

NEVADA NATIVE PLANT SOCIETY

Eriogonum spectabile with a butterfly, 2008. Photo courtesy of Lassen National Forest.

ERIOGONUM SPECTABILE - NOT QUITE EXTINCT

Story by Beth Lowe Corbin

Eriogonum spectabile, Barron's buckwheat, is a rare subshrub with attractive white leaves and slender stems holding white to pink flowers limited to a small area on the Lassen National Forest in Plumas County, in northeast California. It was discovered during rare plant inventory for a proposed timber sale by seasonal botany technician Robin Barron (who now goes by Annie Walker) in July 1997, while I was forest botanist, and was published as a new species in Madroño (Corbin et al. 2000).

The Dixie Fire burned through the entire population area for this buckwheat in 2021. The day in early August when this particular area burned, the fire had raced across tens of thousands of acres in a huge firestorm (Fire Progression

Map). The fire severity in the buckwheat area was stand-replacing, meaning that all vegetation above ground was burned and killed. I feared that the species had been wiped out, but the area was not accessible in 2021 due to road conditions and safety concerns so the buckwheat's fate was initially unknown.

When *Eriogonum spectabile* was first discovered and published, the entire population consisted of three patches of plants within a single quarter-section (specifically a 39-acre polygon). A complete count of plants was made (using pin flags) in 1997: there were 194 plants at the largest patch, and 54 and 3 at the other two, for a total of about 250 plants. Despite intensive searches by Forest Service personnel and others in similar habitats on the Lassen National Forest and Lassen Volcanic Park during subsequent years, no additional occurrences have been found (except a tiny (3 plants) outlier of the main patch).



Postburn single flowering plant, 2022. Photo credit: B. Corbin.

Continued visual observations over the years before the Dixie Fire indicated a fairly stable population. In drought years, plants often looked very stressed. In higher precipitation years, seedlings were sometimes observed, but seedling survival appears sporadic and most (perhaps all) plants appeared to be the same individuals counted in the original census.

The site is at an elevation of 2010-2025 m in an area where moraines form low ridges interspersed by several small kettle lakes. *Eriogonum spectabile* patches were found only on the low ridges, in generally more open sites (but not on all areas that appeared otherwise suitable). Glaciated andesite bedrock or large boulders with smooth and striated surfaces are present. The pre-fire vegetation was a mixture of lodgepole pine, red fir, white fir, and western white pine overstory; the understory was characterized by *Arctostaphylos nevadensis* and some *Ceanothus cordulatus*, with scattered *Stipa occidentalis* ssp. *californica*, *Arctostaphylos patula*, *Ceanothus prostratus*, *Cymopterus terebinthinus* var. *californicus*, and *Helianthella californica*

var. *nevadensis*. No discernable disturbance history was noted before the fire.

On September 14, 2022 I visited the site, along with Allison Sanger, Lassen National Forest botanist, Kim Earll, former Lassen National Forest botanist, and Margaret Widdowson, botanist with ICF from Redding. As expected, we observed that all existing vegetation (trees, shrubs, and herbaceous vegetation) was burned and nearly all killed. A few *Stipa*, *Carex* sp., *Ceanothus cordulatus*, *Stephanomeria lactucina*, *Allium* sp., and *Cymopterus* had resprouted and there were scattered seedlings of *Ceanothus cordulatus*, *Arctostaphylos nevadensis*, and some native annuals (*Phacelia* sp., *Gayophytum* sp., *Calyptridium umbellatum*). To our great excitement, we also found a few plants of *Eriogonum spectabile* that had resprouted from the base. We even found one plant with two flowering stems. At the largest patch we found seven individual plants that had resprouted (including the flowering plant). Moving on to the second patch (where there had been 54 plants) we were discouraged to find none living, even though that site had been quite open before the fire. With little hope, we went to the last patch. Here, the pre-fire habitat had been relatively brushy; previous observations had described three lonely plants being swallowed up by the manzanita (Corbin 2001). We were amazed to find all three plants had resprouted. We found no *Eriogonum* seedlings anywhere.

So, a total of ten plants appears extant, about 4% of the pre-fire population. Is this enough to be viable in the long term? Time will tell. The resprouted plants appeared healthy,

benefiting from post-fire nutrient flush and reduced competition. But could a series of drought years (increasingly common in this time of climate chaos) eliminate these few fragile individuals? I plucked a few *Ceanothus* seedlings from immediately around the *Eriogonum* plants to give them a fighting chance, and we discussed caging plants to reduce potential herbivory.

Even before the fire, *Eriogonum spectabile* was one of the rarest plants in California, with a relatively small number of individuals in a very limited area. The California Native Plant Society (CNPS) has given the species a rarity ranking of 1B.1, and NatureServe ranks it G1S1. Should it have been listed under the Endangered Species Act? Since the entire range and population was on National Forest land, as long as the U.S. Forest Service managed for it, oversight by the

U.S. Fish and Wildlife Service under the ESA would not have been necessary or beneficial. Should management have included reducing vegetative cover in occupied habitat before the fire? With so little known about specific habitat requirements, it's easy to play Monday morning quarterback but difficult to know whether mucking around in the microsite would have been beneficial in either the short or long term, or if it would have affected fire behavior under 2021 conditions.

But there's more to the story. In 2019, Margaret Widdowson collected some seeds for off-site rare plant seed banking through CNPS's California Plant Rescue program. Those seeds are stored at UC Santa Cruz and apparently 116 seeds from 26 maternal lines (individual plants) are in storage. Discussion is underway between the Lassen National Forest



Postburn habitat, 2022. Photo credit: B. Corbin.

and others to determine the best way to grow some of those seeds for replanting on site and possibly offsite to produce additional seeds and provide a small “ark” source, or other alternatives for propagation (I had attempted to collect a few seeds over the years and grow plants, but never had success with germination. No plants exist in cultivation to my knowledge.). Whether those banked seeds are viable and outplanting can succeed remain to be seen, but with so few existing individuals and low numbers of stored seed, the foothold of the species is tenuous.

Eriogonum spectabile has some things going for it. Its site is under USFS management and the agency’s current managers are willing and able to provide resources for protection and re-establishment. Given the elevation and vegetation type where it occurs, there are few weed issues. However, post-fire vegetation is likely to be quite different for the next several decades or longer. We saw almost no tree seedlings, so the area is likely to be dominated by *Ceanothus* and *Arctostaphylos* shrubs. How that may affect the *Eriogonum spectabile* is unsure.

Are stories like *Eriogonum spectabile* going to be more common as mega-fires and other major disturbances become more frequent? How should the Forest Service and other agencies or organizations with limited resources best manage such small, vulnerable populations? This raises many questions, but the answers will not be simple or quick and will need the collective knowledge and attention of a diverse and committed community. In this case, that includes the USFS, CNPS, the Eriogonum

Society, academia, and other interested individuals.

ACKNOWLEDGEMENTS

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BOTANISTS ARE DISAPPEARING - JUST WHEN THE WORLD NEEDS THEM MOST

Story by Annika Geijer-Simpson. Originally published in The Conversation, reprinted with permission.

Can you recall any of the plants you saw today?

Probably not. As a species, we are not programmed to recognise and register everything we see within our field of vision. This would be an overwhelming

amount of information for our brains to process.

You can however, with a little time and practise, be trained to read the plants around you: to recognise which species they belong to and their names, their relationships with other organisms and what they are telling you about the environment they live in. This is to develop what some call a natural literacy.

Most people suffer from what is commonly known as “plant blindness”, a term coined by US botanists Elisabeth Schussler and James Wandersee. They described it as “the inability to see or notice the plants in one’s own environment”. Unless taught, people don’t tend to see plants – despite the fact that at any given moment, there is likely to be a plant – or something made by plants – nearby.

In our latest study (, my fellow researchers and I found that people are not only less aware of plants through a lack of exposure and a loss of knowledge, but demand for an education in botany and opportunities to study it in the UK have diminished too.

THE EXTINCTION OF BOTANICAL EDUCATION

Botany, once a compulsory component of many biology degrees and school programmes, is disappearing fast. It has been over a decade since a student was enrolled in a botany degree in the UK. We believe there has been a gradual erosion of knowledge about plants among biology graduates and the general public as a result.

We examined the number of UK students graduating across a variety of biological science programmes from 2007 to 2019 and found that students studying plant science were outnumbered almost one to 200 by those studying general biology. When we scrutinised the modules offered to students on plant science courses at UK universities, we were surprised to find that only 14% focused solely on plants. Only 1% of modules in plant science and biological science programmes offered any form of training in identifying plant species.

Students are not introduced to the diversity of plant forms and functions at UK universities and are certainly not engaged with how fascinating and dynamic the floral world is. The result is a growing skills gap, with a looming shortage of professionals capable of effectively managing environmental projects. Well-meaning but careless management is not just ineffective, it can add to environmental degradation.

For example, planting thirsty species of tree in the name of capturing carbon from the air can deprive precious bog plants of much needed water. Recklessly cutting and strimming grasslands can wipe out populations of rare orchids.

Harnessed properly, there is no doubt that plants and the services they provide can help solve looming climate and ecological crises. Restoring flood meadows and riverside habitats can reduce flooding from the extreme downpours which are likely to become more common in some areas as the Earth warms.

Less teaching about plants and the ensuing disconnection from the natural world will, if not reversed, have irreparable and disastrous consequences. How many generations of botanists remain before we no longer have the expertise to understand when ecosystems are on the brink of irreparable loss and damage?

The Scottish government has highlighted the lack of a skilled workforce to implement nature-based solutions and argues that “nature literacy” must become a core skill for various professionals, from planners, engineers, architects and educators to farmers, foresters and fishers.

The problem is vast. Various other studies have documented falling plant literacy worldwide. While other studies have identified that plant content is often neglected in textbooks and students who are unable to recognise even local plant species. Our study revealed that the UK curriculum neglects plant ecology and how to identify species, with most of this education taking place at a rudimentary level in primary schools.

REVERSING THE DECLINE IN PLANT KNOWLEDGE

Reviving botanical education is possible by presenting students and the public with evidence of how plants can combat the challenges of the 21st century. An invested and knowledgeable public is one well-equipped to demand environmental policy reform.

Botanists can support this ambition, but ultimately, change needs to come from those who decide policy. This is why

botanists must agitate to bring botany back into the classroom and beyond.

One thing we couldn't fully convey in our paper is just how fascinating and exciting the plant kingdom is. In my experience as an educator, there is no student who cannot be reached. Stories about plants are woven into every society's history, politics and culture. Plants are relevant to every person on the planet – most just don't know it yet.

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Stroud, S., Fennell, M., Mitchley, J., Lydon, S., Peacock, J., & Bacon, K. L. (2022). The botanical education extinction and the fall of plant awareness. *Ecology and Evolution*, 12(7). <https://doi.org/10.1002/ece3.9019>

The original story can be found at: <https://theconversation.com/botanists-are-disappearing-just-when-the-world-needs-them-most-186849>

SOCIETY NEWS

UPCOMING EVENTS

February 2, 2023: *Flora of the Silver Peak Range, Esmeralda County, Nevada*
Speaker: Peri Lee Pipkin; Master's Student, Claremont Graduate University. Peri is a recipient of a 2022 Margaret Williams Grant.

March 2, 2023: *Bi-State Bodie Hills*
Speaker: Tim Messick; Author of the blog <https://bodiehillplants.com>

April 6, 2023: *After the Monsoon, Lincoln County*

Speaker: Arnold (Jerry) Tiehm, Curator of
University of Nevada, Reno Herbarium
Photographer: Jan Nachlinger

May 4, 2023: *Restoring Our Relationship
with Hímu (willow) tentative*
Speaker: Robin Smuda; Native Climate
Intern, Earth and Ecosystem Science
Division, DRI

NNPS 2022 ELECTION RESULTS

Whew, elections are over. We received 26 member ballots; the tally was unanimous in confirming the current composition of Officers and Board of Directors. There was a brave soul that volunteered for the membership chair, we're awaiting confirmation. Jamie McClinton has accepted the Rare Plants Chair from Jim Morefield as he enjoys his well-earned retirement from Nevada Natural Heritage Division. Many thanks, Jim, for your many years in the many positions you have filled in the NNPS. Report filed by Charlene Duncan, for 2022 Election Committee.

NEWSLETTER

Have something to share? We would love to consider your recent trip reports, phenology reports, or Nevada botanical musings for the NNPS newsletter. Contact the editor, Ranae Zauner, for details.

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Newsletter preference: ☐ Paper ☐ Electronic

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|---|----------|--|
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