

## SECTION 7: RARE PLANTS



The Long Term Water Agreement requires management of rare species to be consistent with applicable laws. The Water Dept. monitors populations of two plant species that could potentially be affected by groundwater pumping.

The Inyo County Water Department (ICWD) monitors populations of Owens Valley checkerboom (*Sidalcea covillei*) and Inyo County star-tulip (*Calochortus excavatus*) each year in accordance with Long Term Water Agreement goals to manage rare plants in manner consistent with State and Federal laws. *S. covillei* is listed as endangered by the state of California, and is a US Fish and Wildlife species of concern. Both species are listed under CNPS List 1B.1 (rare, threatened, or endangered in CA and elsewhere).

The Water Department has monitored, in total, up to 31 *S. covillei* sites and up to 33 *C. excavatus* sites from 1993 to 2019. In 2019, ICWD counted or estimated abundance at seven *S. covillei* sites and 30 *C. excavatus* sites. For eight *C. excavatus* sites that also hosted *S. covillei*, only presence and phenology were recorded. Abundance values were derived from a total count of individuals at each site where attainable or if sites were too large to count all individuals, sites were sampled and the abundance estimates were derived by extrapolating the sample mean to the polygon aerial extent of each site.

Along with *C. excavatus*, and *S. covillei*, a few additional herbaceous perennial and shrub species are regularly documented on datasheets

as associated species and during Owens Valley Vegetation Condition (OVVC) surveys. These species are noted as present or absent along with the phenology or counted as part of the vegetation cover. Species of interest are Silverleaf Milkvetch (*Astragalus argophyllus* var. *argophyllus*), Hall's Meadow Hawksbeard (*Crepis runcinata* ssp. *hallii*), White Flowered Rabbitbrush (*Ericameria albidia*), Torrey's Blazing Star (*Mentzelia torreyi*), Frog's-bit Buttercup, (*Ranunculus hydrocharoides*), and Alkali Cordgrass (*Spartina gracilis*).

### Inyo County Star Tulip (*Calochortus excavatus*)

The genus *Calochortus* is distributed only in western North America from British Columbia to Guatemala (Ownbey 1940). *C. excavatus* is endemic to Inyo and Mono Counties occurring in snow-melt fed springs, seeps, riparian corridors and groundwater-dependent alkali meadows between 1300 - 2000 m. *C. excavatus* reproduces by seed and by offset bulbils from the main bulb. The seeds of *Calochortus* species are relatively large and lack obvious adaptations for long-distance dispersal, long distance dispersal is likely facilitated by large herbivores which graze mature fruit and move seed during annual migrations,

potentially facilitating genetic differentiation at small spatial scales and parallel adaptive radiations in geographically restricted clades (Patterson 2004). The relative proportion of carbohydrate storage in below-ground bulbs and above tissues is presumably influenced by antecedent water regime and life stage. In dry years, *C. excavatus* can remain dormant in bulb form. The presence of a dormant seedbank is unknown. Plants may persist up to ten years.

Currently there are 79 known sites supporting *C. excavatus* being monitored, all of which are in the Owens Valley in Inyo County (Table 7.1). The Water Department monitors 31 *C. excavatus* populations annually, LADWP monitors approximately six populations and the Bureau of Land Management monitors eight populations. The 27 populations monitored by the Water Department are located on land owned by LADWP. Individual *C. excavatus* plants were counted using walking grids located within previously mapped population boundaries.



Table 7.1. *C. excavatus* site counts and sparkline from 1993 to 2019.

| Site   | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Time series 1993-2019 |  |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------|--|
| C11    | 26   | 152  | 91   | 80   | 220  | 116  | 208  | 177  | 699  | 337  | 388  | 392  | 128  | 181  | 234  | 64   | 15   | 51   | 62   | 195  | 27   | 41   | 7    | 41   | 48   | 14   | 20   |                       |  |
| BF     |      |      |      | 2    | 1    |      |      | 0    | 0    | 0    |      | 0    | 0    |      | 0    | 0    |      |      |      |      |      |      |      |      |      |      |      |                       |  |
| C13    | 18   | 6    | 58   | 21   | 25   | 21   | 17   | 10   | 6    | 23   | 18   | 5    | 8    | 15   | 18   | 26   | 6    | 13   | 8    | 12   | 4    | 2    | 0    | 7    | 23   | 5    | 6    |                       |  |
| C14    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1974 | 13   | 6    | 2    | 7    |      | 206  | 54   |                       |  |
| C15    | 72   | 46   | 50   | 104  | 45   | 100  | 133  | 98   | 27   | 13   | 103  | 7    | 140  | 112  | 143  | 68   | 1    |      | 5    | 29   | 1    | 1    |      | 0    | 26   | 7    | 42   |                       |  |
| C16    | 282  | 31   | 500  | 450  | 400  | 250  |      | 687  | 658  | 991  | 1124 | 85   | 837  | 203  | 927  | 1227 | 68   | 94   | 38   | 257  | 190  | 375  | 20   | 27   | 901  | 57   | 257  |                       |  |
| C16N   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 232  | 27   | 117  |                       |  |
| C17    | 105  | 77   | 180  | 200  | 111  | 92   | 114  | 236  | 432  | 340  | 286  | 214  | 408  | 262  | 167  | 269  | 145  |      | 198  | 389  | 541  | 317  |      | 127  |      | 176  |      |                       |  |
| C18    |      |      |      |      |      |      | 8    |      |      |      |      |      |      |      |      |      |      |      |      | 35   | 57   | 31   | 10   | 0    | 39   | 98   | 17   | 121                   |  |
| T581   |      |      |      |      |      | 50   |      | 44   | 84   | 96   | 296  | 82   | 290  | 457  | 76   | 183  | 23   | 276  | 265  | 40   | 11   | 32   | 5    | 43   | 539  | 8    | 147  |                       |  |
| TS2    |      |      |      |      | 7    | 16   | 2    | 0    | 4    | 1    | 6    | 0    | 8    | 8    | 1    | 8    | 1    | 7    | 3    | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 0    | 1                     |  |
| TL     |      |      |      |      |      |      |      |      |      |      |      |      | 852  | 662  | 399  | 780  | 174  | 626  | 516  | 533  | 568  | 474  | 112  | 356  | 1511 | 428  | 538  |                       |  |
| BC     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 17   | 15   | 5    | 20   | 3    | 1    | 14   | 17   | 5                     |  |
| C19    | 15   | 0    | 0    | 57   | 45   | 2    | 19   | 6    | 88   | 65   | 173  | 7    | 77   | 95   | 51   | 37   | 1    | 14   | 6    | 0    | 0    | 0    | 0    | 1    | 6    | 8    | 0    |                       |  |
| C20    | 12   | 33   | 42   | 31   | 6    | 3    | 7    | 14   | 10   | 0    | 19   | 16   | 34   | 42   | 6    | 30   | 10   | 39   | 21   | 18   | 0    | 9    | 6    | 14   | 36   | 4    | 7    |                       |  |
| C21    | 0    | 0    | 69   | 9    | 3    | 10   | 0    | 0    | 14   | 0    | 51   | 0    | 39   | 19   | 0    | 49   | 7    | 14   | 6    | 12   | 0    | 3    | 0    | 7    | 73   | 2    | 69   |                       |  |
| C22    | 78   | 0    | 315  | 19   | 100  | 200  | 41   | 54   | 124  | 21   | 348  | 30   | 186  | 40   | 54   | 213  | 62   | 183  | 62   | 22   | 0    | 2    | 0    | 1    | 29   | 19   | 32   |                       |  |
| ASR    |      |      |      |      |      |      |      |      |      |      |      |      | 166  | 296  | 18   | 567  | 34   | 360  | 135  | 107  | 8    | 50   | 0    | 17   | 196  | 8    | 555  |                       |  |
| C168   |      |      |      |      | 2    | 0    | 3    | 0    | 1    | 0    | 1    | 0    | 6    | 0    | 0    | 0    | 0    |      | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 7    | 7    | 5                     |  |
| C28    | 0    | 2    | 5    | 1    | 2    | 4    | 4    | 0    | 4    | 0    | 2    | 0    | 0    | 1    | 0    | 1    | 0    | 0    | 2    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 2                     |  |
| C30    | 120  | 26   | 450  | 32   | 14   | 23   | 0    | 0    | 1    | 0    | 2    | 0    | 260  | 99   | 0    | 355  | 2    | 380  | 151  | 0    | 0    | 0    | 0    | 4    | 59   | 1    | 16   |                       |  |
| C31    |      | 200  | 400  | 92   | 90   | 90   | 100  | 318  | 627  | 527  | 1643 | 81   | 1502 | 506  | 263  | 1793 | 361  | 1220 | 814  | 81   | 36   | 357  | 36   | 626  | 1349 | 141  | 1753 |                       |  |
| C32    | 13   | 0    | 118  | 17   | 1    | 47   | 17   | 3    | 19   | 0    | 6    | 0    | 10   | 14   | 0    | 43   | 2    | 28   | 26   | 1    | 0    | 1    | 0    | 0    | 6    | 1    | 20   |                       |  |
| C35    | 0    |      |      | 33   | 30   | 74   | 67   | 82   | 43   | 53   | 36   | 0    | 28   | 34   | 5    | 6    | 0    | 2    | 11   | 0    | 12   | 7    | 2    | 9    | 2    | 4    | 0    |                       |  |
| C36    |      | 97   | 400  | 200  | 18   | 100  | 150  | 167  | 592  | 4    | 673  | 6    | 681  | 575  | 177  | 1162 | 0    | 61   | 165  | 2    | 0    | 1    | 0    | 2    | 128  | 93   | 126  |                       |  |
| PLC024 |      |      |      |      |      |      |      |      |      | 345  | 1081 | 255  | 661  | 191  | 170  | 1616 | 505  | 448  | 141  | 60   | 222  | 287  | 45   | 164  | 256  | 79   | 293  |                       |  |
| C37    | 15   | 1    | 56   | 55   | 50   | 17   | 64   | 76   | 45   | 20   | 13   | 7    | 16   | 86   | 26   | 59   | 6    | 42   | 55   | 4    | 2    | 8    | 0    | 0    | 24   | 10   | 7    |                       |  |
| C38    |      |      | 36   | 7    | 2    | 15   | 17   | 3    | 1    | 0    | 3    | 2    | 17   | 8    | 5    | 4    | 3    | 2    | 0    | 1    | 0    | 0    | 0    | 0    | 2    | 1    | 0    |                       |  |
| C39    | 1    | 0    | 21   | 3    | 4    | 15   | 6    | 5    | 6    | 5    | 8    | 4    | 17   | 6    | 5    | 14   | 4    | 3    | 11   | 3    | 3    | 2    | 0    | 1    | 15   | 0    | 1    |                       |  |
| C40    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 5    | 4    |                       |  |
| C44    | 55   | 1    | 380  | 150  | 50   | 100  | 248  | 689  | 548  | 90   | 368  | 90   | 321  | 130  | 171  | 320  | 5    | 155  | 92   | 11   | 12   | 36   | 0    | 11   | 67   | 131  | 212  |                       |  |
| WBCC   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 17   | 57   |                       |  |

## Owens Valley Checkerboom (*Sidalcea covillei*)

*S. covillei* occurs from about 1100 - 1300 m elevation in alkali meadows that are periodically wet from nearby streams, springs or ground water in the Owens River drainage. *S. covillei*'s carbohydrate-rich roots allow it to survive drought periods but continuously dry periods are incompatible with population maintenance. *S. covillei* grows to 20-60 cm. The leaves are fleshy and waxy in texture. The inflorescence is an open panicle of several flowers. The leaves and flower sepals are coated in tiny branching hairs.

According to Halford (1993), *S. covillei* population demographics are influenced by annual precipitation, timing and intensity of cattle grazing, competition with shrubs and rhizomatous grass species, and activities that influence surface and groundwater sources. Owens Valley checkerbloom flowers from April through June. ICWD monitored seven *S. covillei* sites and 30 *C. excavatus* sites within the Owens Valley in 2019 (Table 7.2). The number of sites monitored each year is determined by staffing levels in May.

*S. covillei* populations were sampled by first mapping known population locations into polygons and then either sampling individuals via randomly located quadrats, or via hand counts of flagged individuals within mapped sub-populations. Polygon boundaries were marked with flags and mapped by walking the perimeter with a GPS unit. Quadrats (approximately 1 m<sup>2</sup>) were randomly sampled within the polygon. Locations of quadrats were selected using a random bearing and a random number of paces (i.e. three sets of random paces were generated: 1-20, 1-30, 1-40 for small vs. larger polygons). The number of quadrats sampled increased with the size of the polygon; 10 was the minimum number of quadrats sampled. Annual population size estimates are for the non-dormant portion of the population (Fiedler 1998) and are thus likely underestimates of the true population size, especially in dry years when dormancy is expected to be more prevalent.



Table 7.2. *S. covillei* site counts and sparkline for time series 1993-2019.

| Site   | 1993  | 1994   | 1995   | 1996   | 1997  | 1998 | 1999  | 2000  | 2001  | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017 | 2018 | 2019  | Time series 1993-2019 |  |
|--------|-------|--------|--------|--------|-------|------|-------|-------|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|------|------|-------|-----------------------|--|
| S06    |       | 0      |        |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |      |      |       |                       |  |
| UNW031 |       |        |        |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       |       | 9059  |       |       |      |      |       |                       |  |
| S07    |       | 46457  | 78817  | 64299  | 39660 |      |       |       |       |      |      |      |      |      |      |      |      |      | 11101 | 17068 |       |       |       |       |      |      |       |                       |  |
| S08    | 2000  | 2400   | 72156  | 27901  |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 9716  | 9145  |       |       |       |       |      |      |       |                       |  |
| S09    | 826   | 17356  | 10126  | 9674   |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 29162 |       |       |       |      |      |       |                       |  |
| S10    | 1800  | 2976   | 3657   | 10676  | 1996  |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 62    | 946   |       |       |      |      |       |                       |  |
| S11    | 66600 | 124714 | 169367 | 74003  |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 97343 | 79245 |       |       |       |       |      |      |       |                       |  |
| S12    | 64388 | 156288 | 84656  | 25149  |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 11285 | 14064 |       |       |       |       |      |      |       |                       |  |
| S18    |       |        | 181    | 221    | 350   | 520  | 625   | 586   | 754   | 918  | 921  | 872  | 834  | 808  | 715  | 503  | 350  |      | 400   | 682   | 2345  | 699   | 659   | 674   | 716  | 264  | 655   |                       |  |
| S20    |       | 1100   | 1496   | 1582   | 1476  |      |       |       |       |      |      |      |      |      |      |      |      |      | 803   | 507   | 677   | 50    |       |       |      |      |       |                       |  |
| S21    |       | 0      |        |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 335   | 758   | 149   | 95    | 130  | 16   | 82    |                       |  |
| S22    | 92155 | 68126  | 198418 | 141568 |       |      |       |       |       |      |      |      |      |      |      |      | 8000 |      | 57590 | 57279 |       |       |       |       |      |      |       |                       |  |
| S25    |       | 0      | 2000   | 1500   |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 110   | 93    | 120   | 144   | 172  |      | 33    | 42                    |  |
| S27    | 3000  |        | 19396  | 8652   |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 3000  |       | 6633  | 4663  | 9405  | 5348  |      |      |       |                       |  |
| S28    | 22275 | 59999  | 77355  | 89502  |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 80    | 4630  | 3444  | 2721  | 9070  |       |      |      |       |                       |  |
| S29    | 600   | 600    | 9731   |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       | 323   | 378   | 257   | 9     |       |      |      |       |                       |  |
| Hanby  |       |        |        |        |       |      |       |       |       |      | 5    | 5    | 5    | 2    | 2    | 2    | 0    | 0    | 1     | 0     | 0     | 0     | 0     | 0     | 0    | 0    | 0     | 0                     |  |
| S31    | 5000  |        | 51002  |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      | 1200  | 20574 | 19568 | 22924 | 53777 | 29973 |      |      | 32887 | 2000                  |  |
| S32    |       | 100    | 200    |        |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 61    | 45    | 51    | 25    | 70   | 55   | 41    | 38                    |  |
| S33    | 150   | 115000 | 90974  |        | 69743 |      | 41275 | 42351 | 39938 |      |      |      |      |      |      |      |      |      | 5000  |       | 18824 | 17300 |       | 25843 |      |      | 32813 |                       |  |
| S34    | 106   | 67     | 171    | 131    | 129   | 152  | 223   | 94    | 113   | 53   | 75   | 44   | 72   | 91   | 70   | 44   | 0    | 14   |       | 8     | 1     | 0     | 0     | 0     | 0    | 0    | 0     | 0                     |  |
| S35    |       |        | 97452  | 43438  |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 9278  |       |       |       |      |      |       |                       |  |
| S36    | 35000 |        | 28668  | 12868  |       |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 28463 | 24909 | 33144 |       |      |      |       |                       |  |
| S37    | 0     | 0      | 0      | 0      | 0     |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |      |      |       |                       |  |
| S38    | 3     | 10     | 12     | 2      | 1     |      |       |       |       |      |      |      |      |      |      |      |      |      |       |       | 10    | 0     | 0     |       |      |      |       | 0                     |  |

Due to the abundant winter precipitation, many annuals grew in 2019. We took this opportunity to look for some rare annual species that are only found in the wetter years. Species of interest were Geyer's Milkvetch (*Astragalus geyeri* var. *geyeri*), Yellow Spinescape (*Goodmania luteola*), Nevada Orcytes (*Oryctes nevadensis*), Inyo Phacelia (*Phacelia inyoensis*), and Parish's Popcorn Flower (*Plagiobothrys parishii*).

### Geyer's Milkvetch (*Astragalus geyeri* var. *geyeri*)

*Astragalus geyeri* var. *geyeri* occurs from at about 1200-1900m elevation in sandy fast-draining soils associated with Shadscale (*Atriplex confertiflora*) to Single-needle pinyon (*Pinus monophylla*). *A. geyeri* is rare in California only occurring in SE Lassen County and Inyo County. The Lassen County records are from the 1993 & 1997. The Inyo County records are from 1973 in the Owens Valley, and a northern Panamint Mountains record from 1937 from the head of Wood Canyon at about 1939 m elevation. This is an annual herb, stems prostrate to ascending, minutely strigose. Leaves are pinnate compound, 1.5-10 cm long, leaflets 3-13 spaced 5-15 mm apart, linear to oblong, terminal leaflet often longer than others. Inflorescence is down in foliage, 3-8 flowers per cluster, flowers ascending to reflexed, petals white to lilac-blushed, keel tip purple, banner 5.2-7.6mm, recurved 45 degrees or more, keel 3.8-4.8mm long. Fruit 15-25mm long and 6-10mm wide, inflated, distinctly curved, surface minutely strigose, thin papery, beak triangular.

Not since the 1973 Mary DeDecker records, has this species been recorded in Inyo County. The DeDecker location is not GPS'ed but only a general TRS location is given. The general area was searched for a few hours by Zach Nelson

and Jerry Zatorski, on May 11, 2017, but no plants were found. The habitat appeared to be relatively stable with many expected shrub, and herbaceous species found, but *A. geyeri* var. *geyeri* is a relatively small plant about 10cm tall and 10-15cm wide, so plants could have been easily hidden behind a shrub and out of view. On May 25, 2017, a new population of *A. geyeri* var. *geyeri* was located near Farmers Pond in the Laws USGS quadrat, and in May, 2019 this site was revisited.

In 2017 a total of 18 plants were found, all were in fruit and a few had some senesced flowers. In 2019, 150 plants were found, about 25% were vegetative only and 75% were in flower and fruit. The plants were up to 10 cm tall and 10-15cm wide. The habitat is hummocky upland, the plants occurring on the sandy hummocks not in the small 'playa-ettes' in between. Associated species are a mix of woody shrubs and herbaceous perennials and annuals that are rain-water dependent, not wetland indicator species. The area is managed as range for cattle, and has likely been this way since the late 19th Century. The area is also frequented by cottontail rabbits and jack rabbits, rodents (squirrels, mice, rats) native to the Owens Valley, Tule elk and mule deer are year round residents, and some hawk moth larvae predation was noted on nearby plants.

Martin F. Wojciechowski & Richard Spellenberg 2017. *Astragalus geyeri* var. *geyeri*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=54745](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=54745), accessed on November 01, 2017.





## Yellow Spinescape (*Goodmania luteola*)

*Goodmania luteola* occurs in the Eastern Sierra of S Mono County and N Inyo County, and is also found in the W Mojave Desert and San Joaquin Valley. The Inyo County records are concentrated around Klondike Lake, north of Big Pine and the south end of Fish Slough. This is an annual herb, stems prostrate and spreading to about 5-15cm wide. Leaves are cauline, blade round, 2-7mm with petioles 2-4cm long. Flowers are in clusters along long flowering stems, the clusters are subtended by ovate, spine-tipped bracts, flowers 9-15mm across, perianth with 6 yellow lobes. Fruit single seed, light-brown, 1-1.2mm, glabrous, curved.

This species has been documented beginning in 1995 at a few *Calochortus* rare plant locations in spring and while surveying Owens

Valley Vegetation conditions in summer, and it's noted as present or absent along with the phenology. In 2019 *G. luteola* was documented at one location while surveying for other rare plants, and one location while surveying Owens Valley Vegetation in early July. Both locations are in the Klondike Lake area east of US 395. In all locations the species is found in alkali meadows with a moderate amount of cover and desert or alkali sink habitats. For all locations the populations appear to be stable. Plants are only documented as associated species during rare plant surveys, and as vegetation cover during summer vegetation surveys.

James L. Reveal & Thomas J. Rosatti 2017. *Goodmania luteola*, in Jepson Flora Project (eds.) Jepson eFlora, <http://ucjeps.berkeley.edu/cgi>

[bin/get\\_IJM.pl?tid=27187](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=27187), accessed on November 01, 2017.



## Nevada Orcytes (*Oryctes nevadensis*)

*O. nevadensis* occurs in Inyo County of California. There are records from the Owens Valley (eastern Blackrock area north to Laws), Eureka Valley, and Deep Springs Valley, specimen records are only from Owens Valley locations. This is an annual herb, 5-20 cm tall and wide, stems branching near soil line from a taproot. Leaves are linear to ovate, 1-3 cm long, margin shallowly lobed and often wavy, petiole is 5-10mm with narrow wings. Flowers are in umbels emerging from upper leaf axils, flowers narrow urn-shaped 5-8mm long, purple to dusty pink. Fruit round two-valved capsule, 6-7mm across with 10-15 round, flat seed.

This species has been documented beginning in 1982 in the Owens Valley from SE of Lone Pine north to Laws, many sites along the old railroad line or powerline roads, likely due to the easy road access in these areas. The habitat is usually in desert sink on sandy hummocks within this habitat. A few of the known locations where checked and *O. nevadensis* was found in two locations visited in 2019. Plants were not fully documented just noted that they were present at certain locations.

Michael H. Nee 2017. *Oryctes nevadensis*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=35530](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=35530), accessed on November 01, 2017.



## Inyo Phacelia (*Phacelia inyoensis*)

*P. inyoensis* is endemic to Inyo and Mono Counties of California. There are records from the Owens Valley from Olancho to Laws, and southern Mono County. This is an annual herb, 3-10 cm tall and wide, stems decumbent to erect, branching at base with short stiff glandular hairs. Leaves are elliptic to obovate, 0.5-2 cm, margin entire to lobed. Flowers are on flowering stems, narrow bell-shaped 2-6 mm, pale-yellow. Fruit oblong capsule, 3-4 mm across with 18-25 small furrowed seed.

This species has been documented in the Owens Valley since the early 20th Century through the present. The habitat is usually in alkali meadows or desert sink meadows usually at the edges of or in depressions within the

habitat. In 2019 *P. inyoensis* was found as present at three *Calachortus* rare plant locations, of which two were new population locations.

When found at *Calachortus* locations they are associated species, documented as present and the phenology is noted. For *Phacelia* exclusive locations, plants are not fully documented just noted that they were present at these locations. For all locations the populations appear to be stable.

Genevieve K. Walden, Robert Patterson, Laura M. Garrison & Debra R. Hansen 2017. *Phacelia inyoensis*, Revision 1, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=37496](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=37496), accessed on November 01, 2017.



## Parish's Popcorn Flower (*Plagiobothrys parishii*)

*P. parishii* is endemic to Inyo, Mono, Los Angeles and San Bernardino Counties of California. There are records from the Owens Valley from Olancho to Bishop, S Mono County, NE Los Angeles County, and C & SW San Bernardino County. This is an annual herb, 5-30 cm, stems prostrate ascending at ends, branching at base with short spreading hairs. Leaves linear to narrow lance-like, 1-5 cm, surface with hairs that have blisters at base. Flowers are on slender flowering stems, cup-shaped 3-7mm, 5 white petals with yellow base. Fruit nutlet, ovate, 0.8-1.4mm with a rib and ridges.

This species has been documented in the Owens Valley since the early 20th Century through the present. The habitat is moist alkali meadows to mudflats around seasonal ponds. In 2019 *P. parishii* was documented at one known location from SE of Independence while conducting a *Calachortus* survey, and noted as present along with the phenology.

When found at other rare plant locations they are associated species, document as present and the phenology is noted. For all locations the populations appear to be stable.

Ronald B. Kelley 2017. *Plagiobothrys parishii*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=38518](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=38518), accessed on November 02, 2017.





## Silverleaf Milkvetch (*Astragalus argophyllus* var. *argophyllus*)

*Astragalus argophyllus* var. *argophyllus* is endemic to Inyo, Mono, and San Bernardino Counties of California. There are records from the N Owens Valley of Inyo County, S Mono County, and SC San Bernardino County. This is a perennial herb from an underground crown, to 15 cm, stems prostrate to matted with numerous silvery-grey soft hairs. Leaves pinnate compound, 2-15 cm, surface with silvery-grey soft hairs, leaflets elliptic to ovate, 9-21mm l x 4-15mm w, tips acute or obtuse. Inflorescence of 1-4 flowers ascending, flowers bright pink-purple, banner 22-24mm, keel 17-20mm. Fruit 15-25mm long and 7-12mm wide, lanceolate, straight to curved, surface with dense stringy hairs, fleshy when young maturing to stiff and leathery.

This species has been documented in the Owens Valley since 1955 through the present. The habitat is alkali meadows. In 2019 *A. argophyllus* var. *argophyllus* was documented S of Laws at a rare plant site annually checked for *Calochortus excavatus* and *Sidalcea covillei*, and has been documented here since 1993.

When found it is listed as an associated species, document as present and the phenology is noted. For this location the population appears to be stable.

Martin F. Wojciechowski & Richard Spellenberg 2017. *Astragalus argophyllus* var. *argophyllus*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=54626](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=54626), accessed on November 02, 2017.



## Hall's Meadow Hawksbeard (*Crepis runcinata* ssp. *hallii*)

*C. runcinata* ssp. *hallii* is endemic to Inyo, Mono, and Alpine Counties of California. There are records from the Owens Valley and Shoshone of Inyo County, Mono County, and C Alpine County. This is a perennial herb from a taproot, to 20-60 cm. Leaves oblanceolate to narrow obovate, 10-15cm l x 1.5-3cm w, green, margin toothed to lobed. Inflorescence of 1 to many heads on an erect branched stalk, flowers all ligulate, bright yellow with 5 small pointed teeth at end of each petal. Fruit a tapered achene with a feathery pappus attached.

This species has been documented in the Owens Valley since the early 20th Century through the present. Inyo County Water Department has documented this species at 27 rare plant sites since 1993 and 13 vegetation parcels from the Owens Valley Vegetation Conditions (OVVC) surveys since 2000. The habitat is alkali meadows.

In 2019 *C. runcinata* ssp. *hallii* was documented at 10 rare plant sites surveyed in 2019. When found it is listed as an associated species, document as present and the phenology is noted. The OVVC surveys are conducted during the summer months (June-August) and the *C. runcinata* ssp. *hallii* was documented at one vegetation parcel in 2019 and they are listed in the cover data. The plants

are often overgrown with taller species and are beginning to senesce by midsummer, so they can be difficult to find among the tall grasses of summer. For all locations the populations appear to be stable.

David Bogler 2017. *Crepis runcinata* subsp. *hallii*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=5977](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=5977), accessed on November 02, 2017.



## White Flowered Rabbitbrush (*Ericameria albida*)

*E. albida* is endemic to Inyo, Mono, and San Bernardino Counties of California. There are records from the Owens Valley, Saline Valley, N Death Valley, Amargosa Valley and Shoshone of Inyo County, S Mono County, and SW & NW San Bernardino County. This is a woody shrub, 30-150 cm, stems glabrous. Leaves linear, 2-3.5cm l, dark green, glabrous, gland dotted. Inflorescence heads in cyme-like clusters on an erect branched stalk, 5-7 disk flowers, 5-8mm, white. Fruit cylindrical to ellipsoid achene with a feathery white pappus attached.

This species has been documented in the Owens Valley since 1974 through the present. Inyo County Water Department has

documented this species at 25 locations mostly from Owens Valley Vegetation Conditions (OVVC) surveys. The habitat is alkali meadows.

In 2019 *E. albida* was documented during OVVC surveys which are conducted during the summer months (June-August) and *E. albida* was documented in 2 vegetation parcels in 2019 and they are listed in the cover data. The plants are easy to spot among the other vegetation because of the unique appearance of the shrubs. For all locations the populations appear to be stable.

Lowell E. Urbatsch 2017. *Ericameria albida*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=81725](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=81725), accessed on November 02, 2017.





## Torrey's Blazing Star (*Mentzelia torreyi*)

*M. torreyi* is endemic to Inyo and Mono Counties of California. There are records from the Owens Valley and S White Mts of Inyo County, and Mono County. This is a perennial herb from a belowground caudex, to 10-20 cm, stems erect to decumbent, hairy. Leaves broad ovate, 2-4cm, green, deeply pinnate-lobed with 0-7 lobes, margin rolled under. Inflorescence cluster of few flowers with 2-lobed bracts, flowers bright yellow to orange-yellow, 5 petals many protruding stamens. Fruit an urn-shaped capsule with persistent sepals on end with many fusiform spiral 3-ribbed seed.

This species has been documented in the Owens Valley since 1941 through the present. Inyo County Water Department has documented this species at 9 vegetation parcels

from the Owens Valley Vegetation Conditions (OVVC) surveys since 1994. It has also been documented from two other locations not included in the Owens Valley Vegetation Conditions (OVVC) surveys. The habitat is desert sink often in bottoms of small playas. In 2019 *M. torreyi* was documented at two locations during the OVVC surveys. For all locations the populations appear to be stable.

Joshua M. Brokaw, John J. Schenk & Barry Prigge 2017. *Mentzelia torreyi*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=33291](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=33291), accessed on November 02, 2017.



## Frog's-bit Buttercup (*Ranunculus hydrocharoides*)

*R. hydrocharoides* is endemic to Inyo, Mono and Los Angeles Counties of California. There are records from the Owens Valley of Inyo County, Mono County, and WC Los Angeles County. This is a perennial herb growing as a wetland emergent, to 5-25 cm, stems erect to prostrate, rooting at nodes. Leaves ovate to broad ovate, 0.8-2.7cm l x 0.8-1.9cm w, base round to cordate, green, margin entire to dentate. Flowers solitary on stalks, 1cm across, 5-6 petals yellow. Fruit a lenticular achene, 1-1.4mm.

This species has been documented in the Owens Valley since 1941 through the present. Inyo County Water Department has documented this species at two rare plant

locations. The habitat is in creeks and ditches in slow moving water.

In 2019 *R. hydrocharoides* was documented during rare plant surveys. It has only been found in three rare plant locations near Independence and Bishop. At one of the Bishop locations, plants are found most years from 1995-2018, the other Bishop location plants have been found in the last two years (2018 & 2019), and at the Independence location, plants have only been found in 2011. The populations are susceptible to over grazing in the ditches they grow in and may not grow much during years with heavy grazing events.

Alan T. Whittemore 2017. *Ranunculus hydrocharoides*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=40909](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=40909), accessed on November 02, 2017.



## Alkali Cordgrass (*Spartina gracilis*)

*S. gracilis* is endemic to Inyo, Mono, Modoc and Siskiyou Counties of California. There are records from the Owens Valley, Little Lake & Deep Springs Valley of Inyo County, Mono County, E Modoc County and C Siskiyou County. This is a perennial grass, to 18-100cm tall, stems solitary, erect, emerging from a rhizome, rooting at nodes. Leaves linear, 15-27cm l x 2.6-6mm w, green, often inrolled when young, upper surface with ridges. Inflorescence 2-12 on single stalk, 4-25cm l x 5-12mm w, compact, spikelet 6-11mm. Fruit a small grain.

This species has been documented in the Owens Valley since 1911 through the present. Inyo County Water Department has documented this species at 16 rare plant locations since 1996. It has been documented in the Owens Valley Vegetation Conditions



(OVVC) surveys since the baseline years of the 1980's, and there are 74 documented locations from NW Union Wash to Fish Slough USGS quadrats. There are two locations that have been extirpated since the baseline years due to expansion of gravel mine operations. The habitat is alkali meadows.

In 2019 *S. gracilis* was documented during rare plant surveys at 8 locations, and it is documented as an associate species and its presents is noted and the phenology. In 2019 *S. gracilis* was documented in five locations during OVVC surveys, and it is documented as vegetation cover. The populations appear to be stable.

John R. Baird & John W. Thieret 2003. *Spartina gracilis*, in Jepson Flora Project (eds.) Jepson eFlora, [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=40909](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=40909), accessed on October 21, 2019.

