

CROSSOSOMA

Journal of the Southern California Botanists, Inc.



Southern California Botanists, Inc.

– Founded 1934 –

<http://www.socalbot.org>

CROSSOSOMA (ISSN 2996-7481 [ONLINE], ISSN 0891-9100 [PRINT]) is published twice a year by Southern California Botanists, Inc., a California nonprofit organization of individuals devoted to the study, conservation, and preservation of the native plants and plant communities of southern California. *Crossosoma* is published biannually.

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HISTORICAL FLORA OF RED HILL, SAN BERNARDINO COUNTY, CALIFORNIA

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ABSTRACT: The Consortium of California Herbaria data were queried to identify all specimens collected at Red Hill in San Bernardino County, California. These data were used to compile a species list, consisting mainly of Ivan M. Johnston's collections made in 1915 through 1918, along with paraphrased label notes from the specimens and additional notes on the taxa and regional distribution. The site was developed, beginning in the 1920s. The botanical specimens and a short published note (Parish 1917) are the only extant documentation of Red Hill's flora and habitats, including vernal pools, wetlands, upland clay soils and several species not otherwise known from the County or surrounding region. A total of 120 taxa have been collected at the site, including six special-status taxa and 14 aliens. Twenty-four of the taxa have evidently been extirpated from southwestern San Bernardino County as a result of development at the Red Hill site and similar habitats in the area.

KEYWORDS: Red Hill, Flora, Ivan M. Johnston

INTRODUCTION

Red Hill is a topographic outcrop on the bajada downslope from the cismontane eastern San Gabriel Mountains in the City of Rancho Cucamonga, San Bernardino County, California. It is the site of a housing tract, elementary school, community park, restaurant, and golf course. It can be viewed in online imagery at about 33°07' North × 117°37' West. But from 1915 through 1918 it was a favored plant collecting site of Ivan M. Johnston and subject of a short paper on "winter pools" (now called vernal pools) (Parish 1917). Johnston's specimens, along with a few others, document Red Hill's native flora and unique habitat including upland clay soils, wetlands, and vernal pools. The upland clays and vernal pools, and several of the plants that Johnston collected there, were probably unique in San Bernardino County even before development, and may no longer occur anywhere in the County. In at least one case, Red Hill had a significant wildflower display (on a *Lupinus bicolor* label Johnston wrote "an abundant albino form making white large areas on grassy mesa").

This study combined specimen reviews at the UCR and RSA-POM herbaria with a desktop review of the Consortium of California Herbaria data (CCH1 and CCH2, referred to together as CCH except where they are discussed in Methods) to compile the historic Red Hill collections and place them into historical and current regional contexts.

SETTING

Red Hill is a north-south trending outcrop about a mile long and half-mile wide at its southern end (narrower to the north), on the alluvial fan below Cucamonga Canyon (Figures 1 and 2). The north end, near Base Line Road, is at the level of the adjacent bajada. A mile to the south, Red Hill rises about 150 feet (46 m)

above the surrounding bajada where Foothill Boulevard (Historic Route 66) bends southward around it. The crest of Red Hill is about 1470 feet (450 m) elevation, and the flattest part extends northward from the words "Red Hill" on Figure 1 to Base Line Road (see USGS 1981). It is mapped as Pleistocene alluvial deposits, with the surrounding bajada mapped as late and middle Holocene deposits (Morton and Miller 2003). Similar Pleistocene mapping units are shown to the east of Red Hill, but they are topographically indistinct from the surrounding bajada. The Red Hill Fault is shown as a concealed fault about 2 miles long just south of Red Hill, and roughly parallel to the former Pacific Electric tracks (Morton and Miller 2003). Presumably, this fault is responsible for the surface expression of Red Hill and nearby Pleistocene deposits at and above the surrounding bajada surface, and perhaps for the former wetlands in Cucamonga Creek alongside Red Hill. Red Hill and the adjacent bajada surfaces are mapped as loamy sands (Soilweb 2022), although Johnston's and other herbarium labels often say "clay" or "clay mesa."

Informal histories of the Red Hill site are available online from the Red Hill Country Club (Colbank 1972) and Sycamore Inn (Anonymous, no date), but I am not aware of a more rigorous historical account. According to the informal reports, the general area was used for some cattle and sheep grazing by Mission San Gabriel during the Spanish Mission era. It was the centerpiece of Rancho Cucamonga, a Mexican era land grant (Figure 3). Various dates and land grantees are reported online but Prudhomme (or Prudhome) apparently was recognized by the United States, State of California, or both as the grantee in 1872 (California State Archives, no date). The land grant map (Prudhomme, no date) confirms Red Hill's local importance in the 19th century (and probably earlier), showing the hill, adjacent marshlands and streams, and almost no other geographic features (Figure 2). The

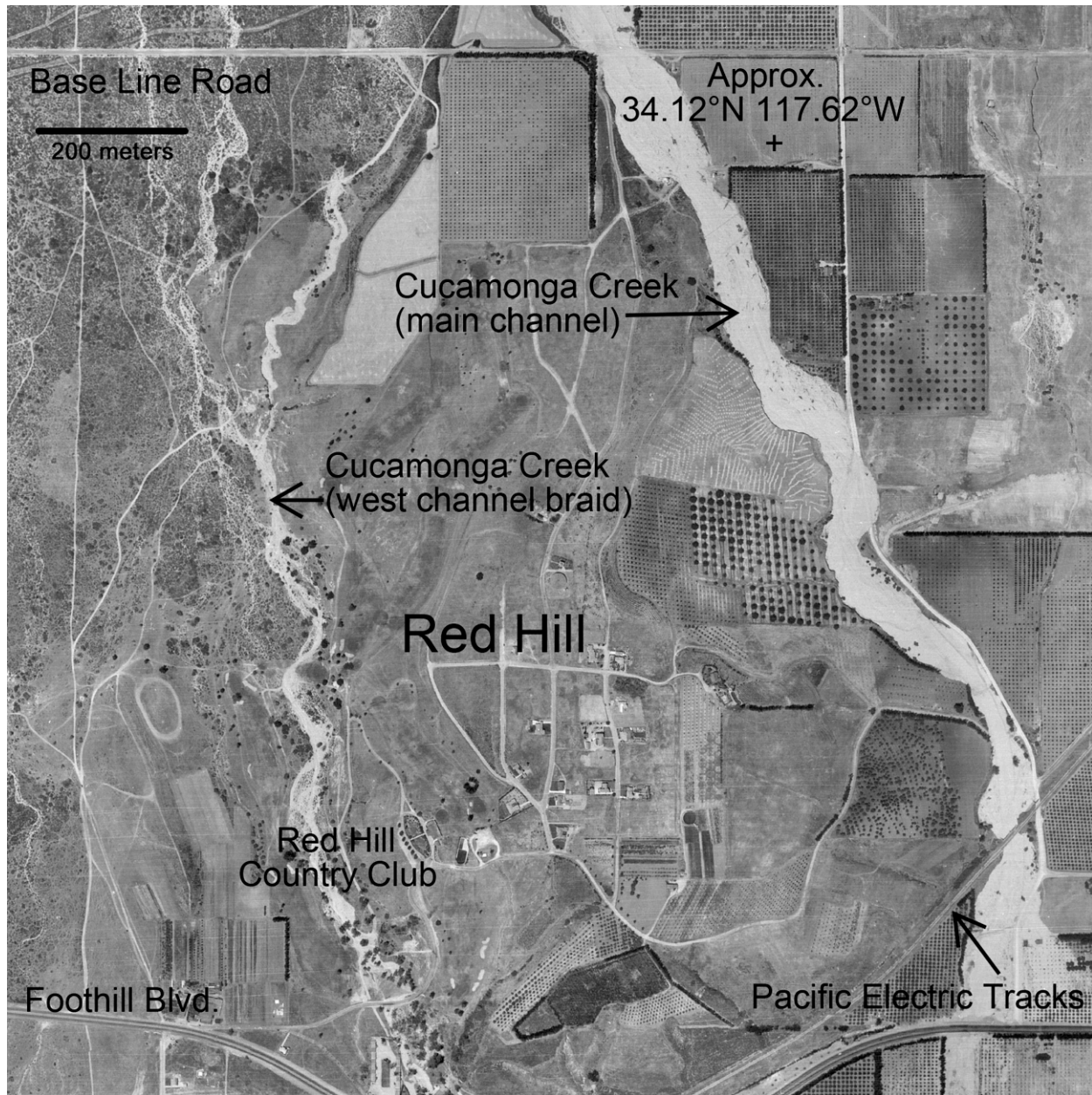


Figure 1. 1938 aerial view of Red Hill. The north to south distance between Base Line Road and Foothill Blvd. is about one mile. Laels added by author. Photo Credit NETROnline/Historic Aerials,

word Cucamonga apparently originated from a Native American place name for Red Hill, but online accounts of its meaning are inconsistent. Before development, the Cucamonga Creek floodplain above and below Red Hill consisted of multiple braided active and inactive washes, probably much like the present-day Lytle Creek alluvial fan, including washes on both sides of Red Hill (Figures 1 and 3). Perennial surface water was apparently present in one or both channels and surrounding marshland. A “fort-like” adobe structure was built at Red Hill and vineyards were planted in the area (probably on the alluvial fan rather than Red Hill itself) shortly after the land grant. The present-day Sycamore Inn (originally Mountain View Inn) was established in the mid-1800s at the foot of Red Hill, north of present-day Foothill Blvd.

Neither Johnston nor other collectors described land uses at Red Hill, with the exception of Johnston’s number 1786, *Potamogeton pectinatus*, “growing on bottom of cement reservoir.” Presumably, this reservoir stored water for irrigation, livestock, domestic use at the Inn, or possibly the earlier adobe structure. Modern development of Red Hill and the surrounding area had already begun by 1930 (the early street layout can be seen in Figure 1) and was essentially complete by 1954 (Figure 2, showing structures or orchards throughout the mesa surface). Cucamonga Creek was channelized east of Red Hill along the “main channel” labeled in Figure 1 and shown as an intermittent “blue line” feature in 1954 (Figure 2). What remained of the alluvial fan upstream and downstream of Red Hill was developed for aggregate mining,

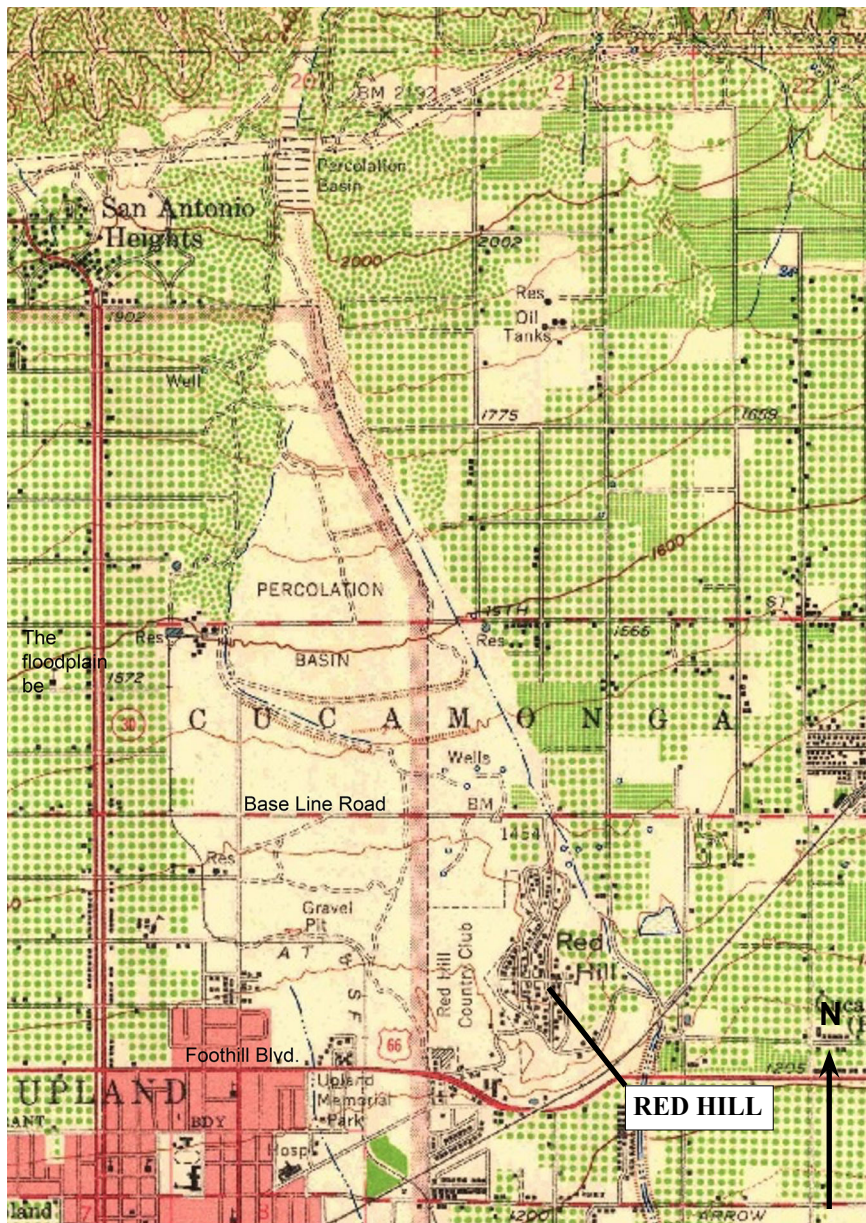


Figure 2. Detail of 1954 USGS 7.5-minute Ontario topographic quadrangle. Foothill Blvd. and Base Line Road labeled for scale. Compare with Figure 1 (United States Geological Survey 1954).

groundwater recharge, agricultural, residential, and commercial land uses. The Red Hill Country Club, in the channel braid west of Red Hill, began operation as a 9-hole golf course in 1921, but part of the present-day course still looked like an alluvial wash in the 1930 aerial view (Figure 1).

BOTANICAL COLLECTIONS

Samual Bonsall Parish (1838-1928) may have collected the first specimen at Red Hill on 17 April 1889. Label notes of his specimen number 2067 (*Sidalcea sparsifolia*) are transcribed as “Red Clay Hill” (capitalized) and the location is georeferenced as Red Hill. There are only a few other Parish specimens from April 1889 in the CCH data and these neither confirm nor refute the possibility that he may have been at Red Hill on that date. Parish’s specimen is the only *S. sparsifolia* record for the site (if it is correctly georeferenced), but habitat was apparently suitable

and the specimen is included in this compilation. Anstruther Davidson (1860-1932) collected another early specimen attributed to Red Hill, reported as “Sycamore Inn” on Davidson’s label, later identified as Red Hill by RSA-POM staff to georeference the location. CCH dates the specimen in 1875 and gives 1896 as its collection number, but Davidson’s labels are notoriously cryptic and he was not in California until 1889 (Los Angeles Times 1932); the specimen was probably collected in 1896. The plant, *Cornus nuttallii*, is primarily a montane species in southern California, and Davidson’s specimen, along with an undated San Bernardino area specimen collected by W.G. Wright (1831-1912 [Harvard University Herbaria and Libraries 2022]), are the only known regional occurrences below the mountains.

The most important collections at Red Hill were made by Ivan Johnston (1898-1960). As a teenager, he was a protégé of Parish and lived “just a few miles east of Claremont” (i.e., near Red Hill; see Munz 1961). His career is described in two obituaries (Correll 1961; Munz 1961). Johnston was an undergraduate botany student under Philip Munz (1892-1974) in 1918 during Munz’s first year at Pomona College in Claremont. Professor Munz, an entomologist from the Midwest, must have learned more of the local flora from his student than vice-versa (see Carlquist 1975). Johnston went on to study under W.L. Jepson (1867-1946) at UC Berkeley and then to a long career at Harvard.

Between April 1915 and July 1918, Johnston made specimens of 85 taxa at Red Hill, most of them represented by multiple collection dates or replicates (Appendix 1). These taxa do not represent a comprehensive flora of the site because many species that would have almost surely occurred there, especially on uplands, were not among Johnston’s collections. Instead, it seems that Johnston focused primarily on seasonal and perennial wetland taxa, along with incidental collection on uplands. Nonetheless, Johnston’s specimens provide lasting documentation of a unique site long since lost to development.

Samuel Parish collected again at Red Hill on 4 May 1917, presumably with Johnston who also has specimen records with the same date. Parish published a short note describing Red Hill “winter pools” and comparing them to similar pools in San Diego County and the Los Angeles coastal prairie (Parish 1917). Parish wrote, “[t]here are four or five of these pools, none of them more than a few yards wide in any part, and in depth less than two feet

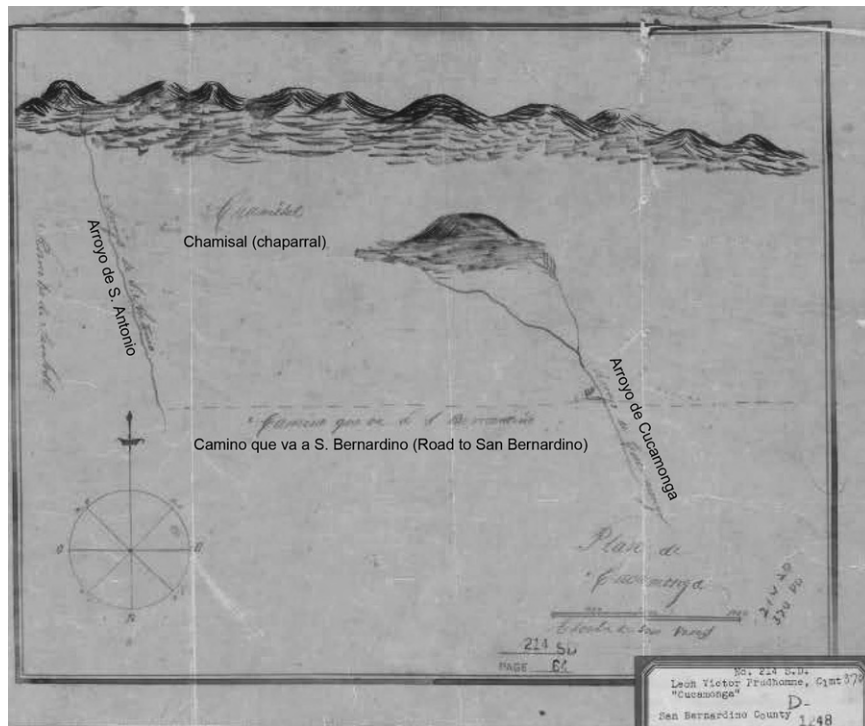


Figure 3. Sketch map (diseño) of the Rancho Cucamonga Land Grant showing Red Hill and adjacent wetlands and streams. Courtesy UC Berkeley, Bancroft Library.

below the surface of the red clay mesa in which they are situated” and “[i]n all of them was an abundant growth of *Psilocarphus globiferous* [*P. brevissimus*] and *Navarretia prostrata*, and in two of them patches of *Callitriche longipedunculata* [*C. marginata*].” These pools apparently were at the north end of the site (i.e., near Base Line Road), based on Munz’s herbarium label notes on his specimen 5557 (*Elatine brachysperma*, “desiccated pools at north end”). Parish also noted a *Deschampsia*, saying “I do not forgive myself for neglecting to collect specimens of this grass, for it is likely to be *D. gracilis* [*D. danthonioides*], another plant which was first found by Orcutt in the San Diego pools.” Parish need not have worried because Johnston and Munz each made multiple specimens of *D. danthonioides* at Red Hill (Appendix 1). In the subsequent decades the San Diego and Los Angeles County vernal pools have been well documented (e.g., Mattoni and Longcore [1997] described the Los Angeles coastal prairie and compiled its flora based largely on historical accounts and specimens), while the Red Hill vernal pools have disappeared both literally, beneath land development, and figuratively, from the botanical literature.

Philip Munz collected at Red Hill on two dates in May 1918 (one of them presumably with Johnston) and once in May 1922. He documented several species Johnston had not collected (Appendix 1). Later collectors Martha Hilend (1928), Louis C. Wheeler (1934), and Justin Wood (2009) added several upland species and aliens to the list. These collections further reinforce that Johnston’s collections do not constitute a flora, but instead reflect Johnston’s own focus and interests.

METHODS AND RESULTS

I have reviewed and generally confirmed the Red Hill specimens housed at RSA-POM and UCR, mostly incidental to my work on other floristic projects over the course of many years.

Additionally, I queried the CCH1 (2022) and CCH2 (2022) databases for all specimens reported from San Bernardino County with “Red Hill” in the locality field. I reviewed the records to confirm the location (there is another Red Hill in the Mojave Desert part of the county). In most cases “Red Hill” was on the original labels, while “Red Hill” was inserted during database georeferencing for some specimens. There are a few other specimens without “Red Hill” in the locality field that may also have been collected at Red Hill (e.g., several Parish specimens collected on or about the same date as his Red Hill collections, with the location “near Upland.”). These were not included in this compilation.

I did not confirm determinations of specimens at other herbaria, but I validated determinations to the extent feasible by viewing images as available and noting annotations reported in the data set or visible on images. Annotations are not always indicated in the CCH data so for species without annotations, “none seen” is stated in the compilation. Ambiguities such as duplicate specimens with differing determinations, or possible misidentifications, are noted where applicable in Appendix 1. I have high confidence in the determinations included in this compilation, based on (1) my own observations of the specimens or duplicates; (2) annotations

Table 1. Apparent regional extirpations of taxa historically documented at Red Hill. See Appendix 1 for additional information. Regions are defined in footnote in Appendix 1.

Taxon	Region of Apparent Extirpation		
	Southwestern San Bernardino County	San Bernardino County (entire)	Inland Empire Valleys
<i>Allium haematochiton</i>	×	×	
<i>Amsinckia eastwoodiae</i>	×	×	×
<i>Brodiaea jolonensis</i>	×		
<i>Callitriche marginata</i>	×	×	
<i>Carex pellita</i>	×		×
<i>Chaenactis carphoclinia</i>	×	×	×
<i>Cladium californicum</i>	×	×	×
<i>Cornus nuttallii</i>	×		×
<i>Deschampsia danthonioides</i>	×		
<i>Elatine brachysperma</i>	×		
<i>Hypericum scouleri</i>	×		×
<i>Isoetes orcuttii</i>	×	×	
<i>Isolepis cernua</i>	×		
<i>Linanthus dianthiflorus</i>	×		
<i>Lysimachia minima</i>	×	×	
<i>Maianthemum stellatum</i>	×		×
<i>Micropus californicus</i>	×		
<i>Muhlenbergia californica</i>	×		
<i>Muhlenbergia utilis</i>	×	×	×
<i>Navarretia prostrata</i>	×	×	
<i>Pilularia americana</i>	×	×	
<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i>	×		
<i>Sidalcea sparsifolia</i>	×		
<i>Woodwardia fimbriata</i>	×		

by other botanists, include experts; or (3) historic or extant local occurrences in comparable habitats. Two taxa (*Amsinckia eastwoodiae* and *Muhlenbergia utilis*) might be considered doubtful due to difficulty with identifications and their geographic ranges. Johnston’s specimens, if correctly identified, are the only regional records of both taxa (see notes in Appendix 1). Nonetheless, one or more duplicates of each species is annotated by one or more experts, as indicated by CCH.

I paraphrased pertinent label notes for each taxon and added commentary regarding regional habitat and distribution for each one based on personal observations, Roberts et al (2004), Munz (1974) and the CCH2 mapping interface for each taxon. Results are presented in Appendix 1. A total of 120 taxa have been collected at the site, including 106 native taxa, six special-status taxa (CNPS 2022), and 14 aliens.

DISCUSSION

Johnston’s specimens and a few others document a diverse wetland (e.g., four species of *Salix* and six species of *Juncus*), vernal pools, upland clay soils with their regionally important diversity, and two long-disjunct taxa not otherwise known from the region (*Cladium californicum* and *Muhlenbergia utilis*).

A total of 24 taxa historically known from Red Hill are apparently now extirpated from southwestern San Bernardino County, and 14 of these also are apparently extirpated from the entire county, the Inland Empire valleys, or both (Table 1). In some cases, Red Hill was the only known regional occurrence and the apparent regional extirpations result directly from development of the site. In other cases, the cumulative regional loss of vernal pools, wetlands, and upland clay soils have caused the extirpations by eliminating habitat at Red Hill and elsewhere.

The Red Hill specimens represent the only known San Bernardino County occurrences of five vernal pool taxa: *Isoetes orcuttii*, *Pilularia americana*, *Callitriche marginata*, *Navarretia prostrata*, and *Lysimachia minima*. If there were other vernal pools in pre-development San Bernardino County, they were not documented by the early botanists. The nearest known vernal pools are in western Riverside County at the Santa Rosa Plateau, Skunk Hollow, and the San Jacinto Valley (Lathrop and Thorne 1968, White 1994, Roberts et al. 2004). Pre-development wetlands were extensive in the San Bernardino area, documented by Parish among others, but most of the cismontane wetlands have been channelized, drained, and developed. For multiple taxa, Johnston's collections from Red Hill and Parish's or others' San Bernardino Valley specimens are the only documentation of their occurrence in southwestern San Bernardino County (e.g., *Cornus nuttallii*, described earlier). And two upland taxa collected at Red Hill represent their only known San Bernardino County occurrences: *Allium haematochiton* and *Brodiaea jolonensis*. Upland clay soils are found in scattered locations around western Riverside County (Roberts et al. 2004) and in some cases support special-status plants and floristic assemblages not seen on other substrates (Boyd 1983). These soils and assemblages are scarce in San Bernardino County, mostly found in the Chino Hills at the southwestern corner of the county. The biodiversity losses identified in Table 1 reinforce the regional importance of remaining vernal pools and upland clay soils in western Riverside County, and riparian habitats throughout the Inland Empire and surrounding mountains.

Johnston collected some alien species (e.g., *Hypochaeris glabra*) but relatively few by comparison with later collectors and the present-day regional flora. For example, *Bromus rubens* and *Lamarckia aurea* were not collected at Red Hill until Hilend collected them in 1928, ten years after Johnston's field work. Likewise, *Cerastium glomeratum*, *Erodium botrys*, and *Verbascum virgatum* were first collected at Red Hill by Wheeler in 1934. And numerous regionally abundant invasive plants (e.g., *Avena barbata*, *A. fatua*, *Chenopodium album*, *C. murale*, *Convolvulus arvensis*, *Erodium cicutarium*, *Hirschfeldia incana*) have never been collected at Red Hill. The absence of these taxa among Johnston's collections may suggest that he was disinterested in alien plants, focused more carefully on wetlands rather than uplands, or possibly absence of these species at Red Hill when Johnston was collecting there.

This approach to compiling and analyzing historic botanical specimens enables present-day biologists to understand long-absent habitat conditions at a site that has been completely altered by modern land uses. No doubt, there are data sets for other lost sites available through CCH for similar compilation. Looking forward, focused present-day botanical collections in key areas can provide data sets that future botanists may use to reconstruct early 21st century plant occurrences, much like Johnston's specimens are used here.

ACKNOWLEDGEMENTS

Many thanks to current and former herbarium curators and staff for access and assistance with the collections over many years: Andrew Sanders and Teresa Salvato (UCR), and Steve Boyd, Mare Nazaire, LeRoy Gross, Tim Ross, Erica Gardner, and Erin Berkowitz (RSA-POM). Thanks also to Marc Baker, Steve Boyd, Frankie Coburn, and Michael Honer for their helpful reviews of an earlier draft of the manuscript.

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APPENDIX 1: COMPILATION OF RED HILL SPECIMENS¹

LYCOPHYTES

Isoetaceae

Isoetes orcuttii A.A. Eaton. **Specimens:** *I. M. Johnston s.n. 8 Mar 1917* US; 34 UC; 1184 RSA, POM, CAS; 1831 RSA, POM, UC, US; *P. A. Munz 2100* POM; *S. B. Parish 11151* UC. **Annotation:** multiple. **Representative label notes:** “Desiccated bottoms of winter pools on a clay mesa,” “shallow winter pools,” “grassy mesa top.” **Comments:** Vernal pool species. These are the only San Bernardino County records in CCH. Possibly now extirpated in the county. Occurs in Riverside County at Santa Rosa Plateau and in May Valley (San Jacinto Mountains).

FERNS

Blechnaceae

Woodwardia fimbriata Sm. **Specimens:** *I. M. Johnston s.n. 9 Dec 1916* POM; *s.n. 6 Oct 1917* CAS. **Annotation:** Steve Boyd (2001). **Representative label notes:** “Cool, swampy place. A few plants are found along the creek on east side,” “not uncommon along creek.” **Comments:** Riparian species; this is the only CCH San Bernardino County location outside the San Gabriel and San Bernardino mountains. Scarce at lower elevations in western Riverside County (Box Springs Mountains, Temescal Canyon) and more common in the Santa Ana and San Jacinto Mountains.

Marsileaceae

Pilularia americana A. Braun. **Specimens:** *I.M. Johnston s.n. 8 Apr 1917* RSA; 33 UC; 34 UCR; 1183 POM, UC, CAS (all collected 8 Apr 1917); *S. B. Parish 11152* UC. **Annotation:** Steve Boyd (2001). **Representative label notes:** “Desiccating pools on clay mesa,” “drying bottoms of winter pools on top of clay mesa,” “shallow winter pond, now dry.” **Comments:** Vernal pool and seasonal wetland species; these are the only San Bernardino County records in CCH. Scattered occurrences in Santa Ana Mountains and interior valleys of western Riverside County.

¹ Nomenclature and taxonomy follow the Jepson eFlora (Jepson Flora Project 2023). Asterisk (*) indicates alien taxa, dagger (†) indicates special-status species. CRPR = California Rare Plant Rank (CNPS 2022). Herbarium codes conform to the Index Herbariorum (<https://sweetgum.nybg.org/science/ih/>). Hickman (ed.) 1993 and Baldwin et al. (eds.) 2012 are abbreviated as TJM1 and TJM2, respectively. “Western Riverside County” refers to the area covered in Roberts et al. (2004); “southwestern San Bernardino County” refers to the cismontane portion of the county (roughly from the Chino Hills, north to the San Gabriel Mountain foothills above Upland, and east to Yucaipa); “Inland Empire” refers to the interior valleys bounded by the San Gabriel and San Bernardino Mountains to the north, the Chino Hills and Santa Ana Mountains to the west, the Palomar Mountains at the south, and San Jacinto Mountains to the east. This encompasses western Riverside County (excluding the Santa Ana Mountains), southwestern San Bernardino County, and southeastern Los Angeles County east of State Route 57.

Pteridaceae

Pellaea andromedifolia (Kaulf.) Fée var. *andromedifolia*. **Specimens:** *I.M. Johnston s.n. 31 Dec 1916* POM; 92 UC. **Annotation:** Steve Boyd (2001). **Representative label notes:** “Shady cliff under shrubs.” **Comments:** Regionally widespread in natural habitats.

Pentagramma triangularis (Kaulf.) Yatsk., Windham & E. Wollenw. **subsp. triangularis**. **Specimens:** *I.M. Johnston 93* UC. **Annotation:** D.M. Smith (1986). **Representative label notes:** “Shady clay bank”. **Comments:** Regionally widespread in natural habitats.

EUDICOTS

Anacardiaceae

Schinus molle* L. **Specimens: *Louis C. Wheeler 1371* LA, RSA, POM, CASC, UC, RENO, GH (11 Sep 1932). **Annotation:** None seen. **Representative label notes:** “Several volunteer trees in this vicinity,” “Clay railroad embankment.” **Comments:** Naturalizing occasionally throughout Inland Empire from ornamental plantings, more strongly invasive in chaparral farther west. This is an early record of a naturalizing occurrence.

Apiaceae

Sanicula arguta Greene ex Coult. & Rose. **Specimens:** *I. M. Johnston 1182* POM; *P. A. Munz 2109* POM. **Annotation:** P. Vargas (1996). **Representative label notes:** “grassy slope.” **Comments:** Upland clay soil species. This is the only CCH San Bernardino County location other than the Chino Hills area in the extreme southwest corner of the county. Occurs on similar soils in western Riverside County.

Asteraceae

Baccharis glutinosa Pers. [*B. douglasii* DC]. **Specimens:** *I.M. Johnston 1813* CAS, POM, UC. **Annotation:** Scott Sundberg (1987). **Representative label notes:** “moist ground.” **Comments:** Wetland species. Rare in San Bernardino County, historically known from wetlands around San Bernardino and Colton, probably extant in the Chino Hills area (collected in 1992). Note that this taxon is distinct from the common *B. salicifolia* (see note in TJM2).

Baccharis salicina Torr. & A. Gray [*B. emoryi* A. Gray]. **Specimens:** *I.M. Johnston s.n. 9 Dec 1916* POM; 25 UC. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Riparian species. Uncommon in cismontane San Bernardino County, historically known from wetlands around San Bernardino and Colton, probably extant around Colton and Chino Hills.

Chaenactis carphoclinia A. Gray var. *carphoclinia*. **Specimens:** Parish 11167 UC **Annotation:** None seen. **Representative label notes:** “Mesa, Upland.” **Comments:** Desert species. This is the only Inland Empire record mapped in CCH. Red Hill is an unexpected locality but plausible because it is not far from the southwest Mojave Desert via Cajon Pass.

Eriophyllum multicaule (DC.) A. Gray. **Specimens:** I.M. Johnston s.n. 6 May 1917 POM; Martha Hilend 159 LA. **Annotation:** Dale E. Johnson (1978). **Representative label notes:** “Damp sand along creek.” **Comments:** Regionally widespread on remaining alluvial fan and bajada habitats.

Helenium puberulum DC. **Specimens:** I.M. Johnston 1653 POM, CAS, UC. **Annotation:** None seen. **Representative label notes:** “Common in open springy ground,” “rather common in swampy ground.” **Comments:** Generally riparian; uncommon in cismontane valleys, more common in mountain foothills.

****Hypochaeris glabra*** L. **Specimens:** I.M. Johnston 97 CAS, UC; 1185 POM; 1195 CAS, POM. **Annotation:** None seen. **Representative label notes:** “Dry clay soil on mesa.” **Comments:** Common invasive weed.

Micropus californicus Fisch. & C. A. Mey. **Specimens:** I.M. Johnston s.n. 23 Apr 1918 POM. **Annotation:** None seen. **Representative label notes:** “Dry ground.” **Comments:** Scarce in interior valleys, mostly on upland clay soils, historically from valley floor sites in southwestern San Bernardino County. Scarce in San Bernardino and San Gabriel mountains foothills, more common in Santa Ana Mountains, Palomar Mountains, and Santa Rosa Plateau.

Microseris heterocarpa (Nutt.) Chambers. **Specimens:** I.M. Johnston s.n. 25 Apr 1918 POM. **Annotation:** K.L. Chambers (1954). **Representative label notes:** None. **Comments:** Clay soil species; scarce in San Bernardino County; historically known from San Bernardino Valley, still extant in the Chino Hills area, in the extreme southwest corner of the county. More widespread in western Riverside County.

Pseudognaphalium californicum (DC.) Anderb. [*Gnaphalium* c. DC.] **Specimens:** I.M. Johnston 1206 POM. **Annotation:** None seen. **Representative label notes:** “Dry mesa.” **Comments:** Regionally widespread in natural and disturbed habitats.

Psilocarphus brevissimus Nutt. var. *brevissimus*. **Specimens:** I.M. Johnston s.n. 25 Apr 1918 POM; P.A. Munz 2099 POM; S.B. Parish 11156 CAS, UC. **Annotation:** Arthur Cronquist (1949). **Representative label notes:** “Grassy mesa top,” “desiccated pools.” **Comments:** Vernal pools, mud flats, wetland margins; widespread in Big Bear Valley (San Bernardino Mountains), probably extirpated from southwestern San Bernardino County. Widespread but narrowly confined to suitable habitat in western Riverside County.

†***Symphotrichum defoliatum*** (Parish) G.L. Nesom [*Aster bernardinus* H.M. Hall]. **Specimens:** I.M. Johnston 95 UCR; 753 POM, UC. **Annotation:** None seen. **Representative**

label notes: “Hillside.” **Comments:** Wetlands; scarce in scattered cismontane Inland Empire locations. More common in San Bernardino and San Jacinto Mountains and west Mojave Desert (Mojave River). CRPR 1B.2.

Boraginaceae

Amsinckia eastwoodiae J.F. Macbr. **Specimens:** I.M. Johnston 88 UC, JEPS; 1175 POM, UC; 1836 POM, UC, GH; 1872 POM, UC, GH. **Annotation:** Fran Chisaki (I.M. Johnston 88 no date); Suksdorf (I.M. Johnston 1836, as *A. johnstonii* Suksdorf). **Representative label notes:** “Abundant on grassy mesa top. Verified by Macbride,” “top of clay mesa among grass.” **Comments:** More common in central California and in coastal southern California but apparently very rare in and around San Bernardino County. Johnston’s specimens from Red Hill and one additional specimen collected near Rialto are the only San Bernardino County records. Johnston 1872 is the type specimen of *A. johnstonii*, a synonym of *A. eastwoodiae*. But validity of these local occurrences may be questionable; two duplicates of Johnston 1872 have been annotated as *A. intermedia* and original determinations of the others have not been revisited by an expert in many decades.

Amsinckia intermedia Fisch. & C.A. Mey. *sensu stricto* [*A. menziesii* (Lehm.) A. Nels. & J.F. Macbr. var. *intermedia* (Fisch. & C.A. Mey.) Ganders]. **Specimens:** I. M. Johnston s.n. 31 Dec 1916 RSA, POM; 39 UC; 1838 POM, GH; 1872 RSA, UCR. **Annotation:** Ray & Chisaki (1957). **Representative label notes:** “Common on grassy mesa top.” **Comments:** Widespread and regionally common in natural habitats and weedy annual grasslands. See notes at *A. eastwoodiae* regarding Johnston 1872.

Amsinckia menziesii (Lehm.) A. Nels. & J.F. Macbr. *sensu stricto* [*A.m.* var. *menziesii*]. **Specimens:** I. M. Johnston 1835 POM, GH, UC; 1870 GH, POM; P.A. Munz 2108 UC. **Annotation:** Suksdorf (1931). **Representative label notes:** “Common on grassy mesa top,” “grassy slopes on hill.” **Comments:** These are probably *A. retrorsa* Suksdorf as treated in TJM2 and the Jepson Herbarium eFlora. It is widespread and regionally common in natural habitats and weedy annual grasslands, whereas *A. menziesii* is apparently scarce in the region. Suksdorf annotated Johnston 1835 UC as *A. parviflora* Heller, a synonym of *A. retrorsa* Suksdorf, (Abrams 1951) which in turn has been considered a synonym of *A. menziesii* var. *menziesii* (Munz 1974).

Cryptantha intermedia (A. Gray) Greene. **Specimens:** Anon. s.n. 1 Apr 1928 POM. **Annotation:** A.C. Sanders (1990). **Representative label notes:** “Near Red Hill, Upland.” **Comments:** Widespread and regionally common in natural habitats and annual grasslands.

Plagiobothrys canescens Benth. **Specimens:** J. Wood 321 RSA. **Annotation:** A.C. Sanders. **Representative label notes:** “Occasional; hillside of remnant sage scrub behind the Sycamore Inn.” **Comments:** Fairly common in shrublands

and grasslands. Since this is the only specimen, it suggests that Johnston and other early collectors did not focus their collections in coastal sage scrub.

Plagiobothrys collinus (Philb.) I.M. Johnston var. ***californicus*** (A. Gray) Higgins. **Specimens:** *I.M. Johnston 1839* POM; *P.A. Munz 2097* POM. **Annotation:** I.M. Johnston. **Representative label notes:** “Grassy mesa top,” “grassy slope.” **Comments:** Regionally widespread in lower elevation shrublands and grasslands.

Plagiobothrys nothofulvus (A. Gray) A. Gray. **Specimens:** *I.M. Johnston 1837* POM; *P.A. Munz 2114* POM. **Annotation:** None seen. **Representative label notes:** “Grassy mesa top,” “grassy slope.” **Comments:** Regionally widespread in shrublands and grasslands.

Plagiobothrys tenellus (Nutt. ex Hook.) A. Gray. **Specimens:** *I.M. Johnston 1840* POM, UC; *P.A. Munz 2118* POM. **Annotation:** None seen. **Representative label notes:** “Grassy mesa top,” “grassy slope.” **Comments:** Regionally widespread in shrublands and grasslands; valleys and mountains.

Brassicaceae

****Brassica nigra*** (L.) W.D.J. Koch. **Specimens:** *P.A. Munz 5561* POM, UC. **Annotation:** None seen. **Representative label notes:** “Light sandy soil,” “Upland, common weed.” **Comments:** Widespread and often abundant invasive weed, mostly farther west than Red Hill. It is interesting to note that *Hirshfeldia incana* (L.) Lagr.-Fossat was not documented among these early collections, though it is now much more common regionally than *B. nigra*.

Caryophyllaceae

****Silene gallica*** L. **Specimens:** *P.A. Munz 2117* POM. **Annotation:** None seen. **Representative label notes:** “Grassy slope.” **Comments:** Common and widespread weed.

****Cerastium glomeratum*** Thuill. **Specimens:** *L.C. Wheeler 2391* RSA. **Annotation:** None seen. **Representative label notes:** “Damp sunny clay hill.” **Comments:** Common and widespread weed.

Chenopodiaceae

Chenopodium californicum (S. Watson) S. Watson. **Specimens:** *M. Hilend 158* RSA. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Regionally widespread in native habitats.

Convolvulaceae

Cuscuta subinclusa Durand & Hilg. **Specimens:** *I.M. Johnston s.n.4 Jul 1918* RSA. **Annotation:** Mihai Costea (2006). **Representative label notes:** “Marshy ground, on *Artemisa* in creek bottom.” **Comments:** Regionally widespread parasite on riparian herbs and shrubs. The most likely host species are

probably *Artemisia douglasiana* Besser or *A. dracuncululus* L., but neither species is recorded from the site.

Cornaceae

Cornus nuttallii Audubon ex Torr. & A. Gray. **Specimens:** *Anstruther Davidson 1896* RSA. **Annotation:** None seen. **Representative label notes:** “Sycamore Inn.” **Comments:** Riparian tree. Widespread in the western San Bernardino Mountains, but the only CCH records mapped in the southwestern part of the county are this and one historic record from San Bernardino.

Crassulaceae

Crassula connata (Ruiz & Pav.) A. Berger. **Specimens:** *L.C. Wheeler 2392* RSA. **Annotation:** None seen. **Representative label notes:** “Damp sunny clay hill.” **Comments:** Widespread in native habitats.

Elatinaceae

Elatine brachysperma A. Gray. **Specimens:** *P. A. Munz 5557* POM. **Annotation:** None seen. **Representative label notes:** “Desiccated pools at north end.” **Comments:** Wetlands (pond margins, vernal pools). Known from a few vernal pools and similar sites in Riverside County, and from higher elevations in the mountains. This was the only CCH occurrence in southwestern San Bernardino County.

Fabaceae

Astragalus didymocarpus Hook. & Arn. **Specimens:** *I.M. Johnston 1188* CAS, POM, UC. **Annotation:** None seen. **Representative label notes:** “Common on mesa top.” **Comments:** Uncommon in native shrublands in southwestern San Bernardino County, somewhat more common in western Riverside County; common and widespread in the deserts. It is unclear which variety this is. The specimen at POM is reported as *A. d.* var. *dispermus* (A. Gray) Jeps. and the one at CAS as *A. d.* var. *didymocarpus*. Images and annotation histories are not available online.

Astragalus gambelianus E. Sheld. **Specimens:** *I.M. Johnston 1187* CAS, POM, UCR, UC, US. **Annotation:** Scott D. White (2007). **Representative label notes:** “Common on mesa top.” **Comments:** Widespread, open places in natural habitats, generally on clay soils; uncommon in San Bernardino County, more common in Riverside County.

Astragalus pomonensis M.E. Jones. **Specimens:** *I.M. Johnston 35* RSA, UC; *1205* CAS, UC; *1845* RSA; *1846* RSA; *P.A. Munz 2107* POM; *L.C. Wheeler 1578* RSA; *2502* RSA, CHSC, UCR, CAS, UC. **Annotation:** None seen. **Representative label notes:** “Very common,” “grassy slope,” “dry clay hillside,” “grassy mesa top.” **Comments:** Widespread and fairly common throughout region on bajadas and valley floors, often on disturbed soils.

Acmispon brachycarpus (Benth.) D.D. Sokoloff [*Lotus humistratus* Greene]. **Specimens:** *I.M. Johnston 1189* RSA, UC. **Annotation:** None seen. **Representative label notes:** “Grassy mesa top.” **Comments:** Scarce in southwestern San Bernardino County, fairly widespread in western Riverside County and Mojave Desert. An apparent duplicate of *Johnston 1189* at RSA is reported as *A. wrangelianus* (below).

Acmispon heermannii (Durand & Hilg.) Brouillet [*Lotus h.* (Durand & Hilg.) Greene]. **Specimens:** *I.M. Johnston s.n.6 May 1917* POM. **Annotation:** None seen. **Representative label notes:** “Damp sand along creek.” **Comments:** Widespread and fairly common throughout region and surrounding mountains, especially on sandy or loamy alluvial soils.

Acmispon micranthus (Torr. & A. Gray) Brouillet [*Lotus hamatus* Greene]. **Specimens:** *I.M. Johnston 1193* RSA, UCR. **Annotation:** R.F. Thorne (1993). **Representative label notes:** None. **Comments:** Widespread and fairly common throughout region, especially on clay soils.

Acmispon wrangelianus (Fisch. & C.E. Mey.) D.D. Sokoloff [*Lotus w.* Fisch. & C.E. Mey.]. **Specimens:** *I.M. Johnston 1189* POM; *P.A. Munz 2110* POM; *5558* POM; *L.C. Wheeler 2500* RSA, UC. **Annotation:** None seen. **Representative label notes:** “Grassy slope,” “dry heavy soil on mesa,” “dry clay hillside.” **Comments:** Scattered locations in southwestern San Bernardino County, more common in western Riverside County.

Lupinus bicolor Lindl. subsp. *microphyllus* (S. Watson) D.B. Dunn. **Specimens:** *I.M. Johnston 1871* SBBG, POM; *P.A. Munz 2103* POM. **Annotation:** None seen. **Representative label notes:** “Grassy mesa,” “grassy slope,” “An abundant albino form making white large areas on grassy mesa.” **Comments:** Widespread and common, seems to persist in weedy annual grasslands. But Johnston’s label notes (SBBG specimen) on color and abundance suggest it contributed to a much greater spring floral display in 1918 than can be seen locally today.

Lupinus microcarpus Sims var. *densiflorus* (Benth.) Jepson [incl. *L. densiflorus* Benth. vars. *aureus* (Kellogg) Munz and *lacteus* (Kellogg) C.P. Smith]. **Specimens:** *I.M. Johnston 1186* POM, UC, US; *1202* RSA, UC; *P.A. Munz 5559* POM; *L.C. Wheeler 2501* LA, RSA. **Annotation:** Rhonda L. Riggins (1996). **Representative label notes:** “Dry clay hillside,” “dry heavy soil on mesa.” **Comments:** Widespread but not common in natural habitats and annual grasslands throughout the region, diminishing with soil disturbance and invasive species.

Lupinus excubitus M.E. Jones var. *excubitus*. **Specimens:** *L.C. Wheeler 1579* CAS, RSA, LA. **Annotation:** Rhonda L. Riggins (1994). **Representative label notes:** “Sunny clay field.” **Comments:** Primarily occurs on desert slopes of the San Gabriel and San Bernardino Mountains, but very similar to other shrubby *Lupinus* taxa in cismontane southern California valleys. These seem to be increasingly uncommon in coastal sage scrub and lower elevation chaparral.

Distinctions among the taxa are unclear; duplicates of *Wheeler 1579* at RSA and LA are reported as *L. formosus* Greene var. *bridgesii* (S. Watson) Greene which is noted as a minor variant of *L. formosus* in Munz (1974) and not recognized in TJM1 or TJM2. Additionally *L. excubitus* var. *excubitus* is difficult to distinguish from *L. albifrons* Benth. var. *hallii* (Abrams) Jeps. [= *L. excubitus* var. *hallii* (Abrams) C.P. Sm.], which is probably more likely to be found at this elevation.”

Trifolium alboburpureum Torr. & A. Gray *sensu stricto* [*T. a.* var. *alboburpureum*]. **Specimens:** *I.M. Johnston 1190* POM, UC. **Annotation:** None seen. **Representative label notes:** “Dry mesa top.” **Comments:** Widespread and still fairly common regionally, mainly in heavy soils, but evidently declining due to exclusion by annual weedy grasses.

Trifolium ciliolatum Benth. **Specimens:** *I.M. Johnston 1194* POM, UC. **Annotation:** None seen. **Representative label notes:** “Common on mesa top.” **Comments:** Widespread in Inland Empire and adjacent San Gabriel, San Bernardino, and Santa Ana mountains

Trifolium depauperatum Desv. var. *truncatum* (Greene) McDermott ex Isely. **Specimens:** *I.M. Johnston 1192* UC, POM; *L.C. Wheeler 2395* POM. **Annotation:** Michael A. Vincent (1998). **Representative label notes:** “Mesa tops,” “damp sunny clay hill.” **Comments:** Clay soils; scarce in San Bernardino County; widespread but decreasing in western Riverside County. *Wheeler 2395* is reported in CCH as *T. depauperatum* var. *amplectans* (Torr. & A. Gray) McDermott but TJM1 and TJM2 treatments describe that taxon’s range as central and northern California.

Trifolium gracilentum Torr. & A. Gray. **Specimens:** *I.M. Johnston 1191* POM. **Annotation:** None seen. **Representative label notes:** “Dry mesa top.” **Comments:** Largely clay soils; scarce in San Bernardino County; widespread but decreasing in western Riverside County.

Geraniaceae

Erodium botrys* (Cav.) Bertol. **Specimens: *L.C. Wheeler 1577* RSA. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Widespread weed, often on clay soils, mostly in annual grasslands, less often in shrublands. Generally less common than *E. cicutarium* (L.) L’Hér.

Geranium carolinianum L. **Specimens:** *I.M. Johnston 1209* POM, UC. **Annotation:** None seen. **Representative label notes:** “Swampy ground.” **Comments:** Native, seasonal wetlands and upland clay soils, a few scattered occurrences in the Inland Empire and surrounding mountains.

Grossulariaceae

Ribes aureum Pursh var. *gracillimum* (Coville & Britton) Jeps. **Specimens:** *I.M. Johnston s.n. 9 Dec 2016* CAS; *23* UCR, UC; *1177* CAS, UC; *P.A. Munz 5565* POM, UC. **Annotation:** M.R. Mesler (2009). **Representative label notes:** “Wash west of the hill,” “sheltered places in wash.” **Comments:** Fairly

common in San Gabriel Mountain foothills and bajadas, less common farther east and south in San Bernardino and Riverside counties; much more common in Los Angeles County.

Hydrophyllaceae

Phacelia distans Benth. **Specimens:** *M. Hilend s.n. 1 Apr 1928* RSA. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Widespread in natural habitats in the Inland Empire and throughout most of southern California.

Phacelia minor (Harvey) Thellung. **Specimens:** *J.M. Wood 322* RSA, UCR. **Annotation:** None seen. **Representative label notes:** “Sycamore/oak woodland, adjacent hillside with remnant coastal sage scrub with *Dichelostemma*, *Artemisia*.” **Comments:** Widespread in natural habitats throughout cismontane southern California.

Hypericaceae

Hypericum scouleri Hook. [*H. formosum* Kunth var. *scouleri* (Hook.) J.M. Coult.]. **Specimens:** *I.M. Johnston 1732* CAS, POM, RSA, UC. **Annotation:** Jennifer Talbot (1988). **Representative label notes:** “Common in open springy spots.” **Comments:** Wetland species; widespread in the San Gabriel, San Bernardino, and San Jacinto mountains; Red Hill was the only CCH record from Inland Empire valleys.

Lamiaceae

Salvia columbariae Benth. **Specimens:** *M. Hilend s.n. Apr 1928* RSA. **Annotation:** K. R. Neisess (1984). **Representative label notes:** None. **Comments:** Widespread and common in natural habitats throughout Inland Empire.

Malvaceae

Sidalcea sparsifolia (C.L. Hitchc.) S.R. Hill [*S. malviflora* (DC.) A. Gray subsp. *sparsifolia* C.L. Hitchc.]. **Specimens:** *Parish 2067* GH. **Annotation:** none seen. **Representative label notes:** “Red clay hill.” **Comments:** Scarce in San Bernardino County, where known from only a few historic specimens in San Bernardino Valley and hills around Redlands and Mentone. The only specimen collected in the county since 1950 is from the Pisgah Peak area (San Bernardino Mountains). Occasional in western Riverside County and more common in the surrounding Santa Ana and San Jacinto mountains.

Onagraceae

Camissoniopsis micrantha (Hornem. ex Spreng.) W.L. Wagner & Hoch [*Camissonia m.* (Hornem. ex Spreng.) P.H. Raven]. **Specimens:** *I.M. Johnston 1196* POM, UC. **Annotation:** Peter H. Raven (1964). **Representative label notes:** “Damp

sand along creek.” **Comments:** Widespread and common in natural habitats throughout Inland Empire.

Epilobium canum (Greene) Raven subsp. *canum*. **Specimens:** *I.M. Johnston 1803* RSA, POM, UC, CAS. **Annotation:** Peter C. Hoch (1979). **Representative label notes:** “Dry hillside.” **Comments:** Widespread throughout Inland Empire, generally near seasonal or perennial streams or shaded slopes.

Epilobium ciliatum Raf. **Specimens:** *L.C. Wheeler 1370* RSA. **Annotation:** None seen. **Representative label notes:** “Along stream on sunny clay hill.” **Comments:** Common and widespread throughout Inland Empire in seasonally mesic natural riparian and anthropogenic habitats.

Orobanchaceae

Castilleja affinis Hook. & Arn. subsp. *affinis*. **Specimens:** *I.M. Johnston 1198* POM; *M. Hilend 153* LA. **Annotation:** None seen. **Representative label notes:** “Dry mesa.” **Comments:** Native upland shrublands; widespread throughout Inland Empire.

Castilleja exserta (A. Heller) T.I. Chuang & Heckard subsp. *exserta* [*Orthocarpus purpurascens* Benth. var. *pallidus* D.D. Keck]. **Specimens:** *P. A. Munz 2106* POM. **Annotation:** David D. Keck (1926). **Representative label notes:** “Grassy slope, sandy soil.” **Comments:** Native upland grasslands and open shrublands; widespread but declining throughout Inland Empire.

Papaveraceae

Eschscholzia californica Cham. **Specimens:** *I.M. Johnston 75* POM. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Upland grasslands and shrublands; widespread throughout Inland Empire; also often in disturbed soils, usually as escaped cultivated selections originating from wildflower seed mixes.

Platystemon californicus Benth. **Specimens:** *I.M. Johnston 1208* CAS, UC, *1278* POM, *1288* POM. **Annotation:** Gary L. Hannan (1989). **Representative label notes:** “Abundant on mesa top.” **Comments:** Native upland grasslands and shrublands; often on clay soils, increasingly uncommon and does not seem to persist with alien grasses or soil disturbance.

Phrymaceae

Diplacus brevipes (Benth.) G.L. Nesom [*Mimulus brevipes* Benth.]. **Specimens:** *I.M. Johnston 1203* POM, UC, CAS. **Annotation:** David M. Thompson. **Representative label notes:** “Dry mesa edge among shrubs.” **Comments:** Widespread in open places of upland shrublands, mostly on xeric exposures, throughout Inland Empire.

Erythranthe floribunda (Lindl.) G.L. Nesom [*Mimulus floribundus* Lindl.]. **Specimens:** *I.M. Johnston s.n. 4 Jul 1918* POM. **Annotation:** Adele Lewis Grant. **Representative label notes:** “Along creek, sandy ground.” **Comments:** Riparian;

widespread throughout Inland Empire and surrounding mountains.

Erythranthe guttata (DC.) G.L.Nesom [*Mimulus guttatus* DC.].
Specimens: *I.M. Johnston* 1204 RSA, POM, UC, CAS.
Annotation: G.L. Nesom (2011). **Representative label notes:** “Swampy ground.” **Comments:** Streams, seeps, pond margins, etc.; widespread and often common throughout Inland Empire and surrounding mountains.

Plantaginaceae

Callitriche marginata Torr. **Specimens:** *I.M. Johnston* 1948 POM, UC; 1756 POM, UC; *S.B. Parish* 11153 UC.
Annotation: R. V. Lansdown, (2007). **Representative label notes:** “Abundant,” “desiccating bottoms of winter pools, carpeting the ground.” **Comments:** Vernal pools. This is the only mapped CCH San Bernardino County occurrence. Several historic occurrences and a few extant occurrences in western Riverside County.

Veronica peregrina L. var. *xalapensis* (Kunth) Pennell.
Specimens: *I.M. Johnston s.n.* 25 May 1918 POM; *P.A. Munz* 2102 POM. **Annotation:** *P.A. Munz* (1922). **Representative label notes:** “Grassy slope,” “dried bed of pools.” **Comments:** Vernal pools and other seasonal wetlands; only a few records in southwestern San Bernardino County, more common in the San Bernardino Mountains and western Riverside County.

Platanaceae

Platanus racemosa Nutt. **Specimens:** *I.M. Johnston s.n.* 4 Mar 1917 POM; 42 UC; 1172 CAS, UC. **Annotation:** None seen. **Representative label notes:** “Occasional on mesa top,” “along creek.” **Comments:** Fairly common and often characteristic of riparian woodlands throughout southern California.

Polemoniaceae

Gilia angelensis V.E. Grant. **Specimens:** *I.M. Johnston* 41 UC.
Annotation: None seen. **Representative label notes:** “On mesa top.” **Comments:** Common and widespread in natural habitats and annual grasslands throughout Inland Empire and surrounding mountain foothills.

Leptosiphon parviflorus Benth. [*Linanthus p.* (Benth.) Greene].
Specimens: *I.M. Johnston* 1199 POM, UC. **Annotation:** Douglas W. Schemske (1996). **Representative label notes:** “Grassy mesa edge.” **Comments:** In southwestern San Bernardino County, still extant around Yucaipa but all other mapped CCH collections are historic. Uncommon and widely scattered throughout Inland Empire valleys, more common in surrounding mountains.

Linanthus dianthiflorus (Benth.) Greene. **Specimens:** *I.M. Johnston* 87 UC. **Annotation:** None seen. **Representative label notes:** “Covering ground after a burn in brush.” **Comments:** Widespread but localized in Inland Empire, tends to occur on clay soils. No mapped CCH collections

in southwestern San Bernardino County since 1950. It is noteworthy that it was collected only once at Red Hill, where it was a fire follower.

†**Navarretia prostrata** (A. Gray) Greene. **Specimens:** *I.M. Johnston* 1201 POM, UCR, CAS, UC; *P.A. Munz* 2105 POM.
Annotation: Stanley C. Spencer (1996). **Representative label notes:** “Abundant on drying bottom of winter pools.” **Comments:** Vernal pools. This was the only San Bernardino County occurrence, and the Santa Rosa Plateau vernal pools are the only mapped western Riverside County occurrences. CRPR 1B.2.

Polygonaceae

Polygonum lapathifolium L. **Specimens:** *I.M. Johnston s.n.* Oct 1916 POM. **Annotation:** None seen. **Representative label notes:** “Swampy ground in the open.” **Comments:** Wetlands. Widespread and common in suitable habitat throughout Inland Empire.

Persicaria punctata (Elliott) Small [*Polygonum punctatum* Elliott]. **Specimens:** *I.M. Johnston s.n.* Dec 1916 POM; 94 UCR; UC. **Annotation:** A.C. Sanders (2020), L. Gross (2007). **Representative label notes:** “Swampy, shady place in willow thicket,” “shady place in swamp.” **Comments:** Wetlands. Scarce at a few sites in Inland Empire and surrounding mountains.

***Rumex crispus** L. **Specimens:** *P.A. Munz* 2231 POM. **Annotation:** None seen. **Representative label notes:** “Springy place.” **Comments:** Widespread and common weed in and around natural wetlands, drainageways, irrigated sites, stock ponds, etc. throughout the region.

Primulaceae

Lysimachia minima (L.) U. Manns & Anderb. [*Anagallis m.* (L.) E.H.L. Krause; *Centunculus minimus* L.]. **Specimens:** *P.A. Munz* 5556 POM, UC. **Annotation:** None seen. **Representative label notes:** “Wash west of the hill,” “dry pools on mesa.” **Comments:** Vernal pool species. The only other mapped CCH Inland Empire locations are vernal pools at the Santa Rosa Plateau and Skunk Hollow (near Menifee).

Primula clevelandii (Greene) Mast & Reveal subsp. *clevelandii* [*Dodecatheon c.* Greene subsp. *c.*]. **Specimens:** *I.M. Johnston* 44 RSA; 1171 UC. **Annotation:** None seen. **Representative label notes:** “Occasional on mesa top,” “grassy mesa edges.” **Comments:** Upland clay soils. Reche Canyon is the only other San Bernardino County occurrence mapped in CCH; several Western Riverside County occurrences in the Box Springs Mountains, Santa Ana Mountains, Santa Rosa Plateau, and Gavilan Hills.

Rhamnaceae

Ceanothus cuneatus (Hook.) Nutt. **Specimens:** *M. Hilend* 157 RSA. **Annotation:** None seen. **Representative label notes:** None. **Comments:** Widespread but not common in native

shrublands on uplands and bajadas throughout the Inland Empire. Common in the San Jacinto Mountains.

Rosaceae

Rosa californica Cham. & Schltld. **Specimens:** *I.M. Johnston* 1795 POM; 2054 POM, UC, CAS; 2055 POM, CAS, UC; 2118 POM, CAS; 2126 POM, CAS, UC; 2128 POM, CAS, A; 2130 CAS, POM, UC. **Annotation:** Multiple, including Barbara J. Ertter (2007). **Representative label notes:** “Large colony in semi-moist ground,” “along a small draw, dry ground,” “on a clay bank,” “thickets in nearby pond.” **Comments:** In and around riparian sites. A few locations in the Inland Empire valleys, common in surrounding mountains. *Johnston 2054* is the type of *R. johnstonii* Rydb., a synonym of *R. californica*.

Rubus ursinus Cham. & Schltld. **Specimens:** *I.M. Johnston* 114 POM; 1197 CAS, UC. **Annotation:** L. H. Bailey (1945). **Representative label notes:** “Common along creek.” **Comments:** Fairly common in riparian sites in the Inland Empire and surrounding mountains, but often displaced by *R. armeniacus* Focke.

Salicaceae

Salix exigua Nutt. [*S. sessilifolia* Nutt.]. **Specimens:** *I.M. Johnston* 1243 POM, CAS, A. **Annotation:** None seen. **Representative label notes:** “Small colony along a small dry canyon.” **Comments:** Widespread and sometimes locally common in riparian sites throughout Inland Empire and surrounding mountains.

Salix laevigata Bebb [*S. bonplandiana* Kunth var. *laevigata* (Bebb) Dorn]. **Specimens:** *I.M. Johnston* 76 UC; 1902 POM, CAS; *P.A. Munz* 2096 POM. **Annotation:** George W. Argus (1991). **Representative label notes:** “Large tree,” “occasional along creeks,” “sandy soil.” **Comments:** Fairly common in and around riparian sites throughout Inland Empire and surrounding mountains, either as scattered individuals or sometimes dominant in overstory.

Salix lasiandra Benth. [*S. lucida* Muhl. subsp. *lasiandra* (Benth.) A.E. Murray]. **Specimens:** *I.M. Johnston* 76 POM; *P.A. Munz* 2280 POM. **Annotation:** None seen. **Representative label notes:** “Marsh,” “occasional along creeks.” **Comments:** Uncommon in the Inland Empire along the Santa Ana River and a few other sites. Much more common in the San Bernardino Mountains.

Salix lasiolepis Benth. var. *lasiolepis*. **Specimens:** *I.M. Johnston* 70 POM, UC; 1173 POM, CAS, UC. **Annotation:** George W. Argus (1989). **Representative label notes:** “Common along streams.” **Comments:** Widespread and often dominant in riparian sites throughout Inland Empire and surrounding mountains.

Scrophulariaceae

Verbascum virgatum* Stokes. **Specimens: *L.C. Wheeler* 2396 RSA. **Annotation:** None seen. **Representative label notes:** “Damp sunny clay hill.” **Comments:** Alien weed; widespread but usually not common in Inland Empire, possibly expanding.

Solanaceae

Nicotiana quadrivalvis Pursh [*N. bigelovii* S. Watson var. *wallacei* A. Gray]. **Specimens:** *P.A. Munz* 5560 POM. **Annotation:** None seen. **Representative label notes:** “Light sandy soil.” **Comments:** Widespread and sometimes common throughout the Inland Empire valleys and surrounding mountains, mostly in chaparral and sandy washes.

Solanum americanum Mill. **Specimens:** *I.M. Johnston* s.n. Nov 1917 POM. **Annotation:** Jennifer M. Edmonds (1986). **Representative label notes:** “Dry sandy field.” **Comments:** Fairly common throughout the Inland Empire in and around seasonal or perennial wetlands, irrigated areas, drainageways etc.

Solanum umbelliferum Eschsch. **Specimens:** *Martha Hilend* 150 RSA. **Annotation:** Sandra Knapp (2010). **Representative label notes:** None. **Comments:** Knapp’s interpretation of *S. umbelliferum* includes *S. parishii* A.A. Heller and *S. xanti* A. Gray (see notes in Roberts et al. 2004 under *S. parishii*). In this broad interpretation, *S. umbelliferum* is fairly common in shrublands and woodlands, especially partially shaded canyon slopes. In the narrower interpretation, *S. umbelliferum sensu stricto* is regionally uncommon, while *S. xanti* is common in shrublands throughout the Inland Empire. *S. parishii* probably does not occur in this part of San Bernardino County.

Violaceae

Viola pedunculata Torr. & A. Gray. **Specimens:** *I.M. Johnston* s.n. 4 Mar 1917 RSA; 77 UC. **Annotation:** None seen. **Representative label notes:** “Occasional on mesa top.” **Comments:** Scattered extant and historic locations in southwestern San Bernardino County, San Gabriel and San Bernardino mountains, widespread and sometimes common on undisturbed clay or loam soils in western Riverside County.

MONOCOTS

Alliaceae

Allium haematochiton S. Watson. **Specimens:** *I.M. Johnston* 115 UC; 1207 POM, UCR, UC, CAS; *L.C. Wheeler* 1583 LA. **Annotation:** T. Jacobsen (1978). **Representative**

label notes: “Large colonies on edges of dry clay mesas.”
Comments: Clay soils. These specimens may be the only San Bernardino County occurrences of *A. haematochiton* in the strict sense. Occurs in western Riverside County in the Santa Ana Mountains, Temescal Valley, Gavilan Hills areas. Records farther east around Yucaipa, Beaumont, and the San Jacinto Mountains are the closely related *A. marvinii* Davidson, often included in *A. haematochiton* in the broader sense.

Amaryllidaceae

Narcissus tazetta* L. **Specimens: *J. Wood* 320 RSA. **Annotation:** None seen. **Representative label notes:** “Sycamore woodland, oak woodland, and adjacent hillside w/ remnant coastal sage scrub.” **Comments:** Ornamental, rarely escaping into natural areas but sometimes persisting around old or abandoned habitations.

Cyperaceae

Carex pellita Muhl. ex Willd. [*C. lanuginosa* Michx.].
Specimens: *I.M. Johnston* 4 CAS. **Annotation:** None seen.
Representative label notes: “Marsh.” **Comments:** This occurrence and two earlier Parish specimens from the San Bernardino area are the only Inland Empire valley locations mapped in CCH. Widespread in the surrounding San Gabriel, San Bernardino, and Santa Ana Mountains, but apparently not in the San Jacinto mountains.

†*Cladium californicum* (S. Watson) O’Neill. **Specimens:** *I.M. Johnston* s.n. 19 Sep 1916 POM; s.n. 21 Oct 1916 POM; s.n. 4 Jul 1918 RSA; 2 CAS; 1731 POM, CAS. **Annotation:** Ira L. Wiggins (1949). **Representative label notes:** “Common in open springy ground,” “a few large tussocks ... in very spongy ground under shading willows,” “on a clay bank,” “In swamp.” **Comments:** This is the only San Bernardino County or Inland Empire location mapped in CCH. Occurs at widely scattered alkaline marsh locations on the central coast and in the Sonoran Desert east of the Salton Sea. CRPR 2B.2

Cyperus niger Ruiz & Pav. **Specimens:** *I.M. Johnston* s.n. 20 Oct 1916 POM, UC; 5 CAS. **Annotation:** Hugh Thomas O’Neill (1941). **Representative label notes:** “Swamp.” **Comments:** A few widely scattered historic and extant locations in marshes or similar wetlands, Inland Empire valleys and surrounding San Gabriel, San Bernardino, and San Jacinto mountains.

Eleocharis radicans (A. Dietr.) Kunth. **Specimens:** *I.M. Johnston* 27 UC; 176 CAS; 1176 POM. **Annotation:** Stanley Galen Smith (1998). **Representative label notes:** “Marshy place.” **Comments:** A few widely scattered historic and extant locations in marshes or similar wetlands, Inland Empire valleys and surrounding San Gabriel, San Bernardino, and Santa Ana mountains. *Johnston* 1176 and 176 were collected the same date and probably are duplicates with a transcription error in one of the records.

Isolepis cernua (Vahl) Roem. & Schult. [*Scirpus cernuus* Vahl].
Specimens: *I.M. Johnston* s.n. 30 Oct 1916 UC; 1212 POM, UC; 1292 CAS. **Annotation:** None seen. **Representative label notes:** “Damp sand along creek.” **Comments:** Several historic locations around Pomona, San Bernardino, and Lake Elsinore; more recent presumably extant occurrences around Aguanga, Murrietta, and Vail Lake. *Johnston* 1212 and 1292 were collected the same date; one of the numbers is probably a transcription error.

Scirpus microcarpus J. Presl & C. Presl. **Specimens:** *I.M. Johnston* s.n. 21 Apr 1916 POM. **Annotation:** None seen. **Representative label notes:** “Moist, shaded ground.” **Comments:** Widespread in wetlands throughout the Inland Empire valleys and surrounding mountains.

Iridaceae

Sisyrinchium bellum S. Watson. **Specimens:** *I.M. Johnston* 1842 POM; 1843 POM, CAS; 1844 POM; 1850 CAS; 1992 POM; 1883 POM; *S.B. Parish* 11176 UC. **Annotation:** Anita F. Cholewa (1991). **Representative label notes:** “Grassy hillside by big *Astragalus* patch on the middle of the east side of Red Hill near an onion colony,” “grassy hillside; a moist bank 10 yds south of big cactus,” “in moist ravine.” **Comments:** Clay soils. Uncommon in the Inland Empire valleys, widespread in surrounding mountains.

Juncaceae

Juncus bufonius L. **Specimens:** *I.M. Johnston* 11 CAS. **Annotation:** None seen. **Representative label notes:** “Winter pools on top of Red Hill.” **Comments:** Widespread and often common in and around seasonal or perennial wetlands, marshes, streambanks, etc. throughout the Inland Empire valleys and surrounding mountains. CCH does not indicate which variety this is; from the geographic ranges reported in TJM2 it could be any of three varieties, though *J. bufonius* var. *bufonius* is the most common local variety.

Juncus dubius Engelm. **Specimens:** *I.M. Johnston* 8 CAS; 10 CAS. **Annotation:** None seen. **Representative label notes:** “Near creek,” “marsh.” **Comments:** Wetlands. Widespread but scattered and uncommon in the Inland Empire valleys, more common in the surrounding mountains.

Juncus macrophyllus Coville. **Specimens:** *I.M. Johnston* s.n. 8 Oct 1916 CAS; 28 Oct 1916 POM, CAS. **Annotation:** Janice Coffey Swab (1988). **Representative label notes:** “By stream,” “along banks of creek.” **Comments:** Wetlands, usually along seasonal or perennial streams. Scarce in Inland Empire valleys, fairly common throughout surrounding mountains.

Juncus mexicanus Willd. ex Schult. & Schult. f. [*J. balticus* subsp. *mexicanus* (Willd. ex Schult. & Schult. f.) Snogerup]. **Specimens:** *I.M. Johnston* s.n. 21 Oct 1916 POM, UC; 3 CAS. **Annotation:** Janice Coffey Swab (1988). **Representative label notes:** “Damp place,” “Marsh,” “swamp.” **Comments:**

Widespread and often common in seasonal or perennial wetlands, marshes, streambanks, etc. throughout the Inland Empire valleys and surrounding mountains. A possible duplicate of *Johnston s.n. 21 Oct 1916 UC* is reported in CCH as *J. balticus* without a subspecies noted. This may represent a separate taxon, or may simply be *J. balticus* in the broad sense which would include *J. mexicanus*.

Juncus rugulosus Engelm. **Specimens:** *I.M. Johnston s.n. 10 Oct 1916 CAS; s.n. 21 Oct 1916 CAS.* **Annotation:** None seen. **Representative label notes:** “Swamp.” **Comments:** Seasonal and perennial wetlands. Widespread but scattered locations in the Inland Empire valleys, more common in surrounding mountains and foothills.

Juncus textilis Buchenau. **Specimens:** *I.M. Johnston s.n. 21 Oct 1916 POM.* **Annotation:** Janice Coffey Swab (1988). **Representative label notes:** None. **Comments:** Perennial wetlands, springs, and seeps, uncommon in the Inland Empire valleys, scattered and localized in the surrounding mountains.

Liliaceae

†***Calochortus catalinae*** S.Watson. **Specimens:** *I.M. Johnston 1210 POM, UC, CAS; P.A. Munz 2098 POM.* **Annotation:** Marion Ownbey (1939). **Representative label notes:** “Grassy slope,” “Dry clay mesa top among grass.” **Comments:** Clay soils in grasslands or shrublands. Scarce in the Inland Empire, but more common farther west. The only other locations in San Bernardino County are in or around the Chino Hills. In western Riverside County, there are a few occurrences in the Santa Ana Mountain foothills and reportedly the nearby Gavilan Hills, though these may be misidentified *C. splendens*. CRPR 4.2.

Poaceae

****Bromus arenarius*** Labill. **Specimens:** *I.M. Johnston 1211 POM, UCR, CAS; S.B. Parish 11157 UC.* **Annotation:** None seen. **Representative label notes:** “Dry mesa top,” “common weed.” **Comments:** Rarely collected regionally; although it is an invasive species, it may have been supplanted throughout the Inland Empire by more successful *Bromus* and *Avena* species.

Bromus sitchensis (Trin.) var. ***carinatus*** (Hook. & Arn.) R.E. Brainerd & Otting [*B. carinatus* Hook. & Arn.] **Specimens:** *I.M. Johnston s.n. 25 Apr 1918 POM.* **Annotation:** None seen. **Representative label notes:** None. **Comments:** Uncommon in the Inland Empire valleys and Santa Ana Mountains, common in the surrounding San Gabriel, San Bernardino, and San Jacinto mountains. Most low elevation San Bernardino County occurrences are historic, still extant in the Chino Hills.

****Bromus diandrus*** Roth. **Specimens:** *I.M. Johnston 96 UC.* **Annotation:** None seen. **Representative label notes:** “Field.” **Comments:** Abundant invasive species

in grasslands, shrublands, woodlands, with or without mechanical disturbance. Usually somewhat deeper soils or lower sun exposure than *B. rubens*.

****Bromus rubens*** L. [*B. madritensis* L. subsp. *rubens* (L.) Husn.]. **Specimens:** *M. Hilend 147 POM.* **Annotation:** None seen. **Representative label notes:** None. **Comments:** Abundant invasive species in grasslands, shrublands, woodlands, with or without mechanical disturbance.

Deschampsia danthonioides (Trin.) Munro. **Specimens:** *I.M. Johnston s.n. 25 Apr 1916 POM; s.n. 1 May 1818 UC; 1970 POM, CAS, UC; P.A. Munz 5564 POM, UC.* **Annotation:** None seen. **Representative label notes:** “Dry heavy soil on mesa,” “desiccating bottoms of winter pools.” **Comments:** Seasonal and perennial wetlands. These are the only records from southwestern San Bernardino County; occurs in vernal pools at several sites in western Riverside County and in riparian and valley floor habitats in the San Bernardino and San Jacinto mountains; few records in the San Gabriel and Santa Ana mountains.

****Hordeum murinum*** L. subsp. ***leporinum*** (Link) Arcang. **Specimens:** *I.M. Johnston 45 UC; 1170 UC, CAS.* **Annotation:** None seen. **Representative label notes:** “Mesa top.” **Comments:** Abundant invasive throughout the region, especially in grazing lands and disturbed or compacted soils. The three specimens were all collected the same date and appear to be duplicates; the CAS specimen is reported as the summer annual subspecies, *H. murinum* subsp. *glaucum* (Steud.) Tzvelev but it is not entered here as a separate taxon because of the early spring collection date.

Koeleria macrantha (Ledeb.) Schult. **Specimens:** *I.M. Johnston s.n. 29 Apr 1916 POM.* **Annotation:** None seen. **Representative label notes:** “Dry, rocky ground.” **Comments:** Mostly upland shrublands. Rare in the Inland Empire valleys and almost all occurrences are historic. Occasional in the Santa Ana Mountains, common in the San Gabriel, San Bernardino, and San Jacinto mountains.

****Lamarckia aurea*** (L.) Moench. **Specimens:** *M. Hilend 146 POM.* **Annotation:** None seen. **Representative label notes:** None. **Comments:** Occasional alien throughout the region, usually in disturbed or compacted soils.

†***Muhlenbergia californica*** Vasey. **Specimens:** *I.M. Johnston 28 POM.* **Annotation:** Paul M. Peterson (1988). **Representative label notes:** “Along creek under trees.” **Comments:** Springs, seeps, and small perennial streams. This and the few other historic occurrences in southwestern San Bernardino County all now presumably extirpated. No records in western Riverside County. Many extant occurrences in San Gabriel and San Bernardino mountains, and a few in the San Jacinto Mountains. CRPR 4.3.

†***Muhlenbergia utilis*** (Torr.) Hitchc. **Specimens:** *I.M. Johnston s.n. 1 Oct 1916 UC; s.n. 12 Oct 1916 UC; s.n. 21 Oct 1916 DAV, UC; s.n. 9 Dec 1916 CAS.* **Annotation:** Paul M. Peterson (1988). **Representative label notes:** “Grows very dense,” “damp sunny place on east side of hill,” “marshy place.” **Comments:** Johnston’s specimens are the only CCH

records mapped in Riverside or San Bernardino counties. Occurs in a few widely disjunct wetland sites of the south coast ranges, western Transverse Ranges, and Great Basin parts of California. A probable duplicate specimen, *Johnston s.n. 21 Oct 1916* POM, is reported in CCH as *M. repens* (J. Presl) Hitchc. which apparently led to Upland being cited as a location for that species by Abrams (1923). *M. repens* occurs in Arizona, New Mexico, and Texas but not California (Peterson 2003). The two species are similar and presumably this specimen is also *M. utilis*. CRPR 2B.2.

Polypogon interruptus* Kunth. **Specimens: *I.M. Johnston s.n. 23 Apr 1916* RSA. **Annotation:** None seen. **Representative label notes:** “Dry grassy mesa top.” **Comments:** Uncommon weed in wetlands; scattered locations in the Inland Empire valleys and surrounding mountains.

Secale cereale* L. **Specimens: *I.M. Johnston s.n. 25 Apr 1916* POM. **Annotation:** None seen. **Representative label notes:** “A few plants at roadside.” **Comments:** Cultivated rye, occasionally found as an escape from croplands along roadsides in agricultural areas.

Potamogetonaceae

Potamogeton pectinatus L. **Specimens:** *I.M. Johnston 1786* CAS, UC. **Annotation:** None seen. **Representative label notes:** “Growing on bottom of cement reservoir.” **Comments:** Aquatic species. Occasional in widely scattered ponds, reservoirs, etc.

Ruscaceae

Maianthemum stellatum (L.) Link [*Smilacina stellata* (L.) Desf.]. **Specimens:** *I.M. Johnston s.n. 4 Jul 1918* POM. **Annotation:** None seen. **Representative label notes:** “A large colony in marshy ground; on a clay bank.” **Comments:** In and around wetlands, usually shaded woodlands or low exposure sites (e.g., north-facing slopes). Johnston’s specimen is the only record from Inland Empire valleys. Widespread but

uncommon in San Gabriel and Bernardino mountains, a few occurrences in San Jacinto Mountains.

Themidaceae

Brodiaea jolonensis Eastw. **Specimens:** *P.A. Munz 5562* POM. **Annotation:** J. Chris Pires (2005). **Representative label notes:** “Light sandy soil.” **Comments:** Rare in Inland Empire valleys; Munz’s specimen is the only San Bernardino County occurrence mapped in CCH. More common nearer the coast. There are a few scattered locations in western Riverside County (Santa Rosa Plateau, Santa Ana Mountains, and adjacent Temescal Canyon). Similar to *B. terrestris* Kellogg subsp. *kernensis* (Hoover) T.F. Niehaus and the ranges of the two taxa overlap locally. *Brodiaea terrestris* subsp. *kernensis* is similarly rare in the Inland Empire, documented only from a few sites in western Riverside County and two historical specimens collected near San Bernardino.

Dipterostemon capitatus (Benth.) Alph. Wood [*Dichelostemma capitatum* (Benth.) Alph. Wood.] **Specimens:** *J.M. Wood 323* RSA. **Annotation:** None seen. **Representative label notes:** “Sycamore woodland, oak woodland, and adjacent hillside w/ remnant coastal sage scrub.” **Comments:** Widespread and often common throughout the region, shrublands and grasslands.

NOTEWORTHY COLLECTIONS
SANTA CATALINA ISLAND
***Eichhornia crassipes* (Mart.) Solms (PONTEDERIACEAE)**

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***Eichhornia crassipes* (Mart.) Solms (Pontederiaceae)**

Eichhornia crassipes, commonly known as water hyacinth, is a free-floating aquatic, stoloniferous, perennial herb in the Pontederiaceae. Plants have a basal rosette of thick leaves, the petioles of which are stout and often inflated. The inflorescence is a few- to many-flowered spike. Petal color ranges from white to lilac (Horn and McClintock 2012). The species is tristylous, although outside of its native range, populations are often composed of a single floral morph (Barrett 1977). All morphs are reported to be highly self-compatible, with little observed reduction of seed production (Barrett 1977). Despite this fact, most reproduction in *E. crassipes*, especially outside of its native range, is likely through asexual, clonal production of ramets on stolons (Zhang *et al.* 2010).

The plant is reported to be native to the American Tropics (Horn and McClintock 2012), primarily Brazil and Argentina (Zhang *et al.* 2010), but has become naturalized worldwide (gbif.org). Once established, *E. crassipes* reproduces quickly, often forming thick mats that choke freshwater lakes, rivers, and other waterways. The Jepson eFlora refers to *E. crassipes* as “perhaps world’s most troublesome aquatic weed” (Horn and McClintock 2012). In California, the relatively few herbarium collections to date belie the extent of the species’ invasion (cch2.org). At the present time, the California Invasive Plant Council (cal-ipc.org) gives the species a Cal-IPC Ranking of “High”, a designation reserved for California’s most noxious invasive plant taxa. The CALWEEDMAPPER regional species map report for *E. crassipes* shows that the taxon is well-established in California’s Central Valley, especially the California Delta region. Herbarium specimen data, along with observation data from CALWEEDMAPPER and iNaturalist, show scattered occurrences elsewhere in the state, including along the Central Coast and Los Angeles Basin.

We collected *E. crassipes* from Santa Catalina Island, in Los Angeles County, on 14 February 2015 (Guilliams, Carter, and Catalano 2649; SBBG172728). Several free-floating plants, presumably ramets from a single introduction event, were observed in an artificial pond in Cape Canyon (33.36043, -118.41880) at 763 ft (233 m) elevation. This pond was adjacent to a road that was undergoing maintenance, bearing obvious signs of recent construction activity (e.g., recently graded bare earth, heavy machinery parked nearby). All putative ramets were removed from the pond and destroyed.

Significance – This collection is significant as the first gathering of *E. crassipes* from Santa Catalina Island, as well as the first from the California Channel Islands as a whole. While none of the islands of the archipelago support extensive freshwater waterbodies, several reservoirs have been constructed on Santa Catalina Island to provide reliable sources of fresh water for the island’s human inhabitants. Spread of *E. crassipes* to these human-made waterbodies would be costly to treat and potentially ecologically damaging.

Acknowledgements

We thank Cameron Williams and Ken Niessen for their helpful reviews of this manuscript.

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NOTEWORTHY COLLECTIONS
SANTA ROSA ISLAND, CALIFORNIA
VASCULAR PLANTS

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Recent fieldwork on Santa Rosa Island (Santa Barbara County, California) resulted in the formal documentation of three new species for the island. These new island records are described here.

Ceanothus oliganthus Nutt. var. *oliganthus* (Rhamnaceae) is an erect shrub that on the mainland can also appear tree-like (Burge & Wilken 2020). Variety *oliganthus* has twigs that are flexible, green to red-brown, and puberulent to villosulous (Schmidt & Wilken 2016). Leaves are flat, ovate, elliptic, or elliptic-oblong, alternate, and evergreen; margins are denticulate most of the length, teeth are minutely gland-tipped with dark, spherical glands. The abaxial leaf surfaces are pale-green or gray green, and adaxial surfaces are darker green, with villosulous or puberulent vestiture. Flowers of this variety are blue to purple-blue, with a glabrous disk and ovary. Fruits are 4-7 mm wide, 3-lobed, glabrous, smooth, usually crested, sometimes not. This variety occurs south of San Francisco Bay, in the Coast Ranges, Transverse Ranges, and northern Peninsular Ranges. Geographically it overlaps with *C.o.* var. *sorediatus* (Hook. & Arn.) Hoover in the South Coast Ranges and Transverse Ranges, and *C.o.* var. *orcuttii* (Parry) Jeps. in the northern Peninsular Ranges. Of the three varieties, var. *orcuttii* is readily separated from the other two by its pilosulous disk and ovary, fruits with rugose valves, and more southern distribution. *Ceanothus oliganthus* var. *oliganthus* is distinguished from *C.o.* var. *sorediatus* in having more pubescence on the twigs as well as the leaf adaxial surfaces, and often by crests on the fruits.

The lone individual of *Ceanothus oliganthus* var. *oliganthus* on Santa Rosa Island was first detected by Morgan Ball during rare plant helicopter surveys in 2015. The plant was observed from the air, growing downslope from the road to National Park Service housing, close to the trailhead to Cherry Canyon. Later that year, the plant was visited on foot by Ken Niessen, who tentatively identified it as *C. oliganthus*, but did not formally voucher it. The first herbarium specimen was collected in flower by McEachern on February 25, 2019 (McEachern SRI-2019-1, SBBG) and subsequently in fruit by Hasenstab-Lehman, Guilliams, and McEachern (Hasenstab-Lehman 3726 SBBG) on May 18, 2021. At the time of collection, it was a compact shrub 1-1.2 m tall,

with ascending to erect stems, and flexible red-brown twigs. The combination of puberulent twigs and leaf adaxial surfaces, as well as smooth, glabrous fruits places it in var. *oliganthus*. However, the fruits lack the typical crests usually seen in this variety. This collection is significant for this species as the first from Santa Rosa Island, and first from any of the California Channel Islands. This taxon was previously only known from mainland California and Baja California, Mexico.

Erigeron sumatrensis Retz. [*Conyza floribunda* Kunth, *C. sumatrensis* (Retz.) E. Walker] (Asteraceae) is a robust annual herb to 2+ m tall (Keil & Nesom 2012). The primary stem is erect, branched distally or throughout, and often conspicuously villous. Cauline leaves are linear to oblanceolate, with margins entire or usually toothed, and surfaces sparsely to densely strigose-hispid to hispid. The capitulescence is usually a large, many-branched panicle. Heads are disciform; phyllaries are usually puberulent; pistillate florets number 60-90; disk florets are 6-10. Cypselae have a pappus of bristles. The species is thought to be native to South America, but has become naturalized worldwide (Keil & Nesom, 2012; gbif.org). It is common in California below 600 m in a variety of habitats.

Erigeron sumatrensis was collected in Lobo Canyon on Santa Rosa Island by Guilliams and Shea (Guilliams 6840, SBBG) on 15 October 2021. Plants were scattered but well-established in the canyon, growing trailside. This collection is significant as the first from Santa Rosa Island. Among the California Channel Islands, this species was previously known from San Miguel and Santa Cruz islands.

Euthamia occidentalis Nutt. [*Solidago occidentalis* (Nutt.) Torr. & A. Gray] (Asteraceae) is a rhizomatous perennial herb, with ascending to usually erect stems to ca. 2 m tall (Semple 2012). Leaves are alternate, linear to narrowly lanceolate, and entire. The capitulescence is usually a large, many-branched, panicle or corymb with ascending branches. Heads are radiate; ray florets are 15-28 in number; disk florets are 6-18. Cypselae have a pappus of bristles. The species primarily occurs in western and central United States, but also occurs in southwestern Canada

and northern Baja California, México. It is common in California in freshwater marshes, meadows, and streams below 2,300 m.

Euthamia occidentalis was first observed by Dirk Rodriguez and National Park Service staff in Lobo Canyon on Santa Rosa Island during vegetation monitoring, but was not formally vouchered. It was photographed by Jim Riley on 16 September 2021, who posted the photographs to iNaturalist with an identification to family rank. Guilliams observed the iNaturalist post and identified the unknown Asteraceae to *E. occidentalis*. The first formal collection was made by Guilliams and Shea (*Guilliams 6836*, SBBG) on 15 October 2021. This collection is significant as the first from Santa Rosa Island. Among the California Channel Islands, the species was previously known from Anacapa and Santa Catalina islands.

ACKNOWLEDGEMENTS

We thank Cameron Williams, Tim Thomas, and an anonymous reviewer for their helpful comments, which improved the manuscript.

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NOTEWORTHY COLLECTIONS
SAN NICOLAS ISLAND, CALIFORNIA
VASCULAR PLANTS

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Recent fieldwork on San Nicolas Island (Ventura County, California) to survey and DNA barcode all land plants on the island resulted in the formal documentation of 13 new species for the island. Four of these are California native plants assumed to be naturally occurring on the island; nine are non-native and presumed to be introduced. One additional native species described below was previously documented but had not been collected in over 50 years. These new island records are described here.

Acmispon strigosus (Nutt.) Brouillet [*Lotus strigosus* (Nutt.) Greene] (Fabaceae) is an annual herb, often branched at the base, with prostrate stems to 5 dm long (Brouillet 2012). Leaves are compound, with flat leaf axes and 4-9 oblanceolate to obovate leaflets. The inflorescence is usually 1-2-flowered, bearing flowers with relatively short corollas (5-10 mm long). Fruits are straight, exserted, and dehiscent. The species is widespread, native, and common in California at low to middle elevations, with a range extending to Arizona in the east and to Baja California Sur and Sonora México in the south (Brouillet 2012). It has been previously documented on all of the California Channel Islands except Santa Barbara and San Nicolas islands. It has also been collected on the Baja California Pacific Islands of Todos Santos, San Martín, and Cedros.

Acmispon strigosus was collected on San Nicolas Island by Guilliams, Hasenstab-Lehman, and Hoyer on 8 April 2019 (Guilliams et al. 5177 SBBG). Plants were located in the northeastern part of the island, on the mesa's top edge between the airfield and the northern escarpment. It was present with other herbaceous taxa that are seldom observed on-island (e.g., *Loeflingia squarrosa* Nutt., *Pectocarya linearis* (Ruiz & Pav.) DC. subsp. *ferocula* (I.M. Johnst.) Thorne. This collection is significant as the first from San Nicolas Island, leaving for the archipelago only Santa Barbara Island without a record of this taxon.

Bolboschoenus maritimus (L.) Palla subsp. *paludosus* (A. Nelson) T. Koyama (Cyperaceae) is an erect, perennial, rhizomatous herb, up to 150 cm in height (Smith 2012). Stems are sharply 3-angled and glabrous, with a leaf sheath apex consisting of a distinctive triangular, membranous, veinless area. Inflorescence bracts are 2-12 mm wide; inflorescences consist

of up to 40 spikelets, each 7-40 mm long. Flower bracts are 5-8 mm long, membranous, with 1-3 mm long awns. Anthers are yellow, and stigmas are generally 2. Fruits are two-sided, with a mucronate apex 0.1-0.4 mm long. This species is common in California in brackish to saline or inland marshes, and along the coast. *Bolboschoenus maritimus* subsp. *paludosus* is native to California and is found northward to Alaska and east to Nova Scotia, as well as in temperate South America, Eurasia, and Africa. It has been collected on San Miguel, Santa Rosa, Santa Cruz and Santa Catalina islands.

This species was previously collected on 10 October 2001 by Junak (*Junak SNI-1723* UCR) along a concrete berm outside the water treatment plant but was processed into collections under the name *Schoenoplectus americanus* (Pers.) Volkart ex Schinz & R. Keller in 2019. A duplicate of this specimen was sent to RSA, where LeRoy Gross determined it to be *Schoenoplectus maritimus* (L.) Lye a synonym of *B. maritimus* (Smith 2012) in August 2019. In 2020 Sanders determined Junak SNI-1723 material to be *Bolboschoenus maritimus* subsp. *paludosus* (California Consortium of Herbaria 2, CCH2). These collections were unknown to us when we collected material on 20 August 2019 (Hasenstab-Lehman 2391; 33.2545 N, 119.4807 W) in a locality similar to the description of the Junak collection. Upon examination of both collections in preparation of this publication, we determined the material from both Junak SNI-1723 and Hasenstab-Lehman 2391 at SBBG to be *Bolboschoenus maritimus* subsp. *paludosus*. This is the only minimum rank taxon of *B. maritimus* present in California. Taken together, these collections are significant as the first occurrence for this species on San Nicolas Island.

Centaurea cyanus L. (Asteraceae) is an annual herb to 1 m tall (Keil 2012). Stems are usually erect, branched distally, and often tomentose. Leaves are simple, linear, entire to lobed, often tomentose, and usually reduced distally. The conspicuous heads are radiant; phyllaries are toothed distal to the middle and lack spines; flowers are usually 25-35 per head; corollas are usually blue. Cypselae are 4-5 mm long, with a pappus of bristles. This showy, non-native species has been introduced throughout the Northern Hemisphere (gbif.org) and has been collected throughout the California Floristic Province. It is native to southern Europe (Keil 2012). It is often included in wildflower mixes (Keil 2012).

Centaurea cyanus was collected by Guilliams, Hasenstab-Lehman, and Hoyer on San Nicolas Island on 2 March 2022 (Guilliams et al 6979 SBBG; <https://www.inaturalist.org/observations/108535493>). Approximately 5-10 plants were growing in gravel adjacent to a residential building (Building 148) in Nicktown. As it was growing with *Linaria maroccana* Hook f. and *Phacelia campanularia* A. Gray var. *campanularia* (also reported here as new), we assume that all were intentionally introduced to the island as part of a wildflower mix; all plants were removed. This collection is significant as the first collection of *C. cyanus* on the California Channel Islands.

***Cryptantha clevelandii* Greene var. *clevelandii* (Boraginaceae)** is a slender, erect, annual herb to 50 cm tall (Simpson et al. 2021). Stems are branched throughout, with strigose and sometimes spreading bristle-like hairs. Leaves are linear to linear-lanceolate, with soft, strigose hairs and bristles along the midvein. Inflorescences comprise cymes in groups of 1-2, lacking bracts. Calyces are accrescent, 1.5-2.5 mm long in flower, up to 4.5 mm long in fruit, erect to spreading. Fruits are 1.5-2 mm long, lance-ovate nutlets, smooth, shiny, and often mottled with gray and brown blotches. The attachment scar edges are generally abutted, forked, and are occasionally gapped at the base. The species is native to California, distributed from San Francisco Bay region to northern Baja California, MX.

Cryptantha clevelandii var. *clevelandii* and *C.c.* var. *florosa* I.M. Johnst. were reported by Wallace (1985), but no specimens were observed from San Nicolas Island. The species was excluded by Junak (2008), as no specimens were collected or observed in preparation of that flora. We collected this species once on San Nicolas on Feb 26, 2019, by Hasenstab-Lehman, Guilliams, and Hoyer (Hasenstab-Lehman et al 1530 SBBG). The collection was made on the sandy bluffs above Corral Harbor. This collection is significant as the first documentation of this species on San Nicolas, a somewhat common taxon on all of the other California Channel Islands.

***Dichondra micrantha* Urb. (Convolvulaceae)** is a perennial herb that grows as a complex mat from creeping stolons that often root at the nodes along the stem (Preston 2012). Leaves have reniform blades, 8-12 mm long, 9-15 mm wide, with petioles 2-3.5 cm long. Flowers are inconspicuous, with white corollas to 2 mm long. The ovary is 2-lobed, styles are 2, and stigmas are capitate. Fruits are capsules separating into two nutlets. This plant is native to east Asia but is widely available in cultivation as an attractive ground-cover. It has been found commonly in coastal wetlands and appears to be spreading to the Sierra Nevada foothills.

Dichondra micrantha was observed by Hoyer in early 2018 in a restoration plot, and in early 2019 by Adam Searcy in planted pines outside the general store in Nicktown. It was collected by Hasenstab-Lehman, Guilliams, and Hoyer twice on San Nicolas Island on 4 April 2019 (Hasenstab-Lehman et al.1694 SBBG). The first collection was just outside air tower 5, and the second

was in the airstrip median, along the margin of a vernal pool. This collection is significant as the first collection of *D. micrantha* on the California Channel Islands.

***Euphorbia maculata* L. (Euphorbiaceae)** is an annual herb with prostrate, pubescent stems (Keil et al. 2013). Leaves are opposite, 4-17 mm long, ovate to oblong, subsessile, denticulate, with a reddish spot, and with free, fringed stipules. Cyathia are generally one per node, with obconic, pubescent involucre. Each cyathium has four elliptic glands that are less than 0.5 mm in length and petal-like appendages that are white to pink. Each cyathium consists of 2-5 staminate flowers, and pistillate flowers with forked styles for one quarter or one third of their length. Fruits are ovoid, lobed, and strigose. Seeds are transversely wrinkled, light brown in color, and four-angled. Introduced, native to the eastern United States, and is known from Santa Cruz, Santa Catalina and San Clemente Islands; widespread in cismontane California and throughout the world (gbif.org).

Euphorbia maculata was observed along roadsides in early 2022 by Hoyer, and collected by Hasenstab-Lehman, Guilliams, and Hoyer on 2 March 2022 (Hasenstab-Lehman et al. 4016 SBBG). It was collected growing along the Jackson Highway and is significant as the first collection on San Nicolas Island. Plants detected were immediately eliminated from the road.

***Lamium amplexicaule* L. (Lamiaceae)** is an herb, usually annual, branched from the base, more or less decumbent, 1-4 dm long (Munz 1974). Leaves are broadly ovate to roundish, truncate or cordate at the base; the lower leaves have petioles and the upper leaves do not. The inflorescence contains few flowers in axillary and terminal clusters. Corollas are tubular, 12-16 mm long, two-lipped, with a pubescent concave upper lip and a spreading two-lobed lower lip. Nutlets are ca. 2 mm long, brownish, and mottled (Munz 1974). This species is native to Eurasia but is widespread in North America (Miller & Wilken 2012). On the Channel Islands, it has been previously collected on Santa Cruz and Santa Catalina islands.

Lamium amplexicaule was collected on San Nicolas Island by Hoyer, Guilliams, and Hasenstab-Lehman (Hoyer et al. 59 SBBG) on January 31, 2019, from the Wells area, at the headwaters of Tule Canyon, south fork in *Leptosyne gigantea* Kellogg dominated scrub habitat. This collection is significant as the first collection from San Nicolas Island, and the only known population introduced to the island.

***Linaria maroccana* Hook. f. (Plantaginaceae)** is an annual herb with stems to 50 cm tall (Preston and Weatherwax 2012). Leaves are linear and 2-4 cm long. Inflorescences are showy, initially dense but becoming open in fruit, with sparsely glandular-puberulent axes. Flowers have lanceolate calyx lobes, corollas are red-violet with throats red, yellow, and/or white, spurs are straight. Fruits are 3-5 mm long. The species is native to the Mediterranean but has widely escaped cultivation in California. It is often included in

wildflower seed mixes (Preston and Wetherwax 2012).

Linaria maroccana was collected on San Nicolas Island by Guilliams, Hasenstab-Lehman, and Hoyer on 2 March 2022 from Nicktown, near Building 148 (Guilliams et al 6980 SBBG). As it was growing with *Centaurea cyanus* and *Phacelia campanularia* var. *campanularia* (also reported here as new), we assume that all were intentionally introduced to the island as part of a wildflower seed mix. All plants were removed. This collection is significant as the first record of this taxon from San Nicolas Island. It has been collected one other time on the archipelago, on Santa Catalina Island, from the Los Angeles County Interpretive Center near Avalon, where it was presumably planted.

***Lycium brevipes* Benth. [*Lycium hassei* Greene, *Lycium brevipes* var. *hassei* (Greene) C.L. Hitchc.] (Solanaceae)** is a low, mounded shrub with spreading branches that become thorny in age (Nee 2012). Leaves are oblanceolate, 0.5-1.5 cm long, and +/- fleshy. Inflorescences are clusters or 1-flowered. Calyces are 2-6 mm long, with oblanceolate lobes either shorter or longer than the calyx tube; corollas are lavender to white and funnel-shaped; stamens are exserted. Fruits are red berries, +/- 1 cm long. *Lycium brevipes* is currently treated as having two varieties, *L.b.* var. *brevipes* with calyx lobes shorter than the calyx tube, and *L.b.* var. *hassei* (Greene) C.L. Hitchc. with calyx lobes equal to or up to three times longer than the calyx tube (Nee 2012). Variety *brevipes* is wide-spread in sw North America, and has been reported from San Clemente Island of the California Channel Islands (Wallace 1985, Ratay et al. 2014). Variety *hassei* was described as a Channel Islands endemic on the basis of early collections from Santa Catalina and San Clemente islands. Due to unpublished reports of wide-spread variation in the ratio of calyx lobe to tube lengths throughout the range of *L. brevipes* (Riefner, 2007), we follow Junak (2008) in recognizing plants of *L. brevipes* from the Channel Islands at species rank at this time.

Lycium brevipes was collected on San Nicolas Island by Guilliams, Hasenstab-Lehman, and Hoyer 25 February 2019 (Guilliams et al 5067 SBBG). It had been previously collected on San Nicolas Island at Corral Harbor by Dunkle (8307 SBBG) in 1939, and in Celery Canyon by Philbrick and Benedict (B69-205) and Philbrick (B69-223) in 1969 (Junak 2008). The taxon was included in A Flora of San Nicolas Island (Junak 2008) on the basis of these collections. The population from which the present collection was made was first observed by Ratay and Vanderplank on 23 June 2015, but not collected at that time. This collection is significant as the first documentation of the species on the island since 1969.

***Mentha spicata* L. (Lamiaceae)** is a rhizomatous perennial herb, with glabrous ascending to erect stems (Tucker 2012). Leaves are lanceolate to lance-oblong, with rounded bases, apices that are acute to acuminate, and serrate margins. This species has spike-like inflorescences, with flowers that have white to pink to lavender corollas. This plant is native to Europe, but has

naturalized throughout much of the United States. In California, it is commonly found in moist places, marshes, lakeshores, and occasionally fields. It has been collected on Santa Cruz and Santa Catalina islands.

Mentha spicata was collected on San Nicolas Island by Hasenstab-Lehman, Guilliams, and Hoyer on 20 August 2019 (Hasenstab-Lehman et al. 2389 SBBG), in a concrete planter just outside the officers' living quarters, and all plants were removed. It was likely planted as an herb for use by residents of the island. It is significant as the first record of this species from San Nicolas Island.

***Parietaria judaica* L. (Urticaceae)** is a perennial herb with decumbent to erect, reddish stems, which are sometimes woody proximally (Preston and Woodland 2012). Leaves are relatively large, with lanceolate to ovate blades up to 9 cm long with distinctive, tapering apices. In California, black fruits set this taxon apart from other parietarias, which have tan, brown, or reddish-brown fruits. It is native to Eurasia and northern Africa, but has been introduced in North America, South America, Japan, Australia, and New Zealand (gbif.org). In California, the species is known from the San Francisco Bay Region, east to Sacramento, northern and southern Monterey Bay, and the cities of Los Angeles and San Diego.

Parietaria judaica was collected on San Nicolas Island by Guilliams, Hasenstab-Lehman, and Hoyer 28 February 2019 (Guilliams et al. 5123 SBBG). It was growing in a small population in the northeast corner of the island, along Beach Road, just opposite of "L" Canyon. This collection is significant as the first record of this taxon from the California Channel Islands.

***Phacelia campanularia* A. Gray var. *campanularia* (Hydrophyllaceae)** is an annual herb to 70 cm tall (Walden et al. 2021). Stems are erect. Leaves are simple, with blades ovate to +-round and 2-7 cm long, margins toothed. Flowers of this species are distinctive, with a relatively large (limb to 3 cm across), bright blue, rotate to campanulate corolla featuring a white spot below each sinus; stamens are exserted, filaments are blue and winged proximally, anthers are white. Fruits are glandular capsules 7-15 mm long; seeds are 40-90. The species is endemic to California, where it grows in the western Mojave and Colorado Deserts below 1,600 m.

Phacelia campanularia var. *campanularia* was collected on San Nicolas Island by Guilliams, Hasenstab-Lehman, and Hoyer on 2 March 2022 in Nicktown, near Building 148 (Guilliams et al. 6985; 33.2541 N, 119.4862 W; <https://www.inaturalist.org/observations/108532225>). Two plants were observed. As it was growing with *Centaurea cyanus* and *Linaria maroccana* (also reported here as new), we assume that all were intentionally introduced to the island as part of a wildflower mix; both plants were removed. This collection is significant as the first record of this taxon from the California Channel Islands.

Plantago elongata Pursh (**Plantaginaceae**) is a small, glabrous, annual plant with thread-like to linear leaves (Rosatti 2012). Inflorescences are generally dense spikes with flowers about 1 mm in width. Each flower is subtended by a round-ovate bract that is equal in size to the calyx, and appressed to it. Corollas are four-lobed, with one erect lobe and three spreading or reflexed lobes. Each fruit contains 3-12 seeds that are 1.5-2.5 mm in length. This species grows from Baja California to British Columbia in seasonally wet depressions, below 200 m. On the Channel Islands, it occurs on San Miguel, Santa Rosa, Santa Cruz, and San Clemente islands.

Plantago elongata was collected by Hasenstab-Lehman, Guilliams, Hoyer, and Benjamin Carter (*Hasenstab-Lehman et al. 1520* SBBG) on 25 February 2019, and 6 April 2019 by Hasenstab-Lehman, Guilliams, and Hoyer (*Hasenstab-Lehman et al. 1701* SBBG). All collections were made close to the airstrip, in depressions that held standing water and supported species commonly found associated with vernal pools or alkaline flats. These collections are significant as they represent the first of this native species on San Nicolas Island.

Salvia rosmarinus Spenn. [*Rosmarinus officinalis* L.] (**Lamiaceae**) is an aromatic shrub with woody stems to 2 m tall (Tutin et al. 1972). Leaves are linear, 1.5-4 cm long, with revolute margins. Inflorescences are axillary and few-flowered. Corollas are usually pale blue, 1-1.2 cm long. Nutlets are brown. It is native to the Mediterranean. While it is widely used in horticulture, especially in Mediterranean-type climates, it is not typically known to escape from cultivation. Without documented cases of naturalization in California, it was not included in the Jepson Manual Second Edition (Baldwin et al. 2012) or the Jepson eFlora project (Jepson Flora Project (eds.) 2022).

Salvia rosmarinus was collected by Guilliams, Hoyer, and Benjamin Carter at Humphrey's Sump, on the northwest corner of San Nicolas Island on 6 February 2016 (*Guilliams et al. 2830* SBBG), and later by Guilliams, Hasenstab-Lehman, and Hoyer on 20 August 2019 (*Guilliams et al. 5625* SBBG). Approximately 16, well-spaced stem clusters of various sizes were later counted at this location on 2 March 2022. This species was likely planted at this location in the late 1960s when the Ventura Nurseryman's Association introduced many species to the island for horticultural purposes. It has evidently persisted at this location and possibly spread.

ACKNOWLEDGEMENTS

We would like to thank Ken Niessen, Tim Thomas, and Cameron Williams for reviews and comments that improved the manuscript.

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NOTEWORTHY COLLECTIONS FOR SAN DIEGO COUNTY, CALIFORNIA

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The following 24 native and naturalized taxa are new plant records and significant rediscoveries for San Diego County. These voucher specimens are part of our ongoing studies of the vascular plants of San Diego County. Some of these specimens are a result of new discoveries made by botanists and local plant enthusiasts using the iNaturalist (iNat) platform. After first being observed on iNat, we worked with the observers to obtain specimen vouchers for the herbarium in order to have plant material for long term documentation and herbarium deposition. The primary specimen collections of these taxa are deposited in the SD Herbarium at the San Diego Natural History Museum, but duplicates (when available) were sent to other regional herbaria as part of specimen exchanges.

NEW COUNTY RECORDS

ABUTILON ABUTILOIDES (Jacq.) Garcke ex Hochr. (MALVACEAE). Anza-Borrego Desert State Park, northern edge of Little Blair Valley, near the end of eastern spur road, among boulders; 33.0325 N, 116.3812 W, elevation 896 m, 22 November 2003, *Hendrickson 105* (SD). Plants ca. 40 cm tall with yellow-orange flowers and growing in decomposed granite on a boulder slope

associated with *Bahiopsis parishii*, *Bebbia juncea* var. *aspera*, *Encelia farinosa*, *Echinocereus engelmannii*, *Ditaxis lanceolata*, *Eriogonum wrightii* var. *nodosum*, and *Nicotiana obtusifolia*.

Previous knowledge. Native status uncertain. Subshrub with orange-yellow flowers native to southern Texas, west-central and southeastern Arizona, Mexico (including the closest states of Baja California, Baja California Sur, & Sonora), and the West Indies. This voucher specimen was originally identified as *Abutilon palmeri* A. Gray but was redetermined to *A. abutiloides* by Rebman in 2014.

Significance. This is the first record for San Diego County and for the state of California. It is unclear whether this represents a native or naturalized occurrence. The nearest occurrence is in Arizona, in Organ Pipe National Monument approximately 340 km to the southeast (SEINet), and the closest occurrence to the south is in the Sierra de La Libertad in the southern portion of the state of Baja California approximately 560 km in distance (BajaFlora 2022). Plants were uncommon to rare at site.

ABUTILON GRANDIFOLIUM (Willd.) Sweet (MALVACEAE). Marine Corps Base Camp Pendleton, vicinity of San Onofre, Basilone Road; 33.38924 N, 117.55507 W, elevation ca. 30 m, 29 October 2020, *Asmus s.n.* (SD). Growing in ruderal vegetation along the paved road associated with *Asphodelus fistulosus*, *Bromus rubens*, *Hedypnois rhagadioloides*, *Erodium moschatum*, and *Hypochaeris glabra*.

Previous knowledge. Non-native shrub, known to South America with obvious spreading trichomes to 5 mm long on stems and petioles. In the USA, naturalized in Hawaii where this species has become a weed along roadsides and other disturbed sites. It is mentioned but not included in the *Abutilon* treatment in the Flora of North America (FNA) as “sometimes cultivated and may escape.”

Significance. This is the first naturalized record for San Diego County and for the state of California. Twenty individuals were observed in the area on the northbound shoulder of Basilone Road. There are two observations on iNat in the general vicinity of the voucher specimen; one from 2015 (<https://www.inaturalist.org/observations/57334533>) and the other in 2020. (<https://www.inaturalist.org/observations/63817131>). This species has naturalized and is persisting along Basilone Road in the northwestern part of Camp Pendleton.

ALTERNANTHERA PHILOXEROIDES (Mart.) Griseb. (AMARANTHACEAE). Lower Otay Lake: East Otay Ranch, south of Otay Lakes Road and northernmost point of Lower Otay Lake Reservoir, adjacent to reservoir trail; 32.64763 N, 116.93005 W, elevation 143 m, 3 September 2020, *Ayon s.n.* (SD). Floating in the littoral zone at the water's edge with *Azolla filiculoides*, *Echinodorus berteroi*, *Pontederia crassipes*, and *Schoenoplectus californicus*.

Previous knowledge. Non-native, invasive, herbaceous, aquatic perennial that floats in mats on the surface of the water and is native to South America. Listed with the California Invasive Plant Council (Cal-IPC) as High, a species with severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. This species is also included on the California Department of Food and Agriculture (CDFA) list as A, an organism of known economic importance subject to state enforced action involving eradication, quarantine regulation, and containment. According to Cal-IPC, it has the potential to invade lakes, streams, canals, ponds, and irrigation ditches and can have severe ecological impacts. It occurs in the San Joaquin Valley, the Sacramento Delta region, and cismontane Los Angeles County (CCH2).

Significance. This collection extends the known range of *A. philoxeroides* to its most southern distribution in California and may be the first record for San Diego County (Plate 1A). There is a collection (*D. Pendleton s.n.* 17 Aug 1990) in the RSA Herbarium

from along De Luz Creek on the San Diego – Riverside County border, but it is unclear if this historic specimen is actually from within San Diego County. There are at least three different occurrences in the northern part of Lower Otay Lake based upon observations on iNat.

BOTHRIOCHLOA ISCHAEMUM (L.) Keng (POACEAE). Marine Corps Base Camp Pendleton, central portion of Base, near a parking lot at the junction of Basilone Road and Roblar Road; ruderal area at the edge of the lot; 33.35072 N, 117.36399 W, elevation 135 m, 25 April 2018, *Rebman 34091* (SD) with *W. Schmidtman & G. Kenney*. Growing in ruderal vegetation with *Erodium botrys*, *Foeniculum vulgare*, *Bromus rubens*, and *Rumex crispus*.

Previous knowledge. Non-native herbaceous perennial, native to southern Europe and Asia that has a reddish to purple inflorescence. In the USA outside of California, there are specimen records for it from Arizona, Florida, Texas, and Utah. In the state of California, it is quite rare, previously known from four specimen collections from Riverside, Shasta, and Tulare counties.

Significance. This is the first record in San Diego County with three individuals observed (Plate 1B). This occurrence is at the edge of a dirt parking lot at the junction of two heavily used roads on Camp Pendleton so it is likely that seeds may have dislodged from the tires of a parked vehicle and established in this area.

CHLORIS TRUNCATA R. Br. (POACEAE). Naval Weapons Station Seal Beach Detachment Fallbrook, South Magazine, study area S, ca. 50 m east of Ammunition Rd., Morro Hill 7.5' USGS Quad; 33.34354 N, 117.28733 W, elevation 165 m, 28 March 2015, *Singh 5292* (SD) with *M. Honer*. Growing in post fire coastal sage scrub (ca. 1 year prior) with regenerating *Malosma laurina*, and with *Antirrhinum nuttallianum*, *Hirschfeldia incana*, and *Matricaria discoidea*.

Previous knowledge. Non-native herbaceous perennial is native to Australia. In the USA outside of California, it has naturalized near woolen mills in South Carolina. In the state of California, it is scattered rarely from Davis south to El Centro but appears to have larger naturalized occurrences in southern California in the Perris Basin, in the vicinity of Lake Skinner, and in the Imperial Valley.

Significance. This is the first record for San Diego County. There are at least four locations along Ammunition Road on Naval Weapons Station Seal Beach Detachment Fallbrook in the south-central part of the installation. Attempts to extirpate it from the military installation are ongoing. Note that this specimen was previously misidentified as *Digitaria sanguinalis* (L.) Scop.

CUCURBITA FICIFOLIA Bouché (CUCURBITACEAE). Tijuana River Valley Regional Park, approximately 300 m north of the ranger station on Monument Road; 32.54853 N, 117.07482 W, elevation 8 m, 23 December 2020, *Uyeda s.n.* (SD) with *Robin*



Plate 1. A. Flowering plants of *Alternanthera philoxeroides* (Amaranthaceae), photo by J. Ayon; B. Inflorescence of *Bothriochloa ischaemum* (Poaceae), photo by J. Rebman; C. *Cucurbita ficifolia* (Cucurbitaceae) fruits hanging from riparian vegetation, photo by K. Uyeda.

Echols-Booth. Vines supported by willow canopy in riparian vegetation dominated by *Salix lasiolepis*.

Previous knowledge. Non-native annual or short-lived perennial vine, native to South America. It is known to naturalize in Mexico, Central America, Europe, Asia, and some Pacific islands. This species is infrequently planted and grown for its edible seeds, fruit, and greens. It is listed in the FNA treatment for the genus *Cucurbita* based on two historic collections in California, one from

San Bernardino County in 1948 (*U. Jensen* 1 RSA) and the other from Ventura in 1968 (*H. Pollard* s.n. 16 February 1968 CAS). In the Jepson eflora it is listed under the treatment for *Cucurbita pepo* L. var. *pepo* as a taxon that may escape cultivation but is not known to naturalize.

Significance. New non-native record for San Diego County and a naturalized occurrence for the state of California (Plate 1C). It appears that occurrences of this species are invading some riparian vegetation along the Tijuana River Valley. In this area, there are

14 iNat observations over multiple years ranging from November 2012 to November 2021 on both sides of the Tijuana River over a span of approximately 2 km in length.

CYPERUS FLAVESCENS L. (CYPERACEAE). Marine Corps Base Camp Pendleton (northeast portion), Hotel Training Area, along the Santa Margarita River just south of De Luz Road, northwest of Fallbrook; 33.39545 N, 117.26418 W, elevation 84 m, 23 August 2018, *Rebman 34647* (SD) with *W. Schmidtmann & G. Kenney*. Rare in riparian vegetation with *Platanus racemosa*, *Salix laevigata*, *S. lasiandra*, *S. lasiolepis*, *Baccharis salicifolia*, *Cyperus odoratus*, *Schoenoplectus acutus* var. *occidentalis*, *S. americanus*, *Typha domingensis*, and *Vitis girdiana*.

Previous knowledge. Non-native annual previously known to several locations north of Yuba City in California, eastern and southern US, Canada, West Indies, South America, Eurasia and Africa. North American (north of Mexico) plants are sometimes recognized as *C. flavescens* var. *poiformis* (Pursh) Fernald while plants from Mexico and Central America are called *C. flavescens* var. *piceus* (Liebm.) Fernald due to their purplish rather than yellowish floral scales (FNA). This collection from San Diego County aligns with var. *poiformis*, if recognized regionally.

Significance. New, non-native record for San Diego County and a California range extension of approximately 725 km. We suspect that this species is overlooked in various wetlands and is probably in other locations along the Santa Margarita River.

DESMAZERIA RIGIDA (L.) Tutin (POACEAE). Marine Corps Base Camp Pendleton, extreme southern portion, Training Area November, north of Oceanside and the San Luis Rey River, canyon just west of Windmill Lake; 33.2553 N, 117.33881 W, elevation 70 m, 30 April 2020, *Rebman 36648* (SD) with *Mulligan & A. Hyduke*. Growing in coastal sage scrub vegetation with *Artemisia californica*, *Rhus integrifolia*, *Salvia mellifera*, *Eriogonum fasciculatum*, *Salvia apiana*, *Melica imperfecta*, and *Encelia californica*.

Previous knowledge. Non-native annual grass is native to southern and western Europe. In the USA outside of California, it has naturalized in the south from New Mexico to South Carolina, in the northeastern USA, in Wisconsin, South Dakota, and in Washington and Oregon. In the state of California, it is scattered along the Pacific coast from the San Francisco Bay area south to Los Angeles and on Santa Catalina Island. It should be noted that many taxonomic treatments recognize this species under the synonym *Catapodium rigidum* (L.) C.E.Hubb.

Significance. This is the first record of this non-native grass species for San Diego County. Although it was relatively rare at the site of collection, at least 100 individuals were found growing on a steep, northeast-facing slope under the canopy of mature coastal sage scrub with very little disturbance.

ERAGROSTIS ECHINOCHLOIDEA Stapf (POACEAE). Naval Weapons Station Seal Beach Detachment Fallbrook, west of Fallbrook,

North Magazine, central part of station, along Ammunition Road on the north side of the road just east of the entrance into the North Magazine; 33.36477 N, 117.26691 W, elevation 196 m, 14 September 2020, *Rebman 37014* (SD) with *J. LaGrange & D. Lawson*. Growing in ruderal vegetation with *Limonium sinuatum*, *Melinis repens*, *Euphorbia maculata*, and *Trichostema lanceolatum*.

Previous knowledge. Non-native herbaceous perennial grass, native to southern Africa. In the USA, it has naturalized rarely in Maryland and has become established in south-central Arizona.

Significance. This is the first record of this non-native grass species for San Diego County and for the state of California (Plate 2A). There are at least three different occurrences of this species distributed for approximately 4.1 km along Ammunition Road on Naval Weapons Station Seal Beach Detachment Fallbrook in the southern part of the installation. There are ongoing efforts to extirpate this non-native species from the military installation.

GAMOCHAETA STACHYDIFOLIA (Lam.) Cabrera (ASTERACEAE). Marine Corp Base Camp Pendleton, northeastern portion of Base, Training Area Hotel, along old De Luz Creek Road above De Luz Creek; 33.41434 N, 117.31846 W, elevation 100 m, 1 June 2017, *Rebman 33493* (SD) with *W. Schmidtmann*. Growing along an old dirt road with ruderal vegetation surrounded by chaparral dominated with *Adenostoma fasciculatum*, *Cercocarpus minutiflorus*, *Quercus berberidifolia*, *Toxicodendron diversilobum*, and *Heteromeles arbutifolia*.

Previous knowledge. Non-native, annual species native to South America and listed as a waif in California (Jepson eflora). This species was also collected at different locations along the same road in April 2017 (*Rebman 32976* SD) and June 2019 (*Rebman 35965* SD). The scattered occurrences range for at least 4.5 km along old De Luz Road in this part of Base.

Significance. This is a new, non-native record for San Diego County and the multiple specimen collections from different sites over different years demonstrate that this species is not a waif, but is naturalized and likely spreading in this area (Plate 2B).

IMPERATA BREVIFOLIA Vasey (POACEAE). Indian Canyon, Deering fork, middle of the canyon; 33.3415 N, 116.4875 W, elevation 707 m, 25 February 2020, *Melgert 34* (SD) with *Hoegen*. Growing in sand/granitic boulders among riparian/canyon vegetation with *Salix exigua* var. *exigua*, *Acmispon heermannii* var. *heermannii*, *Prosopis glandulosa* var. *torreyana*, *Rhus ovata*, *Muhlenbergia rigens*, *Phragmites australis*, and *Epilobium canum* var. *latifolium*.

Previous knowledge. Native, rare herbaceous perennial grass, known to the southwestern USA and northwestern Mexico in the states of Baja California, Baja California Sur, and Sonora. In the USA outside of California, it had been documented from Arizona,

New Mexico, Texas, and Utah, but according to the treatment in the Flora of North America (FNA), this species is currently only known from extant occurrences in the Grand Canyon area of Arizona. In the state of California, it is known mostly from wet or moist desert habitats ranging from Fresno and Death Valley south to near Calexico. However, the majority of specimens documenting its distribution within the state were made more than 50 years ago and it is unclear how many occurrences are still extant in the state. There is another specimen from San Diego County identified to this species listed in the CCH2 as occurring to the north of Ramona, but this specimen needs to be verified as it may not be identified correctly, or it might have escaped from an ornamental planting. It should be noted that this species was mistakenly listed as a noxious weed by CDFA for many years but was removed from that listing in 2003.

Significance. This appears to be the first native record of this rare grass species for San Diego County. It is listed as 2B.1 in the California Rare Plant Ranking system meaning that it is rare, threatened, or endangered in California, but more common elsewhere and that over 80% of the occurrences in California are threatened (CNPS 2022).

JARAVA ICHU Ruiz & Pav. [*Stipa i.* (Ruiz & Pav.) Kunth] (POACEAE). San Diego Metro Area, Del Mar, Crest Canyon Park, east-central portion of Park, north of Del Mar Heights Road and just west of Recuerdo Drive; 32.95551 N, 117.25375 W, elevation 85 m, 20 November 2020, *Rebman 37017* (SD) with *Mulligan, J. Daniel, M. Gonzales, & F. Roberts*. Growing in Torrey Pine woodland/chaparral with *Pinus torreyana* ssp. *torreyana*, *Rhus integrifolia*, *Ceanothus verrucosus*, and *Rhamnus* cf. *ilicifolia*.

Previous knowledge. Non-native herbaceous perennial grass native to Mexico, Central America, and South America that is sometimes sold as an ornamental due to its attractive appearance. According to the Flora of North America (FNA), this species has the potential to become a possible invasive because it is self-compatible and the seeds are dispersed by wind. It has been reported to naturalize rarely in California, but many of the records in the SEINet (2022) consortium appear to be misidentifications of *Pappostipa speciosa* (Trin. & Rupr.) Romasch [= *Stipa s.* Trin. & Rupr.] so it is unclear which records actually represent *J. ichu* without examining the specimens deposited at other herbaria in detail.

Significance. This is the first record of this non-native grass species for San Diego County. It was found growing in the middle of an undisturbed natural area under the canopy of *Pinus torreyana* Parry ex Carrière and native chaparral shrubs. However, this site is downslope from the urban/wildlands interface of housing landscapes so it is possible that seeds may have originated from a nearby horticultural planting.

MORAEA POLYSTACHYA (Thunb.) Ker Gawl. (IRIDACEAE). Fallbrook, South of Vista Valle Camino, 0.3 mi southeast of its junction with Reche Rd, land owned by Valley Oaks Partnership;

33.36817 N, 117.17113 W, elevation 117 m, 16 February 2021, *Crawford 1* (SD). Growing in partially shaded flat, dark-brown sandy-loam soil in oak woodland with *Quercus agrifolia*, *Artemisia californica*, and *Hirschfeldia incana*.

Previous knowledge. Non-native perennial geophyte is native and widespread in central South Africa and Namibia (SANBI 2022). It has been documented as a non-native, naturalized species in southern California in Los Angeles, Riverside, and Santa Barbara counties (CCH2 2022). This species and others in this genus are considered to be toxic to grazing animals (SANBI 2022).

Significance. This is the first naturalized record of this non-native species for San Diego County. According to the collector, at least five individuals in a 3 m radius were observed and removed in 2021. However, fieldwork in early 2022 found 31 additional individuals at the site.

NAVARRETIA AEROIDES L.A. Johnson & D. Gowen (POLEMONIACEAE). Cleveland National Forest, Cuyamaca Mtns., S face of North Peak, S side of Engineers Road, 200 yds. W of junction with North Peak Road; 32.9991 N, 116.598 W, elevation 1449, 3 July 2012, *J. Groth 288* (SD). Odorous annual with blue-lavender flowers growing in a dried depression on hard clay with *Zeltnera venusta* and *Brodiaea orcuttii*.

Previous knowledge. Native annual species endemic to California and recently described (Johnson & Gowen 2017) as a cryptic segregate of *Navarretia divaricata* (A. Gray) Greene subsp. *vidior* (Jeps. & V.L. Bailey) H. Mason, elevated to species status as *N. vidior* (Jeps. & V.L. Bailey) L. A. Johnson & D. Gowen (Johnson & Gowen 2017). It is known to occur in forest openings on clay soils ranging from Mariposa County to Plumas County in the Sierra Nevada, and also in the Trinity mountains of the North Coast Range. This species is a diploid parent species for the allotetraploid *N. vidior*, and resembles that species, but differs in being less robust and having smaller inflorescence heads that are stipitate-glandular throughout. This herbarium specimen was previously identified as *N. peninsularis*.

Significance. New, native plant record for San Diego County and a significant southern range extension of ca. 570 km from its previous southerly distribution in Mariposa County. The voucher specimen is mixed and contains both *N. aroides* (2 plants) and *N. vidior* (3 plants) and was recently annotated by L.A. Johnson as part of his ongoing monographic studies of the genus *Navarretia*. With improved taxonomic knowledge of the *Navarretia divaricata* complex (Johnson & Gowen 2017), this species should be looked for more widely. In San Diego County, the high elevations in the Laguna and Cuyamaca mountains may be likely locations.

NAVARRETIA DIVARICATA Greene (POLEMONIACEAE). Cuyamaca Rancho State Park, Middle Peak, along Middle Peak Loop Fire Road, NW of the peak; 32.9866 N, 116.6054 W, elevation 1667 m, 9 June 2009, *Rebman 18042* (SD) with *K. Rich & J. Green*. Rare with white flowers, growing in pine/oak



Plate 2. A. Inflorescence of *Eragrostis echinochloidea* (Poaceae), photo by J. Rebman; B. *Gamochaeta stachydifolia* (Asteraceae), photo by J. Rebman; A. *Pulicaria arabica* subsp. *arabica* (Asteraceae), photo by M. Mulligan

forest with *Ceanothus palmeri*, *Quercus kelloggii*, *Q. chrysolepis*, *Calocedrus decurrens*, *Pteridium aquilinum*, and *Apocynum androsaemifolium*. Note that the area burned in the 2003 Cedar Fire.

Previous knowledge. Native annual species occurs in foothill and mountain habitats on various soil types and is widely distributed from Santa Barbara and Tulare counties to southern British Columbia in the north and Nevada and western Montana in the east. Within California, it occurs mostly in the northern part of the

state, but is disjunct to the south in Santa Barbara County. Under Johnson and Gowan's (2017) treatment elevating *N. vividior* to species status, subspecies are not recognized within *N. divaricata* and this taxon is recognized simply as *N. divaricata* Greene. The herbarium specimen above was previously identified as *N. peninsularis* Greene.

Significance. New native plant record for San Diego County and a significant southern range extension of ca. 330 km from its previously known disjunct occurrence in eastern Santa Barbara

County. With improved taxonomic knowledge of the *Navarretia divaricata* complex (Johnson & Gowen 2017), this species should be looked for in other parts of San Diego County at high elevations in the Laguna and Cuyamaca mountains.

NAVARRETTIA VIVIDIOR (Jeps. & V.L.Bailey) L.A.Johnson & D.Gowen (POLEMONIACEAE). Boulder Creek, Cuyamaca Rancho State Park, 0.2 mi northwest of the Cuyamaca Lake dam; 32.9918 N, 116.5893 W, elevation 1413 m, 11 June 2020, *Melgert 212* (SD) with *Hoegen*. Ca. 100 plants growing in red, firmly packed gravel along shrubs in partial shade with *Bloomeria crocea* var. *crocea*, *Brodiaea orcuttii*, *B. terrestris* subsp. *kernensis*, *Psilocarphus tenellus*, *Allium amplexans*, *Agnorhiza ovata*, *Clarkia purpurea* subsp. *quadrivulnera*, *Navarretia intertexta* subsp. *intertexta*, *Githopsis diffusa* subsp. *candida*.

Previous knowledge. Native, annual taxon, currently recognized in the Jepson flora as *N. divaricata* subsp. *vividior* (Jeps. & V.L.Bailey) H.Mason, but Johnson & Gowen (2017) recognized it at the species level based on molecular data. The species is endemic to California and occurs mostly in the North Coast Range from Lake and Sonoma counties to Humboldt, Trinity and Shasta counties. It often grows in soils with volcanic influence and commonly at the edges of ephemeral wetlands. The herbarium specimen cited above was provisionally identified as *N. modocensis* L.A. Johnson & D. Gowen prior to molecular analysis, with DNA sequencing confirming it is allopolyploid and thus correctly placed in *N. vividior*. Other specimens at SD that are also now determined as belonging to *N. vividior* were originally identified as *N. peninsularis*.

Significance. New, native plant record for San Diego County and a significant southern range extension of ca. 830 km from its previously known southern occurrence in northern Napa County (Plate 3A). With improved taxonomic knowledge of the *Navarretia divaricata* complex (Johnson & Gowen 2017), this species should be looked for in other parts of San Diego County at high elevation near temporal wetlands in the Laguna and Cuyamaca mountains.

It is worth noting that with the taxonomic determinations recognized above (*N. aeroides*, *N. divaricata*, and *N. vividior*), there are no longer verified occurrences of *N. peninsularis* within San Diego County.

OPUNTIA PILIFERA F.A.C.Weber (CACTACEAE). Chula Vista, Otay Valley Regional Park, owned by the City of San Diego, on edge of cliff, 0.2 km ENE of trailhead to Finney Overlook accessed via Byrd St. near Twining Ave.; 32.58580 N, 117.04665 W, elevation 66 m, 31 March 2018, *Mulligan 3652* (SD) with *Rebman*. One shrub to 4 m tall in clay cobble soils on N-facing slope in coastal sage scrub with *Rhus integrifolia*, *Artemisia californica*, *Simmondsia chinensis* and *Encelia californica*.

Previous knowledge. Non-native, tree-like cactus can grow to 5 m tall, has dark pink flowers, and is native to the states of Puebla,

Oaxaca and Tlaxcala in southern Mexico. The species is quite morphologically diverse and was traditionally used in its native area for “food, fodder, firewood, and living fences” where it was locally planted in yards and considered an important food source especially during harsh agricultural times. (Nilsen et al. 2005). Interest in growing this species horticulturally has waned over time with the increased availability of store-bought domesticated *Opuntia* selections with fewer spines.

Significance. Non-native cactus, and first naturalized record for San Diego County, the state of California, and for the USA. This was an established large, shrubby tree located significantly downslope from houses in a native coastal sage scrub dominated canyon. This is the fifth non-native *Opuntia* species known to naturalize in native vegetation in urban parts of the San Diego metro area.

PHACELIA CILIATA Benth. (HYDROPHYLLACEAE). Lawson Peak, Cleveland National Forest, near Jamul, lower east slope of peak along trail (Carveacre Rd.), 0.2 km from trailhead at Japatul Lyons Valley Rd.; 32.7150 N, 116.70611 W, elevation 671 m, 15 April 2021, *Escalante s.n.* (SD) with *Rebman*. Growing a meter below the trail (old bulldozed road) in disturbed gabbro soil in chamise chaparral with *Adenosotoma fasciculatum*, *Malosma laurina*, *Hesperoyucca whipplei*, *Centaurea melitensis*, *Sonchus asper*, *Bromus rubens*, *Chaenactis artemisiifolia*, *Erodium cicutarium*, and *Hirschfeldia incana*. This site burned during the Valley Fire in fall of 2020.

Previous knowledge. Native annual species is widespread in California, but appeared to skip San Diego County and resumes its distribution in northern Baja California from just south of the border at Valle de las Palmas and extends south to the San Quintin area.

Significance. This is a new native record for San Diego County. It was also documented in several other locations along the trail to Lawson Peak in a 0.25 km stretch. This area is known for other rare and unusual locations of plants, such as *Ribes canthariforme* Wiggins (endemic to the region) and *Penstemon incertus* Brandegees (disjunct ca. 160 km from the San Bernardino and Little San Bernardino Mountains).

PHACELIA ROTUNDIFOLIA Torr. ex S.Watson (HYDROPHYLLACEAE). Anza-Borrego Desert region, east side of Coyote Mountain, west of Clark Dry Lake, ca. 4 km NNW of S22 and Henderson Canyon Rd. junction; 33.3297 N, 116.3054 W, elevation 276 m, 19 February 2020, *Melgert 32* (SD) with *Hoegen* & *M. Berger*. The plants were growing on a south-facing granitic and possibly limestone rock with *Aristida adscensionis*, *Encelia farinosa*, *Brassica tournefortii*, *Perityle emoryi*, *Pectocarya recurvata*, *Cryptantha maritima* var. *maritima*, *Fagonia laevis*, *Aliciella latifolia* subsp. *latifolia*.

Previous knowledge. Native annual with white flowers that occurs on rocky slopes in creosote-bush scrub and pinyon-juniper

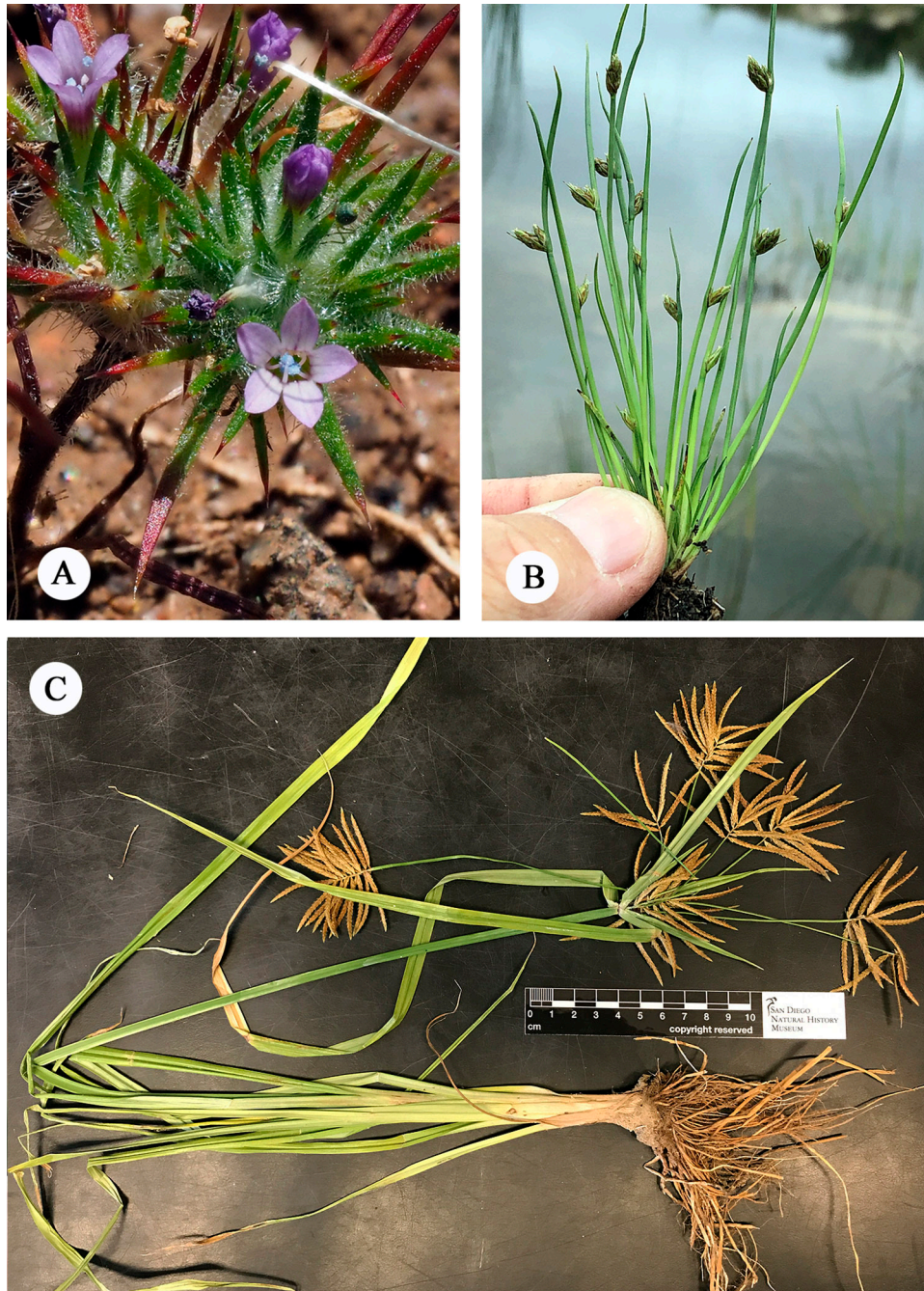


Plate 3. ; **A.** Flowers of *Navarretia vividior* (Polemoniaceae), photo by F. Melgert & C. Hoegen; **B.** *Schoenoplectus saximontanus* (Cyperaceae), photos by J. Rebman **C.** *Cyperus esculentus* var. *macrostachyus* (Cyperaceae), photo by J. Rebman.

woodlands in Arizona, California, Nevada, and southwestern Utah (SEINet 2022). In San Diego County, this species was previously documented once with a photo voucher (*M. Crouse s.n.* 13 March 2010 SDSU 20367) in Henderson Canyon, which is ca. 10 km to the west southwest of the location of the Melgert specimen.

Significance. This is the first vouchered specimen with plant material for San Diego County and the most southern collection

in the state of California. More locations should be searched for along the rocky edges of the Anza-Borrego Desert region.

***PULICARIA ARABICA* (L.) Cass. subsp. *ARABICA* (ASTERACEAE).** Mira Mesa, vernal pool restoration site at Marine Corps Air Station Miramar, 0.3 km south of I-15 and Pomerado Rd intersection, 0.2 km west of I-15, 0.2 km east of Beta Dr and Zodiac Ave intersection; 32.88993 N, 117.11576 W, elevation 156 m, 18 May 2020, *Mulligan 3763* (SD) with *R. Meszaros*. Approximately 200

plants widespread on the edges of five vernal pools in clay soils with *Eryngium aristulatum* var. *parishii*, *Pogogyne abramsii*, *Psilocarphus brevissimus*, *Eleocharis* sp., and *Juncus bufonius*.

Previous knowledge. Non-native, annual species, native to Europe, Asia and Africa. In the late 1800s, this species was collected in Alabama, California, and Florida, but it never appeared to naturalize (FNA). The only previous collection from California was made by G.R. Vasey, the USDA Chief Botanist, in 1875 (*Vasey s.n.* 1875 US 55108). Note that the label locality of this specimen only indicates “California” without specific location or date.

Significance. The San Diego locality represents a new non-native county record and most likely a new naturalized state record for California (Plate 2C). According to Bruce Baldwin, the possible hybridization of this taxon with *P. arabica* subsp. *hispanica* [= *P. paludosa* Link] is worrisome as it could lead to a more aggressive invader (Baldwin pers. comm. 6 June 2020). Plants at the San Diego location were immediately destroyed after identification and the site is currently being monitored and weeded for the next five years.

SCHOENOPLECTUS SAXIMONTANUS (Fernald) J.Raynal (CYPERACEAE). Naval Weapons Station Seal Beach Detachment Fallbrook, west of Fallbrook, North Magazine, north of Ammunition Road, northwest part of station, quarry vernal pool complex; 33.38214 N, 117.28933 W, elevation 245 m, 8 May 2019, *Rebman 35662* (SD) with *A. Arft* & *C. Wolf*. This species was uncommon and growing along a pool edge with vernal pool vegetation including *Eleocharis macrostachya*, *Crassula aquatica*, *Marsilea vestita*, *Juncus bufonius*, *Psilocarphus brevissimus*, and *Elatine brachysperma*.

Previous knowledge. Native, tufted annual with cylindrical stems found in wetlands and ephemerally wet areas. Outside of California, this species occurs mostly in the central USA and ranges from Utah to Ohio and South Dakota to Texas. It also occurs in British Columbia, Canada and in a few states in Mexico including Baja California and Baja California Sur. Within California, it is known from San Luis Obispo and Kern counties south to the vicinity of Temecula in Riverside County. Shiels et al. (2014) used molecular data from chloroplast and nuclear DNA and concluded that it should be placed in the genus *Schoenoplectiella*, as *S. saximontana* (Fernald) Lye.

Significance. This is the first record of this native, wetland species for San Diego County (Plate 3B). Another population was documented on 27 August 2019 at Depot Lake (*Rebman 36071* SD) on Naval Weapons Station Seal Beach Detachment Fallbrook in the northern part of the installation. The closest known population to the occurrence in San Diego County is approximately 30 km to the northeast in Riverside County in a wetland area southwest of Skinner Reservoir and 2 miles east of Murrieta Hot Springs.

REDISCOVERY COLLECTIONS

CYPERUS ESCULENTUS L. var. ***MACROSTACHYUS*** Boeckeler (CYPERACEAE). Marine Corps Base Camp Pendleton (east-central portion), India Training Area, north of Lake O’Neill and south of Del Luz Camp, along Del Luz Creek near its confluence with the Santa Margarita River; 33.36728 N, 117.32353 W, elevation 47 m, 8 August 2017, *Rebman 34646* (SD) with *W. Schmidtmann* & *G. Kenney*. Uncommon and growing in riparian vegetation with *Platanus racemosa*, *Quercus agrifolia*, *Salix laevigata*, *S. lasiolepis*, *Baccharis salicifolia*, *Artemisia douglasiana*, *Toxicodendron diversilobum*, and *Vitis girdiana*.

Previous knowledge. Native perennial, known from the southeastern USA, New York, California, New Mexico, Texas, Mexico, Central America, and South America (FNA). In California, it was previously known from only one historic collection in San Diego on 26 September 1885 (*C. Orcutt 1314* US). The label states “Otay” as the location, however, Orcutt is notorious for unorganized field notes. Instead of a plant, his notebook lists a mollusk under the collection number with two localities, the first being Otay and the second as Pala. It is unclear which locality is correct but Pala is closer to this location.

Significance. This is a rediscovery for San Diego County (Plate 3C) and the second time this taxon has been documented in the state of California (two other *C. esculentus* varieties are widespread in the county). The identification of this voucher specimen was confirmed by Gordon Tucker in 2017. Since this collection, the taxon has been documented by additional voucher specimens and iNat observations in several new locations along the Santa Margarita River. Therefore, it is well represented in this part of San Diego County. In addition, there is a voucher specimen of this taxon (*S. White 2469* UTC) from the Temecula area of Riverside County that appears to be annotated by G. Tucker in 2018 (in the online data but not on the specimen photo), a year after he confirmed the collection from San Diego County. However, duplicate specimens of *S. White 2469* in other herbaria have not yet been annotated and are identified to the species level without an infraspecific name. Temecula is about 30 km to the northeast, which is not far from these Santa Margarita occurrences. This is most likely another locality for this rare variety in California.

LOMATIUM UTRICULATUM (Nutt. ex Torr. & A.Gray) J.M.Coult. & Rose (APIACEAE). Mission Trails Regional Park (western boundary), owned by the City of San Diego, Tierresanta side, W side of Fortuna Mountain, 1.1 mi E of junction with Santo Rd and Hwy 52; 32.84068 N, 117.07864 W, elevation 195 m, 14 March 2019, *Basden-Thomas 166* (SD) with *Mulligan*. Growing on a gentle, north-facing slope above a natural drainage in a grassland with *Malosma laurina*, *Heteromeles arbutifolia*, *Dipterostemon capitatus*, *Stachys* sp. *Sisyrinchium bellum*, and various grasses.

Previous Knowledge. Native, herbaceous perennial ranges in western North America from British Columbia to southern California. In San Diego County, it was historically known from a few collections at Adobe Falls (west of San Diego State University), Paradise Valley, El Cajon, and Fletcher Hills.

Significance. This species had not been documented in San Diego County for 74 years, and this represents the most southern collections of *L. utriculatum* in its range. Native grasslands with clay soils in the western foothills of San Diego County should be searched for new localities. In the same year, a new location was discovered and documented with iNat (<https://www.inaturalist.org/observations/25427524>) in Slaughterhouse Canyon in Lakeside, northeast of Mission Trails Regional Park. Note the basis for the specimen collection was an iNat observation made by Brennan Mulrooney (<https://www.inaturalist.org/observations/21210447>).

PHACELIA IVESIANA Torr. (HYDROPHYLLACEAE). Anza Borrego Desert, Clark Valley, north of Little Clark Dry Lake, ca. 4 km N of S22 at Fonts Point Trail junction; 33.3401 N, 116.2378 W, elevation 181 m, 8 February 2019, *Melgert 22 (SD) with Hoegen*. Growing on a sand dune with *Schismus arabicus*, *Brassica tournefortii*, *Abronia villosa* var. *villosa*, *Larrea tridentata*, *Atriplex polycarpa*, and *Prosopis glandulosa* var. *torreyana*.

Previous knowledge. Annual species, native to southern California, Wyoming, Colorado, and New Mexico. (Jepson eflora). In San Diego County, this species was collected in Borrego Springs on 17 April 1895 (*T.S. Brandegee s.n.* UC) and at the same locality on 19 April 1906 (*M.E. Jones s.n.* POM). More recently, it was observed and documented on iNat in February 2017 by several botanists in two main locations, southeast of Borrego Valley Airport and north of Little Clark Dry Lake.

Significance. This is a rediscovery of a native species that has not been specimen documented in over 110 years in San Diego County. Since the initial 2017 rediscovery, it has been documented via iNat in detail in the two main areas. This species should be looked for in more locations in the Borrego Springs area.

ACKNOWLEDGMENTS

We wish to thank Anna Arft, Matt Berger, Justin Daniel, Robin Echols-Booth, Michael Gonzales, Michael Honer, Abby Hanlen (Hyduke), Gwen Kenney, John La Grange, Jerry Green, John Groth, Dawn Lawson, Ryan Meszaros, Brennan Mulrooney, Karen Rich, Fred Roberts, Warren Schmidtmann, and Christy Wolf for field assistance with specimen collections. We also wish to thank Bruce Baldwin, Robert Preston, John Strother, and Gordon Tucker with help in identifying and verifying some of the new records. A special thanks to Layla Aerne-Haines, Jeannie

Gregory, and volunteers in the Botany Dept. at the San Diego Natural History Museum for help with specimen documentation.

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