

Challenges in Identification of Tuolumne Iris (*Iris hartwegii* ssp. *columbiana*), Mariposa Clarkia (*Clarkia biloba* ssp. *australis*), and Small's Southern Clarkia (*Clarkia australis*) on the Stanislaus National Forest, Tuolumne County

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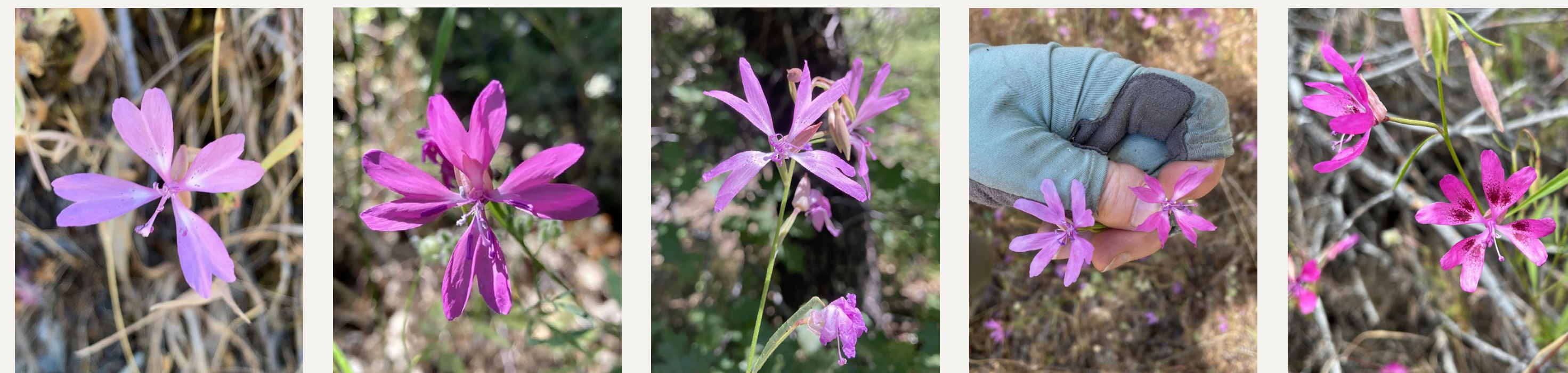
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Background

- Tuolumne County is responding to the threat of megafires with innovative and collaborative actions to protect the residents and resources in the community.
- The Social and Ecological Resilience Across the Landscape (SERAL) project began in fall 2019 with Stanislaus National Forest and Yosemite Stanislaus Solutions.
- The SERAL project aims to conduct forest restoration and fuel reduction activities on over 100,000 acres in Tuolumne County.
- The project goal is to return the forest to its balanced natural condition and increase resilience against fire, drought, insects, and disease.
- Ascent has conducted three years of targeted surveys for sensitive plant species and invasive plant species in support of forest treatment activities to be implemented in the project area.

Who Am I

I am a purple-pink flower, my petal length is 17mm and my petal width is 11mm (length 17mm > width x1.5 = 16.5mm). Am I *C.b.* ssp. *australis* or *C.b.* ssp. *biloba*?



16 Petal claw broad, 2-lobed

17 Stigma not exerted beyond anthers; petals 6-12mm *Clarkia rhomboidea*

17 Stigma exerted beyond anthers; petals generally >12mm

18 Leaves lance-linear *Clarkia australis*

18 Leaves elliptic to ovate *Clarkia virgata*

16 Petal claw 0 or <2mm, not lobed

19 Petals 2-lobed

20 Petals bright pink to magenta, length generally >1.5 x width *Clarkia biloba* ssp. *australis*

20 Petals lavender to purple-pink, length generally <1.5 x width *Clarkia biloba* ssp. *biloba*

19 Petals entire, occasionally notched at tip

- The more common look-alike, *C. b.* ssp. *biloba* can intergrade with *C. b.* ssp. *australis*.
- Some experts suggest that *C. b.* ssp. *australis* originated within the Merced River Canyon and any specimens found outside the Merced River Canyon are intergrades between the more common *C. b.* ssp. *biloba* and *C. b.* ssp. *australis*.
- Could environmental factors, such as weather, affect petal characteristics in these subspecies? Could this help explain the observed variability in petal characteristics?

Identification Challenges

- Inconsistent morphological characters
- Variability in morphological characters
- Overlapping key traits
- Taxonomic issues

Target Species

Three target sensitive plant species presented several identification challenges during botanical surveys



Mariposa clarkia (*Clarkia biloba* ssp. *australis*); CRPR 1B.2, USFS Sensitive



Tuolumne iris (*Iris hartwegii* ssp. *columbiana*); CRPR 1B.2, USFS Sensitive



Small's southern clarkia (*Clarkia australis*); CRPR 1B.2, USFS Sensitive

Who Am I

I am an *Iris hartwegii* population. I mostly have 2-flowered plants but occasionally you will find a 3-flowered plant. My perianth tube length is 11mm. Am I *I.h.* ssp. *columbiana* or *I.h.* ssp. *hartwegii*?

4 Cauline leaves bract-like for at least 2/3 of length *Iris hartwegii* ssp. *pinetorum*

4 Cauline leaves similar to basal

5 Flowers pale cream to yellow or gold-yellow, veined gold or bright yellow or not

6 Flowers 3; outer bract 9-15cm; perianth tube 11-15mm *Iris hartwegii* ssp. *columbiana*

6 Flowers 2; outer bract 6-11cm; perianth tube 5-10mm *Iris hartwegii* ssp. *hartwegii*

5 Flowers blue to lavender or purple (white or pale cream), with cream or +- white throat or not

- *I. h.* ssp. *columbiana* has three, rarely two, pale creamy yellow flowers.
- A population study of the *I. hartwegii* complex by E. Riggs in 2003 found that molecular and morphological data support a revision of the status of *I. h.* ssp. *columbiana* as a variety in the *I. hartwegii* complex (Riggs 2003).
- Carol A. Wilson, Ph.D. (Associate Researcher at the University and Jepson Herbaria) is currently conducting a genetic study to try to resolve relationships among the Iris series California.

Who Am I

My petals are spotted, my stigma is exerted beyond the anthers on the older flowers toward the bottom of my inflorescence but not in the newly opened flowers at the top, my petals are 12mm, and my leaves are linear-elliptic. Am I *C. rhomboidea*, *C. australis*, or *C. virgata*?



Useful tips from other botanists with experience surveying for *C. australis*:

- Typically higher elevation: above 4,000'
- Large flowers: 1.5-2" in diameter compared to 1" for common look-alikes
- Later blooming and no overlap of flowering with similar, more common species (generally mid-July)
- Leaves strictly lanceolate at both ends, with an identical taper curve both distally and proximally; 2+ inches long
- Large anthers and deeper pink color

Conclusion

Further research is needed to help make definitive identifications of these species less challenging and to clarify taxonomic issues.

References

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- Riggs, E. 2003. "Population Study of the *Iris hartwegii* Complex." *Species Iris Group of North America* 70: 3561-3563.
- Stanislaus National Forest, Mi-Wuk Ranger District. 2022 (February). *Biological Evaluation for Forest Service Sensitive Plant Species*. Mi-Wuk Village, CA.
- USDA Forest Service. 2023. Our Native Irises: Pacific Coast Irises. Available: https://www.fs.usda.gov/wildflowers/beauty/iris/Pacific_Coast/iris_hartwegii.shtml. Accessed December 2023.
- Wilson, C.A. Associate Researcher. University and Jepson Herbaria, CA. December 14, 2023—email to Pamela Brillante of Ascent regarding an ongoing study of the Iris series California.