



*C. venustus* "2-spot form"

# MARIPOSA

the newsletter of the *CALOCHORTUS SOCIETY*

c/o Robinett, P. O. Box 1993, Brookings, OR 97415 USA

## In Memoriam – Jim Robinett, 1943-2001

On April 25th, Jim died at home, as he wanted. His formal career was in computer sciences and software engineering, but in his late 30's he discovered a great interest in species bulbs. Starting with South Africans, he soon extended his efforts to the native bulbs of the North American West Coast. Together we explored and located, learned to identify, and collected seed of many species, and Jim began to experiment with growing them from seed. His achievements with successful propagation of native bulbs contributed in terms of adding to existing knowledge, as well as preserving individual species and distinct forms. Jim's bulbs and his horticultural expertise spread worldwide, from Western Europe to Japan, and seeds we collected went to places where it was not possible to send bulbs – Eastern Europe, South Africa, Latin America, Australia, New Zealand.

Spring has come slowly to Brookings this year. It became increasingly hard for Jim to get outside, so he would ask what was coming up, what was in bud, what was blooming. He lived to see one of his "special pets" flowering in profusion this year – the wonderful purple catsears from the ridge above Bear River in Humboldt county, grown from seed. But his quality of life had become so poor that I would not have kept him one day longer even if I could have. He died surrounded by one of his "secret passions" – blooming orchids. He was one of "God's sweet people," my love, my partner, and my pal. I celebrate his life and his work, even as I grieve for him. — *Georgie*

**A Word of Thanks** – *To our readers for their patience. Jim wanted to die at home, and his care was often demanding, so seeds did not get sent out, correspondence did not get answered, and the January publication schedule was missed. Together we decided to get "back on track" with this double issue; Jim was able to review and approve its contents. Now there are questions about the future. I could continue to put out the newsletter, with the support and assistance of friends like Stan Farwig and Frank Callahan, but it may be time for a new editor for Mariposa. Are there any volunteers? Let me know what you think would be best.*

**Subscription Renewals are due** – Subscription rates will be the same as this year – US\$ 9.00 domestic, US\$ 11.50 overseas. People who sent money for seeds but did not receive them will have a credit toward next year's subscription; the amount of credit (if any) is given here →

(These credits will be passed on to any new editor.)

\$ 1.00

## Species of the issue – *Calochortus argillosus*

**Background** – In 1944, Robert F. Hoover (a botanist at the California Polytechnic Institute at San Luis Obispo) proposed in the publication *Leaflets of Western Botany* that the genus *Calochortus* be split into three distinct genera – the genus *Calochortus* (constituting the same species as Ownbey's Section EUCALOCHORTUS, now known simply as Section CALOCHORTUS); the genus *Cyclobothra* (all the species in Ownbey's Section CYCLOBOTHRAS); and the genus *Mariposa* (the species included by Ownbey in his Section MARIPOSA). At the same time, Hoover introduced into his proposed genus *Mariposa* two previously undescribed species, *M. simulans* and *M. argillosa*. (His use of "mariposa" as the genus name required that the names of all the included species have feminine endings in Latin; thus *M. clavata*, *M. lutea*, *M. macrocarpa*, *M. superba*, and *M. venusta*, rather than *C. clavatus*, *C. luteus*, *C. macrocarpus*, *C. superbus*, and *C. venustus*).

Hoover's attempts to gain acceptance for "splitting" the genus *Calochortus* were unsuccessful – and so at first were his efforts to have the two previously undescribed species recognized. But he maintained their separateness from other species, including them in his 1970 monograph, *The Vascular Plants of San Luis Obispo County, California*. Over time, they have been accepted by the botanical "powers-that-be," and today both *C. simulans* and *C. argillosus* are listed in the new *Jepson Manual*. By 1970, Hoover had distinguished three separate forms or subspecies of *C. argillosus* – the first centered around the San Luis Valley (though his "type locality" of this "central form" was further north, in the Arroyo Dos Picachos, east of Hollister in San Benito county); the second or "southern form" in the Point Sal area in Santa Barbara county; and the third or "northern form" in the Santa Clara Valley, extending from Santa Clara county to the area then known as Somersville in Contra Costa county.

We first encountered *Calochortus argillosus* in the mid-1980's, when Jim found an open field filled with beautiful mariposas in Los Altos Hills, at the very northwestern corner of Santa Clara county. We had never heard of *C. argillosus* – nor for that matter of Robert Hoover – and like many another enthusiast who has located this plant, we struggled to identify it. It was sort of similar to *C. superbus* – but not quite, and besides, it was really growing too near the coast. Well, maybe it was a bit like *C. venustus* – but not quite; some did have a "second spot" like many of the South Coast Ranges form of *C. venustus*, but the gland shape was definitely not a square, and the petal markings were almost bizarre. And besides, it was growing in a grassy clay meadow (like *C. superbus* or *C. luteus* does), while *C. venustus* prefers rocky cliffs and banks with excellent drainage, and usually a little shade from the midday heat. So we were puzzled, but Jim collected a bit of seed a month later, brought it home to Sonoma county, and planted it – and marked the box, "*C. superbus?* *C. venustus?*" It seemed to grow for him quite easily, and a few years later we were enjoying our "bizarre" mariposas in bloom.

In 1990, while out "chasing bulbs" with Wayne Roderick, we found a stand of what we then called "purple *C. venustus*" along Road J-1 in San Benito county. At least they seemed to be *C. venustus*, although their petal markings and gland shapes were a bit odd, and (again) they were growing in an open grassy meadow. Then in 1991 Stan Farwig and Vic Girard asked us to come with them to look at a *Calochortus* they had found. They took us to an open meadow along Croy Road west of Morgan Hill in Santa Clara county, to see a mariposa they thought might be Hoover's *C. argillosus* (northern form), and then to an open hilltop northwest of Morgan Hill called "Tulare Hill," where very similar mariposas were scattered. They introduced us to the work of Robert Hoover, and we soon made copies of what materials we could find by him at the Library in Strybing Arboretum in San Francisco. References in hand, we found ourselves finally satisfied that we had a correct identification of our Los Altos Hills mariposas. And

now we recognized that the “purple *C. venustus*” we had seen in San Benito county must be Hoover’s *C. argillosus* (central form). We itched to go see the southern form of this plant, which Hoover placed at Point Sal, but weren’t able to get there until 1993. [What we did not yet realize was that we had this southern form already under cultivation. Someone had sent us a quantity of seed several years earlier marked “*C. simulans* from Reservoir Canyon” (San Luis Obispo county), and Jim had planted it. He had lost most of the seedlings during the “big freeze” of 1990, but a few had survived, and they bloomed in 1993, the same year we went to Point Sal. Lo and behold, we did not have *C. simulans*, but the southern form of *C. argillosus*!]

***C. argillosus* as a species** – The three forms of *C. argillosus* are quite distinct, and so we will describe each separately. But first, we want to discuss what makes it a separate species in the first place. All the forms of *C. argillosus* grow happily in open grassy clay meadows, whether flat or sloped. Indeed, its very name (so aptly chosen by Hoover) means “clay-grower.” Second, all forms have glands that are quite irregular in shape. Hoover described them as “transversely rectangular [wider than it is high-*Eds.*] or lunate,” and we generally agree, although we have seen some plants with glands better described as “house-shaped” or even “transversely linear.” In our experience, the seed capsule is somewhat linear, definitely more narrow than that of *C. superbus* or *C. luteus*, but not so narrow as that of *C. venustus*; and accordingly seed width tends to fall between *C. superbus* and *C. venustus*.

Then, there is the matter of chromosome counts. In 1993, Randy Zebell submitted a master’s thesis to the Biology Department of San Francisco State University entitled, “A Systematic Reevaluation of Three Species of *Calochortus* (Liliaceae): *C. venustus*, *C. simulans*, and *C. argillosus*.” In it he confirmed that the chromosome number of *C. argillosus* was  $2n=14$  (with a few cells showing an additional fragment or fragments); he obtained nearly identical results for *C. venustus* and *C. simulans*. We can compare his numbers with those in Cave’s 1970 monograph, “Chromosomes of the California *Liliaceae*” –

#### Selected Chromosome Counts

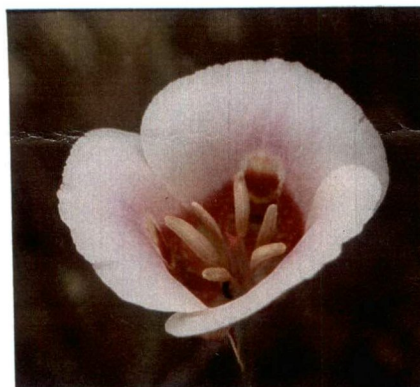
Species (from cell samples from various locations)	Beal & Ownbey (as reported in Cave)	Cave	Zebell
<i>C. argillosus</i>			$2n=14$ , $14+f$
<i>C. catalinae</i>	$n=7$ , $2n=14$	$n=7$ , $2n=14$	
<i>C. luteus</i>		$n=7$	
<i>C. simulans</i>			$2n=14$
<i>C. splendens</i>	$n=7$ , $2n=14$	$n=7$ , $7+f$ , $2n=14$ , $14+f$	
<i>C. superbus</i>	$n=6$ , $7$ $2n=12, 14$	$n=6$ , $6+f$ $n=10$ $n=13+f$ , $14$ $2n=28$	
<i>C. venustus</i>	$n=7$ , $2n=14$	$n=7$ , $n=12$	$2n=14$ , $14+f$
<i>C. vestae</i>	$n=14$ , $2n=28$	$n=14$ , $14+f$	

Zebell also analyzed colors using Munsell hue, value, and chroma data, and found *C. argillosus* spots to be significantly different from the spots of all the forms of *C. venustus* he studied, both in “value” ( $p=0.001$ ) and in “chroma” ( $p=0.006$ ); no other significant differences among the three were found. [One problem with Zebell’s data on chromosome counts is that his sample sizes were very small: for



***CALOCHORTUS ARGILLOSUS* –**

– northern form –



– central form –



(see page 6 for more photographs)

– compare the South Coast Ranges or  
“two-spot” form of *C. venustus* – ↓



– Photographs by Jim Robinett



*C. argillosus*, he used 322 flowers for color analysis, but only 9 for chromosome counts; for *C. simulans*, 447 flowers for color analysis, yet only 1 for chromosome counts. For *C. venustus*, he used 1570 flowers for color analysis, and 9 for chromosome counts.]

We believe petal markings and coloration may be the most distinguishing features among the three forms of *C. argillosus*, and these will be considered below. What all three forms share, however, is a sort of “spokes-of-a-wheel” effect in the markings on the lowermost parts of all the perianth segments, both petals and sepals. They have either a virtually identical longitudinal rose-colored blotch of more or less rectangular shape; or a narrow but clear repetition of the petal markings on the each sepal.

**The “northern form”** – Here *C. argillosus* is at its most variable in terms of colors and petal markings. We have examined stands not only in the Morgan Hill area and Los Altos Hills, but also the vigorous and extensive population around Edgewood Park in southern San Mateo county. We have tried, with Stan Farwig and Vic Girard, to find the “Somerville” population in Contra Costa county Hoover cited, without success. However, we did find several hundred along Tesla Road at the crest of the hill east of Livermore, as well as small group of a dozen or so bloomers in a small gully just beyond; this is in easternmost Alameda county. It appears that many stands of *C. argillosus* may have been wiped out by the building of I-280, which runs down the San Francisco peninsula and passes just west of Edgewood Park. A few years ago it was still possible to find a few isolated stands along I-280, but we have not seen any in the last few years. In one case, along an exit ramp, CalTrans plowed up the area and planted “freeway ivy.” Bye-bye, *Calochortus*. And the Los Altos Hills population no longer exists. Following a bad fire some years ago, the area is now mowed and plowed each spring, and the bulbs no longer survive there. The Edgewood population has been mistakenly identified as the South Coast Ranges or two-spot form of *C. venustus* time and again, including in Edgewood Park’s official plant list. People are fooled by the “second spot” many *C. argillosus* of this form have, and tend to ignore its differences with *C. venustus*. Not only is the grassy-meadow habitat wrong, and the irregular gland shape different, but the petal markings and coloration are quite distinct, as well. Our first page of photos includes one of a South Coast Ranges or two-spot *C. venustus* for purposes of comparison.

This particular *C. venustus* has a typical second spot; note that it is entirely pink-to-rose-to-brick-red in color, as is the primary petal spot below it. The primary spots of *C. argillosus*, on the other hand, are banded, usually starting with brick-red, then a clear transition through a zone of pale yellow which may be narrow or wide, then back to a pink which may be dark or light. If the yellow zone is wide, then the upper pink zone is usually narrow; and *vice versa*. Some of the northern *C. argillosus* have a (usually tiny) second spot, which may be one of the reasons people mistook it for the so-called “two-spot *C. venustus*.” However, in *C. venustus* the second spot is almost always rounded, a rich rose in color, and is often quite large. In *C. argillosus* the second spot (if it exists) is triangular or rhomboidal in shape, in pink and pale yellow, and usually quite tiny. In some cases, the pale yellow portions of the petal markings of northern *C. argillosus* have a noticeably greenish cast. The primary spot may be narrow or wide, but its banding is very striking and, we believe, is the most distinguishing characteristic of the northern form – though it can be found in many plants of the central form also. Finally, underlying petal color of the northern form is most often white, but often blushed pink and occasionally quite pink.

**The “central form”** – This was Hoover’s “type” form of *C. argillosus*, with the “type locality” being east of Hollister, as noted earlier. The grassy meadows of the lower Arroyo Dos Picachos are filled with these flowers in a “good year.” But the biggest population we ever saw was at “Summit Ranch” along Highway

*CALOCHORTUS ARGILLOSUS* –

– central form –



– southern form –



– Photographs by Jim Robinett



J-1 in San Benito county. For a number of years we had noticed a few blooming along the roadside there as we drove J-1 (a favorite road of ours, as it offers both *C. luteus* and *C. venustus* in good quantities along its northern and central reaches, and then, if one turns off toward New Idria near its southern end, one finds *C. clavatus* and *C. splendens* in addition). But in May 1995 as we drove past Summit Ranch, we noticed the face of the hill to the east of the ranchhouse was a "lavender haze" – and with our binoculars discovered that the entire grassy hillside was a mass of *C. argillosus*. There were equally impressive bloomings of *C. argillosus* at other spots along J-1 where it occurs.

This "central form" is distinctive for its petal color, which ranges from pale lavender to deep rich purple; we have also seen a very few flowers which were almost fuchsia in color. The petals are colored on both the interior and exterior surfaces, though the exterior surface is often a little darker or more colorful than the interior. The central spot is usually distinctly banded, like the northern form of *C. argillosus*, and in much the same colors (brick-red, yellow, pink) with the occasional addition of lavender. The gland is similar to the northern form, best described as "transversely irregular." The flowers have longitudinal pink blotches at the base of each flower segment, or a repetition of the petal markings on each tepal, similar to the northern form – what we came to call the "spokes-of-the-wheel" effect.

**The "southern form"** – We first found this form along the road out to Point Sal in Santa Barbara county, where it occurs in increasing numbers as one drives up the eastern side of the coastal ridge and finally in profusion near the crest. However, it also occurs, in great numbers some years, north of Point Sal, in the grassy hills around Morro Bay. Frank Callahan reported to us that he had searched a number of the canyons running east from the coast north of Morro Bay and found good populations in many of them. Hoover also reported it at Los Osos, between Morro Bay and Point Sal, but development has probably reduced its numbers greatly in that area. Also of interest is the fact that the territory immediately south of Point Sal (which is part of Vandenberg Air Force Base and is generally not accessible to the public) appears to be exactly the same habitat as at Point Sal itself, so the southern form of *C. argillosus* may well continue to the south of the Point. And as noted earlier, we were sent seed supposed to come from Reservoir Canyon, east of San Luis Obispo, that produced the southern form when the plants reached flowering size.

At first glance, the southern form appears to be quite different from the northern and central forms of *C. argillosus* and rather a "plain Jane" by comparison. The interior surface of each petal is absolutely white, quite satiny in appearance, and marked only by a single blotch in dark red-purple, squarish or rounded in shape, just above the gland. Gland shapes are wider than high and tend to be somewhat lunate in shape, like a rather "fat" inverted quarter-moon; they are also dark red-purple. There may be a band of soft yellow between the gland and the blotch. The "spokes of the wheel" are in evidence, as in the other forms, either as soft rose-colored elongated blotches, or as tinier repetitions of the single blotch. However, in some cases these tiny repetitions are banded with yellow quite distinctly.

The exteriors of these flowers provide quite a contrast to the interiors. They are generously blushed lavender or even purple, often presenting in profile as "purple flowers" – even though the interiors of the petals are entirely white except for gland and blotch. The interior blotches are often quite visible on the petal exterior, and on the exterior they sometimes show the same type of banding as the northern and central forms display on their petal interiors.



**Discussion** – So we have what Hoover considered to be three distinctive forms of a single species. As Vic and Stan took us to Croy Road and Tulare Hill to see Hoover's northern form, so we took them to Point Sal to see his southern form. And we visited the central form at Dos Picachos separately, but only a few days apart. This led to many discussions among the four of us about these plants, and we reached rather different conclusions about them.

Stan and Vic were most familiar with the Croy Road-Tulare Hill group, which are probably the most diverse in form. In his writings, Vic noted as follows:

The variability of coloration is infinite, ranging from ghostly white petals with citron yellow centers, to white petals infinitely and variably marked and spotted with a wide range of colors, to pink or lavender petals simply or complexly marked. The gland...is quite variable in shape. In general, one can agree with Hoover in that the gland is "transversely rectangular or lunate." A number of plants, however, in the Morgan Hill area, lack glands almost totally or have what appear to be vestigial glands, a few scattered hairs of indeterminate and indistinct patterning where the gland would normally be found. ...It appears to us that [*C. argillosus*] may well be a hybrid of some ancestral complexity (perhaps with *C. luteus*, *C. superbus*, and/or *C. venustus*), but a hybrid so ancient and with so much back-crossing that "throwbacks" no longer occur.

In short, they concluded that these stands at least of the "northern form" were something different from the other plants now considered to be *C. argillosus*.

Jim and I, on the other hand, believed we saw more similarities between all the stands of "northern form" and "central form" we knew. Diverse – yes. Derived from ancient and complex hybrids – quite probably. The most difficult thing for us to understand, however, was where, exactly, the "southern form" fits in. It does share some similarities with the northern and central forms – "spokes-of-the-wheel" effects at the bases of each tepal; greater or lesser patterns of "banding" in the primary spot, at least on the exterior petal surfaces; odd and not always consistent gland shapes; grassy-meadow habitats – it seemed to us that these are the significant elements tying all three forms together. But we found the southern form the most distinctive, and perhaps therefore separable as "its own thing." Frank Callahan has in fact suggested the southern form be elevated to the status of a separate species, and proposed the name *C. maritimus*, recognizing its preferred habitat.

It is unlikely that these questions can be settled to the satisfaction of all without DNA studies – which can be said about many other issues in the genus *Calochortus*.

**Cultivation** – Jim found all three forms of what we are calling *C. argillosus* very amenable to cultivation from seed while we lived in Sonoma county. Despite the diversity in their origins, he followed his usual formulas for potting soil, frequency of watering, feeding, and drying back, and was able to flower them in about three years.

**Risk of extirpation** – One final note before we leave the subject of *C. argillosus*. The first formal acceptance of this plant as a separate species was in the new *Jepson Manual* published by the University of California Press in 1993. Leaving aside any disagreements we have with the description of the plant itself given therein, we disputed the authors' classification of it as "RARE." Subsequently, the

California Native Plant Society (CNPS) proposed listing this species as rare and endangered in the Sixth Edition of its *Inventory of Rare and Endangered Vascular Plants of California* (forthcoming). Though it has suffered some losses from development (for example, along I-280 near Edgewood Park in San Mateo county), we do not believe that classifying *C. argillosus* as "rare" or "endangered" can be justified at this time. Based on correspondence received from various sources, CNPS eventually decided to place it on its "watch list" instead. We think this was a wise decision.

## Readers' Forum

- ✿ From Paige Woodward, Chilliwack, BC, Canada – For good photographs of *C. macrocarpus*, some taken by my sister, Dorrance Woodward, are posted on the website of the Pacific Northwest Natives e-mail group, at <http://www.tardigrade.org/natives/photogallery/page2.html>.

*A couple of years ago, we explored the web and bookmarked all the Calochortus pictures we could find, including some that were clearly misidentified. Our search engine did not turn up the above site, but perhaps it wasn't on the web yet at that time. The pictures Paige writes about are very nice indeed.*

- ✿ From Gwen and Phil Phillips of Cleethorpes, N.E.Lincs, UK – Enclosed is a scan of a slide taken at the top of Morris Ranch Road, Riverside county, on May 30, 1994. Originally we named the plants *C. palmeri* var. *munzii*. Subsequently we were informed that it was *C. davidsonianus*, only to be told recently that our original name was correct. As you will see the flowers have orange "hairs." We mention this because *C. splendens* which has white "hairs" was growing in the same spot. We would be grateful if you would adjudicate.

*See page 10 for the Phillips' photograph. First, in my opinion, your picture is definitely of the plant now called C. palmeri var. munzii. The golden "hairs" – though a little out of focus – are clearly visible, and are diagnostic. The location you name is a little south of Idyllwild, and very close to where Jim and I saw it blooming on McCall Park Road in June 1995. We also found it further south along the eastern side of Lake Hemet, same date. Second, "C. davidsonianus" was the name given by Abrams in 1923 to what later authors called the southern form of C. splendens; it is generally somewhat more pale in color, and tends to have more and longer "hairs" (always white) than the northern form. Interestingly, cytological studies support its distinctiveness, as it appears to be a tetraploid form of C. splendens, and should perhaps be elevated to a separate variety status. However, the botanical "powers-that-be" have not seen fit to do so.*

- ✿ From Colin Jennings, Highbury, South Australia – Mature bulbs of *C. monophyllus* raised from seed from Jim Archibald planted in 1996 (collected in Tuolumne county by yourselves) flowered for the first time during September and October (their fourth year); flowers were almost pure yellow. The other one to flower well was *C. amoenus* from the Archibalds, collected northeast of Springville, Tulare county. It seems to do well in a crowded community situation. I generally leave my seedlings in the same pot for two seasons and do not disturb the small bulbs. I have found that they do not like being disturbed too much, and certainly do not like storing, like other bulbs I grow.

*Jim also left his seedlings in the same container, usually until their first blooming. He generally found "the less disturbance the better" for his bulblets.*

**Bonus photographs –**

***C. palmeri* var. *munzii***  
(from Gwen & Phil Phillips)



**“Oakland star tulip” –**  
***C. umbellatus***  
(from Lottie Jenvey)



✿ From Gwen and Phil Phillips of Cleethorpes, N.E.Lincs, UK, we have the following wonderful list of locations for various *Calochortus* species in the western United States. Their list was chronological; we have rearranged it by species, then location, then by year. They also gave exact dates, but bear in mind that *Calochortus* bloom by seasonal conditions, not by the calendar. Many a person has gone to Location X to see species Y on an exact date, and been disappointed, because the season was too early or too advanced, or it was a dry year and few bloomed, or the bulbs were simply "resting" that year. So we generalized their dates. And we have provided additional locations, in a few cases –

- C. ambiguous* – ARIZONA – On highway 87, 1 mile south of Rye, turn right on Barnhardt Road (dirt) to near the trailhead – a few plants in bloom in early May 1994. Found again widely scattered in late April 1998. (Note: *C. flexuosus* occurs along this same road; see below.)
- C. apiculatus* – MONTANA – From St. Mary (Glacier National Park) on 49 to East Glacier, thousands in late bloom in the grass, late July 1989. Quite small (6 inches), many in seed.
- C. aureus* – ARIZONA – At Petrified Forest National Park, in bloom late May 1993. Seen again early May 1994, but flowers just starting to open. [Eds. note – We found this species growing, somewhat scattered, on both sides of US Highway 191 immediately west of the town of Ganado in Arizona, mid-June.]
- C. elegans* – IDAHO, THE LOLO PASS [the route native Americans guided Lewis & Clark over on their eastward return trip–Eds.] – Go west on 12, then right on forest road 10-9 heading toward forest road 500 (the Lolo Trail) – seen in early July 1991 on banks along this dirt road.  
– WESTERN IDAHO – From Riggins turn west on forest road 617 (Squaw Creek Road) – many found in early July 1991 some 12-15 miles up this road.
- C. eurycarpus* – WEST OF YELLOWSTONE NATIONAL PARK – Take 20 west – Near Island Park many plants in full flower at over 6,000 feet, mid-July 1989.  
– IDAHO – On 75 at Galena Overlook (north of Sun Valley), many in full flower mid-July 1989.
- C. flexuosus* – UTAH – Monument Valley, mid-May 1993.  
– ARIZONA – On I-17 at Camp Verde, turn east on 260. West of milepost 230 on the south side of the road, a small colony of about 30 in bloom, late April 1998.  
– ARIZONA – On 87 south of Rye, turn west on a dirt road toward Barnhardt Trailhead. About ¼ mile up this road, thousands in bloom, late April 1998. (Note: further up the road near the trailhead is *C. ambiguous*; see above.)
- C. greenii* – OREGON – Leave I-5 going north on Siskiyou Summit Road, 2.8 miles up the road on the right a number of plants in bud, early July 1995. Turned around, then about 0.7 miles north of the exit to I-5, saw a few plants in flower opposite a track to Honey Do Ranch. [Eds. note – Can also be found, somewhat scattered, along Copco Road, east of the Henley/Hornbrook area in northernmost Siskiyou county, CALIFORNIA, late June.]
- C. gunnisonii* – WYOMING – Left Cody on 120 north, then left onto 296, Chief Joseph Highway. Mid-July 1989 [no further detail given].  
– MONTANA – Leaving Great Falls on 89 south, many plants in rolling rangeland, late July 1989.  
– NORTHERN WYOMING – On the ALT at Burgess Junction, turn north to Schuyler Park. In bloom along this dirt road, late July 1989.  
– COLORADO – From Fair Play go north on 9 to Alma, then turn west on Forest Road 416 to Kite Lake, then 2-3 miles later turn right onto 415, marked "to Windy Ridge." Go on up to slopes of Mt. Bross. Plants blooming mid-July 1991, very short, about 6 inches tall.

- C. howellii* – OREGON – From 199 north of Kerby, turn west on Eight Dollar Road. Along the road in grassland with *Arctostaphylos* bushes and scattered pines. Many plants in full flower late June 1995. (Note: see *C. tolmiei*, below.) [Eds. note – May also be found, scattered, along the northern end of Patrick-O'Brien Road in southern Josephine county, Oregon, same dates.]
- C. macrocarpus* – IDAHO – On Highway 20 near Craters of the Moon National Park, mid-late July 1989.  
– WESTERN IDAHO – From Riggins turn west on Forest Road 617. A number of plants in tall grass 2-3 miles up this road, early July 1991. [Eds. note – Other good general locations are along Highway 97 north of Weed, CALIFORNIA, and descending from there to the northwest on side roads.]
- C. nuttallii* – WYOMING – Leave Lander on 131 to Sinks Canyon. Blooming in early-mid July 1989.  
– WYOMING – Leave Lander on 287 south, then 28 south. Turn right on Red Canyon Road (dirt). Many in *Artemisia* bushes, mid-June 1991.  
– UTAH – North of Bluff on 191, at the junction with 262. Pink form blooming, mid-May 1993.  
– UTAH – On 128 between Cisco and the Colorado River, pink and white, mid-May 1993.  
– UTAH – North of Vernal on 191 near Steinaker Reservoir. White form, early-mid June 1993.  
– UTAH – From the Visitor Center at Dinosaur National Monument, turn right then right again on Brush Creek Road, marked "to Jones' Hole" – a few miles along this dirt road, many blooming in a mixed population of whites, pinks, and deep pinks, mid-June 1993.  
[Eds. note – We quote here in its entirety a brief but delightful account by Morris West of his encounter with *C. nuttallii*, from a larger article in the September 1992 *Hudsoniana*, the newsletter of the Hudson Valley Chapter of the American Rock Garden Society. West was traveling north from Craig, COLORADO, toward Rock Springs, Wyoming, in late June-early July 1989 – "Our topographic maps of the area indicated that there were some small lakes (Irish Lakes) at the north end of the {Lodore} canyon. We decided we should definitely make a stop. If there had ever been permanent bodies of water at this site, it had been some years, and the slight depressions we took to be the lake beds now served as little more than temporary catch basins for any spring run-off. As we approached the dry lake beds, we realized we had found something more precious than water to a rock gardener. Acres of *Calochortus nuttallii* varying in color from a deep mauve through pink to white. There were thousands – hundreds of thousands – maybe millions. They stretched as far as the eye could see. Just as we would finish photographing the 'best' blossoms someone would find better ones. It consumed at least an hour's time and a considerable amount of film."]
- C. striatus* – NEVADA – From Death Valley National Park take Highway 190 to Death Valley Junction, then State Line Road to Devil's Hole. Just before Devil's Hole in a very arid area, a few very short plants blooming mid-May 1998. [Eds. note – *C. striatus* is also well known to occur in low spots in the desert north of Lancaster, CALIFORNIA, but is at some risk from development there.]
- C. tolmiei* – OREGON – From Highway 199 north of Kerby, turn west on Eight Dollar Road. Early May 1996. [Eds. note – Gwen and Phil write, "*C. nudus* also on this road." We don't think so. The *C. tolmiei* here are the tall white form we've seen only in Oregon, rather than the smaller, often pink form seen in both Northern California and southern Oregon – but "catsears" are a topic for another day. At one spot near the beginning of Eight Dollar Road, in a low place, there are *C. uniflorus*, with this form of *C. tolmiei* growing just above, and around the edges of the low place, apparent hybrids between the two. We believe they mistook either the *C. uniflorus* or the hybrids as *C. nudus*. But *C. nudus* is found at a higher elevation than the 1500 feet or so of this location, and has a plainly marked chevron on each petal. None of these plants has the chevron. There is, by the way, an overlap between the *C. tolmiei* cited here, and the *C. howellii* cited earlier in this list. The *C. tolmiei*, *C. uniflorus*, and their hybrids here are of course "long gone" when the *C. howellii* bloom.]