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THE VEGETATION AND FLORA OF EDWARDS AIR FORCE BASE, WESTERN MOJAVE DESERT, CALIFORNIA

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ABSTRACT

Edwards Air Force Base extends over 121,000 ha in the Antelope Valley of the western Mojave Desert, with much of the area part of a closed endorheic basin that held the Pleistocene Lake Thompson. Notable topographic features are Rogers, Rosamond and Buckhorn dry lakes, while rounded domes and scattered hills are present to the north and east. Elevation gradients are limited, ranging from a low of 690 m to 1044 m near the eastern margin. Diverse communities of saltbush scrub dominate the lower plains, while creosote bush scrub and Joshua tree woodlands are present away from the old lake basin. In many ways EAFB is a biogeographic crossroads with the broader central Mojave Desert to the east, Owens Valley and Great Basin to the north, and cismontane Central Valley and foothills to the west. The flora as currently known contains 403 vascular plant taxa, with 324 (80%) of these native. The eight largest families comprise more than 68% of the flora, led by the Asteraceae with 84 taxa (72 native). Annual plants make up over two-thirds of the total flora.

Key words: creosote bush scrub, flora, Mojave Desert, non-native species, saltbush scrub.

INTRODUCTION

Edwards Air Force Base (EAFB) lies in the Antelope Valley, a low-lying basin at about 700 m elevation that occupies the western edge of the Mojave Desert. The Antelope Valley is roughly triangular in shape and bordered on the southwest by the San Gabriel Mountains and on the northwest by the Tehachapi Mountains (Fig. 1). This western valley is a closed endorheic basin that was the site of the large Pleistocene Lake Thompson (Orme 2008). The boundaries of EAFB include approximately 121,000 ha of the Antelope Valley, extending over portions of Kern, Los Angeles and San Bernardino counties. Geographically, EAFB is approximately 160 km northeast of Los Angeles, 140 km northwest of San Bernardino and 130 km southeast of Bakersfield.

The topography of EAFB can be characterized by broad expanses of flat to gently sloping plains interspersed with broad, rounded domes and a scattered occurrence of steeper, more rugged hills that rise sharply above the surrounding plains. The domes and hills consist mostly of outcrops of granite and quartz monzonite, with non-granitic volcanic rock forming some of the smaller features (EAFB 2008). Limestone is absent. Elevations on base range from 690 m at Rogers Dry Lake to 1044 m at Red Buttes near the eastern boundary.

The base can be divided into three distinct physiographic sections. The first physiographic area occupies the central and southwestern lowlands of the base. This region extends from the southern to the northern boundary of the base and has a low relief of approximately 120 m, with elevations ranging from 690 to 815 m (EAFB 2008). The greatest portion of this area is composed of Rogers Dry Lake (11,453 ha), Rosamond Dry Lake

(5589 ha), Buckhorn Dry Lake (739 ha), and playa complexes north and northeast of Buckhorn Dry Lake (690 ha). In the late Pleistocene, Lake Thompson rose to 710 meters above sea level and covered 950 km² (95,000 ha) of the Antelope Valley (Orme 2008). The lake slowly desiccated following the Pleistocene and the old lakebed is today represented by Rogers, Rosamond and Buckhorn Dry Lakes. Beyond these playas the former lake basin is characterized by exposed lake beds and beach ridges as well as areas mantled by aeolian and fluvial deposits (Orme 2008). Rogers Dry Lake has a long history of aviation use ranging from the development of special aircraft for the U.S. Air Force to its service as a recovery site for early Space Shuttle landings.

The second region is an upland area in the northwest portion of the base north of Rosamond Dry Lake and west of Rogers Dry Lake. This area is characterized by low, rounded hills, including the Rosamond and Bissell Hills, with elevations ranging between 690 and 975 m. The third physiographic area is formed by the highlands to the east of Rogers Dry Lake and extending to the eastern boundary of EAFB. This upland area is similar in landform to that in the northwestern corner of the base except for two prominent relief features. Leuhman Ridge in Kern County reaches 1034 m in elevation, and Haystack Butte in San Bernardino County has an elevation of 1030 m.

The climate of EAFB is typical of the western Mojave Desert with a precipitation regime dominated by winter rainfall (Rundel and Gibson 1996). The presence of the San Gabriel and Tehachapi Mountains to the southwest and northwest of the Antelope Valley limits, but does not prevent, the passage of moist air from the Pacific Ocean. Cyclonic winter storms bring the majority of precipitation, with 80% falling from November through March. A summer weakening of the subtropical high pressure center of the eastern Pacific, however, can occasionally allow low pressure systems from the Gulf of Mexico or tropical storms from the subtropical Pacific Ocean to penetrate and bring August or September rains. Mean annual precipitation at Rogers Dry Lake was 122 mm for 1933–1989 (Londquist et al. 1993) or about 125 mm for 1944–2003 (EAFB 2008). Figure 2

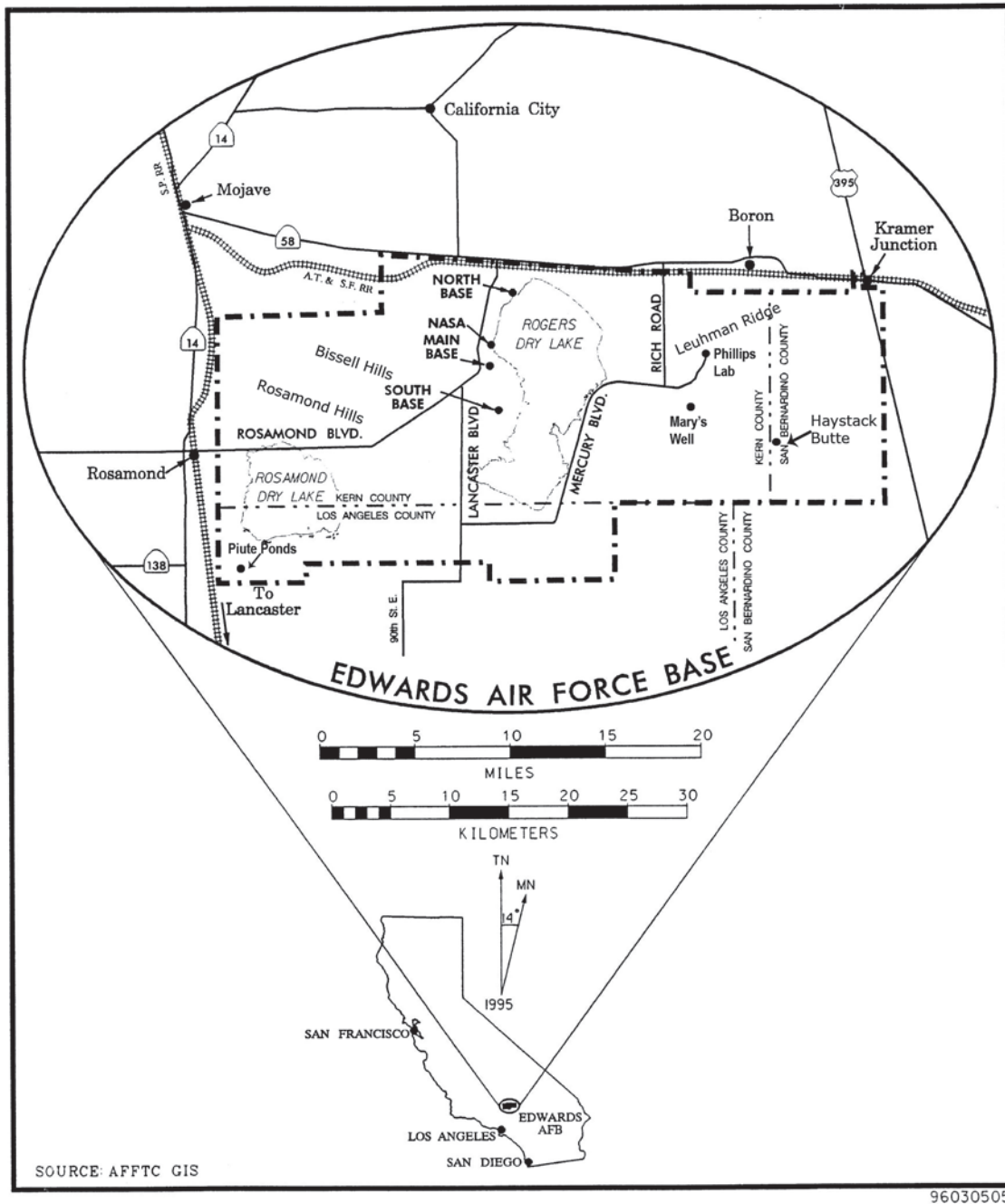


Fig. 1. Location of Edwards Air Force Base in Antelope Valley in the western Mojave Desert, California. Base boundaries are indicated by a dot-dash line.

illustrates the annual precipitation at EAFB from 1944 to 2003 and demonstrates the large amount of inter-annual variation. Seasonal temperature variation is high, with mean summer high temperatures of 36°C, but record extremes up to 45°C. Winter lows at night average -1°C, but record lows are -15°C.

VEGETATION

Saltbush scrub with a dominance of single or multiple species of *Atriplex* is widespread in the western Mojave Desert and

forms the dominant vegetation on EAFB in the areas around Rosamond, Buckhorn and Rogers dry lakes (Fig. 3A; Lichvar and Sprecher 1996; Lichvar et al. 2004). A complex interaction of topography, geology and soils creates special microsite conditions with a diverse set of identifiable associations including sand fields, various dune types, beach ridges and bare clay pans (Fig. 3B; Sharifi et al. 2017a). Dominance by *Atriplex canescens* (four-wing saltbush) is generally associated with deep sand along washes or on dunes. In contrast, stands dominated by *Atriplex confertifolia* (shadscale) occur in areas of deflated dunes with sandy hummocks and pans. Associations of *Atriplex*

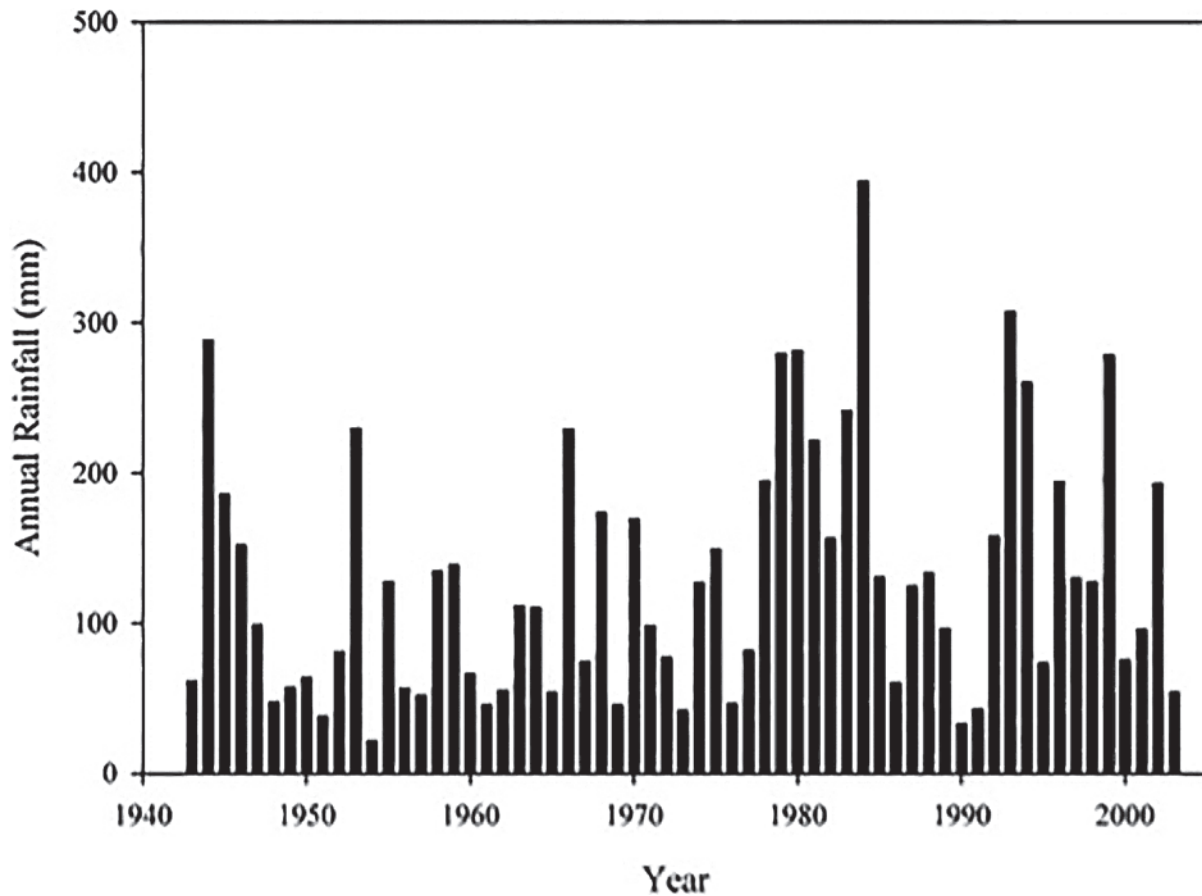


Fig. 2. Long-term calendar-year precipitation from 1944 to 2003 at Edwards Air Force Base, California. Long-term mean annual precipitation is 215 mm (EAFB 2008).

spinescens (spinescale) are limited to areas of the Pleistocene bed of Lake Thompson that have been eroded by flood events to produce shallow sands over the soil surface. Clay drainages exhibit associations of *Atriplex torreyi* (Nevada saltbush) with *Ericameria nauseosa* (rabbitbrush), *Gutierrezia microcephala* (matchweed) and *Artemisia tridentata* subsp. *parishii* (Parish's sagebrush) as co-dominants. *Atriplex parryi* (Parry saltbush) is restricted to depressions and small pans. Associations dominated by *Atriplex polycarpa* (allscale) are typically found in less saline transitional ecotones between playa, oligotrophic soils and upland plant communities. Allscale also occurs on rhyolitic outcrops and clay pans disturbed by trenching.

The edges of clay pans in the southwestern portion of the base where there is a thin veneer of sand that has been sorted into the pan and dune habitat are dominated by stem succulent shrubs such as *Suaeda nigra* (inkweed), *Kochia californica* (gray molly) and *Arthrocnemum subterminale* (Parish's glasswort). The adjacent low remnant dunes are dominated by *Atriplex confertifolia* and *Sporobolus airoides* (alkali sacaton) (Sharifi et al. 2017b).

Creosote bush dominates the moderate elevations above the saltbush communities. The lower-elevation boundary of this community roughly marks the extent of Pleistocene Lake Thompson. *Larrea tridentata* (creosote bush) will not grow on the saline and fine-textured soils of the old lakebed. The broad creosote bush community includes areas of both relatively

low and high species diversity. The portions with low species richness are dominated by *L. tridentata* and/or *Ambrosia dumosa* (burrobush). The more species-rich communities include *Ephedra nevadensis* (Nevada tea), *Grayia spinosa* (spiny hop-sage) and *Krascheninnikovia lanata* (winterfat) as important associated shrubs. These are the same species that make up the understory shrubs in the Joshua tree woodland. The annuals are much more diverse than in the saltbush scrub and are most commonly observed in the sandy soils on the flats near the Rosamond Hills and slopes of the west range.

Rocky slopes on the base support shrub communities with *Eriogonum fasciculatum* var. *polifolium* (bush buckwheat) and *Lycium andersonii* (desert tomato), along with *Ericameria cooperi* (Cooper's goldenbush) and *E. teretifolia* (round-leaf goldenbush). Sandy soils typically have *Acamptopappus sphaerocephalus* (rayless goldenheads), *Lycium cooperi* (peachthorn) and *Tetradymia stenolepis* (felt-thorn). Cacti are relatively uncommon at EAFB and are most evident on upper alluvial fans. The most common species are *Cylindropuntia echinocarpa* (golden cholla) and *Opuntia basilaris* (beavertail cactus).

Joshua tree woodland (Fig. 3C) occurs on deep, sandy soils or in shallow as well as rocky soils on steep hillsides of higher elevation areas of EAFB where surface or subsurface water is available. This distribution along lines of subsurface water distribution can be seen with *Yucca brevifolia* (Joshua tree) north of Leuhman Ridge which appears to follow areas with



Fig. 3. Plant communities at Edwards Air Force Base, California.—A. Saltbush scrub.—B. Pan-dune mosaic near Buckhorn Dry Lake.—C. Open stand of Joshua tree woodland where sand has accumulated above the old lakebed.—D. Mesquite woodland.

subsurface moisture. Joshua trees also occur at the lower elevations where water is trapped in sand dunes above the playa lakebed. Among these habitats, Joshua trees are densest and largest where a layer of sand 5–10 feet deep overlays the clay pan. Joshua tree woodland does not have a distinctive understory of shrubs. The most common associated species are *Ambrosia dumosa*, *Atriplex canescens*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata* and *Larrea tridentata*. Joshua tree woodland differs from the more diverse communities of creosote bush scrub largely on the basis of the presence of sufficient numbers of *Y. brevifolia* to create an image of a woodland. Stands of Joshua tree woodland at EAFB are among lowest-elevation stands anywhere in the range of the species.

Mesquite woodlands (Fig. 3D) on EAFB are largely concentrated in the south-central area of the base directly south of Rogers dry lake in an area with relatively shallow ground water availability (Campbell et al. 2017). In spring, much of the herbaceous understory is formed by non-native annual grasses, which have increased in abundance and cover in years of early rainfall and have greatly transformed the herbaceous community by eliminating most native species. The most common species are *Bromus madriensis* subsp. *rubens* (red brome), *B. tectorum* (cheatgrass), *B. berteruanus* (Chilean chess), *Hordeum murinum* subsp. *leporinum* (barley) and *Schismus barbatus* (splitgrass).

Beyond the major plant communities described above, there are several azonal communities of significance at EAFB. These are communities of limited geographic area that are controlled in distribution by local soil conditions or substrate geology rather than by larger landscape gradients. These include the plant cover on clay pans, sand fields and stable sand which support distinct communities of salt bush scrub. A rich diversity of annual species is associated with the ecotone between the clay pan and the sand dunes where soil-water content is highest as the water evaporates from the clay pans. Several species of *Phacelia* are only found at the base of the deflated dunes when the pans contain several inches of water. This is also the primary habitat for the endangered *Calochortus striatus* (alkali mariposa lily).

Another azonal community can be seen in the sinuous sandy washes that wind through the base. The soil in these washes is formed by layers of fluvial deposits associated with runoff from higher mountain areas. Nutrient content is low in these soils but regular infiltration provides for soil water resources for plants with appropriate root systems. Examples of perennial plant species that are largely restricted to such habitats are *Petalonyx thurberi* (sandpaper plant) and *Lycium cooperi*. Notable for their absence from this habitat at EAFB, however, are several species characteristic of similar sandy washes across the central and eastern Mojave Desert. These include *Ericameria paniculata* (black-banded rabbitbrush) and *Scutellaria mexicana* (Mexican bladder sage).

Alkaline meadows with high soil salinity and pH form distinct local communities at EAFB in the seepage zone to the north of Piute Ponds and adjacent to other local wetland areas such as near water outfall pipes and ditches along Main Base and in the housing areas. These alkaline soils typically support a dense coverage of *Distichlis spicata* (saltgrass) and taxa of the *Juncus balticus-mexicanus* complex (wiregrass). The native bunch grass *Sporobolus airoides* (alkali dropseed) may also be locally common in meadows and at springs. In wet years local areas of the clay pans on the base may be salinized and support

colonization by *Distichlis* and *Juncus* as well as the rare native annual *Puccinellia simplex* (California alkali grass).

The shores of Pleistocene Lake Thompson are thought to have once contained springs and seeps with wetlands, freshwater meadows and willow, but these were gradually lost as the lakebed dried. The last three existing springs on EAFB were related to faults and were dry by 1950. One was destroyed quarrying for road construction at Red Hill. Evidence for another was provided by a belt of mesquite trees, and the third was on the lakebed and marked by a single surviving tree. Today, the main wetlands are at the base wastewater treatment ponds and at Piute Ponds, both of which are man-made wetlands. Piute Ponds form the largest freshwater marsh in Los Angeles County and an important stop for migratory birds on the Pacific Flyway. The wetlands are designated as an Important Bird Area by the Audubon Society and identified as a Significant Ecological Area by the County of Los Angeles (EAFB 2008) as they provide a significant habitat for waterfowl and an important stop for migratory birds. Freshwater marsh forms around the edges of the man-made ponds at Piute Ponds and the South Base retention ponds. The vegetation is dominated by *Typha angustifolia* (cattail), *Bulboschoenus maritimus* (alkali bulrush) and *Schoenoplectus acutus* (tule rush). Piute Ponds are a series of interconnected impoundments constructed in 1961 to evaporate effluent from the Lancaster Water Reclamation Plant (LWRP). The ponds currently receive more than 2400 million gallons of treated wastewater from the LWRP each year. At peak levels the ponds can cover as much as 160 ha of water area. In wet years there can be an internal flow of water from Amargosa Creek into Piute Ponds and occasionally Rosamond dry lakebed.

HUMAN IMPACTS

Native Americans probably had very little impact on the vegetation in the Antelope Valley and more specifically what is now EAFB. They likely harvested edible bulbs, collected the seeds of annuals, made cakes from the mesquite beans and cleared areas near existing springs to build villages. Past evidence of Native Americans has been observed in the rock flakes, beads and fire rings observed during botanical surveys of the base, but Native American populations were small (EAFB 2008). Spanish military expeditions crossed the area of EAFB in the early part of the 18th century, but no native settlements were recorded (EAFB 2008). Mineral prospecting began in the late 19th century, but major impacts were largely limited to the mountain areas. Nevertheless, exploratory pits and mines are widespread across the base. The main focus of early mining activity at EAFB was related to precious metals in the Kramer Hills to the east and later bentonite clay from the dry lakebeds for use as a sealant and lubricant in oil exploration.

Homesteads became widely established on what is now the base in the early 20th century, with a focus on raising livestock and prospecting for minerals. Productive deposits of borates brought more settlers and increased the travel across the dry lakebeds (EAFB 2008). However, land-use changes were largely limited to agriculture and grazing associated with homesteaders who built small ranches in what is now the southern margin of the base. Land was bladed for farming, rice cultivation was attempted on Rosamond Dry Lake, wells were dug for irrigation and cattle were grazed in the area.

A railroad line which crossed the base was one of the first large-scale construction projects and resulted in a long band of disturbance, introduced weeds and caused changes in sheet flow water movement. However the major military mission began with the establishment of the Muroc Bombing and Gunnery Range on the east side of Rogers Dry Lake in 1931 and expanded rapidly with the onset of World War II. Large portions of Leuhman Ridge and North Base were bladed at this time as evidenced by archived photographs in the base files. Nearly every hill on base has numerous trails to the top as these were used for training activities as observation and communication posts. Gradually, many of the WWII era facilities were removed and new facilities built as postwar projects came and went. Most significant of this development was the clearing of the area near Rosamond lakebed for buildings and the main base runways.

Nevertheless, the presence of military security at EAFB has protected much of the historic vegetative cover from changes that have impacted other parts of the Mojave Desert. Since the development of military facilities in WWII there has been only limited ORV vehicle activity and grazing (EAFB 2008). In those areas where grazing has occurred, there is a characteristic dominance today of native and non-native annual species such as *Erodium cicutarium* (red-stem filaree), *Bromus tectorum*, *Amsinckia tessellata* (fiddleneck) and *Bromus madritensis* subsp. *rubens*.

Historically, the open vegetation of the Mojave Desert did not allow fires to carry over significant distances. However, in recent decades the non-native *Bromus madritensis* subsp. *rubens* and *B. tectorum* have become increasingly abundant. In wet years these species provide enough biomass to provide a continuity of fuel between woody shrubs and can facilitate large fires that can have major impacts on shrub survival (Brooks 1999; Brooks and Matchett 2011). More recently, *Brassica tournefortii* (Sahara mustard) has increased alarmingly in abundance and can also provide sufficient fuel to carry a ground fire. Two other ubiquitous non-native species, *Schismus barbatus* and *Erodium cicutarium*, do not normally produce enough biomass to support a fire, but they increase their abundance in the first spring after a fire and can outcompete native annuals by germinating before the native annuals. Before 1995, wildfires were an extremely rare event but fire frequency in the Mojave Desert overall has increased over the last two decades. Only two large fires have occurred on the base, with both located in the northwestern portion of the base and appear to have a human origin. There have been natural lightning fires but these have remained small and are concentrated in the east.

Groundwater has been drawn from wells at EAFB since the first settlements. By the middle of the 20th century an expanding agricultural enterprise utilized large amounts of water. Eventually the drawdown of groundwater level produced cracking in the dry lakebeds, subsidence and environmental concerns. Over time, as military activities expanded, agricultural water use decreased but was replaced to a large extent by increased urban and industrial use. Today, groundwater drawdown remains greater than aquifer recharge (Campbell et al. 2017).

Some of the most significant environmental changes since Ernest Twisselmann carried out his systematic plant collecting in the 1950s and 1960s have been the loss of natural surface springs at Rosamond Lakebed and loss of the cottonwood grove north of Branch Park. The continued lowering of the water table has

affected the mesquite and saltbush and the abundance of some of the rare perennial species. Long-term drought has affected many of the rare annuals whose populations are extremely small in average rainfall years. The health of mature Joshua trees shows evidence of decline in recent years although recruitment is still occurring.

BIOGEOGRAPHY

In many ways EAFB represents a biogeographic crossroads in its position near the western extent of the Mojave Desert. To the north there are open corridors to the southern Owens Valley with connections to the Great Basin bioregion and flora. For example, *Cymopterus deserticola* (desert cymopterus) represents a range extension with closely related species centered in Utah. Similarly, a number of perennial Mojave Desert species with southern origins do not occur on base because of the occasional years when temperatures drop as low as -12°C . These episodes of low temperature also impact non-native species. For example, many of the *Tamarix aphylla* (athel tree) on the base are killed or die back to the ground every decade. Low winter temperatures and an almost complete absence of summer rain may well explain the absence of several typical Mojave species. Plants from the central Mojave Desert that do not occur on EAFB include *Yucca schidigera* and *Encelia farinosa* (brittlebush), and populations of *Psoralea arborescens* (Mojave indigo bush) are rare. Unreliable summer precipitation at the western margin of the Mojave Desert also means that many C_4 summer annuals are either absent or uncommon. Beyond these factors, the absence of some central Mojave taxa at EAFB may be related to the absence of niches associated with high mountain ranges and carbonate substrates in the western Mojave. The higher mountains receive more rainfall and have more microclimate niches for species. The lack of carbonates removes a whole group of species that specialize in that sterile habitat which results in less competition.

To the west, the relatively short distance from the San Joaquin Valley results in annuals such as *Lasthenia californica* and *Layia glandulosa* which are relatively common on the base but much less abundant in the central Mojave. Elevations on the base are too low to support *Pinus monophylla* (single-leaf pinyon) or any species of oak. *Juniperus californica* (California juniper), rare on the base, is only common in the western Mojave. It is replaced by *Juniperus osteosperma* (Utah juniper) in the eastern Mojave.

FLORA

The flora of Edwards Air Force Base as currently known includes 403 vascular plant taxa with 324 of these (80%) native. A relatively small number of the 56 families make up a disproportionate share of the flora. The eight largest families comprise more than 68% of the total flora and over two-thirds of the native taxa. These are the Asteraceae (84 taxa, 72 native), Poaceae (35 taxa, 13 native), Boraginaceae (32 taxa, all native), Polygonaceae (29 taxa, 27 native), Brassicaceae (28 taxa, 15 native), Chenopodiaceae (27 taxa, 21 native), Fabaceae (22 taxa, 19 native) and Polemoniaceae (19 taxa, all native).

The largest genera present in the flora are *Eriogonum* (Polygonaceae) with 17 native species, *Lepidium* (Brassicaceae) with 9 species (4 native), *Atriplex* (Chenopodiaceae) with 12 species

(11 native), *Astragalus* (Fabaceae) with 8 species (10 taxa, all native), and *Cryptantha* (Boraginaceae) with 8 species (all native). Other genera with 5 species include *Chaenactis* (Asteraceae), *Pectocarya* (Boraginaceae), *Euphorbia* (Euphorbiaceae) and *Eriastrum* (Polemoniaceae).

Annual plant species represent the most common life form in the flora with 258 taxa when eight taxa of facultative annuals that occasionally live into a second year are included. Of this total, 205 taxa (79%) are native. The second largest group is comprised of herbaceous perennials with 86 taxa with 64 (75%) of these native. These herbaceous perennials include seven species of geophytes, a diverse group representing four different families.

Many species of herbaceous perennials and annuals are restricted to wetland habitats around Piute Ponds and there are additionally three species of aquatic plants—*Stuckenia pectinata*, *Najas marina* and *Lemna minor*. There are four species of perennial succulent plants present, all Cactaceae. There are 47 shrub and subshrub species, all but one of which are native. Finally, there are 12 tree species present with eight of these native and four introduced. The native trees include four species of *Salix* and *Populus fremontii*, as well as the widespread *Prosopis glandulosa* and a single individual of *Juniperus californica*.

The EAFB flora includes 80 taxa of non-native plants, comprising 20% of the total taxa present. These non-native taxa are heavily concentrated in just three families—Poaceae (22 taxa [21 species]), Brassicaceae (13 species) and Asteraceae (12 species)—which together make up almost 60% of all non-natives. The great majority of non-natives are annuals (55 taxa) or herbaceous perennials (22 taxa).

ENDANGERED SPECIES

Sixteen plant taxa on EAFB are listed or have been listed in the rare and endangered plant inventory of the California Native Plant Society (CNPS 2017). *Astragalus preussii* var. *laxiflorus* and *Eriastrum rosamondense* have the highest classification of 1B.1, indicating that they are seriously threatened because of a limited distribution. *Calochortus striatus*, *Cymopterus deserticola*, *Eriophyllum mohavense*, *Eschscholzia minutiflora* subsp. *twisselmanii* and *Puccinellia simplex* have a rank of 1B.2, indicating that they are moderately threatened. *Loeflingia squarrosa* var. *artemisiarum* recently recovered its 2B.2 rank, indicating that it is rare in California but more common outside of the state; Baldwin et al. (2012) treat the variety as a synonym of *L. squarrosa*. *Canbya candida*, *Castilleja plagiotoma*, *Chorizanthe spinosa*, *Cleomella brevipes*, *Goodmania luteola*, *Muilla coronata*, *Nemacladus gracilis* and *Psorothamnus arborescens* var. *arborescens* are listed as 4.2 or 4.3, indicating species of limited range but inadequately studied.

HISTORY OF PLANT COLLECTING

Plant collecting at what is now EAFB had a significant moment when Catherine Brandegee collected the rare *Cymopterus deserticola* on an unpaved road on the east range south of the original Kramer Junction in 1913. Sporadic collecting occurred in the area prior to the formation of EAFB during World War II. Most notable of the modern collections were those from 1964–1966 by Ernest Twisselmann, the rancher turned botanist famous for his Kern County Flora (Twisselmann 1967), who

began systematic collection on the base. He was followed in 1977–1978 by Larry Heckard from the Jepson Herbarium at Berkeley and Maynard Moe from California State University Bakersfield (Moe 2016).

In January 1989, Computer Sciences Corporation hired David Charlton as part of their NEPA team for completing small environmental documents called AF Form 813's. Unfortunately 1989 and 1990 were below average rainfall years and very little was accomplished botanically. In 1991 and through several high rainfall years later, a base plant list was produced along with a vegetation map and rare plant identification guide. At this time a single-case herbarium was established. Charlton left EAFB for eight years in 1996 returning from 2004 to 2009 to develop management plans for the 10 sensitive species. During this second appointment, an electronic pictorial flora of the base and a vegetation map at the alliance level were completed, and many new and non-native species were collected and added to the EAFB Herbarium. This small herbarium, designated here as EAFB, lacks accession numbers. Thus, the EAFB flora had begun to be assembled independently before the query system of the Consortium of Southern California Herbaria made it possible to more easily determine species that had been previously collected by others. The following is a compilation of 17 seasons of observation by the on-site botanist and collections by others over the years. Botanists Dave Silverman, Denise Laberteaux and Mark Bagley have done surveys on base but were mostly restricted to mapping rare plant populations. A few species reliably identified as occurring on EAFB currently lack vouchers but are included with high confidence.

ANNOTATED CHECKLIST OF THE FLORA

Family classification adheres to FNA (2016), whereas genera and species follow Baldwin et al. (2012) unless otherwise noted. Selected synonymy is provided. Frequency of taxa is denoted by the terms: common, locally common, occasional, uncommon and rare. Rarity follows the California Native Plant Society's Rare and Endangered Plant Inventory (CNPS 2017). In general, the most recent collection voucher is the only one listed. (*) denotes non-native taxa and (†) denotes rare taxa.

GYMNOSPERMS

GNETALES

EPHEDRACEAE

EPHEDRA ASPERA S. Watson. Rough joint fir, Mormon tea. Shrub; scattered occurrences in bajadas and along sandy hummocks. *Charlton 2442* (EAFB).

EPHEDRA NEVADENSIS S. Watson. Nevada Mormon tea, Nevada joint fir. Shrub; occasional and widespread on rocky hillsides, bajadas and dunes. *Charlton 5181* (RSA-POM).

CONIFERS

CUPRESSACEAE

*HESPEROCYPARIS STEPHENSONII (C.B. Wolf) Bartel. Cuyamaca cypress. Tree; a single individual at an abandoned homestead in the northwest corner of the base, site visited twice. *Charlton 3161* (UCR).

JUNIPERUS CALIFORNICA Carrière. California juniper. Tree; a single individual in the southwest corner of the base along the Amargosa Creek drainage. *Charlton 2839* (UCR).

ANGIOSPERMS: EUDICOTS

AIZOACEAE

- **SESUVIUM VERRUCOSUM* Raf. Western sea purslane. Annual; uncommon north of Piute Ponds along inflow into Rosamond Lakebed. *Charlton 5622* (UCR).

AMARANTHACEAE

- **AMARANTHUS ALBUS* L. Tumbling pigweed. C₄ summer annual; common spring and summer weed in the housing area, ditches and at Piute Ponds. *Charlton 3182* (RSA-POM).
- AMARANTHUS BLITOIDES* S. Watson. Mat amaranth. Rare C₄ summer annual; in the housing area and Rosamond dry lakebed. *Charlton 5698b* (UCR).
- AMARANTHUS FIMBRIATUS* (Torr.) Benth. Fringed amaranth. C₄ summer annual; a single skeleton found on the range just north of Boron in 1989 (D. Charlton, pers. obs.). No live plants have ever been observed.
- AMARANTHUS PALMERI* S. Watson. Uncommon weedy annual collected at the Rosamond Duck Club dike and old alfalfa field. *Charlton 4144* (RSA-POM).
- NITROPHILA OCCIDENTALIS* Moq. (S. Watson). Alkali pink. Herbaceous perennial; uncommon mostly on the northeastern side of Rosamond Lakebed south of Rosamond Boulevard with spinescale and hydrophobic soils, also Piute Ponds, Rogers Lakebed. *Charlton 5190* (RSA-POM).

APIACEAE

- **CONIUM MACULATUM* L. Poison hemlock. Herbaceous perennial; it showed up recently along the main access road to Piute Ponds along with narrow-leaf milkweed and stinging nettle. *Charlton 6043* (RSA-POM).
- †*CYMOPTERUS DESERTICOLA* Brandegee. Desert cymopterus. Herbaceous perennial; rare in the northeast-north central base; once occurred in dunes south of Rogers Lakebed, but it is now limited to the higher elevations mostly north of Leuhman Ridge on base due to downdraft of the water table and drought. Plants are scattered across the range in deep sandy soils; listed as CNPS 1B.2. *Heckard 4604* (JEPS).
- LOMATIUM MOHAVENSE* (J.M. Coult. & Rose) J.M. Coult. & Rose. Mojave wild parsley. Herbaceous perennial; scattered in eastern half of base; yellow and maroon flowering forms occur on base on flats, slopes and hillsides. Rosamond Hills, Bissell Peak. *Heckard/Moe 4463* (JEPS).

APOCYNACEAE

- ASCLEPIAS EROSA* Torr. Desert milkweed. Herbaceous perennial; rare on roadsides and washes. *Charlton 3272* (EAFB).
- ASCLEPIAS FASCICULARIS* Decne. Narrow-leaved milkweed. Herbaceous perennial; summer blooming; rare at the South Base water pumping station and at Piute Ponds. *Twisselmann 17494* (RSA-POM).

ASTERACEAE

- ACAMPTOPAPPUS SPHAEROCEPHALUS* (Harv. & A. Gray) A. Gray. Rayless goldenheads. Shrub; fairly common in sandy soils throughout the base. Both var. *hirtellus* S.F. Blake and var. *sphaerocephalus* appear to be present, with the former rare and the latter much more common. One of three common shrub species that pioneer in sterile soils (feltthorn and rubber rabbitbrush are the others). *Charlton 2913* (EAFB).
- **ACROPTILON REPENS* (L.) DC. Russian knapweed. Herbaceous perennial; common along dike roads at Piute Ponds. *Charlton 5345* (UCR).
- AGOSERIS RETRORSA* (Benth.) Greene. Mountain dandelion; herbaceous perennial; rare; one individual found on the rocky slopes of the central Rosamond Hills. *Charlton s.n.* (EAFB).
- AMBROSIA ACANTHICARPA* Hook. Sand bur. Annual; widespread in sandy soils; germinates in spring but flowers late in the season only along roadsides. *Heckard 4671* (JEPS).

AMBROSIA DUMOSA (A. Gray) Payne. Burrobush. Shrub; widespread in creosote bush scrub; also occurs in saltbush scrub on the only barchan dune on base. *Charlton 2820B* (UCR).

AMBROSIA SALSOLA (Torr. & A. Gray) Strother & B.G. Baldwin. Cheesebush. Shrub; very common in sandy soils and washes, primarily between housing and main base. Both var. *pentalepis* (Rydb.) Strother & B.G. Baldwin and var. *salsola* appear to be present. *Charlton 2840* (EAFB).

ANISOCOMA ACAULIS Torr. & A. Gray. Scalebud. Annual; uncommon in the south-central portion of the base and Kramer Hills. *Heckard 4598* (JEPS).

ARTEMISIA SPINESCENS D.C. Eaton. Budsage. Shrub; uncommon south of Rosamond Lakebed north and east to Rich Road. *Charlton 4534* (UCR).

ARTEMISIA TRIDENTATA Nutt. subsp. *PARISHII* (A. Gray) H.M. Hall & Clem. Parish's sagebrush. Shrub; locally common in drainages, especially at the Boy Scout Camp. *Charlton 5646D* (UCR).

BACCHARIS SALICIFOLIUS (Ruiz & Pav.) Pers. Mulefat/seeppwillow. Shrub; Phillips Lab at water pipe leak and guzzler. *Twisselmann 9362* (JEPS).

BAILEYA PAUCIRADIATA A. Gray. Laxflower. Annual; one plant recently observed on railroad right-of-way on the east side of Leuhman Ridge.

BAILEYA PLENIRADIATA A. Gray. Desert marigold. Annual; widespread but scattered just to the east of the base along roadsides. Persists in revegetation mixes. *Charlton 1380* (EAFB).

BRICKELLIA DESERTORUM Coville. Desert brickelbush. Shrub; a few plants occur in the large boulder piles near the main gate to the range. *Charlton 612* (EAFB).

CALYCOSERIS PARRYI A. Gray. Yellow tackstem. Annual; south shore of Rogers Lake to lower Lancaster Boulevard roadside. *Twisselmann 9385* (CAS).

**CENTAUREA DIFFUSA* Lam. Diffuse knapweed. Herbaceous perennial; roadside south of Red Hill, site bladed, plant no longer there and possibly a waif from the railroad. *Charlton 5625* (EAFB).

**CENTAUREA MELITENSIS* L. Tocolote/Maltese star thistle. Annual; rare weed at North Base, observed germinating in a patch for several years. *Charlton s.n.* (EAFB).

CENTROMADIA PUNGENS (Hook. & Arn.) Greene. Spikeweed. Annual; locally common at Piute Ponds in the alkali meadow. *Charlton 3250* (UCR).

CHAENACTIS CARPHOCLINIA A. Gray var. *CARPHOCLINIA*. Pebble pincushion flower. Annual; fairly common on the ranges in heavy soils and at the base of rocky hillsides and in the heavy clay soils off northern Rich Road where the Barstow woolly sunflowers grow. *Charlton s.n.* (EAFB).

CHAENACTIS FREMONTII A. Gray. Fremont pincushion flower. Annual; widespread and common east of the base. Scattered on base, primarily on the range. In low rainfall years, it comes up under creosote bushes. *Charlton 5153* (UCR).

CHAENACTIS MACRANTHA D.C. Eaton. Large-flowered pincushion flower. Annual; rare in washes west of Kramer Junction on the boundary road. *Charlton 5267* (UCR).

CHAENACTIS STEVIODES Hook. & Arn. Esteve's pincushion flower. Annual; uncommon in clumps in sandy soils on Mars Boulevard. *Charlton 4701* (RSA-POM).

CHAENACTIS XANTIANA A. Gray. Xantu's pincushion flower. Annual; the common pincushion flower on base in sandy soils. This plant is not common off-base. *Charlton 2911* (RSA-POM).

**CIRSIIUM VULGARE* (Savi) Ten. Bull thistle. Annual; rare, newly occurring at Piute Ponds probably due to the improved water quality. *Charlton s.n.* (UCR).

DICORIA CANESCENS A. Gray. Desert twinbugs. Annual to short-lived perennial; locally common in the dunes on south Lancaster Boulevard. *Charlton 5342* (RSA-POM).

DIETERIA CANESCENS (Pursh) Nutt. var. *LEUCANTHEMIFOLIA* D.R. Morgan & R.L. Hartm. Hoary tansy aster. Herbaceous perennial; southern

- Mercury Boulevard to south of Branch Park. Blooms in August after the whorl of sandy papery leaves have dried. *Heckard 4701* (JEPS).
- ENCELIA ACTONI Elmer. Acton encelia. Shrub; rare in rolling hills in creosote bush scrub; often in disturbed areas such as under transmission towers. *Charlton 4940* (RSA-POM).
- ERICAMERIA COOPERI (A. Gray) H.M. Hall. Cooper's goldenbush. Shrub; widespread in sandy and rocky soils on base. *Charlton 2906* (UCR).
- ERICAMERIA LINEARIFOLIA (DC.) Urbatsch & Wussow. Narrow-leaf goldenbush. Shrub; a single shrub was observed near the landfill; very rare. *Charlton 2985* (EAFB).
- ERICAMERIA NAUSEOSA (Pall. ex Pursh) G.L. Nesom & G.I. Baird var. HOLOLEUCA (Greene) G.L. Nesom & G.I. Baird. White-stem rubber rabbitbrush. Shrub; locally common in disturbed patches, especially in sandy soils, weedy at west and north of Piute Ponds. *Twisselmann 9353* (CAS, RSA-POM).
- ERICAMERIA NAUSEOSA (Pall. ex Pursh) G.L. Nesom & G.I. Baird var. MOHAVENSIS (Greene) G.L. Nesom & G.I. Baird. Mojave rabbitbrush. Shrub; broom-form shrubby growth with green stems rather than the blue-green color of the other varieties. West of Piute Ponds in depressions and along drainages. *Charlton 4154d* (EAFB).
- ERICAMERIA NAUSEOSA (Pall. ex Pursh) G.L. Nesom & G.I. Baird var. OREOPHILA (A. Nelson) G.L. Nesom & G.I. Baird. Green rubber rabbitbrush. Shrub; weedy, locally common in disturbed areas. *Twisselmann 17471* (RSA-POM).
- ERICAMERIA TERETIFOLIA (Durand & Hilg.) Jeps. Round-leaf rabbitbrush. Shrub; fairly common only in rocky hillsides, especially in the Rosamond Hills. Fall-blooming. *Charlton 4154c* (RSA-POM).
- *ERIGERON BONARIENSIS L. Horseweed. Annual; uncommon in disturbed areas such as the housing area. *Charlton 5694* (RSA-POM).
- ERIGERON CANADENSIS L. Canadian horseweed. Annual; uncommon in disturbed areas such as the housing area. *Charlton 5620* (RSA-POM).
- ERIGERON COULTERI Porter. Coulter's horseweed. Annual; disturbed wet places such as at Branch Park. *Charlton 5689* (RSA-POM).
- *ERIGERON SUMATRENSIS Retz. Gurnsey fleabane. Annual; disturbed wet places such as Branch Park. *Charlton s.n.* (UCR).
- †ERIOPHYLLUM MOHAVENSE (I.M. Johnst.) Jeps. Barstow woolly sunflower. Annual; Rich Road; also a small population on a disturbed path on the isolated hill near Buckhorn Lakebed. Plants occur along the edges of bare areas in the spinescale scrub. On-base populations are well mapped. CNPS 1B.2. *Shafer 117* (UCD).
- ERIOPHYLLUM PRINGLEI A. Gray. Pringle's woolly sunflower. Annual; uncommon in saltbush scrub north of Rosamond and Buckhorn Lakebeds. *Heckard 4600* (JEPS).
- ERIOPHYLLUM WALLACEI (A. Gray) A. Gray. Wallace's woolly sunflower. Annual; widespread and fairly common in sands around the lakebeds. *Heckard 4552* (JEPS).
- EUTHAMIA OCCIDENTALIS Nutt. Western goldeneck. Herbaceous perennial; one small patch at Piute Ponds, not able to relocate. *Charlton s.n.* (EAFB).
- GNAPHALIUM PALUSTRE Nutt. Cudweed. Annual; disturbed areas such as Main Base and on edge of a clay playa west of north Rich Road. *Charlton s.n.* (EAFB).
- *GRINDELIA SQUARROSA (Pursh) Dunal var. SERRULATA (Rydb.) Steyerl. Curly top gumweed. Herbaceous perennial; near settling ponds before new sewage treatment plant resulted in lower water flow; not seen in 20 years. *Charlton 5626* (RSA-POM).
- GUTIERREZIA MICROCEPHALA (DC.) A. Gray. Matchweed. Shrub; locally common in ditches and clay drainages, primarily south of Piute Ponds and Rogers Lakebed. *Heckard 4698* (JEPS).
- HELIANTHUS ANNUUS L. Annual sunflower. Annual; recently observed weed at New Piute Ponds. *Charlton 5636* (RSA-POM).
- HETEROTHECA GRANDIFLORA Nutt. Telegraphweed. Annual; only one location at the Range main gate in a planter, observed over several years. *Charlton 2940* (EAFB).
- ISOCOMA ACRADENIA (Greene) Greene var. BRACTEOSA (Greene) G.L. Nesom. Bracted alkali goldenbush. Shrub; fairly common south of Rogers Lakebed and in the southwest corner of the base. Variety *acradenia* and var. *eremophila* (Greene) G.L. Nesom also appear to be present. *Twisselmann 9361* (CAS).
- IVA AXILLARIS Pursh. Poverty weed. Annual; summer flowering; rare; a small population occurs north of the South Base sewage treatment plant. *Charlton s.n.* (RSA-POM).
- *LACTUCA SERRIOLA L. Prickly lettuce. Annual; uncommon at Piute Ponds, the housing area and Rogers Lakebed. *Charlton 5599* (RSA-POM).
- LASTHENIA CALIFORNICA DC. ex Lindl. subsp. CALIFORNICA. Goldfields. Annual; locally common in spinescale scrub in the central portion of the base, as at southern curve on Mercury Boulevard northeast of Rosamond Lakebed. *Charlton 4861* (RSA-POM).
- LASTHENIA GRACILIS (DC.) Greene. Slender goldfields. Annual; rare south end Buckhorn Lakebed. *Twisselmann 10663* (CAS).
- LAYIA GLANDULOSA (Hook.) Hook. & Arn. White tidytips. Annual; scattered from Buckhorn Lake east to Mars Boulevard on the range. *Heckard 4596* (JEPS).
- LEPTOSYNE BIGELOVII A. Gray. Bigelow's tickseed. Annual; rare in the sandy slopes from Rogers Lakebed to Mars Boulevard. *Heckard 4588* (JEPS).
- LEPTOSYNE CALIFORNICA Nutt. California tickseed. Annual; widespread in sandy soils such as off Mars Boulevard. *Twisselmann 10655* (CAS).
- LEPTOSYNE CALLIOPSIDEA (DC.) A. Gray. Leafy-stem tickseed. Annual; locally common in certain clay pans in the north. *Charlton 4857* (RSA-POM).
- LESSINGIA GLANDULIFERA A. Gray var. GLANDULIFERA. Autumn vinegarweed. Summer annual; scattered primarily in the southwest corner of the base including south of Rogers Lakebed and Branch Park south. *Heckard 4692* (JEPS).
- LEUCOSYRIS CARNOSA (A. Gray) Greene. Shrubby alkali aster. Subshrub; rare in the northeast corner of the base. *Charlton 5597* (RSA-POM).
- LOGFIA DEPRESSA (A. Gray) Holub. Dwarf filago. Annual; uncommon north of Rosamond Lakebed. *Heckard 4495* (JEPS).
- MALACOTHRIX COULTERI Harv. & A. Gray. Snake's head. Annual; widespread but not common throughout the base. *Charlton 5151* (RSA-POM).
- MALACOTHRIX GLABRATA (A. Gray ex D.C. Eaton) A. Gray. Desert dandelion. Annual; widespread and common especially west of Boron. *Heckard 4504* (JEPS).
- MALACOTHRIX SONCHOIDES (Nutt.) Torr. & A. Gray. Yellow saucers. Annual; rare in the southcentral portion of the base off Lancaster Boulevard, dunes between Buckhorn and Rogers Lakebeds. *Charlton 5151a* (RSA-POM).
- MATRICARIA DISCOIDEA DC. Alkali pineappleweed. Summer annual; west of Branch Park in clay soils. *Twisselmann 9389* (CAS).
- MATRICARIA OCCIDENTALIS Greene. Western pineappleweed. Annual; west of Branch Park west to Avenue A. *Twisselmann 9389* (JEPS).
- MONOPTILON BELLIDIFORME Torr. & A. Gray. Mojave desert stars. Annual; rare, only found in the northeast corner of the base in washes along northern border road. *Heckard and Moe 4566a* (JEPS).
- NICOLLETIA OCCIDENTALIS A. Gray. Hole-in-the-sand plant. Herbaceous perennial; uncommon single plants are scattered in the sandy soils in the northern portion of the base, dunes south of Rogers Lakebed and Piute Ponds. *Charlton 3182* (SEINET-UCR).
- PECTIS PAPPOSA Harv. & A. Gray. Chinchweed. C₄ summer annual; rare except after late rains; primarily Kramer Junction area. *Charlton 4042* (EAFB).
- PRENANTHELLA EXIGUA (A. Gray) Rydb. Annual lygodesmia. Annual; rare, primarily on the range. *Charlton 5462* (UCR).
- PSATHYROTES ANNUA (Nutt.) A. Gray. Annual turtlebacks. Annual; rare, south of the flightline east of Lancaster Boulevard on unpaved road. Observed over several years but with small populations. *Charlton s.n.* (EAFB).
- RAFINESQUIA NEOMEXICANA A. Gray. Desert chicory. Annual; widespread but not common and almost always inside a shrub. *Charlton s.n.* (EAFB).

- **SENECIO VULGARIS* L. Common groundsel. Annual; rare in disturbed irrigated areas such as housing. *Charlton 4169* (RSA-POM).
- **SONCHUS ASPER* (L.) Hill. Spiny sowthistle. Annual; rare in disturbed wet areas such as the housing area.
- **SONCHUS OLERACEUS* L. Sow thistle. Annual; uncommon in disturbed wet areas such as the housing area.
- STEPHANOMERIA EXIGUA* Nutt. subsp. *EXIGUA*. Annual milk-lettuce. Annual; uncommon, primarily on the range and southwest of Rogers Lakebed. *Charlton 5334* (RSA-POM).
- STEPHANOMERIA PARRYI* A. Gray. Rock pink. Herbaceous perennial; common on the eastern portion of the base in heavy soils. *Heckard 4871* (JEPS).
- STEPHANOMERIA PAUCIFLORA* (Torr.) A. Nelson. Wire lettuce. Herbaceous perennial; widespread in disturbed and undisturbed sandy areas. *Heckard 4857* (JEPS).
- STYLOCLINE MICROPOIDES* A. Gray. Desert nest-straw. Annual; scattered on sandy slopes as northeast of Rosamond Lakebed. *Charlton 4711* (RSA-POM).
- SYMPHYOTRICHUM FRONDOSUM* (Nutt.) G.L. Nesom. Short-rayed alkali aster. Annual; rare in disturbed wet areas in Housing. *Charlton 5611* (UCR).
- SYNTRICHOPAPPUS FREMONTII* A. Gray. Fremont gold. Annual; widespread on sandy slopes and flats. *Heckard 4854* (JEPS).
- TETRADYMIA AXILLARIS* A. Nelson. var. *LONGISPINA* (M.E. Jones) Strother. Long-spined cottonthorn. Shrub; uncommon in sandy soils in the southwest corner of the base. *Twisselmann 10851* (CAS).
- TETRADYMIA GLABRATA* Torr. & A. Gray. Little-leaf horsebrush. Shrub; uncommon, primarily in the southwest corner of the base as near Parachute Drop Zone—the old agricultural field. *Charlton 4843a* (RSA-POM).
- TETRADYMIA SPINOSA* Hook. & Arn. Spiny cottonthorn. Shrub; rare, collections in the northeast corner of Buckhorn Lakebed. *Twisselman 10851* (SBBG).
- TETRADYMIA STENOLEPIS* Greene. Felthorn. Shrub; fairly common in the northwest corner of the base. Flowers 1–2 weeks in June, hard to collect in flower. *Charlton 3188* (EAFB).
- UROPAPPUS LINDLEYI* (DC.) Nutt. Silver stars. Annual; widespread but not common, primarily in the western portion of the base in the Rosamond Hills. *Charlton 5317* (EAFB).
- **XANTHIUM STRUMARIUM* L. Spiny clotbur. Annual; recently established weed at Piute Ponds. *Charlton s.n.* (UCR).
- XYLORHIZA TORTIFOLIA* (Torr. & A. Gray) Greene. Mojave aster. Herbaceous perennial; fairly common on rocky hillsides in the east but occasionally on beach ridges. *Charlton 2903* (EAFB).
- BORAGINACEAE**
- AMSINCKIA INTERMEDIA* Fisch. & C.A. Mey. Alkali fiddleneck. Annual; rare on Mercury Boulevard in a clay ravine and off northern Rich Road. *Heckard/Moe 4542* (JEPS).
- AMSINCKIA TESSELLATA* A. Gray. Rough fiddleneck. Annual; widespread and common in deep sands, especially at the base of hills, throughout the range. *Charlton 2973* (UCR).
- CRYPTANTHA BARBIGERA* (A. Gray) Greene var. *BARBIGERA*. Barbed forget-me-not. Annual; rare on sandy or rocky slopes on the eastern portion of the range. *Heckard/Moe 4494* (JEPS).
- CRYPTANTHA CIRCUMSCISSA* (Hook. & Arn.) I.M. Johnst. var. *CIRCUMSCISSA*. Capped forget-me-not. Annual; common in sandy areas throughout the base. *Twisselmann 10690* (JEPS).
- CRYPTANTHA DECIPIENS* (M.E. Jones) A. Heller. Gravel cryptantha. Annual; rare scattered on base. *Charlton s.n.* (EAFB).
- CRYPTANTHA DUMETORUM* (A. Gray) Greene. Wire-stem forget-me-not. Annual; rare, scattered in saltbush shrubs and south of Rogers Lakebed. *Twisselmann 10815* (JEPS).
- CRYPTANTHA MICRANTHA* (Torr.) I.M. Johnst. var. *MICRANTHA*. Red-root cryptantha. Annual; widespread including south of Rogers Lakebed. *Heckard 4553* (JEPS).
- CRYPTANTHA NEVADENSIS* A. Nelson & P.B. Kenn. Nevada-forget-me-not. Annual; both var. *NEVADENSIS* and var. *RIGIDA* I.M. Johnst. are present. The former is uncommon and scattered, primarily in the western portion of the base, while the latter is widespread as at the southern border. *Charlton 4708* (RSA-POM).
- CRYPTANTHA PTEROCARYA* (Torr.) Greene. Wingnut cryptantha. Annual; widespread in sandy soils collected south of Rogers Lakebed. The most common erect-growing cryptantha. Both var. *cycloptera* (Greene) J.F. Macbr. and var. *pterocarya* are present. *Twisselmann 10710* (SBBG).
- CRYPTANTHA SIMILIS* K. Mathew & P.H. Raven. Showy capped forget-me-not. Annual; rare in sandy soils near the Mercury Boulevard central curve and the Kramer Hills. *Heckard/Moe 4567* (JEPS).
- EMMENANTHE PENDULIFLORA* Benth. Whispering bells. Annual; Rosamond Hills south to the north end of the Rosamond Lake; rare, observed once in 20 years. *Charlton 4709* (RSA-POM).
- EUCRYPTA CHRYSANTHEMIFOLIA* (Benth.) Greene. var. *BIPINNATIFIDA* (Torr.) Constance. Spotted eucrypta. Annual; rare in rocky shady areas in the Rosamond Hills and Leuhman Ridge. *Charlton 4790* (RSA-POM).
- EUCRYPTA MICRANTHA* (Torr.) A. Heller. Desert eucrypta. Annual; rare in shady rocky hillsides Usually only in wet years. *Charlton 1219* (EAFB).
- HELIOTROPIMUM CURASSAVICUM* L. var. *OCULATUM* (A. Heller) I.M. Johnst. ex Tidestr. Chinese pusley. Annual; uncommon in disturbed clay pans at southern edge of the base. *Charlton 2893* (UCR).
- NAMA DEMISSA* A. Gray. var. *DEMISSA*. Purple mats. Annual; widespread and fairly common in sandy soils, especially in saltbush scrub. *Charlton 5341* (RSA-POM).
- NAMA DEPRESSA* A. Gray. Depressed fiddleleaf. Annual; rare in sandy swales in saltbush scrub. *Charlton 5158* (RSA-POM).
- PECTOCARYA HETEROCARPA* (I.M. Johnst.) I.M. Johnst. Chuckwalla comb-bur. Annual; scattered in sandy soils on the range *Charlton 1548* (EAFB). Many of the specimens referred to this species are now a new species, *Pectocarya anisocarpa* Veno (Guilliams et al. 2013). *Charlton 5164* (RSA-POM).
- PECTOCARYA LINEARIS* (Ruiz & Pav.) DC. subsp. *FEROCULA* (I.M. Johnst.) Thorne. Coastal comb-bur. Annual; primarily in the western portion of the base east to Leuhman Ridge. *Heckard 4617* (JEPS).
- PECTOCARYA PLATYCARPA* (Munz & I.M. Johnst.) Munz & I.M. Johnst. Broad-margined comb-bur. Annual; scattered in sandy soils on the ranges. *Charlton 1490* (EAFB).
- PECTOCARYA RECURVATA* I.M. Johnst. Curved comb-bur. Annual; scattered on the ranges *Charlton 4705* (RSA-POM).
- PECTOCARYA SETOSA* A. Gray. Erect comb-bur. Annual, scattered in patches on hillsides and hilltops on the range. *Charlton 1584* (EAFB).
- PHACELIA BICOLOR* Torr. ex S. Watson. Sticky yellow-throats. Annual; locally common on the edge of playas in the southern portion of the range; there is a white flowered form with no pale purple. *Heckard 5637* (JEPS).
- PHACELIA CRENULATA* Torr. ex S. Watson. var. *CRENULATA*. Purple phacelia. Annual; uncommon in the northeastern corner of EAFB, more common to the east and south. *Phacelia ambigua* has been identified just off base and is closely related. *Charlton 5091* (RSA-POM).
- PHACELIA DISTANS* Benth. California hyacinth. Annual; rare on base, usually along the eastern border. *Heckard 4578* (JEPS).
- PHACELIA FREMONTII* Torr. Yellowthroats. Annual; clay pan edges in the dunes throughout the base, more common in the southcentral portion. *Twisselmann 10712* (JEPS).
- PHACELIA TANACETIFOLIA* Benth. Tansey phacelia. Annual; locally very common under spinescale shrubs. *Heckard/Moe 4478* (JEPS).
- PHOLISTOMA MEMBRANACEUM* (Benth.) Constance. White fiesta flower. Annual; rare in the rocky hillsides in the western portion of the base. *Charlton 4752* (RSA-POM).

- PLAGIOBOTHRYIS CANESCENS Benth. var. CATALINENSIS (A. Gray) Jeps. Valley popcorn flower. Annual; occurs in the area, genus doesn't germinate often on the base, Red Hill. *Heckard 4583* (JEPS).
- PLAGIOBOTHRYIS JONESII A. Gray. Jones's popcorn flower. Annual; species rarely germinates but when it does it is common in the eastern Rosamond Hills near the housing area. *Charlton 4702* (RSA-POM).
- PLAGIOBOTHRYIS LEPTOCLADUS (Greene) I.M. Johnst. Alkali popcorn flower. Annual; locally common in the clay pans west of Branch Park. *Sanders 3724* (UCR).
- TIQUILLIA NUTTALLII (Hook.) A.T. Richardson. Nuttall's crinklemat. Annual; rare in the dunes south of Branch Park. *Charlton 5257* (UCR).
- TIQUILLIA Plicata (Torr.) A.T. Richardson. Fan-leaf crinklemat. Herbaceous perennial; uncommon in sandy areas near Lancaster Boulevard. *Twisselmann 10842* (RSA-POM).

BRASSICACEAE

- ATHYSANUS PUSILLUS (Hook.) Greene. Common sandweed. Annual; rare in the northwestern portion of the base, Rosamond Hills. *Charlton 4712* (UCR).
- *BRASSICA TOURNEFORTII Gouan. Sahara mustard. Annual; roadsides under powerlines paralleling west side of Hwy 395 and south of Kramer Junction in the Kramer Hills. Observed within a few feet of the base boundary fence and expected to expand its range. *Charlton 4961* (RSA-POM).
- *CAPSELLA BURSA-PASTORIS (L.) Medik. Shepherd's purse. Annual; rare weed in disturbed areas and lawns as in housing areas. *Charlton 4143* (EAFB).
- CAULANTHUS COOPERI (S. Watson) Payson. Cooper's jewel flower. Annual; scattered in deep sandy soils, flats and slopes. *Charlton 4795* (RSA-POM).
- CAULANTHUS INFLATUS S. Watson. Desert candle. Annual; hillsides rare, more common in the past. Observed 1 dried skeleton in 1990 on ridges on the range northeast of Boron. *Griesel s.n.* (DS).
- CAULANTHUS LASIOPHYLLUS (Hook. & Arn.) Payson. California mustard. Annual; west central area of EAFB; collected northwest of Buckhorn Lakebed. *Heckard 4473* (JEPS).
- DESCURAINIA PINNATA (Walter) Britton subsp. GLABRA (Wooton & Standl.) Detling. Smooth tansy mustard. Annual; uncommon but germinates in low rainfall years on sandy slopes north of Leuhman Ridge. *Heckard/Moe 4537* (JEPS).
- *DESCURAINIA SOPHIA (L.) Webb ex Prantl. Common tansy mustard. Annual; rare on roadsides. *Charlton 2992* (UCR).
- DITHYREA CALIFORNICA Harv. Spectacle pod. Annual; uncommon in very sandy soils in wet years south of Rogers Lakebed and junction of Mercury and Lancaster Boulevards. *Twisselmann 10688* (CAS).
- ERYSIMUM CAPITATUM (Hook.) Greene var. CAPITATUM. Western wallflower. Herbaceous perennial; north of Rosamond Lakebed on a beach ridge to Buckhorn Lake, very limited range on base. *Charlton 3153* (UCR).
- *HIRSCHFELDIA INCANA (L.) Lagr.-Fossat. Mediterranean hoary mustard. Biennial mustard; in patches along roadsides beginning in the north. First observed in California City and has spread onto base in last decade. *Charlton 1443* (EAFB).
- *HORNUNGIA PROCUMBENS (L.) Hayek. Prostrate hutchinsia. Annual; near shuttle viewing area off Mercury Boulevard; very limited range on base. *Charlton 4716* (EAFB).
- *LEPIDIUM APPELIANUM Al-Shehbaz. Hairy whitetop. Herbaceous perennial; Piute Ponds, uncommon on the southern edge of ponds off Shuttle Road. *Charlton 3204* (UCR).
- *LEPIDIUM CHALEPENSE L. Lens-podded hoary cress. Herbaceous perennial; rare at Rosamond Lakebed. *Twisselmann 10853* (CAS).
- LEPIDIUM DICTYOTUM A. Gray. Alkali peppergrass. Annual; off northern portion of Rich Road *Heckard/Moe 4549* (JEPS).
- *LEPIDIUM DRABA L. Whitetop. Herbaceous perennial; electrical lines west of Piute Ponds in flooded area south of ponds. *Charlton 5203* (EAFB), *Twisselmann 10853* (UCD).
- LEPIDIUM FLAVUM Torr. Yellow peppergrass. Summer annual; northern portion of Rich Road with spinescale. *Twisselmann 10651* (CAS).
- LEPIDIUM FREMONTII S. Watson. Desert alyssum. Subshrub; uncommon on Rich Road on ridges in saltbush scrub. Easily identified when in flower. *Griffin s.n.* (CDA).
- LEPIDIUM LASIOCARPUM Nutt. Hairy-podded peppergrass. Annual; roadside, Bissell Hills, Avenue C. *Sanders 3724* (UCR).
- *LEPIDIUM LATIFOLIUM L. Broad-leaved peppergrass. Herbaceous perennial; uncommon new weed at Piute Ponds. *Charlton s.n.* (CAS).
- *LEPIDIUM PERFOLIATUM L. Shield cress. Annual; rare weed collected in old housing area. *Charlton 2882* (UCR).
- *SISYMBRIUM ALTISSIMUM L. Tumble mustard. Annual; common tumble mustard along roadsides and spreading into undisturbed desert recently. *Charlton 4171*.
- *SISYMBRIUM IRIO L. London rocket. Annual; collected in old housing area. *Heckard 4554* (JEPS).
- *SISYMBRIUM ORIENTALE L. Eastern rocket. Herbaceous perennial; collected in old housing area. *Heckard et al. 4466* (JEPS).
- STANLEYA PINNATA (Pursh) Britton. Prince's plume. Herbaceous perennial; rare in the central-southern boundary near the Parachute Drop Zone-Agricultural Field. *Charlton 5205* (UCR).
- STREPTANTHELLA LONGIROSTRIS (S. Watson) Rydb. Little twist-flower. Annual; scattered in saltbush and creosote bush scrub as at Lancaster Boulevard. *Twisselmann 10700* (JEPS).
- THYSANOCARPUS LACINIATUS Nutt. Lacepod. Annual; most common in the western portion of the base, Rosamond Hills, northeast corner Rogers Lakebed. *Charlton 4793* (RSA-POM).
- TROPIDOCARPUM GRACILE Hook. Keelfruit. Annual; fairly common on rocky hillsides in the Rosamond Hills. *Charlton 4703* (UCR).

CACTACEAE

- CYLINDROPUNTIA ECHINOCARPA (Engelm. & J.M. Bigelow) F.M. Knuth. Golden or silver cholla. Succulent; uncommon; scattered throughout the creosote bush scrub.
- CYLINDROPUNTIA RAMOSISSIMA (Engelm.) F.M. Knuth. Pencil cholla. Succulent; very rare, at the southern boundary road, never observed in flower.
- ECHINOCACTUS POLYCEPHALUS Engelm. & J.M. Bigelow. Cottontop. Succulent; rare on the base southern boundary road; several plants found on one slope; never observed in flower.
- OPUNTIA BASILARIS Engelm. & J.M. Bigelow. Beavertail. Succulent; scattered on bajadas and hillsides throughout the base. *Charlton 4796* (UCR).

CAMPANULACEAE

- †NEMACLADUS GRACILIS Eastw. Slender threadstem. Annual; rare in the deep sands east of Lancaster Boulevard and south of Branch Park. CNPS 4.3. *Shafer 114* (UCD).
- NEMACLADUS RUBESCENS Greene. Desert threadstem. Annual; scattered in deep sands as at Buckhorn Lakebed. *Twisselmann 10844* (JEPS).
- NEMACLADUS SIGMOIDEUS G.T. Robbins. Small-flowered threadstem. Annual; scattered in deep sands as at Buckhorn Lakebed east to Branch Park. *Twisselmann 10681* (JEPS).

CARYOPHYLLACEAE

- †LOEFLINGIA SQUARROSA Nutt. Sage loeflingia. Annual; rare east of Lancaster Boulevard in very low populations, observed only in wet years. Both varieties (*artemisiarum* and *squarrosa*) occur on base and intergrade. Latest taxonomy has dropped the varieties (Baldwin et al. 2012); var. *artemisiarum* (Barneby & Twisselm.) Dorn recently restored to a CNPS 2B.2 rank. *Heckard 4642* (JEPS).
- SPERGULARIA ATROSPERMA R. Rossbach. Black-seeded sand spurrey. Annual; roadside, observed once along Rich Road in a rain puddle. *Charlton 2928* (EAFB).
- SPERGULARIA MACROTHECA (Hornem. ex Cham. & Schltld.) Heynh. var. LEUCANTHA (Greene) B.L. Rob. Large-flowered sand spurrey.

Herbaceous perennial; uncommon in clay drainages along Boy Scout Road with alkali mariposa lily. *Charlton 4456* (UCR).

SPERGULARIA MARINA (L.) Besser. Sand spurrey. Annual; rare in sandy soils south of Boy Scout Road and Branch Park Road. They come up only in certain years. *Twisselmann 9372* (CAS).

CHENOPODIACEAE

ALLENROLFEA OCCIDENTALIS (S. Watson) Kuntze. Iodine bush. Shrub; rare, a large plant and several smaller clumps occur along the northeast shore of Rosamond Lakebed and can be accessed from Rosamond Boulevard. *Heckard 4717* (JEPS).

ARTHROCNEUM SUBTERMINALE (Parish) Standl. Parish's glasswort. Subshrub; rare on Buckhorn lakebed, sterile plants also northeast of Piute Ponds, plants very small.

ATRIPLEX ARGENTEA Nutt. var. EXPANSA (S. Watson) S.L. Welsh & Reveal. Large silverscale. C₄ summer annual; a large patch occurs west of the flightline and west of Lancaster Boulevard in an unusual clay pan. *Charlton 4630* (UCR).

ATRIPLEX CANESCENS (Pursh) Nutt. var. CANESCENS. Four-wing saltbush. C₄ shrub; widespread in sand dunes south of Boy Scout Road/Rosamond Lakebed. *Heckard 4697* (JEPS).

ATRIPLEX CONFERTIFOLIA (Torr. & Frém.) S. Watson. Shadscale. C₄ shrub; common in the low pan and dunes of the southwestern corner of the base. *Charlton 3173* (SEINET-UCR).

ATRIPLEX ELEGANS (Moq.) D. Dietr. var. FASCICULATA (S. Watson) M.E. Jones. Wheelscale. C₄ annual; rare, west of Rich Road on a small clay pan following old pole line road. Collected 3 miles east of Haystack Butte. *Heckard 4854* (JEPS).

ATRIPLEX HYMENELYTRA (Torr.) S. Watson. Desert holly. C₄ shrub; northeast corner of Rogers Lakebed on rocky hilltop, only one population observed on base. *Charlton 4794* (UCR).

ATRIPLEX LENTIFORMIS (Torr.) S. Watson. Quail bush. C₄ shrub; planted at Branch Park as part of revegetation. *Charlton s.n.* (EAFB).

ATRIPLEX PARRYI S. Watson. Parry saltbush. C₄ shrub; uncommon and in low population numbers scattered plants observed on the west side of Rosamond Lakebed and near Piute Ponds. *Heckard 4695* (JEPS).

ATRIPLEX POLYCARPA (Torr.) S. Watson. Allscale. C₄ shrub; occurs on Red Mountain in rhyolite, in sandy areas, in disturbed clay pan trenches, primarily in the north central portion of the base. It can be hard to distinguish from spinescale in winter. *Heckard 4672* (JEPS).

*ATRIPLEX SEMIBACCATA R.Br. Australian saltbush. C₄ herbaceous perennial, rare in dry disturbed areas. *Charlton 3635* (UCR).

ATRIPLEX SERENANA A. Nelson ex Abrams. Bractscale. C₄ shrub; grassy or wet areas on the edge of the housing area. *Charlton 3964* (RSA-POM).

ATRIPLEX SPINIFERA J.F. Macbr. Spinescale. C₄ shrub; primarily in the north-central portion of the base. *Heckard 4851* (JEPS).

ATRIPLEX TORREYI (S. Watson) S. Watson. New Mexico saltbush, Torrey saltbush. C₄ shrub; southwest corner of the base in red clay drainages. *Heckard 4719* (JEPS).

*BASSIA HYSSOPIFOLIA (Pall.) Kuntze. Five-hook bassia. Annual; common in the old settling basins at the old sewage treatment ponds and Piute Ponds. *Heckard 4684* (JEPS).

*CHENOPODIUM ALBUM L. White lambsquarter. Annual; rare in disturbed areas in the housing area. *Charlton 5184* (UCR).

*CHENOPODIUM MURALE L. Nettle-leaf goosefoot. Annual; rare in disturbed areas in housing.

CHENOPODIUM RUBRUM L. var. RUBRUM. Red goosefoot. Annual; locally common on the shallow shoreline at new Piute Ponds, more common when they were first flooded. *Charlton 5612* (UCR).

GRAYIA SPINOSA (Hook.) Moq. Spiny hopsage. Shrub; widespread and scattered in deep sandy soils and rocky hillsides such as north side of Leuhman Ridge. *Heckard 4581* (JEPS).

KOCHIA CALIFORNICA S. Watson. Gray molly. Herbaceous perennial; in the pan and dunes of the southwestern portion of the base with shadscale and inkweed. *Charlton 3159* (UCR).

KRASCHENINNIKOVIA LANATA (Pursh) A. Meeuse & A. Smit. Winterfat. Shrub; widespread in deep sandy soils such as north of Leuhman Ridge. *Heckard/Moe 4545* (JEPS).

MONOLEPIS NUTTALLIANA (Schult.) Greene. Patata. Annual; uncommon but widespread in sandy alluvial fans, clay pans east of Haystack Butte. *Heckard 4845* (JEPS).

*SALSOLA PAULSENII Litv. Barbwire tumbleweed. Annual; locally common such as at roadsides at NASA. *Twisselmann 17472* (RSA-POM).

*SALSOLA TRAGUS L. Tumbleweed, Russian thistle. Annual; fairly common in eroding sand dunes and washes such as those receiving water from Leuhman Ridge rocket engine firings. Common in the sandy soils after the fire in the northwest corner. *Twisselmann 9384* (CAS).

SARCOBATUS VERMICULATUS (Hook.) Torr. Greasewood. Shrub; rare but two populations known, one at the Junction of Lancaster Boulevard and Boy Scout Road and one northeast of Piute Ponds. *Charlton 4845* (RSA-POM).

STUTZIA COVILLEI (Standl.) E.H. Zacharias. Arrowscale. Annual; scattered in sandy areas throughout the base. *Heckard/Moe 4536* (JEPS).

SUAEDA NIGRA (Raf.) J.F. Macbr. Inkweed. Herbaceous perennial; common in the clay pan edges in the southwestern corner of the base to Buckhorn Lakebed. *Heckard 4844* (JEPS).

CLEOMACEAE

†CLEOMELLA BREVIPES S. Watson. Short-stalked stinkweed. Summer annual; Buckhorn Lake dunes, very rare, collected once and difficult to get access to that area now that the firing range has been extended. CNPS 4.2. *Heckard 4590* (JEPS).

CLEOMELLA OBTUSIFOLIA Torr. & Frém. Blunt-leaved stinkweed. Summer annual; roadsides in saltbush scrub and disturbed clay pans in the southern portion of the base. *Charlton 2990* (UCR).

PERITOMA ARBOREA (Nutt.) H.H. Iltis var. ARBOREA. Bladderpod. Shrub; one plant observed at Pancho Barnes' Ranch, appeared to be planted on the edge of one of the old agricultural fields. *Heckard 4856* (JEPS).

CONVOLVULACEAE

*CONVOLVULUS ARVENSIS L. Field bindweed. Herbaceous perennial/vine; rare in the homesteads on the southwestern corner of the base. *Charlton s.n.* (EAFB).

CRESSA TRUXILLENIS Kunth. Alkaliweed. Herbaceous perennial; locally common at Piute Ponds in the alkali meadow west of the south road. *Charlton 5151* (UCR).

CUSCUTA CALIFORNICA Hook. & Arn. var. CALIFORNICA. California dodder. Annual/parasite; occasionally on burrobush in wet years. *Charlton 5125* (EAFB).

CRASSULACEAE

CRASSULA CONNATA (Ruiz & Pav.) A. Berger var. ERECTOIDES M. Bywater & Wickens. Tillaea. Annual; rare in rocks in the Rosamond Hills; only observed once in a wet year. *Charlton 4707* (UCR).

CUCURBITACEAE

CUCURBITA PALMATA S. Watson. Coyote melon. Annual/perennial vine; North Base was completely bladed during WWII, the vegetation is low in diversity, lacks recruitment of Joshua trees and contains some unusual weeds. One plant on the west side of one of the hangers (BLDG 4305). *Charlton 4153d* (RSA-POM).

MARAH FABACEA (Naudin) Greene. Sierra manroot. Herbaceous perennial/vine; rare on the east ranges on sandy rises east of Mars Boulevard. *Charlton 2807* (EAFB), *Heckard, Bacigalupi and Moe 4486* (JEPS).

EUPHORBIACEAE

CROTON CALIFORNICUS Müll. Arg. Desert croton. Herbaceous perennial; uncommon in sand dunes. *Charlton 3255* (RSA-POM).

CROTON SETIGER Hook. Doveweed, turkey mullein. Summer annual; rare in disturbed areas such as NASA. *Charlton 3165* (EAFB).

- EUPHORBIA ALBOMARGINATA Torr. & A. Gray. Rattlesnake spurge. C₄ annual; widespread in creosote bush scrub as near NASA. *Charlton 3966a* (UCR).
- EUPHORBIA MICROMERIA Boiss. Sonoran sandmat. C₄ annual; rare due to the strong westerlies rarely allowing summer thunder showers from going west of Leuhman ridge, northeast corner of the base. *Charlton 4040* (EAFB).
- EUPHORBIA OCELLATA Durand & Hilg. subsp. OCELLATA. Cinder sandmat. C₄ annual; washes north of Leuhman Ridge from summer rains and water releases from rocket site cooling tanks; unusual in that the flowers are yellow rather than the usual pinkish to white. *Charlton s.n.* (EAFB).
- EUPHORBIA SERPYLLIFOLIA Pers. Thyme-leaved spurge. C₄ annual; uncommon weed observed in sidewalk cracks near buildings on the flightline.
- EUPHORBIA SETILOBA Engelm. Yuma sandmat. C₄ annual; common after rains, from Rich Road east. *Charlton 2704a* (EAFB).
- STILLINGIA PAUCIDENTATA S. Watson. Toothleaf. Herbaceous perennial; scattered in sandy soils in the north central portion of the base. *Charlton 2892* (UCR).

FABACEAE

- ACMISPON BRACHYCARPUS (Benth.) D.D. Sokoloff. Low lotus. Annual; rare north of Red Mountain. Observed by other botanists, probably common only one year since 1990 (D. Silverman, pers. comm.).
- ACMISPON PROCUMBENS (Greene) Brouillet. var. PROCUMBENS. Silky California broom. Herbaceous perennial; rare on rises east of Mars Boulevard on the range (eastern). *Charlton 5128* (EAFB).
- ASTRAGALUS ACUTIROSTRIS S. Watson. Keelbeak. Annual; rare in sandy soils, primarily on the ranges in wet years only. *Heckard/Moe 4571* (JEPS).
- ASTRAGALUS DIDYMOCARPUS Hook. & Arn. var. DIDYMOCARPUS. Dwarf locoweed. Annual; rare to uncommon on the ranges in wet years. *Heckard/Moe 4471* (JEPS).
- ASTRAGALUS DIDYMOCARPUS Hook. & Arn. var. DISPERMUS (A. Gray) Jeps. Annual; rare on ranges in wet years. *Twisselmann 10665* (CAS).
- ASTRAGALUS LAYNEAE Greene. Layne milkvetch. Herbaceous perennial; uncommon on roadsides and washes in the Rosamond Hills. *Charlton 5263* (UCR).
- ASTRAGALUS LENTIGINOSUS Douglas var. ALBIFOLIUS M.E. Jones. Mojave rattleweed. Annual/perennial; uncommon in dunes south of Rogers Lakebed and south of Branch Park Road. *Charlton 5139* (UCR).
- ASTRAGALUS LENTIGINOSUS Douglas var. VARIABILIS Barneby. Dappled-pod. Annual/perennial; uncommon and scattered as along the frontage road south of 58 near North Base. One of the few plants in flower in winter. *Twisselmann 9366* (CAS).
- †ASTRAGALUS PREUSSII A. Gray. var. LAXIFLORUS A. Gray. Lancaster milkvetch. Herbaceous perennial; three populations were observed in a wet year; otherwise only one population at an abandoned homestead near the end of the Branch Park Road in a clay pan with numerous sinkholes flowers regularly. The other two populations are at the Boy Scout Camp west of the large water tank. CNPS 1B.1. *Charlton 5646C* (UCR).
- ASTRAGALUS PURSHII Douglas var. TINCTUS M.E. Jones. Long-flowered Pursh's woollypod. Annual; rare, three plants in one year were observed on a slope northwest of Leuhman Ridge on the lower (northernmost) unpaved road. *Charlton 1665* (EAFB).
- LUPINUS FLAVOCULATUS A. Heller. Yellow-eyed lupine. Annual; collected along the northern margin of the base near Bissell and northwest of Rosamond. *Crampton 2534* (UCD).
- LUPINUS MICROCARPUS Sims var. HORIZONTALIS (A. Heller) Jeps. Chick lupine. Annual; rare; only observed in the Rosamond Hills once in a wet year with the lotus. *Charlton 4251* (EAFB).
- LUPINUS ODORATUS A. Heller. Royal lupine. Annual; large patches occur in the south-central portion mostly off 140th street. *Heckard 4845* (JEPS).

- LUPINUS SHOCKLEYI S. Watson. Sand dune lupine. Annual; rare in dunes only, primarily south of Branch Park. *Charlton 5129* (RSA-POM).
- *MEDICAGO SATIVA L. Alfalfa. Herbaceous perennial; rare roadside waif. *Charlton 3932* (EAFB).
- *MELILOTUS ALBUS Medik. White sweet clover. Annual; rare, roadside waif. The roadsides were regularly bladed until the late 1990's so many populations did not persist. *Charlton 3965* (CDA).
- *MELILOTUS INDICUS (L.) All. Yellow sweet clover. Annual; rare roadside waif.
- PROSOPIS GLANDULOSA Torr. var. TORREYANA (L.D. Benson) M.C. Johnst. Honey mesquite. Tree; plants follow the drainages from the San Gabriel Mountains to Rogers Lakebed and are found in the south-central portion of the base. They are suffering from groundwater withdrawal and firewood collection. *Charlton 4455* (EAFB).
- †PSOROTHAMNUS ARBORESCENS (A. Gray) Barneby var. ARBORESCENS. Mojave indigobush. Shrub; very rare, one or two shrubs on the east range in the southern portion on flats with bare areas not in drainages. Collected 3 miles east of Haystack Butte. CNPS 4.3. *Heckard 4856* (JEPS).
- SENNA ARMATA (S. Watson) H.S. Irwin & Barneby. Desert senna. Perennial; collected near the northeast corner of the base. Also in the revegetation mix at North Base on Lancaster Boulevard near NASA viewing stands. *Bacigalupi and Hawkes 3539* (JEPS).
- TRIFOLIUM GRACILENTUM Torr. & A. Gray. Pinpoint clover. Annual; Rosamond Hills, very rare, a single individual observed in a wet year in the granitic rocks. *Charlton 4860* (RSA-POM).
- TRIFOLIUM WILLDENOVII Spreng. Tomcat clover. Rare; Rosamond Hills. *Charlton 4177* (RSA-POM).

FRANKENIACEAE

- FRANKENIA SALINA (Molina) I.M. Johnst. Frankenia. Herbaceous perennial; north of Rosamond Lake. *Heckard 4720* (JEPS).

GERANIACEAE

- *ERODIUM CICUTARIUM (L.) L'Hér. ex Aiton. Red-stem filaree. Annual; widespread and extremely common in sandy soils throughout the base; does well in early rainfall years and warm winters. *Charlton 4168* (EAFB).
- ERODIUM TEXANUM A. Gray. Texas filaree. Annual; rare; observed on rocky hillsides on the range in wet years south of Haystack Butte. *Charlton 4791* (RSA-POM).

LAMIACEAE

- *MARRUBIUM VULGARE L. Horehound. Herbaceous perennial; observed at the horse stables in the early 1990's.
- MONARDELLA EXILIS (A. Gray) Greene. Desert pennyroyal. Annual; uncommon in sandy soils, especially in the south-central portion of the base. *Charlton 3253* (UCR).
- SALVIA CARDUACEA Benth. Thistle sage. Annual; uncommon in sandy soils west of North Base. *Heckard 4593* (JEPS).
- SALVIA COLUMBARIAE Benth. Chia. Annual; uncommon on sandy slopes and cut slopes along roadsides and in washes occasionally. *Heckard 4589* (JEPS).

LENNOACEAE

- PHOLISMA ARENARIUM Nutt. ex Hook. Scaly sandfood. Root parasite; rare; occasionally observed on the ranges. *Charlton 4752* (UCR).

LOASACEAE

- MENTZELIA AFFINIS Greene. Yellow comet. Annual; uncommon, primarily in the Rosamond Hills. *Bacigalupi and Heckard 8432* (JEPS). There are vouchered collections of *Mentzelia eremophila* (Jeps.) H.J. Thoms. & J.E. Roberts from just outside the base to the north and *Mentzelia jonesii* (Urb. & Gilg.) H.J. Thoms. & J.E. Roberts near the south boundary.

MENTZELIA ALBICAULIS (Douglas) Douglas ex Torr. & A. Gray. White-stemmed blazing star. Annual; widespread in sandy soils, Rosamond Hills. *Heckard and Bacigalupi 4499* (JEPS).

MENTZELIA NITENS Greene. Smooth blazing star. Annual; scattered in sandy areas on base. Collected northwest of Rogers Lakebed. *Heckard 4548a* (JEPS).

MENTZELIA VEATCHIANA Kellogg. Copper blazingstar. Annual; uncommon in the northeast corner of the base, Rosamond Hills and at Red Hill. *Heckard 4467* (JEPS).

PETALONYX THURBERI A. Gray. Sandpaper plant. Shrub; rare north of the Rosamond escarpment in a single wash, with several plants. *Charlton 3356* (RSA-POM).

MALVACEAE

EREMALCHE EXILIS (A. Gray) Greene. White mallow. Annual; uncommon in sandy soil south of Rogers Lakebed. *Charlton 4181* (EAFB).

EREMALCHE ROTUNDIFOLIA (A. Gray) Greene. Desert fivespot. Annual; rare on rocky hillsides on the range in wet years, only a couple of plants ever observed on base. *Charlton 1140* (EAFB).

*MALVA NEGLECTA Wallr. Cheeseweed. Annual/perennial; old housing area. *Twisselmann 10711* (SBBG).

SPHAERALCEA AMBIGUA A. Gray var. RUGOSA (Kearney) Kearney. Apricot mallow. Herbaceous perennial; common in the northeast, especially west of Boron. *Heckard 4607* (JEPS).

MOLLUGINACEAE

*MOLLUGO CERVIANA (L.) Ser. Indian chickweed. Summer annual; collected after a summer rain event southeast of Kramer Junction along with *Pectis papposa* and *Lepidium flavum*. *Charlton 4041* (EAFB).

MONTIACEAE

CALYPTRIDUM MONANDRUM Nutt. Sand mat. Annual; occasional on sandy slopes such as on the ranges. *Heckard/Moe 4559* (JEPS).

NITRARIACEAE

*PEGANUM HARMALA L. African rue. Herbaceous perennial; eradicated from the roadside at the "General's House" near flightline. Probably escaped from an herb garden. *Charlton 5342a* (EAFB).

NYCTAGINACEAE

ABRONIA POGONANTHA Heimerl. White-flowered sand verbena. Annual; common sand verbena on base, occurs in any sand dunes in the south-central portion of the base. *Charlton 3184* (UCR).

ABRONIA VILLOSA S. Watson var. VILLOSA. Desert sand verbena. Annual; common Mojave Desert species but rare on base; one patch occurs in dunes on the southern portion of Mercury Boulevard. *Charlton 5157* (UCR).

MIRABILIS LAEVIS (Benth.) Curran var. VILLOSA (Kellogg) Spellb. Wishbone plant. Herbaceous perennial; fairly common in the Rosamond Hills, both the white and rose-pink forms occur on base. *Twisselmann 10839* (RSA-POM).

OLEACEAE

FORESTIERIA PUBESCENS Nutt. Desert olive. Shrub; a few very small plants occur between South Base to Lancaster Boulevard; both flowering and fruiting has been observed. *Charlton 3195* (EAFB).

ONAGRACEAE

CAMISSONIA CAMPESTRIS (Greene) P.H. Raven. Desert sun cups. Annual; fairly common in dunes and washes in the western portion of the base. *Charlton 2905* (UCR).

CHYLISMIA CLAVIFORMIS (Torr. & Frém.) A. Heller var. CLAVIFORMIS. Brown-eyed evening primrose. Annual; widespread especially in the north central portion of the base. *Twisselmann 9386* (CAS).

EPILOBIUM BRACHYCARPUM C. Presl. Annual willowherb. Annual; rare at a water pumping facility at South Base southwest of the old entrance gate. It survives on water releases. Checked over 20 years and still persisting. *Charlton s.n.* (EAFB).

EREMOTHERA BOOTHII (Douglas) W.L. Wagner & Hoch subsp. DESERTORUM (Munz) W.L. Wagner & Hoch. Booth's desert primrose. Annual; widespread throughout the base, especially washes on the east range. *Charlton 5156* (RSA-POM).

OENOTHERA CALIFORNICA (S. Watson) S. Watson subsp. CALIFORNICA. California evening primrose. Herbaceous perennial; rare; one plant observed in a disturbed sandy flat adjacent to a homestead northeast of Piute Ponds. *Pratt and Pierce s.n.* (UCR).

OENOTHERA DELTOIDES Torr. & Frém. var. DELTOIDES. Devil's lantern; birdcage primrose. Annual; widespread in wet years in dune areas, especially the southern portion of the base. *Small s.n.*

OENOTHERA PRIMIVERIS A. Gray subsp. BUFONIS (M.E. Jones) Munz. Yellow evening primrose. Annual; uncommon, scattered throughout the base. *Heckard 4497* (JEPS).

TETRAPTERON PALMERI (S. Watson) W.L. Wagner & Hoch. Palmer's primrose. Annual; uncommon in washes and roadsides, especially in the Rosamond Hills. *Charlton 4706* (RSA-POM).

OROBANCHACEAE

CASTILLEJA EXSERTA (A. Heller) T.I. Chuang & Heckard subsp. VENUSTA (A. Heller) T.I. Chuang & Heckard. Owl's clover. Annual, parasite; uncommon, both flower colors have been observed in the northeast corner of the base. *Bacigalupi 4817* (JEPS).

†CASTILLEJA PLAGIOTOMA A. Gray. Mojave paintbrush. Perennial, Parasite; the authors have never observed this species at such low elevations but an early collection is from north of Rosamond Lakebed and south of Hwy 58. CNPS 4.3. *Moe 1394* (JEPS).

CHLOROPYRON MARITIMUM (Nutt. ex Benth.) A. Heller subsp. CANESCENS (A. Gray) Tank & J.M. Egger. Alkali birdsbeak. Annual; one small population on the west side of Piute Ponds; exact location has not been found again despite attempts. *Charlton 5608* (UCR).

PAPAVERACEAE

†CANBYA CANDIDA Parry ex A. Gray. Pygmy poppy. Annual; observed primarily in swales east of Mars Boulevard on the range only in very wet years; CNPS 4.2. *Charlton 4667* (UCR).

ESCHSCHOLZIA GLYPTOSPERMA Greene. Mojave gold poppy. Annual; not observed on base since 1989, much more common to the southeast. *Heckard 4592* (JEPS).

†ESCHSCHOLZIA MINUTIFLORA S. Watson subsp. MINUTIFLORA. Small-flowered gold poppy. Annual; common and widespread on sandy slopes and flats, especially in the north and east. The rare subsp. *twisselmannii* C. Clark & Faull (CNPS 1B.2) has been collected northeast of the base. *Heckard/Moe 4481* (JEPS).

PLATYSTEMON CALIFORNICUS Benth. Cream cups. Annual; uncommon in sandy areas, especially the northwest quarter of the base. *Charlton 1536* (EAFB).

PHRYMACEAE—generic treatment follows Barker et al. (2012)

DIPLACUS FREMONTII (Benth.) G.L. Nesom. Fremont monkeyflower. Annual; very rare; observed once and collected near firing range at Buckhorn Lake. *Twisselmann 10667* (CAS).

ERYTHRANTHE RUBELLA (A. Gray) N.S. Fraga. Little redstem monkeyflower. Annual; very rare; collected at one playa south of Hwy 58 and west of Rich Road. *Charlton s.n.* (EAFB).

MIMETANTHE PILOSA (Benth.) Greene. Downy monkeyflower. Annual; very rare; collected at one playa south of Hwy 58 and west of Rich Road. *Charlton s.n.* (EAFB).

PLANTAGINACEAE

COLLINSIA BARTSHIFOLIA Benth. var. DAVIDSONII (Parish) Newsom. Desert Chinese houses. Annual; rare north of Rosamond Lakebed on a tall

ridge with the wallflower and sand linanthus; also along Buckhorn Lakebed in the past but not seen there in the last 25 years. *Twisselmann 10680* (JEPS).

**PLANTAGO MAJOR* L. Common plantain, ribgrass. Herbaceous perennial; rare in lawns and parks in the housing area.

PLANTAGO OVATA Forssk. var. *FASTIGIATA* (Morris) S.C. Meyers & A. Liston. Woolly plantain. Annual; locally common on a hillside on the range south of Haystack Butte in high rainfall years. In general, rare on base. *Charlton s.n.* (EAFB).

**VERONICA PEREGRINA* L. subsp. *XALAPENSIS* (Kunth) Pennell. Purslane speedwell. Annual; recently found for the first time in ditches surrounding housing area along with a sterile *Hydrocotyle*. *Charlton s.n.* (UCR).

POLEMONIACEAE

ALICIELLA LEPTOMERIA (A. Gray) J.M. Porter. Sand gilia. Annual; collected in the northern portion of the base off Lancaster Boulevard. *Charlton 1671b* (EAFB).

ALICIELLA MICROMERIA (A. Gray) J.M. Porter. Dainty gilia. Annual; collected in the northern portion of the base off Lancaster Boulevard. *Charlton 4202* (EAFB).

ERIASTRUM DENSIFOLIUM (Benth.) H. Mason. subsp. *MOHAVENSE* (T.T. Craig) H. Mason. Perennial woollystars. Herbaceous perennial; most common on southern Rich Road near the junction with Mercury Boulevard. *Charlton 2993B* (RSA-POM).

ERIASTRUM DIFFUSUM (A. Gray) H. Mason subsp. *DIFFUSUM*. Miniature woollystars. Annual; uncommon annual in sandy areas throughout the base, especially on the west side. *Charlton 5192* (UCR).

ERIASTRUM PLURIFLORUM (A. Heller) H. Mason. subsp. *ALBIFLUX* De Groot. Tehachapi woollystars. Annual; very rare, noted northeast of Piute Ponds. There are several collections from the 1970's. *Charlton 5188* (RSA-POM).

†*ERIASTRUM ROSAMONDENSE* D. Gowen. Rosamond eriastrum. Annual; recently described rare species north and west of Piute Ponds. CNPS 1B.1. *Huddleston and Balk s.n.* (UCR).

ERIASTRUM SAPPHIRINUM (Eastw.) H. Mason. subsp. *BREVIBRACTEATUM* De Groot. Sapphire flower. Annual; fairly common and widespread in sandy areas. *Charlton 5144* (RSA-POM).

GILIA BRECCIARUM M.E. Jones. subsp. *NEGLECTA* A.D. Grant & V.E. Grant. Nevada gilia. Annual; collected at North Edwards in creosote bush scrub. *Davidson et al. 1854* (RSA-POM).

GILIA CANA (M.E. Jones) A. Heller. subsp. *SPECIOSA* (Jepson) A.D. Grant & V.E. Grant. Showy gilia. Annual; creosote bush scrub at Kramer Junction. *Bagley & Athey 1992* (UCR).

GILIA LATIFLORA (A. Gray) A. Gray. Broadleaf gilia. Annual; most common and widespread gilia throughout the base. Both the subsp. *DAVYI* (Milliken) A.D. Grant & V.E. Grant *Twisselmann 10689* (CAS) and subsp. *LATIFLORA* appear to be present. *Charlton 4971* (UCR).

GILIA MINOR A.D. Grant & V.E. Grant. Dwarf gilia. Annual; fairly common on flats in saltbush scrub in the north-central portion of the base off Lancaster Boulevard. *Heckard 4575* (JEPS).

LANGLOISIA SETOSISSIMA (Torr. & A. Gray) Greene subsp. *PUNCTATA* (Coville) Timbrook. Lilac sunbonnets. Annual; one plant observed on a ridge on the range southeast of Boron. It was late in the season and the flowers were lighter than normal.

LEPTOSIPHON CHRYSANTHUS (Nutt.) J.M. Porter & L.A. Johnson subsp. *CHRYSANTHUS*. Golden gilia. Annual; fairly common in patches in sandy soils, especially in the northwestern portion of the base. *Heckard 4590* (JEPS).

LINANTHUS ARENICOLA (M.E. Jones) Jeps. & V.L. Bailey. Sand linanthus. Annual; one plant observed at Rosamond Lakebed in a large distinctive dune in the early 1990s not observed since. Once listed as rare.

LINANTHUS BIGELOVII (A. Gray) Greene subsp. *JOHNSONII* J.M. Porter & R. Patt. Bigelow's desert snow. Annual; uncommon, primarily in northwest corner of the base. Area has been impacted by a large fire.

Linanthus was extremely common in the "miracle March" rainfall events of 1991 when they formed carpets for miles. This is the rare species, maybe one for every 10,000 evening snow [*L. dichotomus*] plants. *Charlton 4231* (IRV).

LINANTHUS DICHOTOMUS Benth. Evening snow. Annual; varies from none to large carpets depending of the timing of the rainfall; mostly in the northwest corner of the base. *Charlton 4968* (UCR).

LINANTHUS PARRYAE (A. Gray) Greene. Parry's linanthus. Annual; fairly common in the sandy flats and washes in the western portion of the base with both the white and purple forms. *Heckard 4602* (JEPS).

LOESELIASTRUM MATTHEWSII (A. Gray) Timbrook. Calico flower. Annual; widespread in late spring in sandy and disturbed areas throughout the base. *Charlton 1806* (EAFB).

LOESELIASTRUM SCHOTTII (Torr.) Timbrook. Schott's calico. Annual; uncommon in sandy areas on the range. *Heckard 4848* (JEPS).

POLYGONACEAE

CENTROSTEGIA THURBERI A. Gray. Red triangles. Annual; widespread but uncommon in the western portion of the base. *Twisselmann 10834* (CAS).

CHORIZANTHE BREVICORNU Torr. Brittle spineflower. Annual; widespread and common on rocky slopes and heavy soils throughout the base. *Charlton 1758* (EAFB).

CHORIZANTHE RIGIDA (Torr.) Torr. & A. Gray. Rigid spinyherb. Annual; uncommon and scattered in heavy soils, desert pavement and rocky hillsides. *Charlton 1528* (EAFB).

†*CHORIZANTHE SPINOSA* S. Watson. Mojave spineflower. Annual; it occurs in bare or disturbed clay soils throughout the northern portion of the base, primarily with spinescale. CNPS 4.2. *Heckard 4843* (JEPS).

CHORIZANTHE WATSONII Torr. & A. Gray. Watson's spineflower. Annual; uncommon in the sandy soils in the western portion of the base. *Heckard 4853* (JEPS).

ERIOGONUM ANGULOSUM Benth. Angle-stem skeletonweed. Annual; scattered in sandy soils in the western portion of the base. *Charlton 5134* (UCR).

ERIOGONUM BAILEYI S. Watson. var. *BAILEYI*. Bailey's skeletonweed. Annual; uncommon and scattered in the sandy flats of the southwestern corner of the base. *Charlton 3810* (UCR).

ERIOGONUM BRACHYANTHUM Coville. Short-flowered skeletonweed. Annual; uncommon in western portion of the base often on roadsides. *Heckard 4670* (JEPS).

ERIOGONUM CLAVATUM Small. Hoover's buckwheat. Annual; sandy slopes; mostly known from older collections. Recently revised nomenclature replacing *E. trichopes* var. *hooveri*. Occurs in clay soils but more of a bright green than yellow green. Looks like a blooming first year *Eriogonum inflatum*. *Davy 2222, Ertter and Shevock 6029* (UC).

ERIOGONUM DAVIDSONII Greene ex J.A. Clark. Davidson's skeletonweed. Annual; rare along roadside of powerline on western border of the base. *Charlton 3963* (UCR).

ERIOGONUM DEFLEXUM Torr. Skeletonweed. Annual; uncommon but widespread in clay soils on base. *Charlton 5200* (UCR).

ERIOGONUM FASCICULATUM Benth. var. *POLIFOLIUM* (Benth.) Torr. & A. Gray. California bush buckwheat. Shrub; locally common on almost all rocky granitic hillsides such as the Rosamond Hills. *Charlton 3157* (EAFB).

ERIOGONUM GRACILLIMUM S. Watson. Slender skeletonweed. Annual; uncommon, scattered in the eastern portion of the base replacing *E. angulosum*. *Heckard et al. 4468* (JEPS).

ERIOGONUM INFLATUM Torr. & Frém. Desert trumpet. Herbaceous perennial; widespread and scattered on rocky hillsides and roadsides. *Charlton 1621* (EAFB).

ERIOGONUM MACULATUM A. Heller. Spotted skeletonweed. Annual; uncommon, primarily on the northeastern quarter of the base, often in loose sand along roadsides. *Charlton 3260b* (EAFB).

ERIOGONUM MOHAVENSE S. Watson. Western Mojave buckwheat. Annual; uncommon in sandy flats, primarily in the western portion of the base. *Twisselmann 10652* (CAS).

ERIOGONUM NIDULARIUM Coville. Bird's nest skeletonweed. Summer annual; scattered on slopes and flats on the range. *Heckard 4609* (JEPS).

ERIOGONUM PLUMATELLA Durand & Hilg. Flat-topped buckwheat. Perennial; uncommon on flats north of the Rosamond Hills. More common in Red Rock Canyon. Collected for identification, as these were once treated as two varieties. *Charlton 4128* (RSA-POM).

ERIOGONUM PUSILLUM Torr. & A. Gray. Yellow turbans. Annual; widespread but uncommon in sandy areas. *Heckard 4633* (JEPS).

ERIOGONUM RENIFORME Torr. & Frém. Kidney skeletonweed. Annual; rare on base, collected twice on the northeastern boundary. *Heckard and Moe 4570a* (JEPS).

ERIOGONUM TRICHOPES Torr. Little trumpets. Summer annual; common in patches in heavy soils, primarily in the northeast quarter of the base. *Heckard 4644* (JEPS).

ERIOGONUM VIRIDESCENS A. Heller. Bright green buckwheat. Annual; alluvial slopes with creosote bush scrub. Collections from near Bissell and just outside the base NW of Rosamond and along Highway 395. *Sanders et al. 7860* (RSA-POM).

†GOODMANIA LUTEOLA (Parry) Reveal & Ertter. Yellow spinycape. Summer annual; uncommon on the range and in sandy soils off Lancaster Boulevard. CNPS 4.2. *Charlton 5138* (UCR).

MUCRONEA PERFOLIATA (A. Gray) A. Heller. Perfoliate spineflower. Annual; uncommon on hillsides and rises on the east range. *Heckard 4849* (JEPS).

OXYTHECA PERFOLIATA Torr. & A. Gray. Round-leaf puncture-bract. Annual; uncommon on ridges and hillsides on the range, primarily in saltbush scrub. *Charlton 4826* (RSA-POM).

PERSICARIA LAPATHIFOLIA (L.) Delarbe. Pale smartweed. Wetland annual to perennial; Piute Ponds. *Charlton 3170n*. (EAFB).

*POLYGONUM AVICULARE L. subsp. AVICULARE. Knotweed. Uncommon annual; on roadsides and unpaved parking lots in compacted soil on Main Base and housing. *Charlton 5632* (UCR).

*RUMEX CRISPUS L. Curly dock. Herbaceous perennial; in the alkali meadow at Piute Ponds. *Charlton 5609* (UCR).

RUMEX HYMENOSEPALUS Torr. Desert rhubarb, canaigre. Herbaceous perennial; uncommon in sandy flats throughout the base. *Charlton 2800* (RSA-POM).

PORTULACACEAE

*PORTULACA OLERACEA L. Purslane. Rare weedy annual; observed in cracks in sidewalks on Main Base.

RANUNCULACEAE

DELPHINIUM PARISHII A. Gray. Desert larkspur. Herbaceous perennial; uncommon but widespread in all rocky hillsides on base. *Twisselmann 10830* (CAS).

SALICACEAE

POPULUS FREMONTII S. Watson. Fremont cottonwood. Tree; common in the old housing area and a few at Piute Ponds. *Twisselmann 9342* (CAS).

SALIX EXIGUA Nutt. Narrow-leaf willow. Tree; locally common in ditches surrounding the housing area, especially near the landfill; controlled by the fire department to keep the drainage ditches cleared. *Heckard 4606a* (JEPS).

SALIX GOODINGII C.R. Ball. Black willow. Tree; rare in a row of willow trees at Piute Ponds. *Twisselmann 9351* (CAS).

SALIX LAEVIGATA Bebb. Red willow. Tree; rare, one tree observed at Piute Ponds. *Heckard 4606* (JEPS).

SALIX LASIOLEPIS Benth. Arroyo willow. Tree; rare tree at Piute Ponds. *Charlton 5692* (UCR).

SOLANACEAE

DATURA WRIGHTII Regel. Jimson weed. Herbaceous perennial; rare on base, one individual observed at a roadside between Main Base and housing. *Charlton 2919*.

LYCIUM ANDERSONII A. Gray. Desert tomato. Shrub; fairly common on rocky hillsides and upper bajadas. *Twisselmann 10567* (JEPS).

LYCIUM COOPERI A. Gray. Peachthorn. Shrub; Locally common on the edge of the stringer washes on base, especially in the north. *Twisselmann 10850* (CAS).

*SOLANUM ELAEAGNIFOLIUM Cav. Silverleaf nightshade. Herbaceous perennial; uncommon at the southern border homesteads near the base boundary. *Charlton 3456* (EAFB).

*SOLANUM NIGRUM L. Black nightshade. Annual; found only at Piute Ponds. *Charlton 3169* (UCR).

TAMARICACEAE

*TAMARIX APHYLLA (L.) H. Karst. Athel tree. Tree; scattered throughout at the homesteads. *Charlton 5175* (UCR).

*TAMARIX CHINENSIS Lour. Chinese tamarisk. Shrub; rare, east of Piute Ponds. *Charlton 3161* (UCR).

*TAMARIX PARVIFLORA DC. Four-petaled tamarisk. Tree; east of Piute Ponds. The rows of tamarisk at the old homesteads have occasional plants that are slightly different looking and bloom at a different time. *Twisselmann 9344* (CAS).

*TAMARIX RAMOSISSIMA Ledeb. Salt cedar. Tree; uncommon but becoming more common as New Piute Ponds has water for a longer period than in the past. Also at leaking pipes at the Rocket Lab. *Heckard 4673* (JEPS).

URTICACEAE

*URTICA DIOICA L. subsp. HOLOSERICEA (Nutt.) Thorne. Stinging nettle. Herbaceous perennial; locally common in a ditch along the main road at Piute Ponds. *Charlton s.n.* (SEINET-UCR).

ZYGOPHYLLACEAE

LARREA TRIDENTATA (DC.) Coville. Creosote bush. Evergreen shrub; widespread and common on bajadas, hillsides and middle elevations. *Charlton 2922* (UCR).

*TRIBULUS TERRESTRIS L. Puncture-vine. C₄ annual; rare in the housing area.

ANGIOSPERMS: MONOCOTS

AGAVACEAE

YUCCA BREVIFOLIA Engelm. Joshua tree. Tree; uncommon overall, but present where the distribution either is in sand dunes south of Rogers Lake that are large enough to store sufficient water for the Joshua tree to survive, or along groundwater drainages in the northern portion of the base. *Charlton 4200* (UCR).

ALLIACEAE

ALLIUM FIMBRIATUM S. Watson var. MOHAVENSE Jeps. Fringed onion. Geophyte; uncommon west of Rich Road on the edges of bare areas along with Barstow woolly sunflower. One year Red Hill was covered with thousands of plants. Then none were seen for the next 10 years. *Charlton s.n.* (EAFB).

ALLIUM LACUNOSUM S. Watson var. DAVISIAE (M.E. Jones) McNeal & Ownbey. Davis' pitted onion. Geophyte; collected just outside EAFB in allscale and creosote bush scrub 1.5 mi northwest of Rosamond. *Charlton 4753* (UCR).

ARACEAE

LEMNA MINOR L. Duckweed. Floating aquatic plant covering a stagnant pond at Piute Ponds adjacent to the main road. *Charlton s.n.* (EAFB).

CYPERACEAE

- BOLBOSCHOENUS MARITIMUS (L.) Palla subsp. PALUDOSUS (A. Nelson) T. Koyama. Alkali bulrush. Herbaceous perennial; dense belts of this species line the margin of Piute Ponds. *Charlton 5616* (RSA-POM).
- ELEOCHARIS PARISHII Britton. Parish's spikerush. Herbaceous perennial; rare at drainages from landscaping in the housing area. *Charlton 3266* (EAFB).
- SCHOENOPLECTUS ACUTUS (Muhl. ex Bigelow) Á. Löve & D. Löve var. OCCIDENTALIS (S. Watson) S.G. Sm. Tule rush. Herbaceous perennial; dense bands of this species line the edges of Piute Ponds. *Charlton 3170* (UCR). Variety *acutus* at the Phillips Laboratory. *Charlton 5329* (RSA-POM).
- SCHOENOPLECTUS AMERICANUS (Pers.) Volkart ex Schinz & R. Keller. Chairmaker's bulrush. Wetland herbaceous perennial; occurs with cattails and bulrush on the edge of Piute Ponds. *Charlton 1311* (EAFB).

HYDROCHARITACEAE

- NAJAS MARINA L. Spiny naiad, water nymph. Aquatic; uncommon in ponds at Piute Ponds. *Heckard 4710* (JEPS).

JUNCACEAE

- JUNCUS BALTICUS Willd. Baltic rush wiregrass. Herbaceous perennial; locally common at Piute Ponds in the alkali meadow. This species belongs to the *Juncus balticus-mexicanus* complex. Some plants have twisted stems and others do not. *Heckard 4714* (JEPS).
- JUNCUS BUFONIUS L. var. BUFONIUS. Toad rush. Annual; uncommon at clay pans off Boy Scout Road. *Charlton s.n.* (UCR).
- JUNCUS MEXICANUS Willd. Mexican rush, wiregrass. Herbaceous perennial; both the twisted stem and non-twisted stem forms occur at Piute Ponds in the alkali meadow. *Heckard 4700* (JEPS).

LILIACEAE

- CALOCHORTUS KENNEDYI Porter. Desert mariposa lily. Geophyte; two populations occur on the top of rocky hills on the range. One small population occurs on the first hill west of Mars Boulevard near the sewage treatment plant. The other on the range was identified by a jogger and has not been verified. *Charlton 4441* (EAFB).
- †CALOCHORTUS STRIATUS Parish. Alkali mariposa lily. Geophyte; population levels are highly variable. In low rainfall years they occur in clay drainages. In high rainfall years nearly every dune or hillock contains plants throughout the Antelope Valley. The most reliable populations can be observed west of Piute Ponds and north of Boy Scout Road at the bridge. CNPS 1B.2. *Huddleston and Balk s.n.* (UCR).

MELIANTHACEAE

- TOXICOSCORDION BREVIBRACTEATUM (M.E. Jones) R.R. Gates. Death camas. Geophyte; uncommon on sandy slopes on the range from north of Leuhman ridge east. *Charlton 4258* (UCR).

POACEAE

- *ARUNDO DONAX L. Giant reed. Herbaceous perennial; one clump occurs on the east side of the north pond, Piute Ponds. *Charlton 5619* (UCR).
- *AVENA BARBATA Pott ex Link. Slender wild oats. Annual; roadside waif observed one plant on a roadside between housing and main base once. *Charlton 3028* (EAFB).
- *BROMUS BERTEROANUS Colla. Chilean chess. Annual; occasionally it occurs within saltbush shrubs northeast of Rosamond Lakebed to Mercury Boulevard. *Charlton 5174* (UCR).
- *BROMUS MADRITENSIS L. subsp. RUBENS (L.) Husn. Red brome grass. Annual; widespread and extremely common throughout the base. *Heckard 4577* (JEPS).
- *BROMUS TECTORUM L. Cheat grass. Annual; surprisingly widespread at this low elevation.

- *CENCHRUS LONGISPINUS (Hack.) Fernald. Spiny burgrass. C₄ annual; uncommon summer weed in the housing area. *Heckard 4685* (JEPS).
- *CHLORIS VIRGATA Sw. Feather fingergrass. C₄ annual; occasionally observed in the ditches around housing and drainages with landscape runoff. *Charlton 4142* (EAFB).
- *CRYPISIS SCHOENOIDES (L.) Lam. Swamp pricklegrass. Annual; once common on the shores of New Piute Ponds it is now infrequent. *Charlton 5613* (RSA-POM).
- *CYNODON DACTYLON (L.) Pers. Bermuda grass. C₄ herbaceous perennial; uncommon weed that escapes from lawns in the housing and Main Base areas. *Charlton 5638* (UCR).
- *DIGITARIA SANGUINALIS (L.) Scop. Hairy crabgrass. C₄ annual; rare weed in the housing and irrigated landscaping.
- DISTICHLIS SPICATA (L.) Greene. Saltgrass. C₄ herbaceous perennial; in wet years it comes up in the clay cracks in the larger pans, especially along Lancaster Boulevard. After several dry years it is seldom seen but can occur on stable dunes near the lakebeds. *Charlton 2820a* (UCR).
- *ECHINOCHLOA CRUS-GALLI (L.) P. Beauv. Barnyard grass. C₄ annual; summer weed in the housing area. *Charlton 5634* (RSA-POM).
- ELYMUS CINEREUS Scribn. & Merr. Great Basin rye grass. Herbaceous perennial; uncommon around South Base. *Charlton 3256A* (UCR).
- ELYMUS ELYMOIDES (Raf.) Swezey. Squirrel-tail grass. Herbaceous perennial; fairly common on rocky hillsides, especially in wet years; primarily observed in the Rosamond Hills north of Rosamond. *Charlton 5145* (UCR).
- *ERAGROSTIS CILLANENSIS (All.) Vignolo ex Janch. Candygrass, stinkgrass. C₄ annual; summer weed of wet areas in the housing area. *Heckard 4716* (JEPS).
- ERAGROSTIS MEXICANA (Hornem.) Link subsp. VIRESCENS (J. Presl) S.D. Koch & Sánchez Vega. Mexican lovegrass. C₄ annual; rare warm weather grass of wet disturbed soils near Piute Ponds. *Charlton 3810a* (RSA-POM).
- FESTUCA MICROSTACHYS Nutt. Small fescue grass. Annual; rare native grass occurs in wet years on the range west of Mars Boulevard. *Twisselmann 10687* (CAS).
- *FESTUCA MYUROS L. Rat-tail fescue. Annual; small patch was observed at a leaking water line south of Branch Park along the road to the obstacle course. *Charlton 4186* (EAFB).
- FESTUCA OCTOFLORA Walter. Eight-week fescue. Annual; occasionally observed in sandy soils on the West Range in wet years. One of the few native annual grasses. *Twisselmann 9379* (CAS).
- HORDEUM JUBATUM L. Squirreltail barley. Herbaceous perennial; uncommon at Piute Ponds in the alkali meadow. *Charlton s.n.* (EAFB).
- *HORDEUM MURINUM L. subsp. GLAUCUM (Steud.) Tzvelev. Foxtail barley. Annual; uncommon spring weed in the housing area and western portion of the base. *Charlton 5133* (UCR).
- *HORDEUM MURINUM L. subsp. LEPORINUM (Link) Arcang. Foxtail barley. Annual; uncommon in the housing area. *Heckard 4636* (JEPS).
- *HORDEUM VULGARE L. Barley. Annual; rare roadside waif. *Charlton 5189* (UCR).
- *LEPTOCHLOA FUSCA (L.) Kunth subsp. FASCICULARIS (Lam.) N. Snow. Sprangletop. C₄ annual; uncommon summer weed at Piute Ponds. *Charlton 5639* (UCR).
- PANICUM CAPILLARE L. Witch grass. C₄ annual; uncommon summer weed at Piute Ponds and ditches in the housing area. *Charlton 5631* (UCR).
- POA SECUNDA J. Presl. subsp. JUNCIFOLIA (Scribn.) Soreng. Nevada blue grass. Annual; fairly common bunchgrass, primarily occurring on north-facing hillsides but can occur in sandy bajadas. *Heckard 4580* (JEPS).
- *POLYPOGON MONSPELIENSIS (L.) Desf. Rabbits-foot grass. Annual; uncommon summer weed in the housing area ditches. *Twisselmann 9371* (CAS).
- †PUCCINELLIA SIMPLEX Scribn. California alkali grass. Annual; rare spring annual along the edges of clay pans east of Rosamond Lakebed, primarily observed in wet years. All known populations have been

mapped and a species report exists in the EAFB electronic library. CNPS 1B.2. *Charlton s.n.* (SEINET-UCR).

*SCHISMUS ARABICUS Nees. Arabian grass. Annual; widespread but not as common as the smaller *S. barbatus*; lasts longer into spring. *Charlton 5141* (UCR).

*SCHISMUS BARBATUS (L.) Thell. Split grass. Annual; widespread and very common annual in disturbed and undisturbed sandy soils. Plants very small in low rainfall years. *Heckard and Moe 4573* (JEPS).

*SETARIA PUMILA (Poir.) Roem. & Schult. Yellow foxtail. Weedy annual grass in housing area ditches. *Heckard 4679* (JEPS).

SPOROBOLUS AIROIDES (Torr.) Torr. Alkali dropseed, alkali sacaton. Herbaceous perennial; fairly common in the southwest corner of the base with shadscale but also at Mary's Well where water is diverted for testing. *Heckard 5333* (JEPS).

STIPA HYMENOIDES Roem. & Schult. Indian rice grass. Herbaceous perennial; common bunch grass in sandy soils, much reduced due to past grazing and recent drought; can form large patches in disturbed areas such as after a fire. *Charlton 2894* (UCR).

STIPA SPECIOSA Trin. & Rupr. Desert needle grass. Herbaceous perennial; widespread in all rocky areas on base. Looks similar to Indian rice grass when sterile but more common in rocky habitats. Both species can occur together. *Charlton 1498* (UCI), 4446.

*TRITICUM AESTIVUM L. Wheat. Annual; rare roadside waif.

POTAMOGETONACEAE

STUCKENIA PECTINATA (L.) Börner. Sago pondweed. Aquatic plant; Piute Ponds.

THEMIDACEAE

DICHELOSTEMMA CAPITATUM (Benth.) Alph. Wood subsp. PAUCIFLORUM (Torr.) Keator. Blue dicks. Geophyte; widespread on sandy slopes and rocky hillsides throughout the base; young sterile plants are common. *Charlton 2860* (EAFB).

†MULLA CORONATA Greene. Crowned onion. Geophyte; a patch occurs north of Rosamond Lakebed in hydrophobic soils; also very rare off Rich Road east to Kramer Junction. CNPS 4.2. *Heckard and Moe 4539* (JEPS).

TYPHACEAE

TYPHA ANGUSTIFOLIA L. Cattail. Herbaceous perennial; common at Piute Ponds. *Charlton 3254* (EAFB).

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