

RARE PLANT PRESS

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VOLUNTEERS MAKE A GREAT FIND

In early June, Rare Care volunteers Mickie Chamness and Janelle Downs stumbled upon a population of small evening primrose (*Eremothera minor*), a state sensitive plant species. It was actually on their way to another primrose monitoring assignment that they noticed the small population of 30 plants in the tracks of the dirt road they were hiking. This population of small evening primrose is one that Rare Care had previously searched for three times in that exact location, but never found any. Good timing and sharp eyes of two knowledgeable botanists provided the right ingredients for a great find!

Small evening primrose is an annual found on sandy and alkaline soils in the dry shrub-steppe habitat around Hanford Reach. Annuals in this ecosystem need spring precipitation to trigger germination; without that, seeds remain dormant in the seedbank. These wet springs occur intermittently, and years

can pass before conditions are right for the seeds to germinate. Therefore, these species are reliant on the longevity of their seedbank for populations to persist.

There had been many previous attempts to find this population of small evening primrose at Hanford Reach National Monument. Rare Care searched for this population on May 11, 2013 during our annual monitoring weekend. That day was memorable; it reached 103 degrees F that afternoon and the conditions were very dry. It was not a good year for annuals. Rare Care staff also looked for this species in 2017 while conducting rare plant monitoring nearby, and Spokane volunteer Lorna Emerich attempted to find it in 2019. A biologist at the refuge had also looked for it on several occasions. In fact, the last time it was documented at this site was in 1997, when over 600 plants were observed.

While Mickie and Janelle counted far

fewer plants than the previous record, it is difficult to determine whether this represents a significant decline. Populations of dryland annuals exhibit huge swings in abundance driven by environmental variation. More observations will be needed, but our failure to find this species on previous attempts highlights the difficulty of tracking these populations.

Monitoring annuals in the drylands of eastern Washington also pose a logistical challenge. We often don't know which year will be a good year for annuals while making our priority monitoring list in the winter. In fact, last year's precipitation was below average until April, but April through June saw above-average precipitation. By then Rare Care volunteers had already made their spring monitoring plans and we were very fortunate to have two volunteers in the right time at the right place.

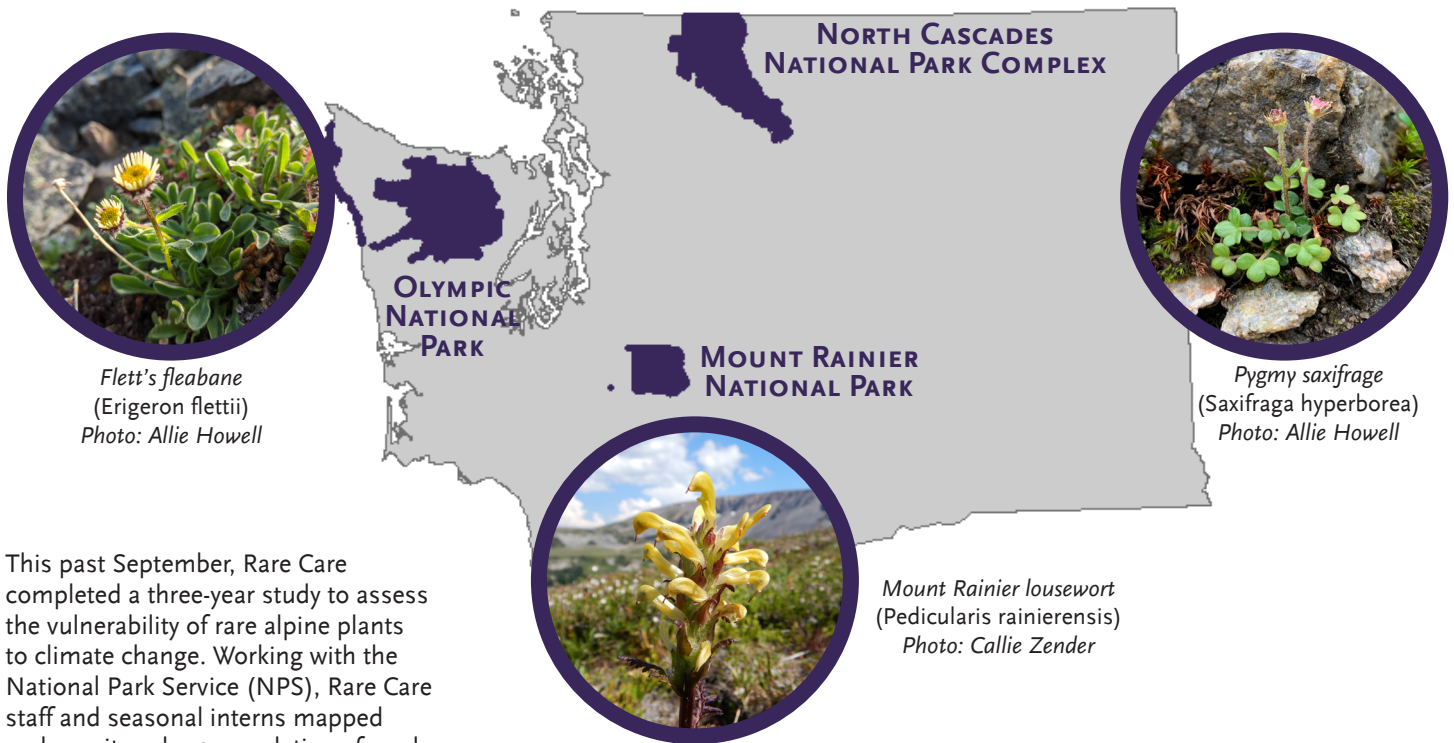


Small evening primrose (*Eremothera minor*)
Photo: Mickie Chamness



Janelle Downs and Mickie Chamness are center and right in the photo.
Photo: Elin Pierce

CLIMATE CHANGE VULNERABILITY IN THE ALPINE



Flett's fleabane
(*Erigeron flettii*)
Photo: Allie Howell

Pygmy saxifrage
(*Saxifraga hyperborea*)
Photo: Allie Howell

Mount Rainier lousewort
(*Pedicularis rainierensis*)
Photo: Callie Zender

This past September, Rare Care completed a three-year study to assess the vulnerability of rare alpine plants to climate change. Working with the National Park Service (NPS), Rare Care staff and seasonal interns mapped and monitored 159 populations found in National Parks in Washington, installed long-term monitoring plots, collected seeds, assessed focal species' vulnerability to climate change, and developed adaptive management strategies that NPS could employ to mitigate the impacts of climate change.

The alpine zone is defined as the area above the tree line. Alpine habitats function like island chains in the sky, isolated from each other by unsuitable lowland habitats, which has promoted the proliferation of unique species found nowhere else. Living at the tops of mountains exposes alpine plants to ecological extremes and makes them uniquely vulnerable to climate change. Plants are adapted to survive under snow and ice for extended periods and are often reliant on snowbanks and snowmelt for moisture during their short growing season.

Climate change is predicted to cause warmer, drier summers and earlier snowmelt. Although species may migrate to follow their shifting ecological niches, for instance low-elevation species may move up the mountainsides, plants already at the top face the challenge of adapting to new neighbors and have nowhere to migrate themselves. Alpine areas are remote and difficult to access and traverse. Data about these species

to inform conservation efforts is often lacking.

For this project, Rare Care mapped 19 rare or understudied alpine plant species at 28 sites in Olympic, North Cascades, and Mt. Rainier National Parks from 2019 to 2022. We recorded each population's extent, population size, flowering status, habitat details, associated species, and potential threats. Most populations had never been mapped in detail, and Rare Care's study provided NPS with baseline data to compare with future monitoring. However, population sizes we estimated for the Olympic endemic Cotton's milk vetch (*Astragalus australis* var. *cottonii*) at three of its seven populations revealed a 60% decrease since they were last monitored in 1985. Rare Care is working with Olympic National Park to investigate if these declines are occurring range wide.

We used the monitoring data and a review of existing literature to quantify species' vulnerability and help NPS prioritize conservation efforts. These vulnerability assessments incorporated a species' habitat preferences, interactions with other species, ability to adapt to changing conditions, and modeled exposure to climate change to rank the species' relative risk. Most were at increased vulnerability due to their association with

late season snowbanks, competition threats and inferred lack of genetic diversity.

For 16 of the species we mapped, we installed 26 long-term monitoring plots that can be resurveyed regularly to detect changes in the species' abundance over time. We placed plots at the edge of the ecotone where we hypothesized the species may first retreat from its habitat, for instance at the lowest elevation of the population. We also collected seeds from eight of the focal species in Mt. Rainier and Olympic National Parks for *ex situ* conservation in the Miller Seed Vault.

Finally, Rare Care compiled a toolbox of conservation management techniques that NPS can use when population declines are observed. We recommended that regional and local endemics be prioritized and that the NPS work with other national parks and other land management agencies to expand seed collections to encompass a species' full range. Although our effort produced the first mapping records available for many of the populations we visited, there were populations we did not have time to monitor. We are hopeful that the national parks will welcome volunteer involvement in the continued monitoring of these vulnerable and unique species.

PARTNER SPOTLIGHT: JESSE MILLER

Sometimes your professional career takes you in a straight line, other times it involves a few twists and turns. For Jesse Miller, it involves looping back around a couple times, at least geographically. His new position as the Botanist for the Washington Natural Heritage Program (WNHP) is the second time he has landed in Olympia – the first was as an undergraduate at Evergreen State College.

It is while a student at Evergreen that he discovered his interest in botany. The extensive forested campus was one of the first landscapes to spark this interest, and perhaps that sowed a seed that would lead him to a deep appreciation of some unique taxa found in mature and old growth forests.

Jesse spent several seasons conducting rare plant surveys in southern Oregon and northern California where he became intrigued by two ginsengs of western North America, devil's club (*Oplopanax horridus*) and California spikenard (*Aralia californica*). "I find these species intriguing because of their striking appearances, interesting histories of cultural use, and their affinities for beautiful old forests," Jesse notes. Middle Fork of the Willamette provided the perfect location to ponder their ecological niches, growing within 500 feet of each other but never occupying the same site – devil's club was always at slightly higher elevations. It is also in the Middle Fork where he found a new population of cryptic paw lichen (*Nephroma occultum*), a very rare old-growth obligate and member of one of his favorite groups of taxa, the Lobariaceae.

With several seasons of botanical fieldwork under his belt, Jesse returned to his roots in the Midwest where he completed a PhD at University of Wisconsin. He grew up on the Great Plains in Kansas but it was not until he returned to the region that he became familiar with the flora of tallgrass prairies. This ecosystem provided fertile ground to study the effects of fire history, habitat connectivity, and soil resource availability on plant communities that led to a post-doctorate in California studying wildfire effects on plant and lichen diversity in the Sierra Nevada.

Jesse's interest in lichens started in the Pacific Northwest, and with his return to the region, he is excited to apply his knowledge in his new position at WNHP. "Washington has a number of very rare lichen taxa that have received little attention from biologists. I look forward to gathering more information about our rare lichen taxa, monitoring them in the field, and updating our state rare lichen list." He notes the work of the Northwest Lichenologists group has been invaluable in gathering data to assess the rarity of lichens, some of which he suspects may be rarer than historically due to climate change and severe wildfires.

One of the appealing aspects of working as the state rare plant botanist is the opportunity to focus on applied research and collaborate with researchers and managers to make tangible contributions to plant conservation. Jesse sees his role as a steward of the cumulative botanical knowledge in the state. "I am hearing many stories about the plants,



the people who work with them, and the conservation history of each species... to some extent, my role is to be the keeper of these stories, and to use that information to further rare plant conservation."

With his extensive knowledge and experience in botanical research and inventory, it is not surprising to discover that you can often find him outdoors, hiking, camping and taking long-distance bike tours. Gardening is also a hobby, and he appreciates having a little more space to grow a vegetable garden in Olympia.

Fortunately, for all of us here at Rare Care and the entire Washington botanical community, Jesse loves sharing his knowledge of plants and lichens and is excited that his new position provides opportunities to engage with the public. Rare Care looks forward to working with Jesse to conserve Washington's rare plants.



Cotton's milkvetch (*Astragalus australis* var. *cottonii*) Photo: Allie Howell



Jailene Merced Hoyos searching for yellow mountain-avens (*Dryas drummondii*) in Olympic National Park. Photo: Allie Howell



Washington polemonium with pollinator
Photos: Brenda McCracken



Washington polemonium scabland habitat
Photo: Wendy Gibble

FOCUS SPECIES PROFILE

Washington polemonium (*Polemonium pectinatum*) is a distinctive perennial Washington endemic. As the Latin name implies, its leaves are pectinate, a term that describes its feathery, pinnately compound leaves that have 11-17 narrow leaflets. These unique leaves make this species stand out amongst other members of the genus in Washington. In mid-May to early June, its branched inflorescence blooms with light blue to lavender flowers that sometimes have faint maroon veins.

Washington polemonium is known from 39 extant occurrences found across a 110-by-50-mile area of eastern Washington's scablands. The scablands were formed during the last ice age when an enormous lake that covered parts of Montana broke the ice barrier damming it, rapidly releasing the lake's 500 cubic miles of water. This water flooded over a vast swath of central and eastern Washington and drained through the Wallula Gap just south of the current confluence of the Walla Walla and Columbia Rivers. The flood scoured soil away and exposed basalt bedrock in a web of intertwining channels that became canyons called coulees. This area is called the scablands. Today, Washington polemonium inhabits the coulee floors in seasonally moist riparian areas and depressions within the shrub steppe ecosystem that dominates the upland areas. Its extent has been reduced due to farming, grazing, changes in hydrology, and the expansion of invasive species. A satellite image of this species' current distribution shows the plant is limited to coulees and streams between densely packed tiles of green, gold, and tan circular farmed fields.

Twenty-one of the 39 known occurrences are on private land, most of which have not been resurveyed in over 30 years. It is currently ranked as a state Threatened and Bureau of Land Management sensitive species. The Washington Natural Heritage Program in 2020 reported that more information about this species' abundance and population trends is needed. To this end, Rare Care has focused on re-monitoring all known occurrences on public land in order to better understand the trends for this species and inform an accurate ranking by federal and state agencies.

UPCOMING EVENTS

SEED COLLECTOR TRAINING

Sunday, May 14th
Center for Urban Horticulture

ANNUAL MONITORING WEEKEND

Friday- Sunday, June 16th - 18th
Umatilla National Forest

rarecare@uw.edu 206.616.0780
uwbotanicgardens.org/rarecare

CHECKERMALLOW SAMPLING

June 28th - 29th, July 5th - 6th
Camas Meadows NAP

CHECKERMALLOW OUTPLANTING

TBD Late October/Early November
Leavenworth Area



University of Washington
BOTANIC GARDENS

VOLUNTEER SPOTLIGHT

Each year Rare Care recognizes volunteers for their outstanding contributions.

Mickie Chamness trained back in 2005 and has completed 17 monitoring assignments and contributed over 140 volunteer hours. We really appreciate Mickie's contributions to the botany surveys at Two Steppe and Marcellus Shrub Steppe NAPs, and her monitoring reports each year are excellent. We are so lucky to have her on the monitoring team for so long! We also appreciate her efforts to promote our program in south central Washington.



Mickie is in the second row on the left
Photo: Wendy Gibble

John Stuart and **Carol Mack** joined the rare plant monitoring program in 2011 and have been incredibly active since then. You can find their names on 67 monitoring reports, each racking up over 440 volunteer hours. They are great company during the monitoring weekends and they have helped foster community within our northeastern Washington volunteers. They welcome any newly trained monitors to come join them for local adventures!



John Stuart and Carol Mack