

Jeff Rose  
NPSNM Report 2014

**Budget**—Award amount \$1000

Car rental (4 days):	\$108
Lodging (3 nights):	\$228
Fuel:	\$90
Total:	\$426

Remaining award of \$574 is to be used on lab supplies and analyses during 2015.

**Collection Information**—Collections of 6 of the 8 taxa of *Polemonium* present in New Mexico were made between 9 August and 12 August 2014. Collections consisted of leaf material for DNA analysis, flowers preserved in ethanol (when present), and a herbarium voucher. Number of DNA samples per population follows in parentheses:

*Polemonium viscosum*. Wheeler Peak area: common in fruit at summit of Fraser Mountain. Unusual form with glabrous leaflets (3).

*Polemonium delicatum*. Wheeler Peak area: abundant in flower and fruit in spruce forest along trail to Wheeler Peak via Fraser Mountain (3).

*Polemonium brandegeei*. Sandia Crest. Frequent on rocks SW of communication tower. In fruit (2).

*Polemonium foliosissimum* var. *molle*. Sandia Crest. Abundant in spruce woods SW of communication tower (3).

*Polemonium foliosissimum* var. *foliosissimum*. Grant County, Gila National Forest; Occasional along Iron Creek (2).

*Polemonium foliosissimum* var. *foliosissimum*. Greenlee Co. AZ; Abundant along road outside Hannigan Meadow Lodge (2)

*Polemonium foliosissimum* var. *foliosissimum*. Greenlee Co. AZ; Common along stream along Coronado trail just NE of Hannigan Meadow Lodge (2)

*Polemonium foliosissimum* var. *flavum*. Graham Co. AZ. Abundant along Swift Creek (5).

**Preliminary Findings**—From the material I collected, the population of *P. viscosum* is unusual in that the leaves are nearly glabrous and not glandular-pubescent as is typical for this species. The glandless condition has not, to the best of my knowledge, yet been reported in the literature. In addition, from my collections of *P. foliosissimum* var. *molle* throughout its range, at least one New Mexico population has white anthers compared to populations in Colorado and Utah that have yellow anthers. Anther color is generally used to help distinguish between species in other genera of Polemoniaceae. My field observations on the *P. foliosissimum* species complex have indicated that populations currently recognized as varieties are easily distinguishable in the field, although my field observations obviously do not encapsulate the full range of variability present. Final results and possible validation of my field observations await much work in the laboratory.

My PhD dissertation research is on the evolutionary relationships and taxonomy of the genus *Polemonium* (Jacobs's ladder, skypilot) in the phlox family (Polemoniaceae). To achieve the goals of my thesis I need DNA material that has been dried quickly to prevent any degradation. This requires freshly collected samples preserved in a desiccant such as silica gel. During 2014 I was lucky enough to be supported through a NPSNM small grant.

I utilized part of my award this August during a four-day collecting trip throughout New Mexico and nearby parts of Arizona and will use the rest during 2015 to process and analyze the material I collected. I had two major goals for my trip. My first goal was to collect from New Mexico populations of wide-ranging Rocky Mountain species. My second, and more important goal, was to collect representative populations of *P. foliosissimum* (leafy Jacob's ladder); a species that is variable and well-represented in New Mexico but has largely been ignored in previous studies.



*Heuchera pulchella*, a species endemic to New Mexico

population will definitely be something to keep an eye on as I collect and analyze my genetic data. On the way back down the mountain I encountered a stray dog named "Allie" that had apparently hiked over a mile from the ski village. Luckily I was able to return her to her owner since she had a phone number on her collar.

From Taos I traveled southward to Sandia Crest just outside of Albuquerque to collect *P. brandegeei* and the first of the three varieties of leafy Jacob's ladder in New Mexico (var. *molle*). On the way I encountered a heavy rainstorm that turned into hail as I ascended Sandia Crest. At the top I was able to find both *P. brandegeei*, growing on rocks with the narrowly endemic *Heuchera pulchella* (Saxifragaceae), as well as *P. foliosissimum* var. *molle* abundantly represented in the spruce woods at the summit. This population was important to add because the last person to study this species in detail had noted intergradation between var. *molle* and the more southern var. *foliosissimum* in this area of

My trip to New Mexico started from Colorado where I had just finished up collecting. My first objective was to collect Rocky Mountain species at the southern end of their distribution in the Albuquerque-Santa Fe area so I headed for Wheeler Peak, which is very accessible via the Taos ski resort. During a lovely early morning hike up the mountain with abundant *P. delicatum* in the spruce forest I finally arrived at the summit to search for *P. viscosum* (skypilot), a species restricted to areas above timberline. Unfortunately all the plants were out of bloom this late in the season. To my surprise, the population here had glabrous leaves as opposed to being densely glandular-pubescent, something that (to my knowledge) has not yet been reported! This species is notoriously variable but this



*Polemonium foliosissimum* var. *foliosissimum*

New Mexico. Interestingly, this population had white anthers. In contrast, the populations I had just seen days before in Utah and Colorado had yellow anthers. Anther color is usually a good character to use to help distinguish species in the phlox family, so this will be something else for me to keep an eye on as I analyze my data!

After travelling south to stay the night in Truth or Consequences I travelled westward toward Silver City. In the desert along the way I was pleased to see a lot of ocotillo (*Fouquieria splendens*) a member of the Fouquieriaceae, the family most closely



*Polemonium foliosissimum*  
var. *flavum*

related to the phlox family.

On my trip to the Silver City area I collected from a population of *P. foliosissimum* var. *foliosissimum* along a streambed that had managed to escape damage from a recent forest fire. Moving further westward to collect more of this variety as well as var. *flavum*, I ran across localities that either had suitable habitat destroyed by invasive species or were currently closed off due to forest fires on Signal Peak near Pinos Altos. Given that this was the most accessible site for var. *flavum* in New Mexico, I improvised and decided to seek out this species in eastern Arizona near the New Mexico border.

The next day I was able to find a very large population of var. *flavum* on top of Mt. Graham being pollinated by a very large number of honeybees. The day after that I drove the winding Coronado Trail to collect from yet another population of var. *foliosissimum* that looked quite different from the one I encountered a few days before in New Mexico. This population appears assignable to what has been called *P. filicinum*.

After a busy semester of teaching I will finally be able to get around to processing my samples in the next few months. Earlier in December I was able to process some and it looks like my trip was a great success! I am looking forward to seeing how the anomalous populations I found in New Mexico are related to everything else I collected this summer and determine if New Mexico has any endemic or near-endemic species of *Polemonium*. Thanks again to the Native Plant Society of New Mexico to expressing an interest in my research.

~Jeff Rose