var. *parviflora* = *Nemophila* aff. *pulchella* var. *fremontii*?/accession
 number **JEPS85184**/Buck, West & Stone #138
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 diffusus/accession number **UCSC7609**/R. Morgan, #4962, 15 Apr 2010
Plagiobothrys nothofulvus/accession number **JEPS82764**/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
Quercus parvula var. *shrevei*/accession number **OBI45780**/David J. Keil, et al., 20641,
 May 7, 1988
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 bipinnatifida/accession number **UCSC6030**/R. Morgan, Apr 8 1982
Sanicula hoffmannii/accession number **UC1595971**/Roy E. Buck and R. Douglas Stone, Jul 4
 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,
 Buck, West & Clifton #9671
Trifolium barbigerum var. *barbigerum*/accession number **JEPS85128**/Buck & West #224
Trifolium barbigerum var. *barbigerum*/accession number **JEPS83085**/West #370
Trifolium barbigerum/accession number **UCSC5356**/Randall Morgan, May 30 1981
Trifolium buckwestiorum/accession number **JEPS82502**/West #110
Trifolium buckwestiorum/accession number **JEPS83454**/Morgan & West #3
Trifolium buckwestiorum/accession number **UCSC7595**/R. Morgan, #5049, 10 Jun 2010
Trifolium buckwestiorum/accession number **JEPS81528**/Buck, West, Hawke & Vigno #1
Trifolium buckwestiorum/accession number **JEPS82767**/West #73
Trifolium buckwestiorum/accession number **JEPS118496**/West #107
Trifolium buckwestiorum/accession numbers **UCSC8870, UCSC8871, UCSC8872**/Dylan
 Neubauer (via James A. West) #72 b, #72c, #72d/21 May 2014
Trifolium depauperatum var. *depauperatum*/accession number **JEPS81915**/Buck & West #200
Trifolium gracilentum/accession number **UCSC6048**/R. Morgan, Apr 27 1995
Trifolium barbigerum var. *andrewsii* = *Trifolium grayi*/accession number **RSA479483**/West
 #103
Trifolium barbigerum var. *andrewsii* = *Trifolium grayi*/accession number **JEPS82603**/West
 #i03.1
Trifolium aff. *grayi*/accession number **UCSC5626**/Randall Morgan, May 26 1981
Trifolium aff. *grayi*/accession number **UCSC5355**/Randall Morgan, May 30 1981
Trifolium microdon/accession number **JEPS81914**/Buck & West #201
Trifolium variegatum var. *melananthum* (= *Trifolium rostratum*)/accession number
JEPS82762/West #56
Trifolium variegatum var. *melananthum* (= *Trifolium rostratum*)/accession number
JEPS83084/West #369
Trifolium variegatum var. *melananthum* (= *Trifolium rostratum*)/accession number
JEPS82640/Buck & West #220
Triphysaria eriantha subsp. *eriantha*/accession number **JEPS82002**/Buck & West #159
Triphysaria eriantha subsp. *eriantha*/accession number **JEPS82004**/Buck & West #160
Triphysaria micrantha/accession number **JEPS825841**/West #198
Triphysaria micrantha/accession number **JEPS89206**/West #28

Triphysaria pusilla/accession number JEPS82638/Buck & West #222

Triphysaria pusilla/accession number JEPS82639/Buck & West #221

Trisetum canescens/accession number JEPS82810/Buck & West #285

Vicia hassei/accession number JEPS82627/Buck & West #239

Vicia hassei/accession numbers UCSC8876, 8877, 8878/Dylan Neubauer (via James A. West)
#74a, #74b, #74c/26 May 2014

Scott Creek Bridge to Big Creek Bridge

The next phase of our watershed perambulation, situated between Scott 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 uncinata 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 exertion, 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*.

Note: Although virtually invisible when viewed with the naked eye from ground level, this afternoon (05/04/2014) I stood on the railing of the Scott Creek Bridge (near the Old Red Schoolhouse) and was able to reach up and pull down a flexible *Alnus rubra* branch. When

broken off and examined, to my surprise, all the twigs were covered with a semi-soft, convex scale (their gestalt akin to a Limpet shell). The pre-1955, near senescent *Alnus*, already showing signs of impending mortality, was covered with "honeydew", giving the leaves a glistening, mirror-like reflective surface and coating both the bridge railings and understory vegetation. This would be an interesting study/project for some enterprising grad-student, adding the caveat..... with the potential to further weaken an already 60+ years old tree, does the sugary exudate also provide a possible substrate for airborne pathogens aka fungal spores to germinate? Conversely, since the Red Alder's foliage is seasonally shed, would this offset a potential pathogen's impact to the tree's overall health? This condition was also observed elsewhere along the riparian corridor but often as occasional/localized occurrences.

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 Scott 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 Scott 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 Scott 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 Scott Creek; leopard lily (*Lilium pardalinum* subsp. *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*), one of the rarest of the nine 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 discoidea*), 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 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 chaparral broomrape (*Orobanche bulbosa*), while back down in the riparian corridor, another jettisoned genus from the Scrophulariaceae, *Veronica* aff. *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 madia (*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 douglasii*), sweet cicely (*Osmorhiza berteroi*), 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-fruited 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 (*Maianthemum racemosum*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), windflower (*Anemone grayi*), Pacific starflower (*Lysimachia latifolia*), western trillium (*Trillium ovatum* subsp. *ovatum*), slink pod (*Scolopos bigelovii*), red clintonia (*Clintonia andrewsiana*), California hedge nettle (*Stachys bullata*), sedge_sect. Ovales (*Carex* aff. *Carex gianonei* complex, **some inflorescences with lowermost spikelets compound-congested**), nodding brome (*Bromus vulgaris*), slender hairgrass (*Deschampsia elongata*), Howell's bluegrass (*Poa howellii*), vanilla grass (*Hierochloa occidentalis* = *Anthoxanthum occidentale*), small-flowered alum root (*Heuchera micrantha*), 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 buckwestiorum*), few-flowered clover (*Trifolium oliganthum*), tomcat clover (*Trifolium willdenovii*), maiden clover (*Trifolium microcephalum*), common wood rush (*Luzula comosa*), small-flowered trefoil (*Acmispon parviflorus*), blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), coyote brush (*Baccharis pilularis*), California nutmeg (*Torreya californica*), sticky monkeyflower (*Diplacus aurantiacus*), Fremont's star lily (*Toxicoscordion fremontii*), morning glory (*Calystegia purpurata* subsp. *purpurata*), Venus's looking-glass (*Triodanis biflora*), tall trisetum (*Trisetum canescens*), California polypody (*Polypodium californicum*.....

lithophyte, with lower sets of pinna longer than upper), big-leaf maple (*Acer macrophyllum*), forest live-oak (*Quercus parvula* var. *shrevei*), wood fern (*Dryopteris arguta*), toyon (*Heteromeles arbutifolia*), red larkspur (*Delphinium nudicaule*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), Pacific madrone (*Arbutus menziesii*), deerweed (*Acmispon glaber* var. *glaber*), hound's tongue (*Cynoglossum grande*), purple cudweed (*Gamochaeta ustulata*), cotton batting plant (*Pseudognaphalium stramineum*), pine grass (*Calamagrostis rubescens*), royal rein orchid (*Piperia transversa*), beargrass (*Xerophyllum tenax*), pussy ears (*Calochortus tolmiei*), common rush (*Juncus patens*), willow herb (*Epilobium ciliatum* subsp. *ciliatum*), slender miner's lettuce (*Claytonia parviflora* subsp. *parviflora*), brittle-leaf manzanita (*Arctostaphylos crustacea sensu lato*), pink everlasting (*Pseudognaphalium ramosissimum*), pinole clover (*Trifolium bifidum* var. *bifidum*), selfheal (*Prunella vulgaris* var. *lanceolata*), bright-blue speedwell (*Veronica* aff. *serpyllifolia* subsp. *humifusa*), Bolander's sedge (*Carex bolanderi*), California brome (*Bromus carinatus* var. *carinatus*), popweed (*Cardamine oligosperma*), red alder (*Alnus rubra*), lady fern (*Athyrium filix-femina* var. *cyclosorum*), paniced bulrush (*Scirpus microcarpus*), western azalea (*Rhododendron occidentale*), yellow willow (*Salix lasiandra* var. *lasiandra*) and hairy wood sorrel (*Oxalis corniculata* subsp. *pilosa* = *Oxalis pilosa*).

The topographical complexities which characterize the **Bettencourt Gulch** sub-watershed are best summed up by the more literary than scientific terms of **vertical, near vertical and very steep**..... this westerly aligned drainage system, extending in a fan-shaped pattern up to the ridge divide separating the Mill Creek sub-watershed from neighboring Scott Creek, was one of the areas hardest hit by the 2009 Lockheed Fire and in its upper reaches, served as habitat for extensive populations of the endemic manzanita, *Arctostaphylos glutinosa*. Being a non-burl forming obligate seeder and directly impacted by the incipient firestorm sweeping up the chaparral cloaked slopes, reduced this localized species to a graveyard of carbonized skeletal remnants..... akin to an alien landscape. As of 03/2012, the principal manzanita constituent of this fire ravaged environment, *Arctostaphylos crustacea sensu lato*, a polyphyletic burl-former and "genetic sponge" referencing *Arctostaphylos glutinosa* genes, is showing above 90% resprouting status and scattered throughout the habitat formerly shared by the two "Arctos", are numerous "pseudo-glutinosa" mimicking their obligate-seeder ancestry within a burl-forming matrix! The following "native" plant species inventory, ordered by familial relationships [03/03-07/2012], represents the first phase of a series of post-fire revisits: golden chinquapin (*Chrysolepis chrysophylla* var. *minor*), tan-oak (*Notholithocarpus densiflorus* var. *densiflorus*), canyon live-oak (*Quercus chrysolepis*), forest live-oak (*Quercus parvula* var. *shrevei*), chaparral live-oak (*Quercus* aff. *wislizeni* var. *frutescens*..... **the reduced in stature, shrub-like chaparral-occupying trees, possessing small spinescent-margined leaves with shiny yellow-green abaxial surfaces, fall within the circumscription of this taxon**)..... knobcone pine (*Pinus attenuata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... coast redwood (*Sequoia sempervirens*)..... California nutmeg (*Torreya californica*)..... California bay laurel (*Umbellularia californica*)..... Pacific madrone (*Arbutus menziesii*), hairy manzanita (*Arctostaphylos crustacea sensu lato*..... **exceedingly complex polyphyletic taxon, referencing *Arctostaphylos andersonii*, *Arctostaphylos glutinosa* and *Arctostaphylos sensitiva* genetic material in myriad recombinations, which theoretically maintain their integrity through time by being anchored within a regenerative burl**), Schreiber's manzanita (*Arctostaphylos glutinosa*..... **morphologically variable endemic, putatively derived from *Arctostaphylos andersonii* x *Arctostaphylos canescens***), California huckleberry (*Vaccinium ovatum*)..... poison oak (*Toxicodendron diversilobum*)..... chamise (*Adenostema fasciculatum* var. *fasciculatum*), wood strawberry (*Fragaria vesca*), toyon (*Heteromeles arbutifolia*), ocean spray (*Holodiscus discolor*

var. discolor), wood rose (*Rosa gymnocarpa*), black-cap raspberry (*Rubus leucodermis*), thimbleberry (*Rubus parviflorus*), California blackberry (*Rubus ursinus*).... blue blossom (*Ceanothus thyrsiflorus var. thyrsiflorus*).... rush trefoil (*Acmispon junceus var. junceus*.... **post 2009 Lockheed Fire, this principally chaparral species has become a dominant component of the oak woodland/chaparral transition zones, in some places a veritable monoculture**), small-flowered trefoil (*Acmispon parviflorus*), Pacific pea (*Lathyrus vestitus var. vestitus*), silver bush lupine (*Lupinus albifrons var. albifrons*.... **extensive population scattered throughout chaparral-defined upper portion of this sub-watershed, growing interspersed with *Arctostaphylos crustacea sensu lato*, chaparral pea (*Pickeringia montana var. montana*).... bush poppy (*Dendromecon rigida*).... paniced willow herb (*Epilobium brachycarpum*).... two-eyed violet (*Viola ocellata*).... California figwort (*Scrophularia californica*).... redwood sorrel (*Oxalis oregana*).... morning glory (*Calystegia purpurata subsp. purpurata*).... sweet-scented bedstraw (*Galium triflorum*).... trail plant (*Adenocaulon bicolor*), woodland madia (*Anisocarpus madioides*), coyote brush (*Baccharis pilularis subsp. consanguinea*), golden yarrow (*Eriophyllum confertiflorum var. confertiflorum*), purple cudweed (*Gamochaeta ustulata*), white hawkweed (*Hieracium albiflorum*), California cudweed (*Pseudognaphalium californicum*), pink everlasting (*Pseudognaphalium ramosissimum*).... sticky monkeyflower (*Diplacus aurantiacus*).... hound's tongue (*Cynoglossum grande*).... hairy honeysuckle (*Lonicera hispidula*).... elk-clover (*Aralia californica*).... Pacific starflower (*Lysimachia latifolia*).... small-flowered alum root (*Heuchera micrantha*).... windflower (*Anemone grayi*).... yerba buena (*Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*).... common milkmaids (*Cardamine californica*), popweed (*Cardamine oligosperma*).... sweet cicely (*Osmorhiza berteroi*), gambleweed (*Sanicula crassicaulis*).... California harebell (*Asyneuma prenanthoides*).... Douglas's iris (*Iris douglasiana*).... Fremont's star lily (*Toxicoscordion fremontii*).... red clintonia (*Clintonia andrewsiana*), Hooker's fairy bells (*Prosartes hookeri*), slink pod (*Scoliopus bigelovii*.... **extensive representation of this early-blooming lilioid, both on the gulch floor and steep hillsides/some plants with mature capsules remaining grass green, others becoming anthocyanic suffused and colored a bronze-maroon early on**).... western trillium (*Trillium ovatum subsp. ovatum*).... common rush (*Juncus patens*), common wood rush (*Luzula comosa var. comosa*).... Vanilla grass (*Anthoxanthum occidentale*), California brome (*Bromus carinatus var. carinatus*), nodding brome (*Bromus vulgaris*), pine grass (*Calamagrostis rubescens*), western fescue (*Festuca occidentalis*), crinkle-awn fescue (*Festuca subuliflora*), Alaska onion grass (*Melica subulata*), Torrey's melic (*Melica torreyana*), Howell's bluegrass (*Poa howellii*).... royal rein orchid (*Piperia transversa*).... bracken (*Pteridium aquilinum var. pubescens*).... nested polypody (*Polypodium calirhiza*.... **lowest 1-3 pinnae generally shorter in length than succeeding ones**).... California maidenhair (*Adiantum jordanii*), goldback fern (*Pentagramma triangularis subsp. triangularis*).... wood fern (*Dryopteris arguta*), western sword fern (*Polystichum munitum*).... giant chain fern (*Woodwardia fimbriata*).... lady fern (*Athyrium filix-femina var. cyclosum*).... giant horsetail (*Equisetum telmateia subsp. braunii*).**

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 plecritis (*Plectritis brachystemon*), hairy fringe-pod (*Thysanocarpus curvipes*) with lower portion of stems hirsute, **drying with maroon-brown blotches** and cauline leaves sagittate-clasping growing sympatrically with narrow-leaved fringe-pod (*Thysanocarpus laciniatus*) displaying glabrous/glaucous lower stems and cauline 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 (*Yabea microcarpa*), a former population of bent-flowered fiddleneck (*Amsinckia lunaris*), 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 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 styrafoam 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 arguta*) 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 berteroi*) 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 oliganthum*), tomcat clover (*Trifolium willdenovii*..... **at least one off-white variant has been seasonally observed occurring within this landslide defined population**), Hasse's vetch (*Vicia hassei*), woodland star (*Lithophragma affine*..... **hypanthium obconic with cuneate base**), hill star (*Lithophragma heterophyllum*..... **hypanthium campanulate with truncate base**), common wood rush (*Luzula comosa*), California man root (*Marah fabaceus*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*..... **during the Summer of 2015, a small population was studied/documentated via seed collection, which was exceptionally robust for the arid/exposed habitat and possessed vibrantly colored stems and foliage, that could due to their thickness, be defined as succulent in nature and leathery to the touch**), 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 Scott 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 Scott Creek between the Cookhouse Gulch and Mt. Cook Gulch drainages**), the aptly named slink 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 four "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 ciliolatum*), the sporadically 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 category, a long established plant of fat Solomon's seal (*Smilacina racemosa* = *Maianthemum racemosum*), 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:** Within a watershed containing 18+ fern species and natural hybrids, only one isolated micro-colony of this documented taxon has been found to date. Originally discovered in the 1970s, growing some 8+ meters above Purdy Road and across from Squirrel Flat, on a mossy cloaked California bay (*Umbellularia californica*), one plant was collected and raised in the private botanical garden of Randall Morgan. This ex situ growing plant was subsequently pressed and deposited at the UCSC Natural History Museum's herbarium and given the accession number of UCSC4869/Randall Morgan, May 26 (2)005. **During the early 1980s, a series of major winter storms reactivated the ancient landslide on which the bay laurel/leather-leaf fern were growing, toppling the support tree and burying both in landslide debris. Ironically, another locally rare taxon, coast barberry (*Berberis pinnata* subsp. *pinnata*), was growing beneath the sympatric duo and has persisted to this day (2015).**

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 (05/2011), 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 (vertical grasslands, in part) 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* = *Acmispon parviflorus*, *Lotus wrangelianus* = *Acmispon wrangelianus*, *Lupinus bicolor sensu lato*, *Lupinus hirsutissimus*, *Lupinus latifolius* var. *latifolius*, *Lupinus nanus*, *Trifolium barbigerum* var. *barbigerum*, *Trifolium bifidum* var. *deciapiens*, *Trifolium ciliolatum*, *Trifolium gracilentum* var. *gracilentum*, *Trifolium microcephalum*, *Trifolium microdon*, *Trifolium oliganthum* (an isolated population numbering 30-40 plants growing along the inner edge of Purdy Road across from Squirrel Flat, may prove to be a rare and yet-to-be-named member of the *Trifolium willdenovii* complex, *Trifolium willdenovii*, *Vicia americana* var. *americana*, *Vicia hassei*..... *Notholithocarpus densiflorus* var. *densiflorus*, *Quercus agrifolia*, *Quercus x morehus*, *Quercus parvula* var. *shrevei*..... *Amsinckia menziesii*, *Cryptantha clevelandii* var. *florosa*, *Cynoglossum grande*, *Nemophila menziesii sensu lato* (variable and complex with some gynodioecious behavior present), *Nemophila parviflora* var. *parviflora*, *Nemophila* aff. *pulchella* var. *fremontii*, *Phacelia distans*, *Phacelia malvifolia*..... *Achillea millefolium*, *Anisocarpus madioides*, *Artemisia douglasiana*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Hieracium albiflorum*,

Malacothrix floccifera, *Pseudognaphalium californicum*, *Rafinesquia californica*, *Stebbinsoseris decipiens* (the vertical grassland component of this steep hillside, pre-2009 Lockheed Fire, supported the largest to date population within the Scott Creek Watershed [700+ individuals] of this taxon, whose type locality was near Eagle Rock)..... *Aesculus californica*..... *Umbellularia californica*..... *Fragaria vesca*, *Heteromeles arbutifolia*, *Holodiscus discolor*, *Oemleria cerasiformis*, *Rubus ursinus*..... *Heuchera micrantha*, *Lithophragma affine*, *Lithophragma heterophyllum*..... *Dudleya caespitosa*..... *Eriogonum nudum sensu lato*, *Pterostegia drymarioides*..... *Adiantum jordanii*, *Pellaea andromedifolia*, *Pentagramma triangularis subsp. triangularis*..... *Polypodium calirhiza*..... *Dryopteris arguta*, *Polystichum munitum*..... *Toxicodendron diversilobum*..... *Hesperocnide tenella*..... *Bowlesia incana*, *Daucus pusillus*, *Osmorhiza berteroi*, *Sanicula crassicaulis*..... *Ceanothus thyrsiflorus*, *Frangula californica subsp. californica*..... *Delphinium patens*, *Ranunculus hebecarpus*..... *Calamagrostis rubescens*, *Melica californica*, *Melica subulata*, *Melica torreyana*, *Poa howellii*, *Trisetum canescens sensu lato*..... *Monardella villosa sensu lato*, *Scutellaria tuberosa*, *Stachys bullata*..... *Triodanis biflora* = *Lysimachia latifolia*..... *Iris douglasiana*..... *Galium californicum subsp. californicum*, *Galium porrigens var. porrigens*..... *Collomia heterophylla*, *Gilia achilleifolia sensu lato*, *Leptosiphon androsaceus*..... *Acer macrophyllum*..... *Toxicoscordion fremontii*..... *Clarkia rubicunda*..... *Eschscholzia californica*..... *Lonicera hispidula*..... *Sambucus nigra subsp. caerulea*..... *Maianthemum racemosum*, *Maianthemum stellatum*..... *Luzula comosa var. comosa* and var. *laxa*..... *Marah fabaceus*..... *Epilobium ciliatum sensu lato*..... *Plectritis brachystemon*..... *Fritillaria affinis var. affinis*..... *Torreya californica*..... *Antirrhinum kelloggii*, *Collinsia multicolor*, *Nuttallanthus (Linaria) texanus*..... *Mimulus aurantiacus* = *Diplacus aurantiacus*..... *Pseudotsuga menziesii var. menziesii*..... *Arbutus menziesii*, *Arctostaphylos crustacea sensu lato*..... *Barbarea orthoceras*, *Cardamine californica var. californica*, *Caulanthus lasiophyllus*, *Thysanocarpus curvipes*, *Thysanocarpus laciniatus*..... *Calandrinia breweri*, *Claytonia perfoliata subsp. perfoliata*..... *Polygala californica*..... *Calystegia purpurata subsp. purpurata*..... *Piperia elongata* (20+ flowering plants observed on steep, burned slope.....only population known for watershed), *Piperia transversa*..... *Dichelostemma capitatum subsp. capitatum*.

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 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 sensu lato* 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 capitate 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 [seeds 0.9mm or less in width/ovate-elongate in profile] possibly representing var. *laxa* 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 = var. *comosa*. 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? All the *Luzula* populations within the Swanton area need to be studied, to determine/document where *Luzula comosa* vars. *comosa/laxa* and *Luzula subsessilis* exist and if there is any genetic exchange, when these two taxa may occur sympatrically. [note: see page 241 of this Essay]

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 Scott 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 jordanii*, *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* = *Asyneuma prenanthoides* (**discovered on 07/14/2011, while revisiting area**)..... *Monardella villosa sensu lato*, *Satureja douglasii*, *Stachys bullata*..... *Smilacina stellata*..... *Corylus cornuta var. californica*..... *Scrophularia californica subsp. californica*..... *Galium californicum subsp. californicum*, *Galium triflorum*..... *Sequoia sempervirens*..... *Cynoglossum grande*, *Phacelia malvifolia*, *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 brevistylum*, *Cirsium occidentale var. venustum*, *Eriophyllum confertiflorum var. confertiflorum*, *Eurybia radulina*, *Layia gaillardiioides* (**extremely rare in county and within Scott 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 unblemished 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*), *Stebbinsoseris (Microseris) decipiens*, *Pseudognaphalium californicum*, *Pseudognaphalium stramineum*, *Rafinesquia californica*, *Symphotrichum chilense*..... *Dichelostemma 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*..... *Fritillaria 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 bedding planes, one of the furthest inland for watershed and genetically isolated from populations on immediate coastal headlands**..... interior populations, in the Scott, 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* = *Diplacus 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 laciniatus*..... 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 Scott 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 Scott 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 endemic and described/published in 2008 as *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 observed 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 commonly 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* (***Quercus agrifolia* var. *agrifolia* x *Quercus kelloggii***), 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* = ***Primula clevelandii* var. *gracilis***), 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 athysanus (*Athysanus 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*), pipestems (*Clematis lasiantha*), western pearlwort (*Sagina decumbens* subsp. *occidentalis*), pitcher sage (*Lepechinia calycina*), California chicory (*Rafinesquia californica*), rare woodland layia (*Layia gaillardoides*) 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 junceus* var. *junceus* = **Acmispon junceus** var. *junceus*).....growing on the exposed ridge-top overlooking Mill Creek, the violet pigmented flowers of blue toadflax (*Linaria canadensis* = **Nuttallanthus texanus**) 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 woolly 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 flavistic 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 **UCR67980**/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 terrestris* subsp. *terrestris*), 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 caruifolium* var. *caruifolium*). 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 Scott 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 Scott 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 (*Dudleya caespitosa*) and a uncommon constituent of the Phlox Family, grassland gilia (*Gilia clivorum*).....most recently, (08/2010), a small colony was discovered growing on a oak-canopied 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: Overlooking the interface between Schoolhouse Gulch and Purdy Road, a localized colony of western burning bush (*Euonymus occidentalis* var. *occidentalis*) was discovered on 03/13/2014, previously obscured by poison oak (*Toxicodendron diversilobum*) and due to recent brush removal, rendered visible.

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. *quadriovulnera* (two separate populations, each with its own distinctive floral color/patterning), *Clarkia rubicunda*..... *Helianthemum scoparium* = *Crocanthemum scoparium* var. *vulgare* *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* var. *thyrsiflorus*, *Frangula californica* subsp. *californica*..... *Achillea millefolium*, *Agoseris grandiflora*, *Anisocarpus madioides*, *Baccharis pilularis* subsp. *consanguinea*, *Artemisia douglasiana*, *Cirsium brevistylum*, *Corethrogyne 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), *Stebbinsoseris decipiens*, *Pseudognaphalium californicum*, *Pseudognaphalium aff. gianonei*, pro.sp.nov., *Pseudognaphalium ramosissimum*, *Pseudognaphalium stramineum*, *Rafinesquia californica*, *Solidago velutina* subsp. *californica*, *Symphytotrichum chilense*.... *Lathyrus vestitus* var. *vestitus* (variable as to foliar indument and wing-like margins of stems), *Lotus micranthus* = *Acmispon parviflorus*, *Lotus salsuginosus* var. *salsuginosus* = *Acmispon maritimus* var. *maritimus*, *Lotus scoparius* var. *scoparius* = *Acmispon glaber* var. *glaber*, *Lotus strigosus* = *Acmispon strigosus*, *Lotus wrangelianus* = *Acmispon wrangelianus*, *Lupinus nanus*, *Trifolium barbigerum* var. *barbigerum*, *Trifolium bifidum* var. *decipiens*, *Trifolium bifidum* var. *bifidum*, *Trifolium buckwestiorum* (area where type specimen for Santa Cruz clover was collected), *Trifolium ciliolatum*, *Trifolium gracilentum* var. *gracilentum*, *Trifolium microcephalum*, *Trifolium microdon*, *Trifolium willdenovii*, *Vicia americana* var. *americana*, *Vicia hassei*.... *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 reinroduction of *Pinus attenuata* genes), *Pseudotsuga menziesii* var. *menziesii*.... *Umbellularia californica*.... *Arbutus menziesii*, *Arctostaphylos crustacea* sensu lato (an isolated remnant population, variable in overall morphology, circumscribed via succession with mixed conifer/oak woodland and healthiest, where not overtopped by aboreal canopies).... *Cardamine oligosperma*, *Caulanthus lasiophyllus*.... *Cryptantha clevelandii*, *Cryptantha micromeres*, *Emmenanthe penduliflora*, *Nemophila parviflora*.... *Agrostis hallii/pallens* 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* = *Festuca 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/flow between 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*.... *Dichelostemma capitatum* var. *capitatum*.... *Calandrinia breweri*, *Claytonia perfoliata* subsp. *perfoliata*.... *Verbena lasiostachys* var. *lasiostachys*.... *Veronica* aff. *serpyllifolia* subsp. *humifusa*.... *Euphorbia crenulata*.... *Sequoia sempervirens*.... *Aesculus californica*.... *Acer macrophyllum*.... *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens*, *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* = *Diplacus aurantiacus*.... *Chlorogalum pomeridianum* var. *pomeridianum*.... *Plectritis brachystemon* (both winged and wingless fruit populations present, but not mixed).... *Castilleja densiflora* subsp. *densiflora* (yellow pouch, lilac-purple galea, off-white bract tips).... *Actaea rubra*.... *Adiantum jordani*.... *Dryopteris arguta*, *Polystichum munitum*.... *Pteridium aquilinum* var. *pubescens*.... *Polypodium calirhiza* (lithophyte, 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, *Oemleria cerasiformis*, *Pentagramma triangularis* subsp. *triangularis*, *Nemophila parviflora* var. *parviflora*, *Quercus parvula* var. *shrevei*, *Sanicula crassicaulis*, *Anisocarpus madioides*, *Dryopteris arguta*, *Marah fabaceus*, *Adiantum jordanii*, *Rubus ursinus*, *Umbellularia californica*, *Baccharis pilularis*, *Iris douglasiana*, *Clinopodium 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 pilosa*, *Stachys bullata*, *Claytonia perfoliata* subsp. *perfoliata*, *Leptosiphon androsaceus*, *Nemophila menziesii* sensu lato, *Pseudotsuga menziesii* var. *menziesii*, *Agoseris grandiflora*, *Lupinus nanus*, *Madia gracilis*, *Osmorhiza berteroi*, *Aesculus californica*, *Clarkia rubicunda*, *Achillea millefolium*, *Eschscholzia californica*, *Acmispon wrangelianus*, *Trifolium ciliolatum*, *Dudleya caespitosa*, *Thysanocarpus* aff. *laciniatus* (stems glabrous and glaucous, leaves not conspicuously sagittate-auriculate and extending beyond other side of stem, style conspicuously exserted), *Crassula connata*, *Gilia clivorum*, *Dichelostemma capitatum* subsp. *capitatum*, *Polypodium* aff. *californicum* (growing as lithophyte), *Chlorogalum pomeridianum* var. *pomeridianum*, *Phacelia distans*, *Quercus agrifolia*, *Cardamine oligosperma*, *Cardamine californica* var. *californica*, *Vicia americana* var. *americana*, *Sanicula gianonei*, pro.sp.nov., *Fritillaria affinis* var. *affinis*, *Cynoglossum grande*, *Juncus patens*, *Cirsium brevistylum*, *Heracleum maximum*, *Pseudognaphalium ramosissimum*, *Diplacus aurantiacus*, *Hesperocnide tenella*, *Trillium chloropetalum*, *Actaea rubra*, *Monardella villosa* subsp. *villosa*, *Solanum douglasii*, *Euonymus occidentalis* var. *occidentalis*, *Polystichum munitum*, *Epilobium ciliatum* sensu lato, *Ceanothus thyrsiflorus* var. *thyrsiflorus*, *Galium triflorum*, *Festuca elmeri*, *Melica torreyana*, *Calandrinia ciliata*, *Sanicula arctopoides*, *Ranunculus californicus*, *Plectritis* aff. *brachystemon*, *Lomatium caruifolium* var. *caruifolium*, *Solidago velutina* subsp. *californica*, *Bromus carinatus* var. *carinatus*, *Trisetum canescens*, *Camissonia ovata* = *Taraxia ovata*, *Oxalis pilosa*, *Elymus glaucus* subsp. *glaucus*, *Poa howellii* and *Quercus x morehus*.

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 dirt road. On 04/27/2011, over the course of two hours, the following taxa were 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 (*Urtica 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 bullata*), 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 lasiolepis*), 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 hispidula*), mugwort (*Artemisia douglasiana*), Torrey's melic (*Melica torreyana*), broad-leaved lupine (*Lupinus latifolius* var. *latifolius*), blue blossom (*Ceanothus thyrsiflorus* var. *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 Solomon's seal (*Maianthemum stellatum*), cow-parsnip (*Heracleum maximum*), blue witch (*Solanum umbelliferum*), Douglas's iris (*Iris douglasiana*), slough sedge (*Carex obnupta*), thimbleberry (*Rubus parviflorus*), baneberry (*Actaea rubra*), nested polypody (*Polypodium calirhiza*), lady fern (*Athyrium filix-femina* var. *cyclosorum*), giant horsetail (*Equisetum telmateia* subsp. *braunii*), 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 sessile vesicular golden glands), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), sweet cicely (*Osmorhiza beteroi*), 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-nine-tails..... possibly reflecting a relationship with *Luzula comosa* var. *laxa*), Hasse'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 (*Gamochaeta ustulata*), climbing bedstraw (*Galium porrigens* var. *porrigens*), California melic (*Melica californica*), purple needlegrass (*Stipa pulchra*), rancher's fiddleneck (*Amsinckia menziesii*), coast buckwheat (*Eriogonum latifolium/nudum* 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 ciliolatum*), varied-leaved collomia (*Collomia heterophylla*), sticky monkeyflower (*Diplacus 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 hypanthium 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 (*Symphoricarpos 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 fringedpod (*Thysanocarpus curvipes*), narrow-leaved fringedpod (*Thysanocarpus laciniatus*..... **both species of fringedpod 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 height), 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 (*Symphotrichum chilense*) and slender hairgrass (*Deschampsia elongata*).

Note: Three additions to the above listed taxa found along this portion of Purdy Road are as follows..... on the north/north-west side of the Schoolhouse Gulch drainage as it passes under the Purdy Road, a localized colony of western burning bush (*Euonymus occidentalis* var. *occidentalis*) occurs, while further along and still roadside, directly across from Squirrel Flat, a rediscovery (05/18/2014) of an uncommon native shrub, coast barberry (*Berberis pinnata* subsp. *pinnata*) was made, almost totally hidden by a tangle of California blackberry (*Rubus ursinus*). Expanding on an already noted taxon which is not only extremely variable but taxonomically complex, *Eriogonum nudum sensu latu*, several plants occur just upslope of the dirt road, which have conspicuously inflated (5-7mm in diameter) inflorescence stems, which are subglabrous and moderately glaucous, with basal and stem leaves long petiolate, non-auriculate, narrowly decurrent along entire length of petiole, with adaxial surface of leaves green and abaxial side conspicuously pannose. The overall growth pattern is basically caespitose, with basal above ground portion of plant, only slightly woody, if at all.

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* = *Stebbinsoseris decipiens*), the presence of one or both parents is not necessary for the continued existence 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.

Note: Growing sympatrically with the centenarian *Sambucus nigra* subsp. *caerulea* duo, an adult specimen of *Quercus agrifolia* var. *agrifolia* x *Quercus parvula* var. *shrevei* occurs. Partially lost within and overtopped by one of the blue elderberry duo..... nonetheless, this hybrid taxon makes its presence known by being the only *Quercus* within fifty feet or so and when one takes the time to carefully examine its extremely variable foliar patterns, it unambiguously displays/combines traits, specific to either parent [see page 243 of this document].

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 incompatibility 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 nigrans* 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 staechadifolium*, see page 233)..... gambleweed (*Sanicula crassicaulis*) and false coast sanicle (*Sanicula pseudolaciniata*, 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 nemophila (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* var. *florosa*) and minute-flowered cryptantha (*Cryptantha micromeres*)..... occasionally growing together on sandbars along Scotts Creek, floriferous monkeyflower (*Mimulus floribundus* = *Erythranthe floribunda*) and musk monkeyflower (*Mimulus moschatus* = *Erythranthe inodora*)..... big-leaf maple (*Acer macrophyllum*) and box elder (*Acer negundo*)..... two-eyed violet (*Viola ocellata*) and redwood violet (*Viola sempervirens*).

***Note: With *Cardamine hirsuta* present in the Scott Creek Watershed and distinguishable from *Cardamine oligosperma* by possessing 4(6) stamens, erect/ascending glabrous siliques containing margined/winged seeds but sharing the same chromosome number (2n=16), are these two sister species interfertile and are some of the overlapping/shared characters seen on many of the plants, the results of interspecific hybridization?

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, Scott 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*) with leaves concave-convex and the axils of some abaxial veins with scattered tufts of stellate pubescence, California bay laurel (*Umbellularia californica*), arroyo willow (*Salix lasiolepis*), 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* var. *consanguinea*), **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* var. *thyrsiflorus*) and California coffeeberry (*Frangula californica* subsp. *californica*), blue witch (*Solanum umbelliferum*) and sub-shrub sister species, Douglas’s nightshade (*Solanum douglasii*), oso 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 bullata*), 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 scandent members of the Legume Family (Fabaceae), Pacific pea (*Laythrus 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 berteroi***) and gambleweed (*Sanicula crassicaulis*) and the ubiquitous California blackberry (*Rubus ursinus*). Other monocots besides the *Carex* demand recognition, namely common rush (*Juncus patens*) and brown bog-rush (*Juncus effusus* var. *brunneus* = ***Juncus hesperius***), Hooker’s fairy bells (*Disporum hookeri* = ***Prosartes hookeri***), Douglas’s iris (*Iris douglasiana*), slim Solomon’s seal (*Smilacina stellata* = ***Maianthemum stellatum***), 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 descends oceanward in the opposite direction) and before entering Scott 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 Scott 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 kalideoscopic journey thru coastal scrub, grassland, benched 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 (*Carex x gianonei*, **pro. sp. nov.**, *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 (aff. *Juncus mexicanus*..... rhizomatous, culms generally slender and dk green, predominantly tortile-compressed, upper leaf-blades **not** always present), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*), short-stalked wood rush (*Luzula subsessilis*)..... 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 (aff. *Festuca roemerii*), 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 (*Prosartes 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 (*Gamochaeta ustulata*), white hawkweed (*Hieracium albiflorum*), California aster (*Corethrogyne filaginifolia*..... var. *californica*), Bioletti's cudweed (*Pseudognaphalium biolettii*), California cudweed (*Pseudognaphalium californicum*), pink everlasting (*Pseudognaphalium ramosissimum*), cotton batting plant (*Pseudognaphalium stramineum*), California aster (*Symphotrichum 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* var. *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. *californicum*), 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 berteroi*), footsteps-of-spring (*Sanicula arctopoides*), gambleweed (*Sanicula crassicaulis*), Gianone sanicle (*Sanicula gianonei*, pro. sp. nov.)..... Pacific pea (*Lathyrus vestitus* var. *vestitus*), yellow bush lupine (*Lupinus arboreus*), summer lupine (*Lupinus formosus* var. *formosus*..... a highly localized species within the Scott 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 arboreus* have been observed, one of which can be seen on the Cal Poly/Swanton Pacific Ranch website, in their ongoing in situ digital documentation of the watershed's flora), sky lupine (*Lupinus nanus*), Lindley's varied lupine (*Lupinus variicolor*)..... red maids (*Calandrinia ciliata*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*)..... sticky monkeyflower (*Diplacus 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 blossom (*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 umbelliferum*)..... 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 calirhiza*)..... 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 Scott Creek between the confluences of Big and Little Creeks), there is a continuum of nw-aligned gulchlets aka **Biodiversity Zone # 1**, 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 Scott 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 Scott 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 (*Melica subulata*), Torrey's melic (*Melica torreyana*), Howell's bluegrass (*Poa howellii*)..... cow-parasit (*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 gambleweed (*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 *Elymus californicus*)..... Monterey pine (*Pinus radiata*..... complex hybrid between *Pinus attenuata* and *Pinus radiata*, reseggregating 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 divaricatum* 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 (*Barbarea 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*), Bioletti's cudweed (*Pseudognaphalium biolettii*), 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 (*Lysimachia latifolia*)..... western nettle (*Hesperocnide tenella*), coast nettle (*Urtica dioica* subsp. *gracilis*)..... spotted coralroot (*Corallorhiza maculata*, aff. 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 porrigens* var. *porrigens*), 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 fabaceus*)..... red elderberry (*Sambucus racemosa* var. *racemosa*)..... slough sedge (*Carex obnupta*)..... 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-vernal pool habitat aka depressions in horse trail, along with *Callitriche* and *Plagiobothrys*)..... skunkweed (*Navarretia squarrosa*)..... morning glory (*Calystegia purpurata* subsp. *purpurata*)..... sticky monkeyflower (*Diplacus aurantiacus*)..... Pacific pea (*Lathyrus vestitus* var. *vestitus*), yellow bush lupine (*Lupinus arboreus*), 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 (*Pentagramma triangularis* subsp. *triangularis*).

*****Note: Also during 2011 but several weeks later, a second population of this locally uncommon species of Sanicula was discovered margining the horse trail, between the lower section of Mt. Cook Gulch and the record holding forest live-oak aka *Quercus parvula* var. *shrevei*. The scattered members of this population numbered in excess of 40 plants and grow exponentially each season, principally due to the passing wildlife engaging the mature schizocarps with their uncinatate bristles!!!**

Perhaps the narrowest of the secondary drainage systems entering into Scott 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 ambience, 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 **former cousin (Adoxaceae for the *Sambucus* and Caprifoliaceae for the *Symphoricarpos*)**, snowberry (*Symphoricarpos albus* var. *laevigatus*) 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 malvifolia*), nested polypody (*Polypodium calirhiza*), wood fern (*Dryopteris arguta*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), California maidenhair (*Adiantum jordanii*), western sword fern (*Polystichum munitum*), bracken (*Pteridium aquilinum* var. *pubescens*), lady fern (*Athyrium filix-femina* var. *cyclosum*), giant horsetail (*Equisetum telmateia* subsp. *braunii*), slender hairgrass (*Deschampsia elongata*), California wild rye (*Elymus glaucus* subsp. *glaucus*), California brome (*Bromus carinatus*), nodding brome (*Bromus vulgaris*), Alaska onion grass (*Melica subulata*), Torrey's melic (*Melica torreyana*), wild ginger (*Asarum caudatum*), hound's tongue (*Cynoglossum grande*), blue creek-sedge (*Carex amplifolia*), Bolander's sedge (*Carex bolanderi*), dense sedge (*Carex densa*), common rush (*Juncus patens*), Indian thistle (*Cirsium brevistylum*), California nutmeg (*Torreya californica*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), redwood (*Sequoia sempervirens*), snowberry (*Symphoricarpos albus* var. *laevigatus*), hairy honeysuckle (*Lonicera hispidula*), blue elderberry (*Sambucus nigra* subsp. *canadensis*), red elderberry (*Sambucus racemosa* var. *racemosa*), California buckeye (*Aesculus californica*), western nettle (*Hesperocnide tenella*), coast nettle (*Urtica dioica* subsp. *gracilis*), giant trillium (*Trillium chloropetalum*), western trillium (*Trillium ovatum* subsp. *ovatum*), thimbleberry (*Rubus parviflorus*), salmonberry (*Rubus spectabilis*), California blackberry (*Rubus ursinus*), fat Solomon's seal (*Smilacina racemosa* = *Maianthemum racemosum*), slim Solomon's seal (*Smilacina stellata* = *Maianthemum stellatum*), Douglas's iris (*Iris douglasiana*), checker lily (*Fritillaria affinis* var. *affinis*), big-leaf maple (*Acer macrophyllum*), box elder (*Acer negundo*), red alder (*Alnus rubra*), hazelnut (*Corylus cornuta* var. *californica*), cow-parsnip (*Heracleum maximum*), sweet cicely (*Osmorhiza berteroi*), Gianone's sanicle (*Sanicula gianonei*, pro.sp.nov.), California huckleberry (*Vaccinium ovatum*), baneberry (*Actaea rubra*), meadow rue (*Thalictrum fendleri* var. *polycarpum*), sweet-scented bedstraw (*Galium triflorum*), American winter cress (*Barbarea orthoceras*), common milkmaids (*Cardamine californica*), popweed (*Cardamine oligosperma*), small-flowered alum root (*Heuchera micrantha*), hill star (*Lithophragma heterophyllum*), selfheal (*Prunella vulgaris* var. *lanceolata*), California hedge-nettle (*Stachys bullata*), California figwort (*Scrophularia californica*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*), California coffeeberry (*Frangula californica* subsp. *californica*), poison oak (*Toxicodendron diversilobum*), tan-oak (*Notholithocarpus densiflorus* var. *densiflorus*), forest live-oak (*Quercus parvula* var. *shrevei*), California bay laurel (*Umbellularia californica*), canyon gooseberry (*Ribes menziesii*), willow herb (*Epilobium ciliatum* subsp. *ciliatum*), Pacific pea (*Lathyrus vestitus* var. *vestitus*), hairy wood sorrel (*Oxalis pilosa*), California man root (*Marah fabaceus*) and oso berry (*Oemleria cerasiformis*).

Still streamside, two members of the Poaceae appear: one species notable for its aromatic foliage and widespread throughout the upper drainage systems of the Scott Creek Watershed, vanilla grass (*Anthoxanthum occidentale*), **generally prefers dry feet and perfect drainage** while the other species, uncommon to rare elsewhere in the county, but represented by substantial numbers in Swanton, crinkle-awn fescue (*Festuca subuliflora*), can often be found growing at the water's edge. A quartet of *Rubus* reside within the riparian corridor: the least common being black-cap raspberry (*Rubus leucodermis*), favoring moist semi-shaded slopes in the redwood-Douglas fir woodlands 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 the "Harvey Gulch" [= tentative name for parallel drainage system nw of Spillway Gulch] enters Mill Creek from the east, it forms an alluvial fan, providing habitat for two unrelated species, windflower (*Anemone oregana* = *Anemone grayi*) decidedly uncommon within the watershed [revisiting this area during 02/2012, a concentrated population exceeding 100 plants were in full flower] and Pacific starflower (*Trientalis latifolia* = *Lysimachia 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 (*Asyneuma prenanthoides*), redwood violet (*Viola sempervirens*), trail plant (*Adenocaulon bicolor*) and California milkwort (*Polygala californica*..... a uniformly pale flowered race, consisting of 100+ plants). Several decades ago, a colony of calypso orchid (*Calypso bulbosa*) was discovered in the upper part of "Harvey 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 the "Harvey 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 the "Harvey Gulch" as it enters Mill Creek, yielded the following species..... documented as they were encountered: *Anemone grayi*, *Scoliopus bigelovii*, *Trillium ovatum* subsp. *ovatum*, *Trientalis latifolia* = *Lysimachia 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* var. *menziesii*, *Equisetum telmateia* subsp. *braunii*, *Lonicera hispidula*, *Aralia californica*, *Athyrium filix-femina* var. *cyclosorum*, *Rhododendron occidentale*, *Arnica discoidea*, *Polygala californica*, *Juncus 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 parviflorus*, *Alnus rubra*, *Juncus hesperius*, *Trisetum* aff. *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 pardalinum* subsp. *pardalinum*, *Clinopodium* (*Satureja*) *douglasii* and *Elymus glaucus* subsp. *glaucus*.

Note: "Harvey Gulch" and its parallel counterpart to the immediate south, Spillway Gulch, are separated by a narrow ridge akin in places to traversing the cutting edge of a knife blade..... both of these deeply incised micro-watersheds were blackened by the 2009 Lockheed Fire and two plus years later have rebounded from a biodiversity perspective. On 03/11/2012, a brief one and one-half hour traversal of this ever ascending series of increasing-in-aridity habitats, beginning bankside at Mill Creek and terminating along the ridgeline Lockheed

fireroad, yielded the following native species more or less in the order they were encountered: *Carex amplifolia*, *Umbellularia californica*, *Rubus ursinus*, *Equisetum telmateia* subsp. *braunii*, *Rubus parviflorus*, *Stachys bullata*, *Alnus rubra*, *Oxalis oregana*, *Cardamine oligosperma*, *Pteridium aquilinum* var. *pubescens*, *Athyrium filix-femina* var. *cyclosum*, *Scrophularia californica*, *Persicaria punctata*, *Juncus hesperius*, *Urtica dioica* subsp. *gracilis*, *Solanum douglasii*, *Rhododendron occidentale*, *Cardamine californica*, *Bromus carinatus* var. *carinatus*, *Bromus vulgaris*, *Ribes menziesii*, *Notholithocarpus densiflorus* var. *densiflorus*, *Juncus patens*, *Trillium ovatum* subsp. *ovatum*, *Viola sempervirens*, *Fragaria vesca*, *Sequoia sempervirens*, *Lilium pardalinum* var. *pardalinum*, *Anisocarpus madioides*, *Boykinia occidentalis*, *Iris douglasiana*, *Scoliopus bigelovii*, *Galium triflorum*, *Anemone oregana* = *Anemone grayi*, *Adenocaulon bicolor*, *Melica subulata*, *Polygala californica*, *Galium californicum* subsp. *californicum*, *Sanicula crassicaulis*, *Festuca subuliflora*, *Lathyrus vestitus* sensu lato, *Torreya californica*, *Dryopteris arguta*, *Lonicera hispidula*, *Acer macrophyllum*, *Pentagramma triangularis* subsp. *triangularis*, *Maianthemum racemosum*, *Vaccinium ovatum*, *Ceanothus thyrsiflorus* var. *thyrsiflorus*, *Arbutus menziesii*, *Calamagrostis rubescens*, *Holodiscus discolor* var. *discolor*, *Pinus attenuata*, *Anthoxanthum occidentale*, *Heteromeles arbutifolia*, *Clematis lasiantha*, *Pseudognaphalium biolettii*, *Solanum umbelliferum*, *Arnica discoidea*, *Cynoglossum grande*, *Pseudognaphalium x gianonei*, pro.sp.nov., *Pseudognaphalium californicum*, *Claytonia perfoliata* subsp. *perfoliata*, *Diplacus aurantiacus*, *Calystegia purpurata* subsp. *purpurata*, *Lepechinia calycina*, *Symphoricarpos albus* var. *laevigatus*, *Baccharis pilularis* subsp. *consanguinea*, *Toxicodendron diversilobum*, *Quercus parvula* var. *shrevei*, *Lysimachia latifolia*, *Heuchera micrantha*, *Sambucus nigra* subsp. *caerulea*, *Adiantum aleuticum*, *Prosartes hookeri*, *Rosa gymnocarpa*, *Woodwardia fimbriata*, *Sanicula x gianonei*, pro.sp.nov., *Clintonia andrewsiana*, *Nemophila parviflora* var. *parviflora*, *Oemleria cerasiformis*, *Clinopodium douglasii*, *Marah fabaceus*, *Heracleum maximum*, *Corylus cornuta* subsp. *californica*, *Hesperocnide tenella*, *Quercus agrifolia* var. *agrifolia*, *Acmispon glaber* var. *glaber*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Pseudognaphalium ramosissimum*, *Arctostaphylos crustacea* sensu lato, *Danthonia californica*, *Acmispon junceus* var. *junceus*, *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.... *Erythranthe (Mimulus) cardinalis*, *Anthoxanthum (Hierochloa) occidentale*, *Juncus effusus* var. *pacificus* and *Montia parvifolia* (making infrequent appearances on moss-buffered boulders as it also does in the Big Creek sub-watershed, between the beginning of Powerhouse Grade and the First Falls).

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 sensitiva*), 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* var. *florosa*) 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 californica*). 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 discoidea*) 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 donnelliana*. **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..... aggressive in their colonization and outsized, some attaining two meters in height 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. *cyclosorum*)..... 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 glaucus* subsp. *glaucus*), western fescue (*Festuca occidentalis*), Alaska onion grass (*Melica subulata*), Torrey's melic (*Melica torreyana*)..... canyon gooseberry (*Ribes menziesii*)..... slink pod (*Scolopus*

bigelovii)..... trail plant (*Adenocaulon bicolor*), rayless arnica (*Arnica discoidea*), broad-leaved aster (*Eurybia radulina*), purple cudweed (*Gamochaeta ustulata*), white hawkweed (*Hieracium albiflorum*), slender tarweed (*Madia gracilis*), coast tarweed (*Madia sativa*), Bioletti's cudweed (*Pseudognaphalium biolettii*), cotton batting plant (*Pseudognaphalium stramineum*), California chicory (*Rafinesquia californica*)..... Pacific starflower (*Lysimachia latifolia*)..... bush poppy (*Dendromecon rigida*)..... sticky monkeyflower (*Diplacus aurantiacus*)..... morning glory (*Calystegia purpurata* subsp. *purpurata*)..... varied-leaved collomia (*Collomia heterophylla*)..... hairy honeysuckle (*Lonicera hispidula*)..... rattlesnake weed (*Daucus pusillus*), sweet cicely (*Osmorhiza berteroi*), gambleweed (*Sanicula crassicaulis*)..... California bay laurel (*Umbellularia californica*)..... Pacific madrone (*Arbutus menziesii*), hairy manzanita (*Arctostaphylos crustacea, sensu lato*), California huckleberry (*Vaccinium ovatum*)..... deerweed (*Acmispon glaber* var. *glaber*), Bioletti's trefoil (*Acmispon junceus* var. *biolettii*), rush trefoil (*Acmispon junceus* var. *junceus*), coastal trefoil (*Acmispon maritimus* var. *maritimus*), small-flowered trefoil (*Acmispon parviflorus*), Pacific pea (*Lathyrus vestitus* var. *vestitus*), maiden clover (*Trifolium microcephalum*), giant vetch (*Vicia gigantea*)..... 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*)..... California milkwort (*Polygala californica*)..... wood strawberry (*Fragaria vesca*), ocean spray (*Holodiscus discolor*), thimbleberry (*Rubus parviflorus*)..... redwood sorrel (*Oxalis oregana*)..... California bedstraw (*Galium californicum* subsp. *californicum*), sweet-scented bedstraw (*Galium triflorum*)..... Cleveland's cryptantha (*Cryptantha clevelandii* var. *florosa*), minute-flowered cryptantha (*Cryptantha micromeres*), yerba santa (*Eriodictyon californicum*), small-flowered nemophila (*Nemophila parviflora* var. *parviflora*)..... foothill sedge (*Carex tumulicola*)..... white globe lily (*Calochortus albus*), checker lily (*Fritillaria affinis* var. *affinis*)..... soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*)..... California nutmeg (*Torreya californica*)..... elk-clover (*Aralia californica*)..... Douglas's iris (*Iris douglasiana*)..... common milkmaids (*Cardamine californica* var. *californica*), California mustard (*Caulanthus lasiophyllus*)..... sleepy catchfly (*Silene antirrhina*)..... miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*)..... Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... redwood (*Sequoia sempervirens*)..... Hooker's fairy bells (*Prosartes hookeri*)..... western trillium (*Trillium ovatum* subsp. *ovatum*)..... blue witch (*Solanum umbelliferum*)..... paniced willow herb (*Epilobium brachycarpum*), willow herb (*Epilobium ciliatum* subsp. *ciliatum*)..... yerba buena (*Satureja douglasii*)..... California figwort (*Scrophularia californica* subsp. *californica*)..... blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*)..... California man root (*Marah fabaceus*)..... royal rein orchid (*Piperia transversa*).

Note: Revisiting the *Dichondra donelliana* population on 03/07/2012, resulted in no visible representation for this uncommon native taxon for Santa Cruz County but growing sympatrically (if the *dichondra* still exists in a dormant state), was a very "in your face" population of another county wide uncommoner, namely *Bowlesia incana*. [As of 11/2013, the previously reclusive "native" *Dichondra* has re-emerged from its post- 2009 Lockheed Fire hibernation and is doing well..... having lost none of its original population configuration and still nestled between grassland edge and the towering verticality of the coast redwood.]

Growing in alluvium south of Mill Creek Bridge surrounded by red elderberry (*Sambucus racemosa* var. *racemosa*), are salmonberry (*Rubus spectabilis*) and coast nettle (*Urtica dioica* subsp. *gracilis*), with red alder (*Alnus rubra*) and arroyo willow (*Salix lasiolepis*) giving vertical contrast. Sequestered within this organic latticework of interwoven branches, a magnificent specimen of giant chain fern (*Woodwardia fimbriata*) visually impacts the roadside observer, its nearly 2.5 meters-high stature simulating a short-trunked tree fern. Scattered throughout this seasonal umbrella of light modifying foliage, robust examples of lady fern (*Athyrium filix-femina* var.

cyclosorum) and western sword fern (*Polystichum munitum*) can be discerned and wood fern (*Dryopteris arguta*) reluctantly adjusts to an environment wetter than the nearby well-drained slopes that it calls home. Paralleling the 2.5 meters-high *Woodwardia fimbriata* as to stature, circa 300 meters below Scotts Creek Bridge, growing in alluvium and set back from the creek by 5-6 meters, a magnificent specimen of lady fern (*Athyrium filix-femina* var. *cyclosorum*), easily topped 2 meters in height and at least, 1.5 meters across at the maximum spread of its fronds!

The riparian corridor between Scott and Big Creek Bridges (**on the Scott 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 brackets, (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 var. *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, particularlyly 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, particularlyly 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. *cyclosorum***

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)

Symphotrichum 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 Scott 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 = Erythranthe floribunda (A)..... **both Erythranthe floribunda and**

Erythranthe inodora are principally sandbar occupants

Mimulus moschatus = Erythranthe inodora (P)

Osmorhiza berteroi (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)..... dioecious 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 [while collecting *Claytonia perfoliata* subsp. *perfoliata* seed along the margins of Swanton Road during the 03/2012 time frame, a new and highly distinctive form was observed in several sites..... characterized by having complex paniculate branched inflorescences looking somewhat like reduced heads of broccoli, and consistently producing seeds, one half the size of sympatric forms of this taxon that were displaying a racemose alignment of flowers and expelling mature seeds, double-the-size of the paniculate form]. 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, *Calandrinia*, *Claytonia* and *Montia*, formerly placed within the Portulacaceae have been given their own family..... the Montiaceae.

Within the Scott 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 \pm 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 \pm 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. *laevigatus*), 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 phytodes*), 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 Scott 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 Scott Creek, hosted scarlet monkeyflower (*Mimulus cardinalis* = *Erythranthe cardinalis*), floriferous monkeyflower (*Mimulus floribundus* = *Erythranthe floribunda*), Snouted monkeyflower (*Mimulus guttatus* var. *gracilis* = *Mimulus nasutus* = *Erythranthe nasuta*), musk monkeyflower (*Mimulus moschatus* = *Erythranthe inodora*) and downy monkeyflower (*Mimulus pilosus* = *Mimetanthe pilosa*)! **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 Scott Creek Watershed and possibly representing the source material for the original find. On 08/06/2014, while exploring the lower Scott Creek riparian corridor near the interface of Queseria Creek and Scott Creek, I discovered one old and substantial in size "gigas" form of *Juncus patens*, which I proceeded to document with three envelopes of mature inflorescences and copious amounts of seed. 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 tomcat clover (*Trifolium willdenovii*). Another legume, an infrequently encountered coastal scrub/maritime chaparral denizen, coastal trefoil (*Lotus salsuginosus* var. *salsuginosus* = *Acmispon maritimus* var. *maritimus*), was found growing down stream below the entrance of Mill Creek into Scott Creek and disappeared following the "El Nino" scouring (this population was fortunately documented by a seed collection deposited at the UCSC Arboretum).

Note: 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, several hundred plants of this previously rare to the watershed taxon, were observed..... rendering the rarity status temporarily moot! The largest concentration occurred, where the upper edge of the Schoolhouse Ridge connects with the Seymore Hill. Here was an area of chaparral, previously cleared to store helicopter transported logs from a timber harvesting, with 6 decades of accumulated duff removed, exposing the siliceous mudstone and mineral rich soil modified by the subsequently fast moving fire. Within this disturbed arena, *Acmispon maritimus* var. *maritimus* formed large sheets of interdigitating plants, making for one horizontal tapestry. Also flourishing, due to the effects of the 2009 Lockheed Fire, was rush rose (*Crocanthemum scoparium* var. *vulgare*) competing with the deerweed (*Acmispon glaber* var. *glaber*) and rush trefoil (*Acmispon junceus* var. *junceus*) duo, for available space. Whether the primary disturbance via bulldozer or the fast moving holocaust or a combination of both produced such an extraordinary population explosion of an otherwise locally extremely rare native taxon, is open to debate. During the 2015 season, several revisits to the site, yielded no representatives of the coast trefoil. The once disturbed habitat is slowly being reclaimed by the surrounding native taxa and offers a living laboratory for the study of succession and the variety of vegetational mosaics than can occur from disturbance regimes through time within a given area. If and when the current drought ends and the El Nino weather pattern returns, some of the thicker walled seeds from the original population may germinate and yield more material for further documentation and study.

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!

Across Swanton Road from the entrance to the Old Miller Homestead, a narrow pathway connects the tarmac to the horse trail paralleling Scott Creek, with dimensions circa 40' x 5' and containing a surprisingly complex assemblage of "natives" which not only margin the foot path but lay claim to its very center. The following inventory, arranged by families, is a cogent example of the concentrated diversity of species to be found within the watershed even in areas of frequent disturbance: *Maianthemum ramosum*, *Maianthemum stellatum*; *Rubus parviflorus*, *Rubus ursinus*; *Cardamine californica*, *Cardamine oligosperma*; *Galium triflorum*; *Claytonia perfoliata* subsp. *perfoliata*; *Osmorhiza berteroi*, *Sanicula crassicaulis*, *Sanicula gianonei*, *pro. sp. nov.* (the two *Sanicula* taxa bookend the trail, with *S. crassicaulis* closest to Swanton Road and *S. gianonei* adjacent to the horse trail); *Stachys bullata*; *Oxalis oregana*; *Scrophularia californica*; *Lonicera hispidula*; *Bromus carinatus*, *Melica subulata*; *Fritillaria affinis*; *Actaea rubra*; *Nemophila parviflora* var. *parviflora*; *Solanum douglasii*; *Urtica dioica* subsp. *gracilis*; *Trillium chloropetalum*, *Trillium ovatum* subsp. *ovatum*; *Umbellularia californica*; *Torreya californica*; *Quercus parvula* var. *shrevei*; *Sambucus racemosa* var. *racemosa*; *Aesculus californica*; *Frangula californica* subsp. *californica*; *Dryopteris arguta*, *Polystichum munitum*; *Pteridium aquilinum* var. *pubescens*; *Polypodium calirhiza* (lowest 1-3 pinnae shorter than succeeding ones); *Iris douglasiana*; *Euonymus occidentalis* var. *occidentalis*.

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 androgynous**, and cousin panicked 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 Scott Creek. Some other displaced native species, which occasionally crop up on Scott 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 (*Mimetanthe pilosa*) 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 Scott 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* = *Amsinckia 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* sensu lato), 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: Along Swanton Road, more or less midway between Mill and Big Creek Bridges, two exceeding robust specimens of *Fritillaria affinis* and *Trillium chloropetalum* were observed..... the *Fritillaria*, circa 1 meter in height with 17 open flowers and developing buds and the *Trillium*, with 25+ flowering stems from a long established rhizome. Also noteworthy, while studying this localized cluster of monocots during the 03/04 2014 time frame, was the sympatry of two color forms of *Trillium chloropetalum*, one yellow-green and the robust specimen, brownish. Besides growing side by side, the two color variants also exhibited distinct floral fragrances..... with capsules developing, anthers overarching the stigmatic folds and no documented pollinators present. Are the flowers of *Trillium chloropetalum* occasional or obligate selfers, with the original pollinating vector(s) no longer present or infrequent visitors, and could this be an underlying factor in this taxon's ability to maintain several sympatric forms, each with their distinct floral color and scent?

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 (*Barbarea 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.

Note: Sometimes road maintenance and its impact on directly adjacent habitat can have a serendipitous effect on small, localized populations of uncommon natives. Such is the case of a concentrated colony of *Nemophila pedunculata*, growing roadside south of the Mill Creek Bridge. What was originally observed a decade back to be less than twenty plants growing sympatrically with sister species *Nemophila parviflora*, has now, due to seasonal disturbance from truck tires and other corridor maintaining activities, expanded its territory [as observed between 01/2013 and 02/2013] by some 20 feet and its numbers five fold, to more than 100 individuals!

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 (*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*), shining peppergrass (*Lepidium nitidum* var.

nitidum), purple-beaked owl's clover (*Triphysaria micrantha*), Mt. Diablo cottonweed (*Micropus amphibolus*) and slender goldfields (*Lasthenia gracilis*), 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* = *Oxalis 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* subsp. *consanguinea*), rattlesnake weed (*Daucus pusillus*), selfheal (*Prunella vulgaris* subsp. *lanceolata*), and canyon gooseberry (*Ribes menziesii* var. *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): WGS84: 37.116095, -122.238338, elevation 822ft

Bannister Gulch (b): WGS84: 37.116676, -122.247327, elevation 376ft

Beehive Hill: WGS84: 37.082027, -122.245640, elevation 226ft

Bettencourt Gulch (a): WGS84: 37.111001, -122.228772, elevation 1493ft

Bettencourt Gulch (b): WGS84: 37.101628, -122.249159, elevation 358ft

Bulb Field: WGS84: 37.074967, -122.247050, elevation 380ft

Mill Creek Bridge: WGS84: 37.077964, -122.244260, elevation 94ft

Mill Creek Dam/Reservoir: WGS84: 37.117029, -122.212170, elevation 1478ft

Upper Cookhouse Gulch drainage(a): WGS84: 37.071989, -122.248037, elevation 425ft

Upper Cookhouse Gulch drainage(b): WGS84: 37.070260, -122.245441, elevation 445ft

Cookhouse Gulch Bifurcation: WGS84: 37.073127, -122.243099, elevation 353ft

Lower "Harvey Gulch": WGS84: 37.092796, -122.230892, elevation 282ft

Upper "Harvey Gulch": WGS84: 37.092807, -122.225086, elevation 869ft

Schoolhouse Gulch Complex, w-fork: WGS84: 37.086156, -122.246267, elevation 247ft

Schoolhouse Gulch Complex, central: WGS84: 37.085828, -122.244008, elevation 245ft

Schoolhouse Gulch Complex, e-fork: WGS84: 37.084834, -122.243085, elevation 373ft

Schoolhouse Gulch Complex, upper (a): WGS84: 37.090733, -122.243251, elevation 488ft

Schoolhouse Gulch Complex, upper (b): WGS84: 37.089430, -122.242194, elevation 537ft

Schoolhouse Gulch Complex, upper (c): WGS84: 37.088133, -122.241345, elevation 546ft

Schoolhouse Gulch Complex, upper (d): WGS84: 37.085345, -122.242112, elevation 431ft

Schoolhouse Gulch Complex, lower: WGS84: 37.083404, -122.246104, elevation 143ft

Schoolhouse Ridge(Upper Pozzi Meadow): WGS84: 37.083729, -122.242890,
elevation 407ft

Schoolhouse Ridge(Lower Pozzi Meadow): WGS84: 37.080230, -122.244857,
elevation 201ft

Scott Creek Bridge: WGS84: 37.079935, -122.247305, elevation 105ft

Seymore Hill (Scott Creek side), displaced chaparral: WGS84: 37.098797,
-122.246618, elevation 568ft

"Slide Area", Purdy Road: WGS84: 37.087447, -122.248616, elevation 152ft

Upper Pozzi Meadow Gulch(MillCreek drainage...top): WGS84: 37.083387,
-122.242777, elevation 394ft

Upper Pozzi Meadow Gulch(Mill Creek drainage...bottom): WGS84: 37.081220,
-122.242293, elevation 181ft

Upper Spillway Gulch: WGS84: 37.088578, -122.226470, elevation 694ft

Lower Spillway Gulch: WGS84: 37.089580, -122.232730, elevation 184ft

Vertical Grassland (w-facing) overlooking Squirrel Flat: WGS84: 37.086347,
-122.247425, elevation 353ft

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 Scott 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
Acer negundo/accession number **OBI45698**/David J. Keil, et al., 20659, May 6, 1988
Acmispon maritimus/accession number **UCSC7416**/R. Morgan #5043, 30 May 2010
Acmispon wrangelianus/accession number **OBI45572**/David J. Keil, et al., 20623, May 7, 1988
Agoseris grandiflora var. *grandiflora*/accession number **OBI45507**/David J. Keil, et al., 20628, May 7, 1988
Agrostis scabra/accession number **CAS411246**/V.F. Hesse # 1329, July 22 1954
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
Amsinckia lunaris/accession number **OBI45771**/David J. Keil, et al., 20648, March 7, 1988
Antirrhinum kelloggii/accession number **JEPS82645**/Buck & West #215, Apr 22 1983
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 **UCSC5814**/R. Morgan, Dec 26 1976
Arctostaphylos "sp"/accession number **UCSC6117**/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 crustacea aff. subsp. *subcordata*/accession numbers **UCSC8936, 8937, 8938, 8939**/Dylan Neubauer (via James A. West) #98a, #98b, #98c, #98d/01 September 2014
Arctostaphylos "glandulosa"/accession number **UCSC5796**/R. Morgan, Jan 1977
Arctostaphylos "glandulosa"/accession number **UCSC5805**/R. Morgan, Jan 17 1977
Arctostaphylos tomentosa subsp. *subcordata* = *Arctostaphylos crustacea* aff. subsp. *subcordata*/accession number **JEPS81977**/Buck & West #155
Arctostaphylos tomentosa subsp. *subcordata* = *Arctostaphylos crustacea* aff. subsp. *subcordata*/accession number **UCSC5812**/Randall Morgan, s.n., 25 Jan 1977
Arctostaphylos tomentosa subsp. *subcordata* = *Arctostaphylos crustacea* aff. subsp. *subcordata*/accession number **UCSC5813**/Randall Morgan, s.n., 14 Jan 1977
Arnica discoidea/accession number **JEPS30906**/Thomas #4089
Astragalus gambelianus/accession number **JEPS82614**/Buck & West #252
Athysanus pusillus/accession number **JEPS82961**/West #54.1
Brodiaea terrestris subsp. *terrestris*/accession number **JEPS82807**/Buck & West #288
Cardamine californica/accession number **OBI45575**/David Keil, et al., 20620, May 7, 1988
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
Castilleja affinis/accession number **OBI45358**/David J. Keil, et al., 20602-2, May 7, 1988
Cirsium occidentale var. *venustum*/accession number **DS393474**/J.H. Thomas, 4099, May 7, 1954
Claytonia exigua subsp. *exigua*/accession number **JEPS81986**/Buck & West #182
Claytonia parviflora ssp. *parviflora*/accession number **JEPS82772**/West #39
Clematis lasiantha/accession number **JEPS83087**/West #345
Clinopodium douglasii/accession number **OBI45354**/David J. Keil, et al., 20598, May 7, 1988
Corallorhiza striata/accession number **JEPS89230**/Buck & West #228
Corethrogyne filaginifolia/accession number **UCSC7227**/Randall Morgan #1313, 20 Oct 1988
Cornus sericea subsp. *occidentalis*/accession number **OBI45769**/David J. Keil, et al, 20650, May 7, 1988
Delphinium patens/accession number **OBI45578**/David J. Keil, et al., 20617, May 7, 1988
Dichondra donelliana/accession number **UCSC 8931**/Dylan Nuebauer (via James A. West) #89, 08 June 2014
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
Galium porrigens/accession number **OBI45586**/David J. Keil, et al., 20608, May 7, 1988
Gilia achilleifolia subsp. *achilleifolia*/accession number **JEPS82646**/Buck & West #214
Gilia achilleifolia subsp. *multicaulis*/accession number **UC1561076**/Taylor #9657
Gilia achilleifolia subsp. *multicaulis*/accession numbers **UCSC8873, 8874, 8875**/Dylan Nuebauer (via James A. West) #73a, #73b, #73c/26 May 2014
Gilia clivorum/accession number **JEPS82960**/West #53.1
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 **JEPS6052**/Hesse #1318
Lathyrus vestitus var. *vestitus*/accession number **OBI45658**/David J. Keil, et al., 20575, May 6, 1988
Layia gaillardioides/accession number **JEPS82643**/Buck & West #217
Layia gaillardioides/accession number **JEPS89803**/Taylor, Buck, West & Clifton #9658
Layia gaillardioides/accession number **UCSC7398**/R. Morgan, 24 May 2010, #5032
Layia gaillardioides/accession number **OBI45583**/David J. Keil, et al., 20612, May 7, 1988
Linanthus androsaceus = *Leptosiphon androsaceus*/accession number **JEPS82809**/Buck & West #286
Lonicera hispidula/accession number **OBI45704**/David J. Keil, 20652, May 7, 1988
Lotus stipularis var. *stipularis* (*balsamiferus*)/accession number **JEPS83126**/Buck & West #372

Lupinus bicolor/accession number **OBI45570**/David J. Keil, et al., 20625, May 7, 1988
Lupinus nanus/accession number **OBI45585**/David J. Keil, et al., 20610, May 7, 1988
Madia exigua/accession number **JEPS83093**/Buck & West #380
Madia exigua/accession number **JEPS82580**/West #114, Jun 10, 1983
Madia gracilis/accession number **JEPS82629**/Buck & West #237
Madia gracilis/accession number **JEPS82581**/James A. West #115, Jun 10, 1983
Madia gracilis/accession number **OBI45569**/David J. Keil, et al, #20626, May 7, 1988
Malacothrix floccifera/accession number **JEPS82788**/Buck & West #308
Marah fabacea/accession number **OBI45777**/David J. Keil, et al., 20642, May 7, 1988
Melica torreyana/accession number **OBI45565**/David J. Keil, et al., 20630, May 7, 1988
Mimulus cardinalis = *Erythranthe cardinalis*/accession number **JEPS83050**/Buck & West #417
Mimulus floribundus = *Erythranthe floribunda*/accession number **JEPS81562**/Buck & West #85
Mimulus floribundus = *Erythranthe floribunda*/accession number **JEPS82875**/Buck & West #416
Mimulus moschatus = *Erythranthe inodorata*/accession number **JEPS81560**/Buck & West #87
Minuartia douglasii/accession number **JEPS82647**/Buck & West #213
Monardella villosa subsp. *franciscana*/accession number **OBI77164**/Taylor Crow
Monardella villosa subsp. *franciscana*/accession number **OBI77171**/Taylor Crow
Monardella villosa/accession number **OBI77180**/Taylor Crow
Nemophila menziesii/accession number **JEPS81922**/Buck, West & Stone #192
Nemophila menziesii/accession number **JEPS82016**/Buck, West & Stone #135
Nemophila menziesii/accession number **JEPS82018**/Buck & West #162
Nemophila menziesii/accession number **JEPS82019**/Buck & West #163
Nemophila menziesii/accession number **JEPS82020**/Buck & West #164
Nemophila menziesii/accession number **JEPS82021**/Buck & West #165
Nemophila pedunculata/accession number **UCSC4272**/Randall Morgan, Feb 7 2004
Nemophila pedunculata/accession number **UCSC7600**/R. Morgan, #4972, 27 Apr 2010
Nemophila pedunculata/accession number **JEPS82775**/West #57
Nemophila pedunculata/accession number **JEPS82776**/West #31
Oemleria cerasiformis/accession number **JEPS81994**/Buck & West #150
Oemleria cerasiformis/accession number **OBI45700**/David J. Keil, et al., 20656, May 7, 1988
Oemleria cerasiformis/accession number **UCR67869**/Keil #20656
Pellaea mucronata var. *mucronata*/accession number **JEPS82789**/Buck & West #309
Phacelia malvifolia/accession number **UC794459**/Constance & Macbride #3307
Plagiobothrys bracteatus/accession number **UCSC4033**/Randall Morgan, May 14 2003
Plectritis congesta/accession number **OBI45581**/David J. Keil, et al, #20614, May 7, 1988
Pogogyne serpylloides/accession number **JEPS82600**/West #139
Polypodium scouleri/accession number **UCSC4869**/Randall Morgan, May 26 (2)005
Pseudotsuga menziesii/accession number **OBI45668**/David J. Keil, et al., 20565, May 6, 1988
Psilocarphus tenellus/accession number **OBI45584**/David J. Keil, et al., 20611, May 7, 1988
Pterostegia drymarioides/accession number **OBI45573**/David J. Keil, et al., 20622, May 7, 1988
Quercus agrifolia/accession number **UCSC5525**/Randall Morgan, Oct 13 1978
Rafinesquia californica/accession number **OBI45772**/David J. Keil, et al., 20649, May 7, 1988
Ranunculus hebecarpus/accession number **OBI45781**/David J. Keil, et al., 20638, May 7, 1988
Rhododendron occidentale/accession number **JEPS83604**/Buck & West #443
Ribes divaricatum/accession number **OBI45770**/David J. Keil, et al., 20651, May 7, 1988
Ribes menziesii/accession number **JEPS82000**/Buck & West #146
Ribes menziesii/accession number **JEPS82001**/Buck & West #148
Rubus spectabilis/accession number **JEPS81998**/Buck & West #147

Rumex californicus/accession numbers UCSC8919, 8920/Dylan Neubauer (via James A. West) #95a, #95b/01 September 2014

Rumex transitorius/accession numbers UCSC8921, 8922, 8923/Dylan Nuebauer (via James A. West) #96a, #96b, #96c/01 September 2014

Sambucus nigra subsp. *caerulea*/accession number OBI45702/David J. Keil, et al., 20654, May 7, 1988

Sanicula crassicaulis/accession number OBI45568/David J. Keil, et al., 20629, May 7, 1988

Sanicula crassicaulis = *Sanicula gianonei*, pro. sp. nov./accession number JEPS83081/West #358

Sanicula crassicaulis = *Sanicula gianonei*, pro. sp. nov./accession number JEPS89270/West #358a "TYPE"

Sanicula crassicaulis = *Sanicula gianonei*, pro. sp. nov./accession number JEPS83051/West #298

Sanicula hoffmannii/accession number JEPS83059/Buck & West #455

Satureja douglasii/accession number UCR67854/Keil #20598

Scirpus koilolepis = *Isolepis carinata*/accession number SJSU10205/C.W.Sharsmith #8786, May 15 1983

Scutellaria tuberosa/accession number JEPS82626/Buck, West & Hawke #240

Solanum umbelliferum/accession number OBI45775/David J. Keil, et al., 20644, May 7, 1988

Spiranthes romanzoffiana/accession number UCSC8925/Dylan Neubauer (via James A. West), #97a, 01 September 2014

Stipa pulchra/accession number OBI45574/David J. Keil, et al., 20621, May 7, 1988

Symphoricarpos albus var. *laevigatus*/accession number JEPS85160/Buck & West #491

Thysanocarpus curvipes/accession number SBBG95498/Keil #20615

Torreya californica/accession number SJSU15167/D. Garvey, Apr 13 1993

Torreya californica/accession number OBI45774/David J. Keil, et al., 20647, May 7, 1988

Torreya californica/accession number UC463449/Wiggins #5086

Torreya californica/accession number UC463450/Wiggins #5088

Trifolium ciliolatum/accession number JEPS82644/Buck & West #216

Trifolium ciliolatum/accession number OBI45776/David J. Keil, et al, #20645, May 7, 1988

Trifolium gracilentum var. *gracilentum*/accession number JEPS101286/Taylor, Buck, West & Clifton #9662

Trifolium microdon/accession number UCSC6102/R. Morgan, May 18 1996

Trifolium obtusiflorum/accession number JEPS82876/Buck & West #415

Trifolium oliganthum/accession number JEPS82641/Buck & West #219

Trifolium oliganthum/accession number OBI45559/David J. Keil, et al, #20637, May 7, 1988

Trifolium variegatum/accession number UCSC5683/Randall Morgan, May 23 1995

Trifolium willdenovii/accession number OBI45579/David J. Keil, et al, #20616, May 7, 1988

Veronica serpyllifolia subsp. *humifusa*/accession number UCSC3115/Randall Morgan, Apr 9 2002

Urtica dioica/accession number OBI45778/David J. Keil, et al., 20643, May 7, 1988

Vicia gigantea/accession number OBI45662/David J. Keil, et al., 20570, May 6, 1988

Vicia hassei/accession numbers UCSC8879, 8880, 8881/Dylan Neubauer (via James A. West) #75a, #75b, #75c/26 May 2014

Yabea microcarpa/accession number UCSC8589/Jim West, Ia-A, 15 April 2014

Yabea microcarpa/accession number UCSC8590/Jim West, Ia-B, 15 April 2014

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 Scott Creeks, this 2 meters high sandbar anchored goliath, 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 Scott 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 Scott 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*, *Hierochloa occidentalis* = *Anthoxanthum occidentale*, *Epilobium ciliatum* sensu lato, *Solanum douglasii*, *Notholithocarpus densiflorus* var. *densiflorus*, *Woodwardia fimbriata*, *Umbellularia californica*, *Cynoglossum grande*, *Collomia heterophylla*, *Claytonia perfoliata* subsp. *perfoliata*, *Nemophila parviflora* var. *parviflora*, *Frangula californica* subsp. *californica*, *Melica torreyana*, *Scrophularia californica*, *Laythrus vestitus* sensu lato, *Vicia gigantea*, *Phacelia californica* (leaves, stems and inflorescences clothed with stiff, pustulate-based eglandular trichomes), *Deschampsia elongata*, *Petasites frigidus* var. *palmatus*, *Carex amplifolia*, *Scirpus microcarpus*, *Pseudotsuga menziesii* var. *menziesii*, *Oxalis oregana*, *Galium*

triflorum, *Cardamine californica* var. *californica*, *Smilacina stellata* = *Maianthemum stellatum*, *Bromus carinatus* var. *carinatus*, *Urtica dioica* subsp. *gracilis*, *Mimulus guttatus* complex (aff. *Erythranthe nasuta*), *Pteridium aquilinum* var. *pubescens*, *Poa howellii*, *Cyperis eragrostis*, *Aralia californica*, *Torreya californica*, *Equisetum telmateia* subsp. *braunii*, *Tiarella trifoliata* var. *unifoliata*, *Trillium ovatum* subsp. *ovatum*, *Cicuta douglasii*, *Callitriche marginata*, *Veronica americana*, *Juncus patens*, *Sanicula crassicaulis*, *Trisetum* aff. *canescens*, *Elymus glaucus* subsp. *glaucus*, *Carex* sect. *Ovales* (aff. *Carex gianonei*, **pro.sp.nov.**), *Osmorhiza berteroi*, *Rumex salicifolius* complex = *Rumex salicifolius* (decumbent with one tubercle), *Trifolium microcephalum*, *Iris douglasiana*, *Polypodium californicum* (lithophyte, lower sets of pinna longer than succeeding ones), *Prosartes hookeri*, *Ribes menziesii* var. *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. *cyclosorum* 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), *Scoliopus bigelovii*, *Calystegia purpurata* subsp. *purpurata*, *Pentagramma triangularis* subsp. *triangularis*, *Asyneuma prenanthoides*, *Festuca occidentalis*, *Carex globosa*, *Smilacina racemosa* = *Maianthemum racemosum*, *Fritillaria affinis*, *Heuchera micrantha*, *Diplacus aurantiacus*, *Festuca elmeri*, *Fragaria vesca*, *Oxalis pilosa*, *Ceanothus thyrsiflorus* var. *thyrsiflorus*, *Trifolium willdenovii*, *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-steepening banks, one encounters *Lonicera hispidula*, *Boykinia occidentalis*, *Veronica americana*, *Carex nudata*, *Erythranthe* (*Mimulus*) *cardinalis*, *Adiantum jordanii*, *Helenium puberulum* 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! **Three additions to the observable native species list were recorded while crossing Big Creek Bridge**..... growing partially inundated during the rainy season and with its rhizomes securely embedded in a cluster of mudstone fragments, **coltsfoot** (*Petasites frigidus* var. *palmatus*) proudly displayed its maple-like leaves on erect stalks. Nearby, the lethal cousin of the culinary carrot, the aforementioned **water hemlock** (*Cicuta douglasii*), reveled in its aquatic habitat. Rounding out this morphologically diverse trio, is a relatively common "native" constituent of the riparian corridors but sporting a new identity..... what was formerly called **musk monkeyflower** (*Mimulus moschatus*), is now properly referred to as *Erythranthe inodora*.

Entering Scott 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 perverse: 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 Scott 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 Scott 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 moisture retentive west facing slopes are fast losing their remaining manzanitas 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 Scott, 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 junceus* var. *junceus* = *Acmispon junceus* var. *junceus*), 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 Scott 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 biolettii*), 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 (*Lysimachia latifolia*..... **one white flowered plant observed**)..... California water starwort (*Callitriche 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 hesperius*), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus var. phaeocephalus*)..... bent grass hybrid complex (*Agrostis hallii* x *Agrostis pallens* putative intergrades), California brome (*Bromus carinatus var. carinatus*), nodding brome (*Bromus vulgaris*), California oat grass (*Danthonia californica 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. pubescens*)..... 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* = *Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*..... **putative intergrades with Stachys rigida, based on vestigial 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 obnupta*), small-bracted sedge (*Carex subbracteata*), dwarf club rush (*Isolepis carinata*)..... red elderberry (*Sambucus racemosa var. racemosa*)..... sweet-scented bedstraw (*Galium triflorum*)..... sticky monkeyflower (*Diplacus aurantiacus*)..... poison oak (*Toxicodendron diversilobum*)..... blue blossom (*Ceanothus thyrsiflorus var. thyrsiflorus*), California coffeeberry (*Frangula californica* subsp. *californica*)..... California man root (*Marah fabaceus*)..... dwarf brodiaea (*Brodiaea terrestris* subsp. *terrestris*), blue dicks (*Dichelostemma capitatum* subsp. *capitatum*), Ithuriel's spear (*Triteleia laxa*)..... lovage (*Ligusticum apiifolium*..... **scattered population, of this rare for SC County taxon, growing on west facing slope overlooking upper portion of gulch**), sweet cicely (*Osmorhiza berteroi*), 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 Scott 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 sepals 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 crustacea 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 menziesii* var. *menziesii*)..... 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 (*Barbarea 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 arboreus*)..... 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*).

Note: Revisiting the aforementioned *Sanicula hoffmannii* population on 08/01/2012, yielded the following ecological data per population size and associate taxa..... the *Sanicula hoffmannii* population, including both adult and seedling representation, numbered between 50 and 60 plants, some of which seemed to enjoy a periodic disturbance regime, for they were growing in the middle of the horse trail!!! Also growing bankside, above and below the horse trail, were the following assemblage of native, common to rare, grasses..... *Bromus carinatus* sensu lato, *Bromus vulgaris*, *Festuca elmeri*, *Festuca occidentalis*, *Festuca subuliflora*, *Melica subulata* and *Melica torreyana*.

Back along Swanton Road, a sedge new to our inventory, round-fruited sedge (*Carex globosa*), displays antrorsely 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 (*Diplacus 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 purpurata* subsp. *purpurata*), California blackberry (*Rubus ursinus*) and Pacific pea (*Lathyrus vestitus* var. *vestitus*), scandent 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 (*Symphotrichum 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 morehus*), 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 re segregate definable knobcone traits throughout the Scott 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 Scott 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 prenanthoides* = *Asyneuma prenanthoides*), redwood violet (*Viola sempervirens*), varied-leaved collomia (*Collomia 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 divaricatum* 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* alliance), 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* sensu 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 (*Hierochloa occidentalis* = **Anthoxanthum occidentale**) both possessing foliage that rewards the olfactorily 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 honeysuckle (*Lonicera hispidula* var. *vacillans* = **Lonicera hispidula**) and snowberry (*Symphoricarpos 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 arboreus*) x broad-leaved lupine (*Lupinus latifolius* var. *latifolius*).

A conspicuous component of the Grass Family (Poaceae) within the Scott 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 (*Hierochloa 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 Scott Creek Watershed occur, namely rayless arnica (*Arnica discoidea*..... **note: more prevalent in chaparral since 2009 Lockheed Fire**), windflower (*Anemone grayi*) 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 (*Anthoxanthum occidentale*), yerba buena (*Clinopodium douglasii*), yarrow (*Achillea millefolium*), California nutmeg (*Torreya californica*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), wild ginger (*Asarum caudatum*), blue blossom (*Ceanothus thrysiflorus*), sweet cicely (*Osmorhiza heteroi*), California sagebrush (*Artemisia californica*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), canyon gooseberry (*Ribes menziesii* var. *menziesii*), coltsfoot (*Petasites frigidus* var. *palmatus*) 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 (*Diplacus 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 sempervirens*), forest live-oak (*Quercus parvula* var. *shrevei*) and California phacelia (*Phacelia californica*). Groupings of **morphologically dissimilar taxa belonging to the same family** occur with some frequency throughout the Scott 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 Scott 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 events (1940/1955) which severely scoured the watershed's lower portion and removed the populations, remains unknown.** Since the salmonberry (*Rubus spectabilis*) is well established in the lower portions of both the Mill and Big Creek sub-watersheds and does not extend into the upper reaches of Scott Creek proper, the absence of this ornamentally attractive member of the Rosaceae in the lower reaches of Little Creek, may be recruitment failure compounded by the restrictive/vulnerable range of this taxon. Unlike the ubiquitous representation of related thimbleberry (*Rubus parviflorus*) and California blackberry (*Rubus ursinus*) and to a lesser extent, black-cap raspberry (*Rubus leucodermis*) in the upper Little Creek drainage (allowing for replacement via seed and detached root systems downstream following a major mass

wasting/flooding event), the Little Creek salmonberry populations (if they ever existed) may have been totally decimated by either the 1940/1955 events or earlier ones and lacked the necessary satellite populations upstream to insure eventual repopulation.

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 complimented 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 (*Diplacus 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 fimbriata*), lady fern (*Athyrium filix-femina* var. *cyclosorum*), 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 sitchensis*), sporting foliage clothed with a silvery indument akin to finely spun aluminum. Since the 2009 Lockheed 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* subsp. *consanguinea*, *Cirsium brevistylum*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Gamochaeta ustulata*, *Hieracium albiflorum*, *Layia 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, retrorsely 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* aff. *canescens*..... *Oxalis pilosa*, *Oxalis*

oregana..... *Polygala californica*..... *Viola ocellata*, *Viola sempervirens*..... *Asyneuma prenanthoides*, *Triodanis biflora*..... *Ribes menziesii* var. *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 siberica*..... *Lathyrus vestitus* sensu lato, *Acmispon heermannii* var. *orbicularis*, *Acmispon parviflorus*, *Acmispon glaber* var. *glaber*, *Acmispon wrangelianus*, *Lupinus* aff. *propinquus* E. Greene, *Trifolium bifidum* var. *decipiens*, *Trifolium ciliolatum*, *Trifolium gracilentum* var. *gracilentum*, *Trifolium microcephalum*, *Trifolium obtusiflorum* [var. *cruzeze*, a new variety described by Randall Morgan, in his ongoing molecular revision of the genus *Trifolium*], growing roadside overlooking 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 var. **obtusiflorum** was discovered growing on a sandbar below Scott Creek Bridge and documented via pressing for the Jepson Herbarium, *Trifolium oliganthum*, *Trifolium willdenovii*, *Vicia gigantea*, *Vicia hassei*..... *Chlorogalum pomeridianum* var. *pomeridianum*..... *Callitriche marginata* (now placed in the family Plantaginaceae)..... *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. *agrifolia*, *Quercus parvula* var. *shrevei*..... *Ceanothus thyrsoiflorus* var. *thyrsoiflorus*, *Frangula californica* 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 albicans* 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* = *Maianthemum racemosum*, *Smilacina stellata* = *Maianthemum stellatum*..... *Trientalis latifolia* = *Lysimachia latifolia*..... *Aquilegia formosa*, *Clematis lasiantha*, *Ranunculus hebecarpus*..... *Amsinckia menziesii* var. *intermedia* = *Amsinckia intermedia*, *Cryptantha clevelandii* var. *florosa*, *Cryptantha micromeres*, *Cynoglossum grande*, *Emmenanthe 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* subsp. *ciliatum*..... *Juncus bufonius*, *Juncus patens*..... *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens*, *Galium triflorum*..... *Mimulus aurantiacus* = *Diplacus aurantiacus*, *Mimulus* aff. *nasutus* Greene = *Erythranthe* aff. *nasuta* (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 scorpioid 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*..... *Athyrium filix-femina* var. *cyclosorum*..... *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*..... *Dichelostemma 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: WGS84: 37.097641, -122.207357, elevation 1214ft

Big Creek Sub-Watershed (a): WGS84: 37.107072, -122.204298, elevation 1433ft

Big Creek Sub-Watershed (b): WGS84: 37.102542, -122.186485, elevation 1457ft

Big Creek Sub-Watershed (c): WGS84: 37.078108, -122.216725, elevation 309ft

Big Creek Fish Hatchery: WGS84: 37.074549, -122.221564, elevation 108ft

Big Creek Bridge/Lower Big Creek Sub-Watershed: WGS84: 37.067087, -122.228947, elevation 59ft

Little Creek/South Fork: WGS84: 37.068186, -122.205254, elevation 578ft

Little Creek/North Fork: WGS84: 37.073188, -122.204784, elevation 527ft

Lower Little Creek: WGS84: 37.065683, -122.222064, elevation 150ft

Upper Mt. Cook Gulch Complex: WGS84: 37.066031, -122.240512, elevation 700ft

Lower Mt. Cook Gulch Complex: WGS84: 37.063502, -122.232895, elevation 409ft

Mt. Cook Gulch Complex/Displaced Chaparral: WGS84: 37.063754, -122.234606, elevation 664ft

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 Scott Creek**

Watershed and environs, then deposited in the Jepson Herbarium, U.C. Berkeley, are as follows:

- Acer macrophyllum*/accession number **OBI71172**/David J. Keil, et al., 20585, May 6, 1988
Achillea millefolium/accession number **OBI45666**/David J. Keil, 20566, May 6, 1988
Adiantum jordanii/accession number **OBI45652**/David Keil, et al., 20580, 5/6/88
Anisocarpus madioides/accession number **OBI45665**/David J. Keil, et al., 20568, May 6, 1988
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
Aspidotis californica/accession number **UCSC7152**/R. Morgan, 2 Feb 1977
Aster subspicatus = *Symphotrichum 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 perfoliata subsp. *perfoliata*/accession number **OBI45650**/David J. Keil, et al., 20582, May 6, 1988
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
Heuchera micrantha/accession number **OBI45660**/David J. Keil, et al., 20573, May 6, 1988
Heteromeles arbutifolia/accession number **OBI45669**/David J. Keil, et al., 20564, May 6, 1988
Holodiscus discolor/accession number **OBI45661**/David J. Keil, et al., 20572, May 6, 1988
Iris douglasiana/accession number **OBI45656**/David J. Keil, et al., 20576, May 6, 1988
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* = *Diplacus aurantiacus*/accession number **UCR67974**/Keil, #20574
Mimulus aurantiacus var. *aurantiacus* = *Diplacus aurantiacus*/accession number **OBI45659**/
David J. Keil, et al., 20574, May 6, 1988
Nemophila parviflora var. *parviflora*/accession number **JEPS82954**/West #41.2
Nemophila parviflora var. *parviflora*/accession number **JEPS81538**/Buck, West & Stone #471
Nemophila parviflora var. *parviflora*/accession number **JEPS85184**/Buck, West & Stone #143
Oxalis oregana/accession number **OBI45657**/David J. Keil, et al., 20577, May 6, 1988

Oxalis pilosa/accession number OBI45571/David J. Keil, et al., 20624, May 7, 1988
Phacelia californica/accession number JEPS82792/Buck & West #304
Pinus radiata/accession number JEPS83129/Buck & West #440
Polygala californica/accession number JEPS83127/Buck & West #353
Quercus x morehus/accession number JEPS81522/Buck & West #7
Ribes "sp"/accession number UCSC5358/Randall Morgan, Nov 10 1976
Rubus parviflorus/accession number OBI45244/David J. Keil, et al., 20586, May 6, 1988
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 *Latuca*), 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* aff. *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 positioned, landslide derived drainage system aka "mini-gulch", which is now blocked by Swanton Road: wood strawberry (*Fragaria vesca*), California blackberry (*Rubus ursinus*), toyon (*Heteromeles arbutifolia*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), wood fern (*Dryopteris arguta*), bracken (*Pteridium aquilinum* var. *pubescens*), western sword fern (*Polystichum munitum*), nested polypody (*Polypodium calirhiza*).....**lowermost pairs of pinna shorter than succeeding ones**, California maidenhair (*Adiantum jordanii*), Torrey's melic (*Melica torreyana*), California wild rye (*Elymus glaucus* subsp. *glaucus*), California brome (*Bromus carinatus* var. *carinatus*), nodding brome (*Bromus vulgaris*), Pacific madrone (*Arbutus menziesii*), redwood (*Sequoia sempervirens*), big-leaf maple (*Acer macrophyllum*), box elder (*Acer negundo* var. *californicum*), coast live-oak (*Quercus agrifolia* var. *agrifolia*), forest live-oak (*Quercus parvula* var. *shrevei*), California buckeye (*Aesculus californica*), red alder (*Alnus rubra*), California bay laurel

(*Umbellularia californica*), tan-oak (*Notholithocarpus densiflorus* var. *densiflorus*), California nutmeg (*Torreya californica*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), Monterey pine (*Pinus radiata*), arroyo willow (*Salix lasiolepis*), poison oak (*Toxicodendron diversilobum*), coast nettle (*Urtica dioica* subsp. *gracilis*), western nettle (*Hesperocnide tenella*), hound's tongue (*Cynoglossum grande*), blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*), California coffeeberry (*Frangula californica* subsp. *californica*), western burning bush (*Euonymus occidentalis* var. *occidentalis*), blue elderberry (*Sambucus nigra* subsp. *canadensis*), red elderberry (*Sambucus racemosa* var. *racemosa*), hairy honeysuckle (*Lonicera hispidula*), striped coralroot (*Corallorhiza striata*), checker lily (*Fritillaria affinis* var. *affinis*), western trillium (*Trillium ovatum* subsp. *ovatum*), slim Solomon's seal (*Smilacina stellata* = *Maianthemum stellatum*), Douglas's iris (*Iris douglasiana*), common wood rush (*Luzula comosa*), Indian thistle (*Cirsium brevistylum*), willow dock complex (*Rumex salicifolius* sensu lato), California bedstraw (*Galium californicum* subsp. *californicum*), sweet-scented bedstraw (*Galium triflorum*), gambleweed (*Sanicula crassicaulis*), cow-parsnip (*Heracleum maximum*), sweet cicely (*Osmorhiza berteroi*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), mugwort (*Artemisia douglasiana*), woodland madia (*Anisocarpus madioides*), California hedge-nettle (*Stachys bullata*), small-flowered alum root (*Heuchera micrantha*), canyon gooseberry (*Ribes menziesii* var. *menziesii*), California man root (*Marah fabaceus*), small-flowered nemophila (*Nemophila parviflora* var. *parviflora*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*), common milkmaids (*Cardamine californica* var. *californica*), popweed (*Cardamine oligosperma*), California figwort (*Scrophularia californica*), sticky monkeyflower (*Mimulus aurantiacus* = *Diplacus aurantiacus*), Pacific pea (*Laythrus vestitus* sensu lato), small-flowered trefoil (*Lotus micranthus* = *Acmispon parviflorus*), sky lupine (*Lupinus nanus*), California tea (*Rupertia physodes*), morning glory (*Calystegia purpurata* subsp. *purpurata*) and California poppy (*Eschscholzia californica*).

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 incisions..... 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* var. *menziesii*, *Sambucus nigra* subsp. *canadensis*, *Holodiscus discolor*, *Baccharis pilularis* subsp. *consanguinea*, *Toxicodendron diversilobum*, *Rubus parviflorus*, *Mimulus aurantiacus* = *Diplacus aurantiacus* and *Eriophyllum confertiflorum* var. *confertiflorum*. Complimenting their overtopping brethren, the following annuals and herbaceous perennials, plus one quasi-woody vine (*Lonicera hispidula*) and a gravity-defying adventurous fern (*Polypodium calirhiza*), turn the understory into a texturally complex botanical tapestry: *Fritillaria affinis*, *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens*, *Galium triflorum*, *Pseudognaphalium californicum*, *Laythrus vestitus*, *Stachys bullata* (possible intergrades with *Stachys ajugoides* var. *rigida* = *Stachys rigida* var. *quercetorum*..... variations in ring-of-hairs alignment in corolla tube and positioning of corolla within calyx), *Fragaria vesca*, *Rubus ursinus*, *Cynoglossum grande*, *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 jordanii, Pteridium aquilinum var. pubescens, Dryopteris arguta, Polystichum munitum, Pentagramma triangularis, Osmorhiza berteroi, Rafinesquia californica, Claytonia perfoliata subsp. perfoliata, Nemophila parviflora var. parviflora, Phacelia malvifolia, Oxalis pilosa, Gamochaeta ustulata, Calystegia purpurata subsp. purpurata, Carex aff. subbracteata, Sisyrinchium bellum, Maianthemum racemosum, 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 displaying revegetation to such a degree, that its botanical diversity compares favorably with the lower and much longer **unburned** stretch of road! Restricting the height 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 subsp. californicum, Galium triflorum, Epilobium ciliatum subsp. 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 fendleri sensu lato, 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, Maianthemum stellatum, Dichelostemma capitatum subsp. capitatum, Lonicera hispidula, Navarretia squarrosa, Scrophularia californica (one specimen with flavistic flowers observed, making it the third such discovery of this uncommon forma for the watershed), Fragaria vesca, Frangula californica subsp. californica, Oemleria cerasiformis, Diplacus aurantiacus, Dryopteris arguta, Polystichum munitum, Adiantum jordanii, Pteridium aquilinum var. pubescens, Heracleum maximum, Toxicodendron diversilobum, Nemophila parviflora var. parviflora, Aphanes occidentalis, Rubus ursinus, Heteromeles arbutifolia, Pseudotsuga menziesii var. 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 macraei*), maiden clover (*Trifolium microcephalum*), 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), tomcat 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 noctuinus* 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 aurantiacus* = *Diplacus aurantiacus*)..... rattlesnake weed (*Daucus pusillus*), cow-parsnip (*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* = *Clinopodium douglasii*), rigid hedge-nettle (*Stachys ajugoides* var. *rigida*)..... creeping hearts (*Pterostegia drymarioides*)..... 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*), coast dandelion (*Agoseris grandiflora* var. *grandiflora*), California sagebrush (*Artemisia californica*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), Indian thistle (*Cirsium brevistylum*), California aster (*Corethrogyne filaginifolia*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), broad-leaved aster (*Eurybia radulina*), purple cudweed (*Gamochaeta 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 (*Micropus 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 (*Symphotrichum chilense*)..... red maids (*Calandrinia ciliata*)..... California poppy (*Eschscholzia californica*), cream cups (*Platystemon californicus*)..... American winter cress (*Barbarea orthoceras*), common milkmaids (*Cardamine californica* var. *californica*), popweed (*Cardamine oligosperma*), narrow-leaved fringepod (*Thysanocarpus laciniatus*)..... 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 (*Symphoricarpos 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* = *Stipa lepida*), purple needlegrass (*Nassella pulchra* = *Stipa pulchra*), pine bluegrass (*Poa secunda* subsp. *secunda*), tall trisetum *Trisetum* aff. *canescens*)..... Hooker's fairy bells (*Prosarte hookeri*)..... soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*)..... white globe lily (*Calochortus albus*)..... dwarf brodiaea (*Brodiaea terrestris* subsp. *terrestris*), blue dicks (*Dichelostemma capitatum* subsp. *capitatum*)..... poison oak (*Toxicodendron diversilobum*)..... Cleveland's cryptantha (*Cryptantha clevelandii* var. *florosa*), 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. *quadriovulnera*), farewell-to-spring (*Clarkia rubicunda*)..... California bedstraw (*Galium californicum* subsp. *californicum*), climbing bedstraw (*Galium porrigens* var. *porrigens*), sweet-scented bedstraw (*Galium 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)..... pipestems (*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 (*Juncus bufonius*..... **extremely variable as to stature, and how much is due to environmental factors needs to be studied locally**), common rush (*Juncus patens*)..... knobcone pine (*Pinus attenuata*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)..... heterocodon (*Heterocodon rariflorum*)..... 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*)..... and 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 west-facing inner roadbank extending upslope circa 10 meters from the tarmac's edge, and stretching ribbon-like between Winter and Archibald Creeks. Here is a comprehensive review of the native taxa found growing within this narrowly defined section of our botanical journey, illustrating on the micro level what surprises await the botanical sleuth elsewhere in remoter parts of the watershed: hoary bowlesia (*Bowlesia incana*), California figwort (*Scrophularia californica* subsp. *californica*), morning glory (*Calystegia purpurata* subsp. *purpurata*), wood strawberry (*Fragaria vesca*), California blackberry (*Rubus ursinus*), coyote mint (*Monardella villosa* sensu lato), mountain dandelion (*Agoseris grandiflora* var. *grandiflora*), coast live-oak (*Quercus*

agrifolia var. *agrifolia*), forest live-oak (*Quercus parvula* var. *shrevei*), toyon (*Heteromeles arbutifolia*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), yarrow (*Achillea millefolium*), poison oak (*Toxicodendron diversilobum*), climbing bedstraw (*Galium porrigens* var. *porrigens*), wood fern (*Dryopteris arguta*), California maidenhair (*Adiantum jordanii*), California buckeye (*Aesculus californica*), mugwort (*Artemisia douglasiana*), California man root (*Marah fabaceus*), stinging phacelia (*Phacelia malvifolia*), California aster (*Symphytotrichum chilense*), California hedge-nettle (*Stachys bullata*), California bay laurel (*Umbellularia californica*), hound's tongue (*Cynoglossum grande*), Pacific pea (*Laythrus vestitus* sensu lato), miner's lettuce (*Claytonia perfoliata* sensu lato), western nettle (*Hesperocnide tenella*), goldback fern (*Pentagramma triangularis* subsp. *triangularis*), California polypody (*Polypodium californicum*, sensu lato), popweed (*Cardamine oligosperma*), Torrey's melic (*Melica torreyana*), California larkspur (*Delphinium californicum* subsp. *californicum*), giant trillium (*Trillium chloropetalum*), bracken (*Pteridium aquilinum* var. *pubescens*), slim Solomon's seal (*Maianthemum stellatum*), Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), oso berry (*Oemleria cerasiformis*), American winter cress (*Barbarea orthoceras*), Gianone's sanicle (*Sanicula gianonei*, pro.sp.nov.), Douglas's nightshade (*Solanum douglasii*), redwood (*Sequoia sempervirens*), western sword fern (*Polystichum munitum*), checker lily (*Fritillaria affinis* var. *affinis*), cow-parsnip (*Heracleum maximum*), blue elderberry (*Sambucus nigra* subsp. *canadensis*), California coffeeberry (*Rhamnus californica* subsp. *californica*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), sticky monkeyflower (*Diplacus aurantiacus*), soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*), straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*), California wild rye (*Elymus glaucus* subsp. *glaucus*), California sagebrush (*Artemisia californica*), Gianone everlasting (*Pseudognaphalium gianonei*, pro.sp.nov.), hairy honeysuckle (*Lonicera hispidula*), giant vetch (*Vicia gigantea*), California bedstraw (*Galium californicum* subsp. *californicum*), gambleweed (*Sanicula crassicaulis*), narrow-leaved fringepod (*Thysanocarpus laciniatus*), nodding brome (*Bromus vulgaris*), sweet cicely (*Osmorhiza berteroi*), small-flowered nemophila (*Nemophila parviflora* var. *parviflora*), creeping hearts (*Pterostegia drymarioides*) and yerba buena (*Satureja douglasii*).

A Rosaceae is 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 (*Psilocarphus tenellus* var. *tenellus*), California water starwort (*Callitriche marginata*), dwarf pearlwort (*Sagina apetala*..... **naturalized from Europe**) and a variant of toad rush (*Juncus bufonius*) with filiform flowering culms.

Within and contiguous to the Scott 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 microdune 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.
- (8) Within the Scott Creek Watershed and its environs, an ergot-like fungus has been consistently observed parasitizing the caryopsis on a substantial number of mature *Agrostis blasdalei* inflorescences. Within a given population, this condition can affect one or two flowering culms or in some cases, all of the season's inflorescences, while adjacent plants may be wholly free from this spore born infection. This raises a number of interesting questions, namely: (a) does this condition also occur within the Marin, Sonoma and Mendocino populations?, (b) does proximity to the ocean and subsequent

influence of summer coastal fog create a favorable environment for the persistent/ yearly occurrence of this pathogen?, (c) has it co-existed with this taxon long enough, to generate a certain percentage of resistant individuals within any given population, and if so, what are the underlying genetics of this resistance?, (d) does the percentage of resistant plants vary from population?, (e) can the spatial relationship of individual members of a given population to each other play any role in the number of plants infected? and (f) on an individual basis, can the resistance/susceptibility status change seasonally or over time, given the cyclical nature of the coastal weather patterns? With related taxa, *Agrostis densiflora* and *Agrostis exarata* often found growing sympatrically with *Agrostis blasdalei* and in several documented instances, forming hybrids, do any of the aforementioned questions also apply to them as well and does the hybrid nature of some of the taxa confer thru heterosis, a significantly higher degree of resistance?

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 \pm 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* = *Amsinckia 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-verbena (*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 variicolor*) 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 Scott 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 Scott Creek Marsh. Shadowing the lower portion of Swanton Road and threading its way through other native and introduced grass species, creeping rye (*Leymus triticoides* = *Elymus triticoides*), luxuriates within the western confines of the Scott Creek Marsh and forms diffuse scatterings on the coastal prairie where siliceous terrace deposits (eolian sand) prevail. Sporadically margining both sides of Swanton Road, between Archibald and Queseria Creeks, are variable populations of *Symphotrichum chilense* and growing in a perennially moist section proximal to the roadside access of the George Valentine Gulch, **is a localized cluster of related *Symphotrichum subspicatum*..... conspicuous by having all of its phyllaries spreading and foliaceous rather than appressed and graduated.**

Note: An envelope containing pressed inflorescences and mature cypselae from the above mentioned *Symphotrichum subspicatum*, was deposited at the UCSC Arboretum, vouchering this uncommon taxon for the watershed.

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), paniced 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 fringed pod (*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-buffed 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 Scott Creek environs. **Adding structural contrast to the vertical array of surrounding vegetation, eleven members of the morphologically diverse Asteraceae.....**Bioletti's cudweed (*Pseudognaphalium biolettii*), California cudweed (*Pseudognaphalium californicum*), Gianone everlasting (*Pseudognaphalium gianonei*, *pro.sp.nov.*), pink everlasting (*Pseudognaphalium ramosissimum*), California goldenrod (*Solidago velutina* subsp. *californica*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California sagebrush (*Artemisia californica*), mugwort (*Artemisia douglasiana*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), California aster (*Symphotrichum chilense*) and yarrow (*Achillea millefolium*)..... **challenge the passing observer to connect the phylogenetic dots and discern the familial relationship between this native undetected.** 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 along our traversal share a vibrant, grass-green coloration..... **a localized mini-colony uniformly colored a dull gray** (possibly inherited from diploid ancestor *Dudleya farinosa*) and sharing the base of this ancient landslide with our Poaceae trio and the aforementioned Asteraceae quartet, is 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 humungous rotational slump/pull apart (guiding Swanton Road in a westernly 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 californica*, *Artemisia douglasiana*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Pseudognaphalium biolettii*, *Pseudognaphalium californicum*, *Pseudognaphalium gianonei*, *pro.sp.nov.*, *Pseudognaphalium ramosissimum* and *Symphotrichum chilense*..... while fewer numerically, the Lamiaceae's contributions are no less rewarding, with *Monardella villosa* sensu lato displaying remarkable variation throughout the watershed, *Satureja douglasii* = *Clinopodium douglasii* and *Stachys ajugoides* var. *rigida* = *Stachys rigida* var. *quercetorum*, exuding a pungency not to everyones liking!

Marching down the steep, topographically irregular slopes of tributary gulches feeding into the flood plain of the lower Scott Creek and reveling in the alluvium rich bottoms, California buckeye (*Aesculus californica*) 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 pollen for the foraging non-native, European honey bees! **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 lasiolepis*) willows, red elderberry (*Sambucus racemosa* var. *racemosa*), straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*)..... **concentrated colony growing in grove of old *Salix lasiandra* var. *lasiandra* and *Salix lasiolepis* trees, reaching 8+ meters in height where supported by one *Salix lasiandra* var. *lasiandra* trunk, otherwise averaging 2-3 meters in high where free standing**, 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 (*Lilaea scilloides* = *Triglochin scilloides*) and forming a green skin on the water's surface, smaller duckweed (*Lemna minor*) and directly across the tarmac, colonies of California wild rose (*Rosa californica*) and California aster (*Symphotrichum chilense*) weave tapestries tinted mauve and pink against the backdrop of a red alder (*Alnus rubra*) lined Scott 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 whispering bells (*Emmenanthe penduliflora*). **Here is a partial listing of the native species concentrated within this isolated island of chaparral, which was totally burned in the 2009 fire:** yerba santa (*Eriodictyon californicum*), coyote mint (*Monardella villosa sensu lato*), broad-leaved aster (*Eurybia radulina*), white globe lily (*Calochortus albus*), California tea (*Rupertia physodes*), brittle-leaf manzanita (*Arctostaphylos crustacea sensu lato*/forming an extensive, morphologically complex but localized population), chamise (*Adenostema fasciculatum*), California huckleberry (*Vaccinium ovatum*), golden chinquapin (*Chrysolepis chrysophylla* var. *minor*), pine grass (*Calamagrostis rubescens*), stinging lupine (*Lupinus hirsutissimus*), sky lupine (*Lupinus nanus*), Cleveland's cryptantha (*Cryptantha clevelandii* var. *florosa*), minute-flowered cryptantha (*Cryptantha micromeres*), yarrow (*Achillea millefolium*), tall layia (*Layia hieracioides*), Torrey's melic (*Melica torreyana*), slender fescue (*Vulpia octoflora* var. *octoflora*), California bedstraw (*Galium californicum* subsp. *californicum*), climbing bedstraw (*Galium porrigens* var. *porrigens*), California brome (*Bromus carinatus* var. *carinatus*), California wild rye (*Elymus glaucus* subsp. *glaucus*), Hasse's vetch (*Vicia hassei*), small-flowered nemophila (*Nemophila parviflora* var. *parviflora*), Venus's looking-glass (*Triodanis biflora*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), creeping hearts (*Pterostegia drymarioides*), hairy wood sorrel (*Oxalis pilosa*), bush poppy (*Dendromecon rigida*), short-podded trefoil (*Lotus humistratus* = *Acmispon brachycarpus*), Bioletti's trefoil (*Lotus junceus* var. *biolettii* = *Acmispon junceus* var. *biolettii*), small-flowered trefoil (*Lotus micranthus* = *Acmispon parviflorus*), strigose trefoil (*Lotus strigosus* = *Acmispon strigosus*), yerba buena (*Satureja douglasii* = *Clinopodium douglasii*), knobcone pine (*Pinus attenuata*), Douglas's iris (*Iris douglasiana*), sweet cicely (*Osmorhiza berteroi*), pink everlasting (*Pseudognaphalium ramosissimum*), maiden clover (*Trifolium microcephalum*), common milkmaids (*Cardamine californica* var. *californica*), popweed (*Cardamine oligosperma*), wild celery (*Apiastrum angustifolium*), California chicory

(*Rafinesquia californica*), woodland madia (*Anisocarpus madioides*), rattlesnake weed (*Daucus pusillus*), toyon (*Heteromeles arbutifolia*), hound's tongue (*Cynoglossum grande*), Fremont's star lily (*Toxicoscordion fremontii*), gambleweed (*Sanicula crassicaulis*), common rush (*Juncus patens*), downy buttercup (*Ranunculus hebecarpus*), redwood (*Sequoia sempervirens*), California milkwort (*Polygala californica*), twining snapdragon (*Antirrhinum kelloggii*), Indian thistle (*Cirsium brevistylum*) and morning glory (*Calystegia purpurata* subsp. *purpurata*).

Between Archibald and Queseria Creeks, **two small but botanically diverse west-facing watersheds exist**, drained by seasonal streamlets emptying into the bottomland paralleling Scott 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 Scott 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 Scott 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-buffed west facing slopes**, in association with California sagebrush (*Artemisia californica*), sticky monkeyflower (*Diplacus aurantiacus*), stinging phacelia (*Phacelia malvifolia*), yellow bush lupine (*Lupinus arboreus*), yarrow (*Achillea millefolium*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), lizard tail (*Eriophyllum staechadifolium*), deerweed (*Lotus scoparius* var. *scoparius* = *Acmispon glaber* var. *glaber*), climbing bedstraw (*Galium porrigens* var. *porrigens*), intermediate fiddleneck (*Amsinckia menziesii* var. *intermedia* = *Amsinckia intermedia*), gambleweed (*Sanicula crassicaulis*), coffee fern (*Pellaea andromedifolia*), grassland gilia (*Gilia clivorum*), *Eriogonum latifolium/nudum* intergrades (attaining shrub-like status circa 1 meter in height, coyote mint (*Monardella villosa* sensu lato) and poison oak (*Toxicodendron diversilobum*). Ironically, three deciduous members of the rose family (**Rosaceae**) can be found growing sympatrically on this slope, and when in full-leaf mode and flowering, showing no apparent relationship to each other..... the shrubs in question being *Holodiscus discolor*, *Oemleria cerasiformis* and *Prunus emarginata*. Apparently, both populations of bitter cherry (*Prunus emarginata*) are expanding their range clonally as well as by dispersed fruits, those within lower Queseria Creek varying considerably as to stature, foliar morphology and inflorescence 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 tracteries 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* = *Micranthes 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* = *Stipa 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 maul oak (*Quercus chrysolepis*) have adjusted by reducing their vertical status, in the maul oak'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 hebecarpus*), tall layia (*Layia hieracioides*), California bedstraw (*Galium californicum* subsp. *californicum*), Douglas's nightshade (*Solanum douglasii*), soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*), blue dicks (*Dichelostemma capitatum* subsp. *capitatum*), California figwort (*Scrophularia californica* subsp. *californica*), western nettle (*Hesperocnide tenella*), woolly marbles (*Psilocarphus tenellus* var. *tenellus*), wood strawberry (*Fragaria vesca*), western rush (*Juncus occidentalis*), common rush (*Juncus patens*), purple cudweed (*Gamochaeta ustulata*), hairy honeysuckle (*Lonicera hispidula*), sun cup (*Camissonia ovata* = *Taraxia ovata*), hairy wood sorrel (*Oxalis pilosa*), California vervain (*Verbena lasiostachys* var. *lasiostachys*) and common corethrogyne (*Corethrogyne filaginifolia*).

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 Scott 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* subsp. *consanguinea*, *Toxicodendron diversilobum*, *Claytonia perfoliata* subsp. *perfoliata*, *Fragaria vesca*, *Stachys bullata*, *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 porrigens* var. *porrigens*, *Galium californicum* subsp. *californicum*, *Trillium chloropetalum* (several color phases present), *Oemleria cerasiformis*, *Monardella villosa* sensu lato, *Calystegia purpurata* subsp. *purpurata*, *Stipa lepida*, *Stipa 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*, *Micranthes (Saxifraga) californica*, *Phacelia malvifolia*, *Chlorogalum pomeridianum* var. *pomeridianum*, *Achillea millefolium*, *Laythrus vestitus* var. *vestitus*, *Vicia americana* var. *americana*, *Fritillaria affinis* var. *affinis*, *Clarkia rubicunda*, *Eschscholzia californica*, *Adiantum jordanii*, *Polystichum munitum*, *Pentagramma triangularis* subsp. *triangularis*, *Dryopteris arguta*, *Pteridium aquilinum* var. *pubescens*, *Polypodium californicum* (growing as lithophyte), *Polypodium calirhiza* (growing as epiphyte), *Diplacus (Mimulus) aurantiacus*, *Rubus ursinus*, *Cirsium brevistylum*, *Aesculus californica* (one golden-leaved seedling observed), *Osmorhiza berteroi*, *Smilacina stellata*, *Quercus agrifolia* var. *agrifolia*, *Umbellularia californica*, *Corylus cornuta* var. *californica*, *Cardamine californica* var. *californica*, *Cardamine oligosperma*, *Anaphalis margaritacea*, *Cryptantha micromeres*, *Urtica dioica* subsp. *gracilis*, *Symphyotrichum chilense*, *Clinopodium (Satureja) 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 thyrsiflorus* var. *thyrsiflorus*, *Agrostis hallii/pallens* intergrades, *Galium triflorum*, *Sequoia sempervirens*, *Psilocarphus tenellus* var. *tenellus*, *Dudleya caespitosa*, *Carex brevicaulis*, *Carex tumulicola*, *Heteromeles arbutifolia*, *Calochortus albus*, *Castilleja affinis* subsp. *affinis*, *Sisyrinchium bellum*, *Eriogonum latifolium/nudum* intergrades, *Oxalis pilosa*, *Ranunculus californicus*, *Stachys rigida* var. *quercetorum*, *Eriophyllum staechadifolium*, *Crassula connata*, *Dichelostemma capitatum* subsp. *capitatum*, *Acmispon glaber* var. *glaber*, *Ribes menziesii* var. *menziesii*, *Pseudognaphalium ramosissimum*, *Drymocallis glandulosa* var. *wrangelliana*, *Heterotheca sessiliflora* subsp. *bolanderi*, *Epilobium canum* subsp. *canum*, *Taraxia ovata*, *Corallorhiza striata*, *Barbarea orthoceras*, *Iris douglasiana*, *Verbena lasiostachys* var. *lasiostachys* and *Gamochaeta ustulata*.

As the last major sub-watershed entering into the Scott 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 [perhaps 300,000 to 400,000 years old], 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. *quadrivulnera*, of which the closest population within the Scott 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 flood plain 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* var. *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*..... *Euonymus occidentalis* var. *occidentalis*..... *Salix lasiolepis*..... *Sequoia sempervirens*..... *Umbellularia californica*..... *Clinopodium 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*, *Corethrogyne 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 beneolens*, *Pseudognaphalium biolettii*, *Pseudognaphalium californicum*, *Pseudognaphalium* aff. *gianonei*, **pro.sp.nov.**, *Pseudognaphalium ramosissimum*, *Pseudognaphalium stramineum*, *Solidago velutina* subsp. *californica*, *Symphytotrichum 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 sympatrically with *Heterotheca sessiliflora* aff. subsp. *echioides*, on a south facing grassy knoll which overlooks the west fork of the Queseria drainage complex and is north-east of the Strawberry Shack circa 1/4 mile), *Epilobium ciliatum* subsp. *ciliatum*..... *Veronica americana*..... *Delphinium californicum* subsp. *californicum*..... *Amsinckia menziesii*, *Phacelia malvifolia*..... *Lonicera hispidula*..... *Mimulus aurantiacus*..... *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 Scott 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 roadside 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 [revisiting the *Rumex transitorius* population during 2012 added a sister species to the checklist, namely *Rumex*

californicus, with inner 3 perianth lobes deltoid in outline, marginally denticulate near base and lacking tubercles]. 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 [the adaxial foliar surface clothed with a cinerous indument] and stramineous mature inflorescences.

Ensnared 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 and rattlesnake carrot (*Daucus pusillus*), widespread locally but extremely variable as to overall gestalt. 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 porrigens* var. *porrigens*), California man root (*Marah fabaceus*), coast buckwheat (*Eriogonum latifolium sensu lato*), yellow bush lupine (*Lupinus arboreus*), California figwort (*Scrophularia californica*), lizard tail (*Eriophyllum staechadifolium*), 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 polypody (*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*..... extensive population, with multiple grass-green rosettes), arroyo willow (*Salix lasiolepis*), blue witch (*Solanum umbelliferum*), coyote mint (*Monardella villosa* sensu lato..... approaching subsp. *franciscana*, in part), Pacific pea (*Lathyrus vestitus* var. *vestitus*), coast nettle (*Urtica dioica* subsp. *gracilis*), blue elderberry (*Sambucus nigra* subsp. *canadensis*), California aster (*Symphotrichum 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 hesperius*), common wood rush (*Luzula comosa*), sticky monkeyflower (*Diplacus aurantiacus*), popweed (*Cardamine oligosperma*), panicked willow herb (*Epilobium brachycarpum*) and creeping hearts (*Pterostegia drymarioides*).

Ending our traversal with a subtle but noteworthy native, California goosefoot (*Chenopodium californicum*), 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 **Scott 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 breweri* 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 sympatrically, **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 eglandular 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 barbarae*) and slough sedge (*Carex obnupta*) occur (**an extensive population of *Carex barbarae* also occurs above and to the east of the benched seeps..... see page 222**), 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* = *Symphiotrichum 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* subsp. *consanguinea*), 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: David J. Kiel, PhD of Calpoly/SLO, documented on May 3, 1988, *Myosurus minimus* (Ranunculaceae) growing within the Scott Creek Marsh complex.

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 (*Gnaphalium obtusifolium*), sneezeweed (*Helenium puberulum*), Douglas' aster (*Symphiotrichum 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], **often producing nodal proliferations on scandent brush supported stems, some inflorescences with lower 1-5(+) spikelets compound-congested, these being gynaeandrous, androgynous and-or mixed**), umbrella sedge (*Cyperus eragrostis*), low club rush (*Isolepis cernua*/perennial phase, forming dense micro-tussocks), California tule (*Schoenoplectus californicus*/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 height [1.5-1+ m] and diameter [2-5+ mm], inflorescences compact to open-spreading. perianth parts sub-equal as to length [5-7mm], basically forming an extensive colony [possibly clonal] on slopes and possibly part of the hybrid complex with *Juncus lescurii* and *Juncus breweri*, which dominates the west side of the adjacent Scott Creek Marsh), common rush (*Juncus patens*), brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*)..... common monkeyflower (*Mimulus guttatus*/var. *grandis*-subsp. *litoralis*, with honey-scented flowers = *Erythranthe grandis*)..... water smartweed (*Persicaria punctata*)..... hairy wood sorrel (*Oxalis pilosa*)..... watercress (*Nasturium officinale*)..... floating pennywort (*Hydrocotyle ranunculoides*)..... yerba buena (*Clinopodium douglasii*), bugle hedge-nettle (aff. *Stachys ajugoides*/leaf-bases truncate/cuneate, inflorescences with soft, spreading hairs with 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 arboreus*)..... California coffeeberry (*Frangula californica* subsp. *californica*)..... slender hairgrass (*Deschampsia elongata*), California wild rye (*Elymus glaucus* subsp. *glaucus*), red fescue (*Festuca rubra*)..... coast nettle (*Urtica dioica* subsp. *gracilis* with some plants tending towards subsp. *holosericea*, displaying proportionally fewer stinging trichomes and more softer to the touch, non-stinging trichomes on abaxial surface of leaves and stems)..... Watson's willow herb (*Epilobium ciliatum* subsp. *watsonii* with inflorescence dense and flowers subtended by foliaceous bracts)..... Pacific oenanthe (*Oenanthe sarmentosa*).

Note: The Scott Creek Marsh as now constituted, consists of two main components separated by Scott Creek proper..... to the west, the seasonally inundated wetland is a botanical treasure throve 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 margining them: yarrow (*Achillea millefolium*), mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), lizard tail (*Eriophyllum staechadifolium*), western goldenrod (*Euthamia occidentalis*), purple cudweed (*Gnaphalium obtusifolium*), California cudweed (*Pseudognaphalium californicum*), California aster (*Symphotrichum chilense*)..... creek dogwood (*Cornus sericea* subsp. *sericea*)..... western lady's mantle (*Aphanes occidentalis*), oso berry (*Oemleria cerasiformis*), Pacific cinquefoil (*Potentilla anserina* subsp. *pacifica*), California wild rose (*Rosa californica*), thimbleberry (*Rubus parviflorus*), California blackberry (*Rubus ursinus*)..... California brome (*Bromus carinatus* var. *carinatus*), slender hairgrass (*Deschampsia elongata*), California wild rye (*Elymus glaucus* subsp. *glaucus*), creeping wild rye (*Elymus triticoides*), California canary grass (*Phalaris californica*), Torrey's melic (*Melica torreyana*)..... California buckeye (*Aesculus californica*)..... snow berry (*Symphoricarpos albus* var. *laevigatus*)..... coast live-oak (*Quercus agrifolia* var. *agrifolia*)..... California coffeeberry (*Frangula californica* subsp. *californica*)..... arroyo willow (*Salix lasiolepis*)..... red elderberry (*Sambucus racemosa* var. *racemosa*)..... California larkspur (*Delphinium californicum* subsp. *californicum*)..... toad rush (*Juncus bufonius* sensu lato), brown bog-rush (*Juncus hesperius*), common rush (*Juncus patens*), short-stalked wood rush (*Luzula subsessilis*/ **forma typica**

with **capitate inflorescences**)..... cow-parsnip (*Heracleum maximum*), Pacific oenanthe (*Oenanthe sarmentosa*), gambleweed (*Sanicula crassicaulis*), Gianone sanicle (*Sanicula gianonei*, *pro.sp.nov.*)..... Watson's willow herb (*Epilobium ciliatum* subsp. *watsonii*/**inflorescences dense with foliaceous bracts subtending flowers**)..... Gianone sedge (*Carex gianonei*, *pro.sp.nov.*/ *Carex harfordii* **matrix, with lower 1-5 spikelets compound-congested**), slough sedge (*Carex obnupta*), umbrella sedge (*Cyperus eragrostis*), paniced bulrush (*Scirpus microcarpus*)..... broad-leaved cattail (*Typha latifolia*)..... slim Solomon's seal (*Maianthemum stellatum*)..... giant horsetail (*Equisetum telmateia* subsp. *braunii*)..... wood fern (*Dryopteris arguta*)..... goldback fern (*Pentagramma triangularis* subsp. *triangularis*)..... nested polypody (*Polypodium calirhiza*/**growing as lithophyte but with some of the lowest pinnae shorter than the succeeding ones**)..... bracken (*Pteridium aquilinum* var. *pubescens*)..... straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*)..... California figwort (*Scrophularia californica*)..... California poppy (*Eschscholzia californica*)..... morning glory (*Calystegia purpurata* subsp. *purpurata*)..... yellow bush lupine (*Lupinus arboreus*), bearded clover (*Trifolium barbigerum*), maiden clover (*Trifolium microcephalum*), white-tipped clover (*Trifolium variegatum* sensu lato), giant vetch (*Vicia gigantea*)..... yerba buena (*Clinopodium douglasii*), California hedge-nettle (*Stachys bullata*)..... dwarf orthocarpus (*Triphysaria pusilla*)..... sea lettuce (*Dudleya caespitosa*)..... water smartweed (*Persicaria punctata*), willow dock (*Rumex salicifolius* complex)..... stinging phacelia (*Phacelia malvifolia*)..... California man root (*Marah fabaceus*)..... soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*)..... climbing bedstraw (*Galium porrigens* var. *porrigens*)..... watercress (*Nasturtium officinale*)..... coast nettle (*Urtica dioica* subsp. *gracilis*/**variable populations, some tending towards subsp. holosericea, with proportion of stinging to non-stinging trichomes, leaf morphology-coloration and presence-absence of cinerous indument on abaxial leaf surfaces and stems**)..... slender miner's lettuce (*Claytonia parviflora* subsp. *parviflora*), miner's lettuce (*Claytonia perfoliata* subsp. *perfoliata*).

As a botanical denouement for the entire watershed, the perpetually exfoliating mudstone cliff faces, with their perennial seepages overlooking the south end of Scott 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 pearlwort (*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 pearlwort 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 powellii*); 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: During the Summer of 2015, a second population of this locally rare member of the Caryophyllaceae, was discovered growing at the north end of Scott Creek Beach. This population, established on a localized near-vertical seep, consisted of more than 100 plants, in various stages of flowering and mature capsule production. Seed was collected from several

dozen plants, supplementing the herbarium sheet documentation done earlier in the year with the equally restricted population, growing at the south end of Scott Creek Beach.

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): WGS84: 37.061057, -122.206338, elevation 655ft

Archibald Creek Sub-Watershed (b): WGS84: 37.054775, -122.220839, elevation 125ft

"George Valentine Gulch" (a): WGS84: 37.047489, -122.219303, elevation 266ft

"George Valentine Gulch" (b): WGS84: 37.046365, -122.221552, elevation 104ft

Hydrologically active, benched landslide derived w-facing slopes overlooking the

Casa Verde: (a) WGS84: 37.042197, -122.222327, elevation 81ft

(b) WGS84: 37.040975, -122.223864, elevation 94ft

Lower Old Schoolhouse Road: WGS84: 37.062800, -122.226055, elevation 122ft

Purple Godetia Population/ancient eolian sand deposit: WGS84: 37.043439,
-122.212059, elevation 496ft

Queseria Creek Sub-Watershed (a): WGS84: 37.054805, -122.209480, elevation 825ft

Queseria Creek Sub-Watershed (b): WGS84: 37.052713, -122.207883, elevation 731ft

Queseria Creek Sub-Watershed (c): WGS84: 37.046718, -122.209014, elevation 454ft

Queseria Creek Sub-Watershed (d): WGS84: 37.043806, -122.220091, elevation 110ft

Ridge, between Old Schoolhouse Road and Archibald Creek, with s-facing displaced

chaparral (a): WGS84: 37.060414, -122.211770, elevation 901,

(b): WGS84: 37.058217, -122.214954, elevation 699ft

S-facing "Benched Seeps" overlooking Scott Creek Marsh: WGS84: 37.045780,
-122.228544, elevation 139ft

Scott Creek Beach (s-end): WGS84: 37.034169, -122.227466, elevation 14ft

Scott Creek Beach(w-end): WGS84: 37.043356, -122.233528, elevation 19ft

Scott Creek Marsh (w-side of Scott Creek): WGS84: 37.042181, -122.229068, elevation -7ft

Scott Creek Marsh (e-side of Scott Creek): WGS84: 37.042375, -122.226249, elevation 13ft

"Unnamed Gulch" (a): WGS84: 37.051673, -122.216603, elevation 440ft

"Unnamed Gulch" (b): WGS84: 37.049264, -122.221914, elevation 73ft

Queseria/Molino Divide: WGS84: 37.040524, -122.224628, elevation 75ft

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 Scott 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 densiflora/accession number JEPS82937/James A. West #263, Sep 9 1984
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 JEPS82957/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
Castilleja densiflora/accession number OBI73323/David J. Keil, et al., 30752, May 7, 2010
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
Crassula aquatica/accession number OBI72953/David J. Keil, 20560, May 3, 1988
Cynoglossum grande/accession number OBI73383/David J. Keil, et al., 30760, May 7, 2010
Delphinium californicum subsp. *californicum*/accession number JEPS81497/Buck & West #28
Delphinium californicum subsp. *californicum*/accession number JEPS81498/Buck & West #28
Eriophyllum staechadifolium/accession number OBI45365/David J. Keil, et al., 20606, May 7, 1988
Festuca californica/accession number JEPS81997/Buck & West #175
Festuca californica/accession number JEPS81912/Buck, West & Stone #196
Frangula californica subsp. *californica*/accession number OBI45366/David J. Keil, et al., 20607, May 7, 1988
Gilia achilleifolia subsp. *multicaulis*/accession number JEPS82621/Buck & West #245
Gilia achilleifolia subsp. *multicaulis*/accession number UC1561076/Taylor, Buck, West & Clifton #9657
Iris douglasiana/accession number OBI73382/David J. Keil, et al., 307616, May 7, 2010
Juncus lesueurii = *Juncus lescurii*/accession number JEPS81547/Buck & West #112
Juncus lesueurii = *Juncus lescurii*/accession number JEPS81563/West #83
Juncus lesueurii = *Juncus lescurii*/accession number JEPS88968/West #196
Lilaea scilloides = *Triglochin scilloides*/accession number JEPS81516/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 variicolor/accession number **JEPS82804**/Buck & West #291
Melica californica/accession number **JEPS81995**/Buck & West #181
Monardella villosa subsp. *franciscana*/accession number **OBI77167**/Jim West
Monardella villosa subsp. *franciscana*/accession number **OBI77169**/Jim West
Myosurus minimus/accession number **OBI72952**/David J. Kiel #20559
Nasella lepida = *Stipa lepida*/accession number **JEPS83471**/Buck & West #476
Nasella pulchra = *Stipa pulchra*/accession number **JEPS83470**/Buck & West #477
Pellaea andromedifolia/accession number **JEPS85189**/Buck & West #514
Pentachaeta bellidiflora/accession number **JEPS21642**/Thomas #4031
Phacelia malvifolia/accession number **OBI45364**/David J. Keil, et al., 20605-2, May 7, 1988
Piperia michaelii/accession number **UCSC4699**/Randall Morgan, Jan 6 1981
Poa secunda subsp. *secunda*/accession number **JEPS82650**/Buck & West #204
Potentilla anserina subsp. *pacifica*/accession number **JEPS83095**/Buck & West #401
Psilocarphus tenellus var. *tenellus*/accession number **JEPS83111**/Buck & West #347
Psilocarphus tenellus/accession number **OBI72954**/David J. Keil, 20561, May 3, 1988
Rafinesquia californica/accession number **JEPS83078**/Buck & West #425
Ranunculus hebecarpus/accession number **JEPS81919**/Buck & West #197
Ribes divaricatum var. *pubiflorum*/accession number **JEPS81920**/Buck & West #195
Ribes divaricatum var. *pubiflorum*/accession number **JEPS81923**/Buck & West #166
Rubus ursinus/accession number **OBI45701**/David J. Keil, et al., 20664, May 6, 1988
Sambucus racemosa var. *racemosa*/accession number **OBI72948**/David J. Keil, et al., 20663,
 May 7, 1988
Saxifraga californica/accession number **JEPS81990**/Buck & West #174
Stachys rigida/accession number **OBI45236**/David J. Keil, et al., 20594, May 7, 1988
Thysanocarpus laciniatus/accession number **JEPS81985**/Buck & West #183
Trisetum canescens = *Trisetum cernuum* subsp. *canescens*?/accession number **JEPS82810**/Buck &
 West #285
Vicia gigantea/accession number **UCR67982**/Keil #20570
Vicia hassei/accession number **OBI73385**/David J. Keil, et al., 30758, May 7, 2010
Vulpia microstachys var. *pauciflora* = *Festuca microstachys* var. *pauciflora*/accession number
JEPS82628/Buck, West & Hawke #238
Yabea microcarpa/accession number **JEPS81910**/Buck & West #202

Here is a recapitulation of the extraordinary depth and diversity of the native flora, both current and historical, defining the Scott Creek Watershed and its environs, this time by enumerating those genera represented by 3 or more documented species (subspecies/varieties counted as separate taxa) and their current nomenclatural changes.

The genus *Trifolium* with 18+ species: *T. albopurpureum* var. *albopurpureum* = *T. neolagopus*, in part, *T. appendiculatum* = *T. rostratum*, *T. barbigerum* var. *barbigerum* = *Trifolium barbigerum*, *T. bifidum* var. *decipiens*, *T. buckwestiorum* [TYPE LOCATION], *T. ciliolatum*, *T. depauperatum* var. *truncatum*, *T. gracilentum* var. *gracilentum* = *Trifolium gracilentum*, *T. grayi*, *T. macraei*, *T. microcephalum*, *T. microdon*, *T. obtusiflorum* (+ var. **cruzense**), *T. oliganthum*, *T. "pseudo-*

barbigerum", *T. variegatum* = *T. dianthum*, in part, *T. willdenovii* and *T. wormskioldii*.

Note: Randall Morgan's ongoing study of this genus from a molecular perspective, has added new taxa and reclassified previously merged/synonymized components of at least two difficult complexes, (the *T. albopurpureum*/*T. macraei* and *T. variegatum* groups) and when ultimately published, may swell the total number of native clovers for the area discussed in this Essay, to more than 20 valid taxa.

The genus *Carex*, with 15+ species, excluding the [*C. gianonei*/*C. nitidicarpa* complexes and an undetermined taxon simulating *C. vulpinoidea*]: *C. amplifolia*, *C. barbarae*, *C. bolanderi*, *C. brevicaulis*, *C. densa*, *C. dudleyi*, *C. globosa*, *C. gracilior*, *C. harfordii*, *C. nudata*, *C. obnopta*, *C. subbracteata*, *C. subfusca*, *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. variicolor*): *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. variicolor*.

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. heermanii* var. *orbicularis*, *A. junceus* var. *junceus* and var. *biolettii*, *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*, *J. occidentalis*, *J. patens*, *J. phaeocephalus* sensu lato and *J. xiphioides*.

Note: A species related to and possibly confused with *J. lescurii*, *J. breweri* may also occur within the Scott 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* = *Erythranthe* with 7+ species: *M. cardinalis*, *M. floribundus*, *M. guttatus* complex, *M. moschatus*, *M. nasutus* [valid species in own right versus component of *Mimulus guttatus* complex..... see page 30 of this essay for nomenclatural changes for this group]

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 *Epilobium* with 7 species: *E. brachycarpum*, *E. canum* subsp. *canum*, *E. ciliatum* subsp. *ciliatum*, *E. ciliatum* subsp. *watsonii*, *E. densiflorum* [found in Beaver Flat Marsh circa 30 years ago but not recently seen..... growing sympatrically with locally rare relative, *Epilobium hallianum*], *E. hallianum* and *E. minutum*.

The genus *Festuca* with 7 possibly 8 species found in the watershed: *F. californica*, *F. elmeri*, *F. microstachys* var. *pauciflora*, *F. occidentalis*, *F. roemerii*, *F. rubra*, *F. subulata** and *F. subuliflora*.

Note: An herbarium pressing, Buck & West #307, from the Scott 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! **With *Vulpia microstachys* var. *pauciflora* and *Vulpia octoflora* vars. *hirtella/octoflora* returned to the genus *Festuca*, the current total of native *Festuca* documented for the Scott Creek Watershed, is now nine!**

The genus *Arctostaphylos* with 5 species: *A. crustacea* sensu lato, *A. crustacea* subsp. *subcordata*, *A. glutinosa*, *A. ohloneana* and *A. sensitiva*..... [***A. glutinosa* and *A. ohloneana* are both endemic to the Scott Creek Watershed**].

The genus *Clarkia* with 5 species: *C. davyi**, *C. prostrata**, *C. purpurea* subsp. *purpurea*, *C. purpurea* subsp. *quadrivulnera* and *C. rubicunda*

*** [While these two taxa, are separate and consistently distinct morphologically, within the purveyance of this Essay, their taxonomic status remains unresolved, raising the question..... is the local species designated *C. prostrata* the "genuine" *C. davyi* and the erect, bicolored taxon with gray encrusted seeds, a new and unrecognized species?]**

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 *Elymus* with 5 species: *E. californicus*, *E. glaucus* subsp. *glaucus*, *E. glaucus* subsp. *virescens*, *E. mollis* subsp. *mollis* and *E. triticoides* subsp. *triticoides*.

The genus *Melica* with 5 species: *M. californica*, *M. harfordii*, *M. imperfecta*, *M. subulata*, *M. torreyana*.

The genus *Phacelia* with 5 species: *P. californica*, *P. distans*, *P. imbricata* subsp. *imbricata*, *P. malvifolia* and *P. suaveolens*.

The genus *Piperia* with 5 species: *P. elegans*, *P. elongata*, *P. michaelii*, *P. transversa* and *P. unalascensis*.

The genus *Sanicula* with 5 species: *S. arctopoides*, *S. bipinnatifida*, *S. crassicaulis*, *S. gianonei*, pro.sp.nov. [see pages 86-87, 136-137 of this essay] and *S. hoffmannii*..... [a taxon designated *S. "pseudo-laciniata"*, displaying consistent biochemical and overall gestalt differences from *S. crassicaulis*, upon further analysis, may warrant removal from *S. crassicaulis* sensu lato and given species status in its own right].

The genus *Amsinckia* with 4 species: *A. intermedia*, *A. lunaris*, *A. menziesii* and *A. spectabilis* var. *spectabilis*

The genus *Cryptantha* with 4 species: *C. clevelandii*, *C. flaccida*, *C. micromeres* and *C. torreyana*.

The genus *Galium* with 4 species: *G. californicum* subsp. *californicum*, *G. porrigens* var. *porrigens*, *G. trifidum* subsp. *columbianum* and *G. triflorum*.

The genus *Nemophila* with 4 species: *N. menziesii* sensu lato, *N. parviflora* var. *parviflora*, *N. pedunculata* and *N. aff. pulchella* var. *fremontii* [a molecular workup of this taxon needs to be done, to accurately define its place within the *Nemophila* hierarchy].

The genus *Plagiobothrys* with 4 species: *P. bracteatus*, *P. chorisianus* var. *chorisianus*, *P. diffusus* and *P. nothofulvus* [some plants assigned to *P. bracteatus* may prove to be *P. hispidulus* when their nutlets are examined under a microscope].

The genus *Plantago* with 4 species: *P. elongata*, *P. erecta*, *P. subnuda* and *P. maritima*.

The genus *Poa* with 4 species: *P. douglasii*, *P. howellii*, *P. secunda* subsp. *secunda* and *P. unilateralis*.

The genus *Quercus* with 4 species and assorted misfits: *Q. agrifolia* var. *agrifolia*, *Q. chrysolepis*, *Q. parvula* var. *shrevei*, *Q. wislizeni* var. *frutescens* [on the upper reaches of the Schoolhouse Ridge and as it transitions across the Seymore Hill into the "chalks", what appears to be *Q. parvula* var. *shrevei*/*Q. wislizeni* var. *frutescens* intergrades occur, gradually becoming reduced-in-stature trees with small, extremely spinescent margined leaves which are conspicuously bicolored. At least 2 dozen examples of the non-F1 *Q. x morehus* have been documented for the area defined by this essay, ranging in habitat from the Lockheed Ridge to the Western Terrace, all of which have at least one *Q. parvula* var. *shrevei* nearby. One mature *Quercus x chasei* [*Q. agrifolia* var. *agrifolia* x *Q. parvula* var. *shrevei*] has been observed/studied growing in the upper reaches of Calf Gulch and in the opinion of this author, also represents a non-F1 hybrid whose origins occurred millenia ago and have been locked up in the *Q. agrifolia* genome. Collected leaves, representing the majority of the *Q. x morehus* taxa and the sole example of *Q. x chasei*, have been deposited with the UCSC

Arboretum for structural analysis and DNA extraction].

The genus *Ranunculus* with 4 species: *R. aquatilis* var. *diffusus*, *R. californicus* var. *californicus*, *R. hebecarpus* and *R. uncinatus*.

The genus *Rubus* with 4 species: *R. leucodermis*, *R. parviflorus*, *R. spectabilis* and *R. ursinus*.

The genus *Salix* with 4 species: *S. lasiandra* var. *lasiandra*, *S. lasiolepis*, *S. scouleriana* and *S. sitchensis*.

The genus *Stachys* with 4 species: *S. ajugoides*, *S. bullata*, *S. chamissonis* and *S. rigida* var. *quercetorum*.

The genus *Viola* with 4 species: *V. glabella*, *V. ocellata*, *V. pedunculata* and *V. semperv*

The genus *Artemisia* with 3 species: *A. californica*, *A. douglasiana* and *A. pycnocephala*.

The genus *Deschampsia* with 3 species: *D. cespitosa* subsp. *holciformis*, *D. danthonioides* and *D. elongata*.

The genus *Layia* with 3 species: *L. gaillardiioides*, *L. hieracioides* and *L. platyglossa*.

The genus *Madia* with 3 species: *M. exigua*, *M. gracilis* and *M. sativa*.

The genus *Polypodium* with 2 species and one allotetraploid hybrid: *P. californicum*, *P. x calirhiza* and *P. scouleri*.

The genus *Polystichum* with 2 species and one natural hybrid: *P. x californicum*, *P. dudleyi* and *P. munitum*

The genus *Rosa* with 3 species: *R. californica*, *R. gymnocarpa* and *R. spithamea*.

The genus *Triteleia* with 3 species: *T. hyacinthina*, *T. ixioides* subsp. *ixioides* and *T. laxa*.

The genus *Vicia* with 3 species: *V. americana* subsp. *americana*, *V. gigantea* and *V. hassei*.

Supplementing the extensive herbarium documentation found throughout this essay, is a partial listing of the seed (achene, cypselae, nutlet, et al), inflorescence collections and living material (divisions/cuttings), representing rare, uncommon, taxonomically problematic and horticulturally valuable native taxa, that have been deposited with and accessioned by the UCSC Arboretum, controlled by the Ray Collett Trust and administered by Brett Hall. The majority of these collections are supplemented with Google Earth coordinates, generating data points that can be used in the creation of maps showing species distribution patterns within the Scott Creek Watershed and its environs. A recent accession report from the UCSC Arboretum (2012), detailing the majority but not all of the "seed" collections made for the Scott Creek Watershed/environs, totaled 594 pages with 2322 records processed..... covering circa 30 years but principally focusing on the years from 2000 thru the present. As of (07/2014), the

number of collections approaches 3,000. Since many of these collections are of taxa poorly represented in herbarium collections, students studying ecology/population dynamics and in need of these material, could raise out those "species of interest", which not only would provide invaluable source material for research but generate ex situ herbarium vouchers, to be shared with interested institutions.

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 sympatrically 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 and **reduced-in-stature form** growing on roadbank se-of Mill Creek Bridge)

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..... see pages 204-205 of this essay)

Agrostis densiflora (between Scott Creek Beach and Greyhound Rock Beach, several populations growing on the Santa Cruz Terrace documented with mature inflorescences + **several collections of the gigas phase [given the moniker "Big Blue"] from s-end of Scott Creek Beach**). A comprehensive collection made of population growing on Santa Cruz Terrace above extreme south end of Scott Creek Beach.

Agrostis exarata (several distinct components of this species exist within and proximal to the Scott 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.....** see page 90 of this essay. 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*. Revisiting and carefully examining this possible hybrid population took place during 06-07/2012, and several envelopes of mature

inflorescences with ripe caryopsis were collected..... concentrated within a 30' x 20' area, 70+ plants occurred, with *A. exarata*, *A. blasdalei* and a wide range of putative hybrids growing intermixed, some of which, may represent multi-generational crosses resulting in a distinct blurring of the taxonomic boundaries circumscribing the parental species)

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 Scott Creek Marsh..... see page 205 of this essay)

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..... see page 206 of this essay)

Amelanchier utahensis (one population documented with mature pomes 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..... 30 years ago, grew on "Slide Area" overlooking Purdy Road but has since been replaced with *Amsinckia intermedia*)

Anagallis minima (pressed inflorescence and seed collected from Laguna de las Trancas)

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 Scott Creek Marsh)

Anemone oregana = *Anemone grayi* (extensive but localized population, circa 100+ plants, growing in lower Harvey Gulch drainage before it enters Mill Creek..... growing sympatrically with *Adenocaulon bicolor*, *Festuca subuliflora*, *Melica subulata*, *Polygala californica*, *Scoliopus bigelovii*, *Trientalis latifolia*, *Trillium ovatum* subsp. *ovatum*, et al..... see pages 164-165 of this essay)

Anthoxanthum occidentale (several populations documented with caryopsis collections, including ones taken from the Mill Creek and Little Creek sub-watersheds)

Antirrhinum kelloggii (several collections made, before and after 2009 Lockheed Fire, from the Schoolhouse Ridge complex and both Scott 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..... several seed collections made)

before and following 2009 Lockheed Fire)

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 discovery and the collected seed is no longer viable)

Arctostaphylos glutinosa (several collections made of mature drupes/stones, **including "green glut" of Schoolhouse Ridge, which perished during the 2009 Lockheed Fire..... cuttings taken from this infrequently occurring *Arctostaphylos andersonii* influenced segregant of the *A. glutinosa* genotype, are now growing at the UCSC Arboretum**)

Arctostaphylos crustacea subsp. *subcordata* (one population documented, prior to 2009 Lockheed Fire, with mature drupes/stones from Schoolhouse Ridge..... **this disjunct population of an insular taxon was totally deprived of its aerial biomass thanks to the 2009 Lockheed Fire, but being a burl-forming resprouter, has not only "reveged" itself but as of 03/2012, is initiating inflorescences. On 11/10/2012, select leaves and branch tips with nascent inflorescences were collected for structural diagnosis/DNA extraction and deposited with the UCSC Arboretum. During 10/2013, several supplemental collections of mature fruits/nutlets were collected and added to the already accessioned material of this rare taxon held by the UCSC Arboretum. Note: Digital images of this insular taxon, taken at the Tilden Regional Park, Regional Parks Botanic Garden, perfectly match the isolated population found on the 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)

Asarum caudatum (seed collected from extensive populations growing along riparian corridor, between Mill and Big Creek Bridges..... often growing intermixed with *Dicentra formosa*)

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 e-edge of Pumpkin Field Marsh)

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

Asyneuma prenanthoides (seed collections made from upper Little Creek, the plants growing mainly on soils derived from decomposed "granitics" aka quartz diorite)

Bowlesia incana (population growing on w-facing roadbank, between Old Schoolhouse Road and Big Creek Fire Station, documented with schizocarp collection..... **a second population, also growing on e-facing bank overlooking Swanton Road but between Big Creek Fire Station and**

lower Archibald Creek drainage, documented by schizocarp collection during 04/2012)

Boykinia occidentalis (seed collected from populations growing streamside in upper Scott, Mill and Big Creeks)

Bromus carinatus var. *carinatus* (comprehensive documentation of the distinctive ecotypes found within watershed, which range from having simple, ascending panicles thru ones with lower branches compound/intricately branched and retrorsely aligned..... **certain populations have inflos with distinctive lower branches elongate-pendant and are more-or-less naked below apices, a trait possibly derived from past hybridization with *Bromus sitchensis***)

Bromus carinatus var. *maritimus* = *Bromus maritimus*? (coastal bluff ecotype, along maritime edge of Santa Cruz Terrace between Scott 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 Scott Creeks including road cut above "Bowl Area", which connects Bettencourt Gulch overview with Seymore Hill)

Carex barbarae (only known populations for the Scott Creek Watershed occur overlooking the northern edge of the Scott Creek Marsh and an e-facing eolian sand covered terrace edge, circa 120 feet above the marsh proper. Both populations are documented with several envelopes of mature inflorescences..... for [1] structural analysis, [2] DNA extraction and [3] possible extraction of viable achenes). **Since both localized populations appear to be partially/wholly sterile and provided cordage for the Amah Mutsun, comparative DNA workups should be done on the extant coastal populations, between Quiroste/San Mateo County and the Scott Creek Marsh/Santa Cruz County, to see if all or some of these populations represent anthropogenic introductions.**

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 [**when raised from achenes this form comes true, with both lower 1-5 spikelets compound-congested and in part, androgynous**]..... mature inflorescences collected from plants growing along the Scott Creek riparian corridor and the Big Creek sub-watershed, between the Fish Hatchery and the lower falls [**in 03/2012, both living material and spent inflorescences with viable achenes, were collected along Gazos Creek Road in neighboring San Mateo County and deposited with the UCSC Arboretum**])

Carex gianonei [*C. harfordii* matrix] complex (comprehensive documentation of this polymorphic syngameon **with inflorescence and mature 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 Scott Creek Marsh..... see pages 13-14, 19-20, 51-56, 59-61, 64-65, 95, 99 and 103-104 of this essay). **During 05/2014, the TYPE AREA, a perennially moist ditch along the n-end of Swanton Road and draining into the Harry Wain Arroyo, was documented with a comprehensive collection of mature achenes, representing circa 90% of the existing localized population.**

Carex globosa (as discussed in this essay, both *Carex globosa* and *Carex brevicaulis* of the section **Montanae** can be viewed in situ, without leaving Swanton Road. Both species are found growing on the upper edges of the inner roadbanks, with *Carex brevicaulis* located on the north half of Swanton Road just beyond Washout Turn and *Carex globosa* down in the valley of Swanton, positioned midway between Big and Little Creeks. Pressings have been made, to validate the existence of these two related and easily overlooked taxa, and deposited at the UCSC Arboretum.

Carex gracilior (localized population growing in the Scott Creek riparian corridor, along horse trail south of Lower Gianone Barn Gulch Marsh. Documented with living plant material [select divisions to grow and study], herbarium pressings and mature perigynia/achenes, which were deposited with the UCSC Arboretum)

Carex "imperfecta" (comprehensive documentation via inflorescences for structural analysis and DNA extraction..... **100+ 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 and sympatric *Carex x gianonei* populations..... see pages 13-14, 19-20, 51-56, 59-61, 64-65, 95, 99 and 103-104 of this essay. Living material, representing samplings from several separate habitats, also collected and deposited with the UCSC Arboretum)**

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..... see pages 13-14, 19-20, 51-56, 59-61, 64-65, 95, 99, and 103-104 of this essay)**

Carex nudata (localized population growing literally in Mill Creek, with rhizomes and root systems threaded between granitic/quartz diorite rocks. Documented with mature inflorescences and fertile achenes, which act as voucher material..... **also found in Big Creek, below first falls**)

Carex obnupta (a widespread taxon within the Scott Creek Watershed and environs, often found in ancient marshes with populations isolated from each other and varying in perigynia morphology and fertility. **Several populations, differing in perigynia gestalt and fertility, have been documented with both inflorescences and mature perigynia/achenes, for DNA analysis and raising out.**

Carex tumulicola (extensive population growing along horse trail, between Cookhouse Gulch and the Bulb Field, documented with comprehensive mature perigynia/achene collection and deposited with UCSC Arboretum. **This particular population would be ideal, both as an addition to the native wild garden and as an effective erosion abater for unstable slopes**)

Castilleja densiflora sensu lato, aff. Orthocarpus noctuinus Eastw. (remnant population of circa 60+ plants rediscovered [05/2012] on s-end of Magic Triangle Ridge, long after initial encounter in same general area, with this vanilla scented white-bracted variant of *C. densiflora*, circa 30 years ago. Documented with seed collected from 60% of extant population)

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)

Caulanthus lasiophyllus (seed collections made, pre- and post-2009 Lockheed Fire, from both the upper Seymore Hill ridge system and along Lockheed Fire Road/Mill Creek side)

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)

Cicendia quadrangularis (seed collected, 04/20/2013, from scattered population of 200+ diminutive plants growing in the Sandy-bottom reservoir)

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

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-central portion of Las Trancas Arroyo, [3] w-facing grassy slope overlooking interface of Highway 1 with n-end of Swanton Road and [4] w-facing sandy slope overlooking Laguna de las Trancas..... **all populations are erect in mode of growth, have bicolored flowers and gray encrusted seeds..... see pages 41-42 of this essay**)

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 brown..... see pages 41-42 of this essay**).

Note: Until this taxon and the erect *C. aff. davyi* are studied on a molecular level and compared with the types for both taxa, the exact placement of either "species" locally, remains

in a taxonomic limbo. If the bonafide *C. prostrata* is tricolored with a chromosome count of $n=26$, putatively derived from *C. davyi* ($n=17$) x *C. speciosa* ($n=9$) and occurs in San Luis Obispo County, is the prostrate/flowers concolored/seeds dark brown without encrustations the true *C. davyi* and the erect taxon with bicolored flowers and gray encrusted seeds, an unnamed species?

Clarkia purpurea subsp. *quadrivulnera* (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..... see pages 41-42 of this essay)

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] Scott Creek side of Seymore Hill, w-facing grassy slope proximal to upper Calf Gulch and also home to *Micropus californicus* var. *subvestitus* and first discovered population of *Sanicula "pseudo-laciniata"*, [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 250+ individuals and [5] no longer extant representation growing sympatrically with *Clarkia* aff. *davyi* along eastern edge of Laguna de las Trancas..... see pages 41-42, 102-103 and 213 of this essay)

Clarkia rubicunda (seed collections made for both the **robust form** growing on "slide area" overlooking Purdy Road and **low growing type** on coastal headlands overlooking China Ladder Gulch/Highway 1 and Morehus Arroyo/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**. A second population growing in a drainage ditch along Swanton Road, produced pinkish flowers that remained that color even after drying..... **seed was collected and possibly thru selfing and sib-crossing, might yield a cultivar worthy of including in a wild garden or use as a pot plant**. On pages 145 and 171-172 of this essay, a synoptic overview describes some of the complexities, both as to foliar/floral pigmentation and inflorescence variability, that occur throughout the watershed..... **and initiating during 2012, an ongoing project to document as many of the distinct and often re-occurring forms via seed as possible, then depositing the collections with the UCSC Arboretum**. During the Summer of 2015, a population was discovered/documentated via seed collection, growing on the "Slide Area" overlooking Purdy Road, that was not only far more robust than any concurrently flowering plants of this ubiquitous taxon elsewhere in the watershed but displayed foliage with intense anthocyanic coloration and had stems and leaves markedly succulent. Considering the xeric environment this small population was growing in, both as to hard baked soil and total lack of canopy cover, the seeds from this collection warrant raising out,

just for their possible value in xeriscaping!!!)

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

Clematis lasiantha (achenes collected from colony growing in chaparral, overlooking unnamed gulch which crosses Purdy Road, between Calf Gulch and the Slide Area. Google Earth coordinates: (WGS84) 37.092734, -122.247207, elevation 348ft)

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 Scott 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 and the stems/foilage can range from uniformly green to an intense viniferous suffusion..... the flowers are sessile in verticels differing markedly from sympatric *Collinsia multicolor*. A second population, growing on the "slide area" overlooking Purdy Road, has also been documented with seed collections)

Collinsia multicolor (several populations documented for watershed, including representatives from north and south ends of Swanton Road..... **the southernmost population for the watershed, overlooking the Scott Creek Marsh from the Queseria/Molino Divide, displays the most intensely colored flowers and leathery textured foliage, making it a worthwhile candidate for the rock garden**)

Corethrogyne filaginifolia [var. *californica*] (alba form from lower Big Willow Gulch [**five separate plants**] documented with cypselae collections)

Crocanthemum (*Helianthemum*) *scoparium* var. *vulgare* = *Crocanthemum scoparium* var. *scoparium* (since the 2009 Lockheed Fire, several well established plants of this fire follower, have been reseeding themselves near the Upper Schoolhouse Ridge/Seymore Hill interface..... an area, prior to the fire, that was a staging area, bulldozed for helicopter transported logs. Growing sympatrically and at a distance, virtually indistinguishable from, were large "mounds" of *Acmispon glaber* var. *glaber* and *Acmispon junceus* var. *junceus*)

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)

Delphinium decorum subsp. *decorum* (seed collected from one plant along n-end of Swanton Road, overlooking Washout Turn, during 05/2014)

Delphinium nudicaule (seeds collected from scattered plants growing on the granitics, both cliff faces and exfoliated fragments, between the Old Powerhouse and Lower Big Creek Falls)

Delphinium patens subsp. *patens* (seeds from this attractive albeit common native, collected from robust plant growing on "slide area" overlooking Purdy Road)

Dendromecon rigida (during 03/20012, circa two and a half years following the 2009 Lockheed Fire, seed was collected from the extensive population extending up the Mill Creek side of the Schoolhouse Ridge)

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. **Seeds recollected from same population during Summer of 2013 and herbarium pressings made in 2014**)

Dicentra formosa (seed collected from extensive populations margining the Scott Creek riparian corridor, between the Scott and Big Creek Bridges. This horticulturally attractive understory species was the larval host plant for the now presumed extinct Strohbeen's Parnassian butterfly aka *Parnassius clodius strohbeeni*)

Dodecatheon clevelandii subsp. *sanctarum* = *Primula clevelandii* var. *gracilis* (**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)

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, the w-facing siliceous mudstone slope overlooking Washout Turn and s-facing roadbank near north entrance of Swanton Road)

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..... see pages 18-19, 86, 194, 208 and 216 of this essay.** 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 Scott Creek Beaches, have also

been documented extensively with seed collections. Additional collections from the Schoolhouse Ridge complex, upper Little Creek drainage and along the southern portion of Swanton Road, between Archibald Creek and the Queseria/Molino Divide, have also been made..... **rediscovered within the Big Creek subwatershed, 05/31/2012, growing on the sandstone capping the granitic cliffs directly above the old quarry)**

Elymus californicus (comprehensive collections from within the Scott Creek Watershed..... principally those populations found in [a] area above Beaver Flat, [b] along Scott Creek between confluences of Mill and Big Creeks with Scott 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. **Several other forms, distinctive in their structural gestalt, have been collected with mature inflorescences..... a reduced in stature component of the *Elymus glaucus* complex, found growing in the exposed grassland which defines the upper reaches of Buckeye Grove Ridge [in this locale, growing sympatrically with the innermost studied population of *Agrostis blasdalei*] and also occurs on the west facing portion of Gulch # 3, is characterized by having extremely narrow, almost filiform, inflorescences)**

Elymus glaucus subsp. *virescens* (coastal bluff ecotype, from analogous habitats overlooking the north and south ends of Greyhound Rock State Beach..... **possibly a new species or subspecies. The *Elymus glaucus* complex within the Scott Creek Watershed and its environs, has many different facies..... I have collected viable/mature inflorescences from the most distinctive forms and deposited them at the UCSC Arboretum, for raising out and determining which are genetically stabilized as per observable characteristics. The "isolated" populations found on the bluffs, overlooking both the north and south ends of Greyhound Rock State Beach warrant a thorough study unto themselves but they also may be an extreme example of overall stature reduction coupled with virtually awnless glumes/lemmas and densely caespitose in growth habit. This maritime ecotype appears to be longer lived than its inland counterparts and has reduced/quasi rigid flowering culms often aligned at 45 degree angles, making them visually distinctive. Caryopses of this distinctive ecotype/subspecies, recollected during 11/2013 and 06-08/2015, from coastal headlands overlooking north and south [Dylan's Garden] ends of Greyhound Rock Beach. At both coastal locations and proximal to the *Agrostis* Rectangle, this reduced in stature form occurs sympatrically with a series of intermediates with *Elymus glaucus* subsp. *glaucus*, suggesting that these populations represent hybrid swarms and the reduced form differs considerably from the subsp. *virescens* found growing along the north end of Swanton Road and ne-facing grassy slope overlooking Last Chance Road..... above Upper Gianone Barn Gulch Marsh).**

Emmenanthe penduliflora (a collection of mature inflorescences with ripe capsules, was taken from the upper ridge system which separates the Big and Little Creek sub-watersheds during 05/2012..... **nearly three years following the 2009 Lockheed Fire, scattered populations of this pleasantly aromatic fire-following annual were still evident but more as scattered isolates than extensive post-fire colonizers)**

Epilobium hallianum (collected from Beaver Flat in 2009 **and 2015**, plus collections from both West's Spring, Marti's Park Marshes in 2009 and **Rosetta Stone Pine Marsh in 2015**)

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 and during 06/2012, a remnant of the original population was discovered on the nw-face of the "Solar Panel Hotspot", not producing any inflorescences and growing under a suffrutescent *Quercus parvula* var. *shrevei*. With decreasing exposure to direct sunlight as the Shreve Oak's biomass increases, the long term survival for this locally uncommon taxon, even in a vegetative state, remains questionable**)

Eriophyllum confertiflorum var. *confertiflorum* (populations growing in upper reaches of the Scott Creek Watershed, **namely the chaparral and "chalks", are often compact in growth habit with inflorescences extremely variable as to overall gestalt and ray flowers intensely colored..... worth doing a comparative study between lower elevation/coastal bluff populations and those found growing on the xeric ridgetops on either side of the Seymore Hill divide.** Cypselae collected from several population sites growing on the "Chalks" and additional collections made from along the n-end of Swanton Road and w-facing roadbank proximal to Big Creek Bridge..... all of these deposited with the UCSC Arboretum. **Of note: the population growing at the n-end of Swanton Road, due west of Washout Turn, is distinctive by the sympatry of two related taxa..... *Eriophyllum confertiflorum* var. *confertiflorum* and *Eriophyllum staechadifolium* and the foliar variability where these two species interdigitate..... an intermixed population of two species that possibly represents some gene exchange and warrants further study relative to genetic/reproductive barriers and limits of intraspecific foliar variability)**

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*] (several collections made documenting isolated coastal bluff populations between Waddell and Scott Creek Beaches)

Euonymus occidentalis var. *occidentalis* (seed collections made from shrubs growing within Scott Creek riparian corridor, between Scott 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 Scott 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 Scott Creek Watershed.....**this taxon is variable as to stature, number of florets per spikelet and color of stamens, which can be yellow or purple**)

Festuca idahoensis subsp. *roemeri* = *Festuca roemeri* var. *klamathensis* (several mature caryopsis collections taken from long established population, growing on exposed grassy slope overlooking n-end of Swanton Road, above Washout Turn..... **plus a second series of collections (2013), from isolated population growing on summit of Solar Panel Gate Refugium**)

Festuca occidentalis (in depth collections made of this variable and aesthetically desirable native bunch grass, including populations found on the Last Chance Ridge, Schoolhouse Ridge complex and both sides of the upper Little Creek drainage)

Festuca octoflora (pre- and post-2009 Lockheed Fire populations from chaparral, on both the Scott and Mill Creek sides of the upper Seymore Hill ridge system)

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. *achilleifolia* (seed collected from Little Creek drainage..... concentrated population growing on slide area overlooking access dirt road along with *Phacelia californica*)

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. Localized population growing on inner roadbank proximal to Mill Creek Bridge, documented with herbarium pressings..... **on 10/13/2015, seed from putative intergrades between the two subspecies, was collected from the "Slide Area" along Purdy Road**)

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..... during 06/2014, a localized population growing on and above siliceous mudstone/bedding plane, which formed the original Highway 1 and proximal to Washout Turn, was documented via seed collecting. This population was also growing sympatrically with *Silene verecunda sensu lato*)

Gnaphalium palustre (mature cypselae collected along dirt road, which crosses central portion of Gianone Haybarn Gulch and stays wet during Winter/Spring months and occupying a vernal pool environment in Squirrel Flat)

Guillenia lasiophylla = *Caulanthus lasiophyllus* (seed collected from scattered population growing along access road, connecting Scott Creek side of Seymore Hill with "chalks", just above and overlooking "Bowl Area"..... **subsequently documented and seed collection made , along upper ridge between Little Creek and Archibald Creek drainages**)

Heracleum maximum (schizocarps collected from scattered plants growing along Scott Creek riparian corridor which averaged 3+ meters in height)

Helenium puberulum (cypselae collected from robust [1.5m in height] plant growing in the upper "micro-marsh"/seasonal pond, which drains into Beaver Flat Marsh proper and also where the marsh proper enters into Beaver Flat Gulch)

Heliotropium curassavicum var. *oculatum* (between north end of Greyhound Rock and Waddell Beaches, scattered plants observed growing on exposed banks of reduced/fragmented siliceous mudstone..... where beach and cliff face meet)

Hesperocyparis abramsiana var. *abramsiana* (one mature tree discovered in 2015. growing on north facing forested hillside overlooking Scott Creek, down stream from confluence with Little Creek. Growing sympatrically with an extensive population of *Torreya californica*. Documented with herbarium pressings [OBI] and also mature cone collections, still attached to branches)

Heterotheca sessiliflora subsp. *bolanderi* (comprehensive collections, including Seymore Hill populations, which approach subsp. *echioides* in bristly indument and herbage exuding scent of camphor..... variable taxon as to mode of growth, chemical signature, foliar color and indument, inflorescence gestalt, and even color of pappus. With the exceptions of the [1] Seymore 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, were collected from populations growing on the Western Terrace, between Lasher Marsh and Cowboy Shack Gulches..... **see page 47-48 of this essay**)

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 and pressed aerial non-flowering stems from Laguna de la Trancas..... one of two documented populations for Santa Cruz County..... **see page 102 of this essay and Laguna de las Trancas population also documented via digital photographs**)

Horkelia californica var. *californica* (achenes 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* (achene 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 sw-end of West Spring Marsh documented with mature schizocarps..... localized colony discovered [09/2014] , growing sympatrically with *H. ranunculoides*, along se-edge of Laguna de las Trancas and documented [08/2015] with both seed collections and **herbarium pressings made**)

Hypericum anagalloides (attractive mat-forming perennial native which has horticultural value in colonizing moist spots within a wild garden..... seed collected from population growing along n-end of Swanton Road, in drainage ditch which empties into Harry Wain's Arroyo)

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* [annual form], *Juncus occidentalis*, *Perideridia gairdneri* subsp. *gairdneri*, *Wyethia angustifolia*, to name just a few associate "natives"/**second collection [05/2012] made from Old Highway 1 roadbed, above Washout Turn, growing intermixed with annual form of *Isolepis cernua***)

Isolepis cernua (**two localized populations of the annual form documented, [1]** from Old Highway 1 roadbed, above Washout Turn, documented with pressed plant material and achenes and **[2]** growing in moist depressions along dirt road, paralleling Big Willow Marsh down to the Frog Pond. The **perennial cespitose form of *Isolepis cernua***, also growing sympatrically with *Isolepis carinata*, along edge of Western Terrace overlooking lower Cowboy Shack Gulch, documented with achenes..... this locale is of particular interest, in that it is a localized island of biodiversity, featuring besides the two *Isolepis* species, *Plantago subnuda* and the rare native grass species, *Agrostis blasdalei*)

Juncus acuminatus (one collection of mature inflorescences, with capsules containing viable seed, from sandbar below confluence of Mill and Scott Creeks..... **collected on 07/25/2001**)

Juncus aff. *breweri* (extensive colony encompassing lower portion of Laguna de las Trancas outflow, where it joins the upper section of Gianone Barn Gulch. The population is characterized by having aerial stems tortile-compressed without basal blades, the stems ranging from erect thru arcuate with inflorescences predominately compact/condensed and florets 5-6mm in length. **[Several collections made from this colony during Fall of 2012 and 2013, focusing on documenting stem/inflorescence morphology and obtaining viable seed for later raising out].** Related populations occur nearby, circumscribing the Gianone Barn Gulch Upper Marsh and the western edge of the Laguna de las Trancas) **Note: An adjacent population, between Last Chance Road and the spring/headwaters for Gianone Barn Gulch, with rhizomes 8-10+ millimeters in diameter/stems ranging from distinctly arcuate to erect, tortile-compressed and with at least one observed culm producing from upper sheath a 9.5cm blade, may represent *Juncus mexicanus* or hybrids between *Juncus breweri* and *Juncus mexicanus*. Inflorescences for both populations are predominately compact and dense. The substrate, both of these sympatric**

populations are growing in, is derived from eolian sand overlaying siliceous mudstone.

Juncus hesperius x *Juncus patens* hybrids (an in depth sampling of this rarely collected hybrid, documented with mature inflorescences from more than three dozen plants..... for structural analysis, DNA extraction and potential seed extraction. **Two envelopes of manually crushed inflos, containing a small percentage of viable seeds, have been deposited [12/10/2011] with the UCSC Arboretum for growing out..... envelope #1 represents a long established plant growing in the nw end of the Sandy-bottom reservoir and envelope #2 contains material collected from a robust specimen of this hybrid growing adjacent to the w-end of the Big Willow Marsh. In 2012, several additional envelopes [documenting 12+ additional hybrid taxa] have been added for study and growing out purposes, containing both mature inflorescences and/or manually crushed capsules which released, depending on the individual plant, a small to substantial [but in no way approaching the normal count for either parent] amount of potentially viable seed. Recent [10-11/2012 and 01&07/2014] re-collections of previously discovered hybrid taxa have focused on, besides viable seed, documenting stem and inflorescences, for the purpose of structural analysis and DNA extraction. At least two representatives of this hybrid taxon [nw-edge of Laguna de las Trancas and interface of the aforementioned Laguna's outflow with the upper portion of Gianone Barn Gulch] occupy areas of at least 6' wide x 10' long and if each is in actuality one plant, may be between 50 and 80+ years old!) [See pages 14-15, 48-49 of this essay].**

Note: When raised from seed (2014-2015), juvenile seedlings produce foliaceous blades which are channeled (analogous to mature *Juncus occidentalis* leaves) and as seedlings develop, terete culms are produced. Are the early canaliculate leaves the primitive condition for the genus and the cylindrical culms derived? During the transition from abaxial/adaxial surfaced proto-leaves to tubular-in-gestalt culms, do the margins of the "early" leaves grow towards each other, ultimately connecting and forming the cylindrical culms and if examined under a microscope, would reveal a faint longitudinal suture or are the terete culms already developed and do the early "leaves" morph into the basal bladeless leaf sheaths? As of 06/13/2015, 19 F2 seedlings have been raised and have produced mature culms, ranging in coloration from grass green to bluish/glaucous and those plants initiating inflorescences (10 months from germination), contrary to the majority of plants favoring the *J. hesperius* parent in culm coloration, are producing flowers with 6 stamens, as with the *J. patens* parent!

Note: One 2+ years old *J. hesperius* x *J. patens* flowering/fruited plant, raised from seed collected from an F1 hybrid growing proximal to the Big Willow Gulch Marsh hybrids, has two years in a row produced inflos with some early flowers producing six stamens and the remaining flowers appearing to display apomixis. Needless to say, sub-globose capsules are produced throughout each inflorescence containing a substantial amount of viable seed. As the 2015 season draws to a close and the above mentioned 19 F2 hybrids [only seven plants have produced inflos during their first growth year] have their mature inflos harvested for potentially viable seed, it will prove educational if obligate selfing/apomixis also occurs with a corresponding volume of fertile seed produced.

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

within the Swanton area, representing all the distinct phases of this series of related taxa, have been and will continue to be collected and deposited with the UCSC Arboretum and supplemented with living representatives of the various "types" for establishing a reference group within the Arboretum's California section)

Juncus patens (in the early 1970s, a gigas form of *Juncus patens* was observed growing on sandbars within the upper part of the Scott Creek riparian corridor and from a gestalt/stature/biomass perspective, was an analog of *Juncus effusus* var. *pacificus* [**with flowering culms, 1-1.5meters in length**]. 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 Scott 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 14-15 and 48-49 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. On 08/06/2014, one large and apparently long established/healthy specimen of the gigas form of *Juncus patens* was discovered in the lower portion of the Scott Creek riparian corridor, near the confluence of Queseria and Scott Creeks..... three envelopes of representative inflos and 1,000+ seeds were collected)**

Juncus xiphioides (growing creekside and viewable from Swanton Road, a small cluster of five plants survived the erosive energy of several past winter storms. This remnant colony of a horticulturally attractive native monocot, was 30+ years ago, far more widespread in the Scott Creek riparian corridor but due to past extreme storm events, persists only in small isolated patches)

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.

Note: populations either have or lack pappus on cypselae and based on the most recent molecular studies, may all prove to be *Lasthenia gracilis*..... an extreme example of crypticism)

Layia gaillardoides (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, the coloration uniform whether pre- or post-anthesis)**

Layia hieracioides (several populations documented via cypselae collections, these showing some variations in capitula size and chemical signatures..... specifically: **[a] Schoolhouse Ridge populations/Mill Creek side, [b] Solar Panel Gate "hotspot" and [c] w-facing roadbank, between Queseria Creek and Molina/Queseria divide)**

Layia platyglossa (cypselae collections made from Scott Creek side of Seymore Hill populations and the variable, **as to capitula size**, populations proximal to the Western Terrace/coastal prairie, between the Pumpkin Field Marsh and Scott Creek Marsh)

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

Ligusticum apiifolium (scattered populations, principally w-facing, extending in an arc-like pattern along the synform between the upper portion of Mt. Cook Gulch and the Magic Triangle..... **also an isolated colony in the upper reaches of the gulch complex, connecting the Bulb Field with the Buckeye Grove Ridge.....** all known populations within the aforementioned areas documented with comprehensive schizocarp collections)

Lillium pardalinum subsp. *pardalinum* (seed collected from a robust specimen, circa 7.5-8 feet in height, growing in alluvium adjacent to Big Creek, between fish hatchery and old power station and from an equally vigorous example growing in a scattered population up Mill Creek, proximal to alluvial flood plain which defines the entrance into the Harvey Gulch drainage system.)

Lomatium caruifolium var. *caruifolium* (populations documented via schizocarp collections, from lower Schoolhouse Ridge, top of the synform overlooking Pumpkin Field Marsh and w-facing exposed slope overlooking LC micro-marsh #1.) **[note: individual plants within the local populations vary considerably as to foliar gestalt and can range from glabrous and grass green to densely covered with short trichomes giving the compound leaves a cinerous cast]**

Lotus formosissimus = *Hosackia gracilis* (extensive population growing on the coastal prairie/Western Terrace between Morehus Arroyo and Big Willow Gulch..... occupying depressions that are seasonally wetter than surrounding area and forming concentrated sheets of bicolored [violet/gold] flowers, which are intensely scented and on a warm, slightly breezy day, can be olfactorally detected, some distance from point of origin)

Lotus purshianus = *Acmispon americanus* var. *americanus* (on the Mill Creek side of the Seymore Hill, a distinctive form of this widespread annual native occurs along a narrow strip of grassland/oak woodland interface, **which forms prostrate mats..... when raised from seed, this ground-hugging variant of the typical erect form also grows in a horizontal mode, making it a valuable ground-cover and potential weed abater.** Seed was collected from this isolated population between 06/2012 and 07/2012 and deposited with the UCSC Arboretum, to be raised out and its genetics studied). **On 10/01/2012, seed was collected from the robust, erect growing form of this taxon, which has occupied a stretch of roadside drainage ditch between the Mill Creek Bridge and Canfield driveway, for at least 20 years. This form can reach a meter or more in height and possibly has value in being utilized as a weed abater.**

Lotus salsuginosus var. *salsuginosus* = *Acmispon maritimus* var. *maritimus* (rare in the Scott 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 Scott Creek riparian corridor)

Lupinus arboreus x *Lupinus variicolor* (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 Scott 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 the 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)

Luzula aff. *comosa* (distinctive form from n-facing bank overlooking Purdy Road/Squirrel Flat, with inflorescences consisting of elongate, arching branches akin to a cat-of-nine-tails, documented with mature "inflos" and seed for study [seed 0.9 mm in width or less] = var. *laxa* Circa a quarter mile further along the Purdy Road, growing on the "Slide Area", is another form with densely capitate inflorescences and this was also documented via seed and mature inflorescences = var. *comosa*..... see pages 145-146 of this essay)

Luzula subsessilis (populations documented with spent inflorescences and mature seed, from [a]upper portion of the Cookhouse Gulch Complex [e-fork, draining inner prairie] which has densely capitate seed heads with seeds 0.9-1 mm wide and +/- spherical in outline and additional populations documented, from [b]w-facing edge of mixed coniferous/oak woodland overlooking lower Las Trancas Arroyo and [c]n-end of Swanton Road, e-facing grassland paralleling central Gianone Barn Gulch. **note: population [a] 500-600+ plants, [b] 70-80+ plants and [c] 200-300+ plants) with population [a] also documented with herbarium pressings)**

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. **A recent collection [05/2012], from the w-facing slope of the Schoolhouse Ridge Complex overlooking Squirrel Flat, was made of a small population combining traits specific to *M. gracilis* and *M. exigua*, with the plants redolent of the distinctive cherry syrup chemical signature and the capitula long-peduncled)**

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 lato] 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 and several putative hybrids with *Melica torreyana*, either growing sympatrically or intermixed)

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 scattered throughout the watershed documented with caryopsis collections)

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

Micranthes (Saxifraga) californica (concentrated population growing on west-facing hillside overlooking the lower portion of Purdy Road, documented with spent inflorescences and mature seed. Area completely burned in 2009 Lockheed Fire but successfully rebounded, from a native species diversity perspective, and at the time of seed gathering, 04/2012, the following taxa were abundant and in full flower..... *Collinsia multicolor*, *Plectritis congesta* **subsp. brachystemon**,

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. californicus** (extensive population growing on Scott Creek side of Seymore Hill, above Bettencourt Gulch access road **but below** isolated population of **var. subvestitus**)

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

Microseris bigelovii (two populations observed/collected, differ in capitulum size and overall proportions of cypselae by a factor of 50%..... plants growing on e-facing grassy slope, between Pumpkin Field Marsh and Back Ranch Road **are markedly smaller** than north end of Swanton Road colony, between Harry Wain's Arroyo and Washout Turn. **Whether these differences in overall gestalt, are genetic or environmentally induced, warrant further study**)

Microseris paludosa (Arroyo de las Trancas population documented with cypselae collections..... **this population is ecologically distinctive by sharing the same general habitat with two**

relatives, *Agoseris grandiflora* and *Stebbinsoseris decipiens*)

Mimulus cardinalis = *Erythranthe cardinalis* (several color variants, orange through red, documented by seed collections..... from Big and Scott Creeks riparian corridors)

Mimulus floribundus = *Erythranthe floribunda* (several populations of this locally uncommon annual, documented growing on/proximal to sandbars along the Scott and Big Creek drainage systems..... **often sympatric with but genetically isolated from the perennial *Mimulus moschatus* = *E. inodora*. Within the Scott Creek Watershed and usually growing streamside on sandbars, the following species of *Erythranthe* occasionally can be found co-existing: *E. cardinalis*, *E. floribunda*, *E. aff. guttata*, *E. moschata* = *E. inodora* and *E. nasuta*)**

Mimulus guttatus = *Erythranthe guttata* complex [ERYTHRANTHE SECT. SIMIOLA] (extensive documentation via seed/inflos and often significant plant parts, of key [reproductively isolated via geography] types found within the Scott Creek Watershed and its environs..... **including population of rhizomatous/stoloniferous *E. grandis* growing along n-end of Swanton Road, in perennially moist drainage ditch, which empties into Harry Wain's Arroyo. This population is unique within the Scott Creek Watershed, in that it periodically produces a few plants with flowers wholly lacking in any maculations = clear unspotted butter-yellow corollas..... see pages 12-13, 31-32, 37, 42-44 and 195 of this essay). Within this complex, an isolated population growing on a perennially moist seep, between the upper and lower Seymore Fields [Mill Creek sub-watershed], having cleistogamous flowers, the mature calyces immaculate, with the lower lobes acute and incurving/touching the forward pointing uppermost one but differing from the related obligate selfer, *Erythranthe nasuta*, growing on patches of moss in a reduced/nanistic mode of growth [upper Calf Gulch and Gulch #1] and displaying an erect mode of growth, 20-30+cm in height, growing on sandbars along the Scott Creek riparian corridor.**

Mimulus guttatus subsp. *arenicola* = *Erythranthe arenicola* (population growing vertically, on seasonally wet siliceous mudstone cliff/waterfall face, s-end of Greyhound Rock Beach, documented via herbarium pressings. This localized population of a rare county wide member of the *Mimulus guttatus* complex, most likely has its origins further up the drainage system of Gulch #1..... across Highway 1 and originating on the Old H-H Ranch. Three species of *Erythranthe* have been documented from this micro-watershed, including the aforementioned *Erythranthe arenicola*)

Mimulus moschatus = *Erythranthe inodora* (several populations, from various points within the watershed, documented with seed collections)

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 on chaparral dominated ridges away from the immediate coast and also along Swanton Road, between Scott and Big Creek Bridges, tend towards this subspecies..... distinguished, in part, from **subsp. franciscana**, by having thin, subglabrous leaves with cuneate/obtuse bases)

Montia fontana (seed collection made from colonies growing in Marti's Park Marsh)

Montia parvifolia (pressed plant and viable seed documenting solitary plant, growing along Scott Creek, on sandbar midway between confluences with Mill and Big Creeks)

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 Scott 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 sympatrically 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 Scott Creek and this time, growing in association with *Nemophila* aff. *puchella* var. *fremontii* and *Nemophila parviflora*)

Nemophila **aff. pulchella** **var. fremontii** (comprehensive seed collections made 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 Scott Creek riparian corridor, this distinctive taxon **grows sympatrically with two other species of *Nemophila*..... namely,**

Nemophila parviflora var. *parviflora* and *Nemophila pedunculata*)

Nuttallanthus texanus (uncommon in the Scott Creek Watershed and its environs..... a small population has persisted on a grassy slope overlooking the north end of Swanton Road, sharing habitat with *Festuca roemerii* var. *klamathensis*, *Pseudognaphalium biolettii*, *Pseudognaphalium californicum*, *Pseudognaphalium x gianonei*, **pro.sp.nov.** and *Clarkia* aff. *davyi* [**erect mode of growth, bicolored flowers, gray-encrusted seeds**]. one plant collected during 04/2012, which yielded seed from several mature capsules)

Oxalis pilosa (an attractive albeit diminutive native, sharing the watershed with one showy native sister species [*Oxalis oregana*], an obnoxious counterfit introduction [*Oxalis corniculata*] and an introduced, pestiferous but visually arresting relative, [*Oxalis pes-caprae*]..... ***Oxalis pilosa*, has merit both as a hanging-basket and rock garden native species**)

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)

Phalaris californica (variable as to stature and inflorescence gestalt..... several populations documented with comprehensive caryopsis collections, including Beaver Flat, Gianone Barn Gulch Marsh [exceedingly robust form with flowering culms 2+ meters in height], Lasher Marsh, upper Winter Creek drainage system and the coastal headland overlooking n-end of Greyhound Rock State Beach)

Pinus attenuata (as noted on **page 6, question #24** of this essay..... juvenile representatives of this close relative of *Pinus radiata* often produce needles in fascicles of 4 & 5, which possibly represent an ancestral connection with the pines of Mexico and thru reduction, are now mainly 3-needed. Several envelopes containing multiple examples and each representing a separate in situ specimen, have been sent to the UCSC Arboretum for documentation and study.

Pinus radiata (as noted on **page 6, question #24** of this essay..... juvenile representatives of this "hybrid swarm" often produce needles in fascicles of 4 & 5, which possibly represent an ancestral connection with the pines of Mexico and thru reduction, are now mainly 3-needed. Several envelopes containing multiple examples and each representing a separate in situ specimen, have been sent to the UCSC Arboretum for documentation and study.

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

hispidulus or represent, what has been called *Plagiobothrys bracteatus* var. *aculeolatus*..... see pages 88-89 of this essay)

Plagiobothrys chorisianus var. *chorisianus* (comprehensive collections from Beavers Flat, Rosetta Stone Pine, West Spring, Marti's Park and Upper and Lower 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 Scott Creek Watershed, including the recently discovered population on the lower Calf Gulch side of the Seymore Hill, growing sympatrically with *Plagiobothrys* aff. *bracteatus*..... see pages 87-89 of this essay)

Plantago elongata (isolated population growing on original Highway 1 siliceous mudstone roadbed, which overlooks the north end of Swanton Road/"Washout Turn" **[this population is growing sympatrically with *Plantago erecta*, *Juncus bufonius*, a nanistic form of *Trifolium* aff. *variegatum* = *Trifolium dianthum* and a localized but extensive population of *Isolepis carinata* which ironically, is growing with the annual form of *Isolepis cernua*]**.... 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. A second collection of this widespread native was taken, 05/19/2012, from **an exceedingly variable as to stature population**, growing along the original Highway 1 roadbed, which overlooks Washout Turn..... this population, besides comprising plants displaying stature extremes is also unique for the area, by growing sympatrically with locally uncommon relative, *Plantago elongata*)

Plantago maritima (a large, isolated population growing in a horizontal mudflat environment along with *Agrostis densiflora*, on coastal headland above s-end of Scott 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 Scott Creek Beach**)

Plantago subnuda (one inland population from Marti's Park Marsh documented with mature inflorescences and seed, an isolated cluster of plants growing along edge of drainage ditch which empties into Harry Wains Arroyo, 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 Scott Creek Marsh documented, from both the immediate coastal bluffs and the rocky slopes overlooking the Western Terrace)

Pseudognaphalium biolettii (cypselae 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..... **during 05/2012, cypselae collected from population growing along and above n-end of Swanton Road, between Harry Wain's Arroyo and Washout Turn/growing sympatrically with extensive population of *Pseudognaphalium x gianonei***)

Pseudognaphalium gianonei, **pro.sp.nov.** (several populations documented, e.g., w-facing grassy slope overlooking n-end of Swanton Road above Washout Turn, s-facing mudstone bank overlooking n-end of Swanton Road beyond entrance to Last Chance Road, w-facing mudstone bank overlooking Swanton Road between Purdy Road gate and Harvey Field and Lockheed Ridge fire road/Mill Creek side..... **see page 8 of this essay**)

Quercus agrifolia x Quercus parvula var. shrevei (several adult specimens of this hybrid taxon documented with envelopes containing pressed branchlets/individual leaves, showing all aspects of veinal alignment and presence/absence of tufts of stellate trichomes, where lateral and mid-vein interface. One specimen in question, **is growing sympatrically with the two centenarian *Sambucus nigra* subsp. caerulea "trees"** along Swanton Road, west of the Mill Creek Bridge, while two more proximal taxa are along the edge of Swanton Road above its intersection with Mountain Lion Gulch..... **see pages 8, 119 of this essay**)

Quercus x Chasei (one adult tree, circa 20m in height, discovered several decades ago growing on w-facing slope, the Scott Creek side of the Seymore Hill complex and due north of the upper Calf Gulch drainage system. Several small branch tips, with tell-tale leaves and empty cupules, have been collected for structural examination and DNA extraction.

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 nor displayed any tendency towards flowering/fruiting..... **see pages 5-6, 70, 118-119, 125, 188 and 191 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 Scott Creek..... documented with spent inflorescences, achene collections and herbarium pressings. **From a distance, looks superficially like *Sanicula crassicaulis***)

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 Scott Creek Bridge and mouth of Cookhouse Gulch)

Ricciocarpus natans (found in the Laguna de las Trancas, this locally rare liverwort floats on the

water's surface with *Azolla filiculoides* and also anchors itself terrestrially bankside. Documented with several pressed thalli and deposited with the UCSC Arboretum..... see page 102 of this essay)

Rosa californica (a superior form, with up to 40 flowers per truss [aggregate inflorescence/cymose] 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 Scott Creek riparian corridor, between Scott 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, China Ladder Marsh and on the Santa Cruz Terrace between Greyhound Rock and Scott Creek Beaches)

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

Sagina maxima subsp. *crassicaulis* (seed collection made from one population growing on moist cliff face overlooking s-end of Scott Creek Beach). **Note: isolated population, growing on near vertical seep, a veritable tapestry of native taxa, including *Plantago maritima* and perennial form of *Isolepis cernua*, under constant threat of cliff face exfoliation and impacts from winter storm activity. During 09/2014, seed was recollected from the remaining localized colony and deposited with the UCSC Arboretum. Herbarium pressings made in 2015. A localized colony of 100+ plants discovered (2015), growing on moist cliff face overlooking north end of Scott Creek Beach and documented with comprehensive seed collection.**

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

Sanicula bipinnatifida (extensive population growing on exposed grassy slope between Las Trancas Arroyo and Last Chance Road, across from Upper Gianone Spring Marsh)

Sanicula gianonei, **pro.sp.nov.** (several populations documented, both within the Scott Creek

Watershed and its adjacent maritime draining gulch systems..... see pages 87, 136-137 of this essay)

Sanicula hoffmannii (comprehensive documentation from Last Chance Ridge, Lair Gulch complex, Beaver Flat, upper Calf Gulch..... **including two recently [2011] discovered populations growing on coastal side of the Scott Creek riparian corridor, flanking the Mt. Cook Gulch drainage system)**)

Sanicula "pseudo-laciniata" (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..... see pages 86-87 of this essay)**)

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

Sedum spathulifolium (seed collected from small, long isolated population, growing on near vertical face of the Lower Big Creek Falls. Worth doing a genetic workup on and comparing this population with populations elsewhere in the Santa Cruz Mountains)

Sidalcea malviflora **aff. subsp. laciniata** (robust plant, with flowering stems circa 50cm+ and fruit segments glandular-puberulent..... growing out of siliceous mudstone bank overlooking n-end of Swanton Road, between Harry Wain's Arroyo and Washout Turn)

Sidalcea malviflora **aff. subsp. malviflora** (dwarf/greatly reduced in stature population growing on wind swept headland/oceanside edge of Western Terrace, between Gulch #5 and w-fork of Big Willow Gulch..... fruiting bodies/mericarps subglabrous to sparsely glandular-puberulent, shallowly to deeply net-veined and pitted)

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)

Solidago elongata (scattered populations of this horticulturally desirable goldenrod are principally found in "ancient" marshes, both on the immediate coast..... **China LadderMarsh, Morehus Arroyo Marsh and Big Willow Marsh.....** and marsh-like habitats away from the coastline..... **Beaver Flat, West Spring Marsh and Marti's Park Marsh.** Long-lived rhizomatous/colonial taxa often expend more energy in asexual expansion of the colony with a consequent reduction in seed[cypselae] production, unless the population is physiologically disturbed by external events such as fire or change in surrounding canopy cover [*Calamagrostis rubescens*] and in the case of *Solidago elongata*, **the impact of immature cypselae being eaten by diurnal lepidopteran[?] larvae!!!**)

Sparganium eurycarpum **subsp. eurycarpum** (seed collections made from Laguna de las Trancas)

Stachys chamissonis (one population documented from China Ladder Marsh.....the flowering

stems often reaching 2.5+ meters in height)

Stebbinsoseris decipiens (20+ separate populations documented..... each population variable as to presence/absence of either parent, overall growth pattern and cypselae coloration..... **see pages 39-40 of this essay**)

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 Scott Creek Bridge and the other, also growing on a mudstone outcropping, circa 200 feet above Purdy Road cattleguard along with *Athysanus pusillus* and *Layia gaillardoides*. **Since this species appears to be, at least locally, self-pollinating..... it would be interesting to determine, if each of these isolated populations shows any differences on a molecular level**)

Stephanomeria elata (for many years, scattered populations of this taxon found growing throughout the Scott 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, High Hill 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 tubercles on the cypselae faces and pappi plumose their entire length**)

Stipa lepida and *Stipa pulchra* (intermixed population of these two native grass species growing on se-facing bank overlooking Swanton Road, below entrance to Last Chance access road..... comprehensive collection of mature caryopses made, to determine if any gene flow between these two related taxa can occur)

Symphotrichum subspicatum (documented with herbarium pressing from the Allium Marsh and collections of mature inflorescences with attached/loose cypselae from localized population along Swanton Road proximal to George Valentine Gulch..... **see page 58 of this Essay**)

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

Thalictrum fendleri sensu lato (several populations reside within the Scott Creek Watershed, ranging from the **mesic** riparian corridor proper up to the **xeric** decomposed granitics found in the Little Creek sub-watershed's higher elevations. The achenes are variable in the number of elevated veins present, usually 1-3. Several comprehensive achene collections have been made, documenting the various populations based on their ecological preferences)

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..... **isolated population growing roadside**, between Winter and Archibald Creeks, documented with envelope containing entire plant and still attached silicles in varying stages of maturity)

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 aff. *albopurpureum* var. *albopurpureum* (collection made along access road thru chaparral, above "Bowl Area" on Scott Creek side of Seymore Hill, prior to 2009 Lockheed Fire/note: **this particular taxon, as it occurs within the Scott Creek Watershed, may prove through molecular analysis, to be aligned with *T. macraei*. One specimen, originally identified as *T. albopurpureum*, from the "Buckeye Grove" area, has been determined thru molecular analysis, to be *T. neolagopus***)

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" (2014)..... TYPE COLLECTION**, on Schoolhouse Ridge, no longer extant)

Trifolium ciliolatum (scattered population growing along Purdy Road, between "Slide Area" and Squirrel Flat, which also extends up the w-facing slope, colonizing the "vertical grassland" just below the crest of the Scott Creek side of the Schoolhouse Ridge..... growing sympatrically with *Stebbinsoseris decipiens* and both taxa documented by seed/cypsela collections and deposited with the UCSC Arboretum)

Trifolium macraei (concentrated population, documented via seed collection, growing on edge of synform overlooking Western Terrace, between central portion of Big Willow Gulch and the Pumpkin Field Marsh..... growing with *Lasthenia* aff. *gracilis*, *Astragalus gambelianus*, *Epilobium canum* subsp. *canum*, et al)

Trifolium microdon (seed collected from localized population, growing on n-facing vertical grassland above Purdy Road and overlooking Squirrel Flat..... this small area hosts a diverse assemblage of "natives", including *Delphinium patens* subsp. *patens*, *Nemophila menziesii* var. *atomaria*, *Clarkia rubicunda*, *Trifolium microcephalum*, *Leptosiphon androsaceus* and *Plectritis congesta* subsp. *brachystemon*)

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 precipitous 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/note: **according to the recent molecular work done by Randall Morgan and associates, this particular taxon is now classified as *Trifolium obtusiflorum* var. *cruzenze***)

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. **Distinctive form simulating *T. obtusiflorum* but possibly an undescribed variety of *T. willdenovii*, documented with seed and pressings (2015), growing along Purdy Road across from Squirrel Flat.**)

Trifolium aff. variegatum var. pauciflorum (nanistic race growing on moss, which forms sheets over the exposed siliceous mudstone comprising the original Highway 1/overlooking Washout Turn..... north end of Swanton Road/**note: This population and others like it, growing in similiar habitats, may prove to be *T. dianthum***)

Trifolium willdenovii (two morphologically distinct forms documented: (1) a robust type from the Purdy Road "slide area", with pale tan colored seeds and (2) a compact, greatly reduced overall in stature form, possessing dark seeds and growing along nw facing edge of Solar Panel Hot Spot)

Triphysaria eriantha subsp. rosea (scattered population growing in grassland between Sandy-bottom Reservoir and Big Willow Gulch..... along eastward dipping synform. **Note: subsp. eriantha has been documented as occuring sympatric with this population and occasionally appearing within the nearby subsp. rosea sensu latu populations**)

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***)

Uropappus lindleyi (cypselae collected from small population growing on e-facing slope overlooking the Upper Seymore Field..... a collection made 06/08/2012, on w-facing slope overlooking Purdy Road/Squirrel Flat, which combines vertical grassland and mixed oak-conifer woodland/chaparral vegetation patterns and prior to the 2009 Lockheed Fire, supported an estimated population of *Stebbinsoseris decipiens*, that was somewhere in the range of **300-400 plants**)

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

Viola pedunculata (seed collected from scattered population growing on w-facing grassy slope overlooking 1st Mini-Marsh, ocean side of lower Last Chance Road)

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..... Scott Creek side of upper Seymore Hill and apparently lost in 2009 Lockheed Fire but documented with several collections of cypselae. Revisiting the area during 04/2013, five plants were observed somewhat removed from the original population site and appearing vigorous, with some inflorescences displaying fully developed capitula..... On 08/10/2014, revisited post-2009 Lockheed Fire satellite population and collected cypselae from 10 capitula, with a large percentage of cypselae showing minute apical bore holes, possibly beetle produced, resulting is less than 10% of cypselae being viable..... Revisiting the site during 09/2015), a satellite population growing some 50 feet due south from the original discovery site of several decades ago, yielded three robust plans with an abundance of healthy capitula and several envelopes of viable cypselea were collected)

Xerophyllum tenax (one juvenile plant collected from scattered population, on lower ridge between Bannister and Bettencourt Gulches..... growing in amongst *Vaccinium ovatum*, *Quercus parvula* var. *shrevei*, *Sequoia sempervirens* and *Pinus attenuata*)

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 Pacific 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 Scott 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. Included within these collections, is extensive documentation of the *Agrostis blasdalei* populations, for both Santa Cruz and San Mateo Counties plus several examples of hybridization between *Agrostis blasdalei* and *Agrostis exarata* [var. *pacifica*]. Staying within the genus *Agrostis*..... in situ collected material documenting what was called *Agrostis aristiglumis*, from terrace outcroppings overlooking Highway 1 and adjacent to Gulch #4, with the lemma venation excurrent as two very conspicuous awns, needs to be thoroughly examined from a molecular perspective, to determine if sinking it within the *Agrostis microphylla* circumscription is warranted.

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 is a broad overview of **families (62+)** with species/subspecies/variety representation (in descending numerical order) **within viewing range**, that have been observed over the past 30 years:

Asteraceae(37)..... *Achillea millefolium*, *Agoseris grandiflora*, *Anisocarpus madioides*, *Artemisia californica*, *Artemisia douglasiana*, *Baccharis glutinosa*, *Baccharis pilularis* subsp. *consanguinea*, *Cirsium brevistylum*, *Corethrogyne filaginifolia* (**var. californica** and **var. filaginifolia**), *Deinandra corymbosa*, *Eriophyllum confertiflorum* var. *confertiflorum*, *Eriophyllum staechadifolium*, *Eurybia radulina*, *Euthamia occidentalis*, *Gamochaeta ustulata*, *Grindelia hirsutula* var. *hirsutula*, *Helenium puberulum*, *Hieracium albiflorum*, *Layia hieracioides*, *Madia gracilis*, *Madia sativa*, *Microseris bigelovii*, *Petasites frigidus* var. *palmatus*, *Pseudognaphalium biolettii*, *Pseudognaphalium californicum*, *Pseudognaphalium x gianonei*, pro.sp.nov. (*P. californicum* x *P. stramineum*), *Pseudognaphalium ramosissimum*, *Pseudognaphalium stramineum*, *Psilocarphus tenellus*, *Rafinesquia californica*, *Solidago elongata*, *Solidago velutina* subsp. *californica*, *Stebbinsoseris* (*Microseris*) *decipiens*, *Symphotrichum chilense*, *Symphotrichum subspicatum* and *Uropappus lindleyi*

Poaceae(30)..... *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, with some showing possible ancestral influence of Bromus sitchensis**), *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), *Elymus glaucus* subsp. *virescens*, *Festuca californica*, *Festuca elmeri*, *Festuca occidentalis*, *Festuca roemerii* = *Festuca idahoensis* subsp. *roemerii* = *Festuca roemerii* var. *klamathensis*, *Festuca rubra* (native, diffuse mode-of-growth ecotype, growing proximal to Harry Wain's pine grove and elsewhere along edge of Western Terrace overlooking Highway 1), *Festuca subuliflora*, *Hordeum brachyantherum* subsp. *brachyantherum*, *Koeleria macrantha*, *Leymus triticoides* = *Elymus triticoides* subsp. *triticoides*, *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 microstachys* var. *pauciflora* = *Festuca microstachys*

Fabaceae(21)..... *Acmispon americanus* var. *americanus*, *Acmispon glaber* var. *glaber*, *Acmispon heermannii* var. *orbicularis*, *Acmispon wrangelianus*, *Lathyrus vestitus* var. *vestitus* (variable as to growth patterns and foliar indument), *Lupinus arboreus*, *Lupinus bicolor*, *Lupinus latifolius* var. *latifolius*, *Lupinus nanus*, *Lupinus variicolor*, *Rupertia physodes*, *Trifolium bifidum* var. *decepiens*, *Trifolium depauperatum* var. *truncatum* = ***Trifolium stenophyllum***, *Trifolium gracilentum*, *Trifolium macraei*, *Trifolium microcephalum*, *Trifolium microdon*, *Trifolium willdenovii*, *Vicia americana* subsp. *americana*, *Vicia gigantea* and *Vicia hassei*

Rosaceae(16)..... *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(11)..... *Angelica tomentosa*, *Apiastrum angustifolium*, *Bowlesia incana*, *Cicuta douglasii*, *Daucus pusillus*, *Heracleum maximum*, *Osmorhiza berteroi*, *Sanicula arctopoides*, *Sanicula crassicaulis*, *Sanicula gianonei*, pro.sp.nov. and *Yabea microcarpa*

Ferns and Fern Allies(11)..... *Woodwardia fimbriata*, *Pteridium aquilinum* var. *pubescens*, *Athyrium filix-femina* var. *cyclosum*, *Dryopteris arguta*, *Polystichum munitum*, *Equisetum telmateia* subsp. *braunii*, *Polypodium californicum*, *Polypodium calirhiza*, *Adiantum jordanii*, *Pellaea andromedifolia*, and *Pentagramma triangularis* subsp. *triangularis*

Cyperaceae(10)..... *Carex amplifolia*, *Carex brevicaulis*, *Carex densa*, *Carex x gianonei* (*Carex harfordii* matrix, including TYPE area), *Carex globosa*, *Carex obnupta*, *Carex subbracteata*, *Carex tumulicola*, *Cyperus eragrostis*, and *Scirpus microcarpus*

Boraginaceae(9)..... *Amsinckia menziesii* var. *intermedia* = ***Amsinckia menziesii***, *Cryptantha clevelandii* (var. *florosa*), *Cryptantha micromeres*, *Cryptantha torreyana* (one population occurred along north end of Swanton Road but was lost during a severe El Nino weather system in the early 1980's), *Cynoglossum grande*, *Nemophila parviflora* var. *parviflora*, *Nemophila pedunculata*, *Phacelia malvifolia* var. *malvifolia* and *Plagiobothrys bracteatus*

Juncaceae(9)..... *Juncus bufonius* sensu lato, *Juncus effusus* var. *pacificus*, *Juncus hesperius*, *Juncus occidentalis*, *Juncus patens*, *Juncus phaeocephalus* var. *phaeocephalus*, *Juncus xiphioides*, *Luzula comosa*(?) and *Luzula subsessilis*

Polygonaceae(6)..... *Eriogonum latifolium* sensu latu, *Persicaria punctata*, *Pterostegia drymarioides*, *Rumex californicus*, *Rumex salicifolius* and *Rumex transitorius*

Ranunculaceae(6)..... *Actaea rubra*, *Delphinium californicum* subsp. *californicum*, *Delphinium decorum* subsp. *decorum*, *Ranunculus californicus*, *Ranunculus hebecarpus* and *Thalictrum fendleri* var. *polycarpum*

Brassicaceae(5)..... *Barbarea orthoceras*, *Cardamine californica*, *Cardamin oligosperma*, *Nasturtium officinale* and *Thysanocarpus laciniatus*

Phrymaceae(5)..... *Diplacus aurantiacus*, *Erythranthe arvensis*(?), *Erythranthe cardinalis*, *Erythranthe inodora* and *Erythranthe grandis*

Plantaginaceae(5)..... *Callitriche heterophylla* var. *bolanderi*, *Collinsia heterophylla* var. *heterophylla*, *Collinsia multicolor*, *Plantago subnuda* and *Veronica americana*

Fagaceae(4)..... *Notholithocarpus densiflorus* var. *densiflorus*, *Quercus agrifolia* var. *agrifolia*, *Quercus x morehus* [non-F1 hybrids] and *Quercus parvula* var. *shrevei*

Onagraceae(4)..... *Clarkia rubicunda*, *Epilobium brachycarpum*, *Epilobium ciliatum* subsp. *watsonii* and *Taraxia ovata*

Orchidaceae(4)..... *Corallorhiza* sp., *Piperia elegans* subsp. *elegans*, *Piperia michaelii* and *Piperia transversa*

Saxifragaceae(4)..... *Heuchera micrantha*, *Lithophragma affine*, *Lithophragma heterophyllum* and *Micranthes californica*

Caryophyllaceae(3)..... *Cardionema ramosissimum*, *Silene verecunda* [subsp. *verecunda*] and *Stellaria nitens*

Montiaceae(3)..... *Calandrinia ciliata*, *Claytonia perfoliata* subsp. *perfoliata* and *Montia fontana*

Papaveraceae(3)..... *Dicentra formosa*, *Eschscholzia californica* and *Platystemon californicus*

Polemoniaceae(3)..... *Collomia heterophylla*, *Gilia achilleifolia* subsp. *multicaulis* and *Navarretia squarrosa*

Rubiaceae(3)..... *Galium californicum* subsp. *californicum*, *Galium porrigens* var. *porrigens* and *Galium triflorum*

Salicaceae(3)..... *Salix lasiandra* var. *lasiandra*, *Salix lasiolepis* and *Salix sitchensis*

Sapindaceae(3)..... *Acer macrophyllum*, *Acer negundo* and *Aesculuc californica*

Adoxaceae(2)..... *Sambucus nigra* subsp. *caerulea* and *Sambucus racemosa* var. *racemosa*

Betulaceae(2)..... *Alnus rubra* and *Corylus cornuta* subsp. *californica*

Caprifoliaceae(2)..... *Lonicera hispidula* and *Symphoricarpos albus* var. *laevigatus*

Crassulaceae(2)..... *Crassula connata* and *Dudleya caespitosa*

Ericaceae(2).... *Arbutus menziesii* and *Arctostaphylos crustacea* subsp. *crinita*

Grossulariaceae(2)..... *Ribes divaricatum* var. *pubiflorum* and *Ribes menziesii* var. *menziesii*

Iridaceae(2)..... *Iris douglasiana* and *Sisyrinchium bellum*

Liliaceae(2)..... *Fritillaria affinis* and *Prosartes hookeri*

Melanthiaceae(2)..... *Trillium chloropetalum* and *Trillium ovatum* subsp. *ovatum*

Orobanchaceae(2).... *Castilleja affinis* subsp. *affinis* and *Triphysaria pusilla*

Pinaceae(2)..... *Pinus radiata* and *Pseudotsuga menziesii* var. *menziesii*

Rhamnaceae(2)..... *Ceanothus thyrsiflorus* var. *thyrsiflorus* and *Frangula californica* subsp. *californica*

Ruscaceae(2)..... *Maianthemum racemosum* and *Maianthemum stellatum*

Solanaceae(2).... *Solanum douglasii* and *Solanum umbelliferum*

Themidaceae(2)..... *Dichelostemma capitatum* subsp. *capitatum* and *Triteleia laxa*

Urticaceae(2)..... *Hesperocnide tenella* and *Urtica dioica* subsp. *gracilis*

Agavaceae(1)..... *Chlorogalum pomeridianum* var. *pomeridianum*

Anacardiaceae(1)..... *Toxicodendron diversilobum*

Aristolochiaceae(1)..... *Asarum caudatum*

Campanulaceae(1)..... *Triodanis biflora*

Celastraceae(1)..... *Euonymus occidentalis* var. *occidentalis*

Chenopodiaceae(1)..... *Chenopodium californicum*

Convolvulaceae(1)..... *Calystegia purpurata* subsp. *purpurata*

Cornaceae(1).... *Cornus sericea* subsp. *occidentalis*

Cucurbitaceae(1)..... *Marah fabacea*

Cupressaceae(1)..... *Sequoia sempervirens*

Hypericaceae(1)..... *Hypericum anagalloides*

Lauraceae(1)..... *Umbellularia californica*

Malvaceae(1)..... *Sidalcea malviflora* subsp. *laciniata*

Myrsinaceae(1)..... *Trientalis latifolia*

Oxalidaceae(1)..... *Oxalis pilosa*

Polygalaceae(1)..... *Polygala californica*

Scrophulariaceae(1)..... *Scrophularia californica*

Taxaceae(1)..... *Torreya californica*

Valerianaceae(1)..... *Plectritis ciliosa*

Verbenaceae(1)..... *Verbena lasiostachys* var. *lasiostachys*

Violaceae(1)..... *Viola pedunculata*

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* = ***Diplacus 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 glaucus* subsp. *glaucus*), coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California aster (*Symphotrichum chilense*), common rush (*Juncus patens*), California blackberry (*Rubus ursinus*), and mugwort (*Artemisia douglasiana*).

For additional data and photos pertaining to the Scott Creek Watershed and its environs, go to <http://www.spranch.org>, [spranch.calpoly.edu](http://www.spranch.calpoly.edu)