

Douglasia

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WASHINGTON NATIVE PLANT SOCIETY

To promote the appreciation and
conservation of Washington's native plants
and their habitats through study, education,
and advocacy.



About This Issue

by Walter Fertig

Change is a constant in nature (as evidenced by gray, cold winter yielding to bright, green spring) and in the editing business. With this issue, we say farewell to our editor of the past three years, Alaina Kowitz, who has traded her red marker and thesaurus for a new position as Communications and Chapter Program Coordinator for the Washington Native Plant Society. Alaina did a great job (along with the whole editorial committee team) cranking out three colorful and inciteful issues of *Douglasia* every year. Thanks Alaina!

I am stepping in as acting editor for this issue, but WNPS will be hiring a new permanent editor later this spring. If you know someone, or are interested yourself, this is your opportunity to make a contribution to Washington botany.

After five years at the helm of the editorial committee, I will be stepping down this spring as well. I plan to continue to contribute articles now and then. But it will be good to have some new perspectives and fresh ideas for the magazine.

You can contribute to the evolution of *Douglasia* by completing the WNPS membership wide survey coming in April. In particular, we want to know what sort of articles and information you find most useful and enjoyable in *Douglasia*. And in addition to filling out the survey, consider contributing to *Douglasia* and the WNPS blog, Botanical Rambles, by writing plant-related stories of your own! Ultimately, WNPS and *Douglasia* are communal efforts, and we need everyone taking an active role to thrive.

The WNPS Membership survey is an electronic survey, however, we acknowledge that some members need a paper survey by mail to participate. Your input is important to us too! Please contact the WNPS office to request a paper copy at info@wnps.org or (206)527-3210.



Information for Contributors

Members and others are invited to submit material for publication in *Douglasia*. We now accept scientific manuscript submissions that will be peer-reviewed. Other articles, book reviews, poetry, photography, or illustrations are welcome. All materials submitted should relate to the study of Washington's native plants. Acceptance will be based on space and appropriateness, and materials are subject to copyediting (substantive editing with author's permission). Contributors are reminded that the *Douglasia* audience ranges from the professional botanist to the interested enthusiast. For more information about how to contribute, see: wnps.org/douglasia/contribution.

Email submissions to Douglasia@wnps.org.

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* The WNPS Arthur R. Kruckeberg Fellow is the highest honor given to a member by our society. This title is given to those who have made outstanding contributions to the understanding and/or preservation of Washington's flora, or to the success of WNPS.

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Article references are available on the WNPS website here:
wnps.org/douglasia.

On the cover: The Dalles Mountain buttercup, aka obscure buttercup (*Ranunculus tritermatus*) with a grass widow (*Olsynium douglasii*) at The Dalles Mountain Ranch State Park. PHOTO: MARK TURNER

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President's Message: The View from Here

by Gail Sklar

Dear WNPS Members,

I am writing this in late February and my garden is beginning to get busy and pop, but it is not as active or exciting yet as the growth WNPS is experiencing right now. Like our gardens and natural areas, WNPS is growing and beginning to bloom. Denise Mahnke became the Executive Director on January 1, 2024. This spring, WNPS will be hiring a new program manager for the stewardship and YEER programs. This position will include oversight of the stewardship curriculum, implementation of the YEER program, and tracking volunteer activity and project success over time. The new program manager will work with WNPS partners and collaborate with local cities and schools as well as WNPS chapters to support successful programs throughout the year and across the whole state.



Change does not happen without thought and planning. WNPS is starting to revisit its Strategic Plan, which will serve as the society's road map for the next three years. While WNPS has met many of the goals set by the 2020–2023 plan, not all were reached. Now, the newly formed strategic planning team will look at the goals and build on them to continue WNPS' growth.

A new crop of WNPS grants will be awarded during the first week of April! This is when the Conservation, Education, and Research and Inventory committees will announce the recipients of new WNPS grant awards after a rigorous review process. Previous grant winners are actively sharing the results of their projects with detailed reports (some published to *Douglasia*). The first grant report webinar was offered in January on "Gardening Under Native Deciduous Trees."

Native Plant Appreciation Month (NPAM) starts in April 2024. As many of you might have read in February's eNews, I am the state Chair of the NPAM committee. When I first joined, it was Native Plant Appreciation Week, which started in 2004. In 2020, it went from a weeklong celebration to a full month. Joining me on the committee are Julie O'Donnell, Cici Asplund, and Savanna Reid. The committee welcomes new members. The NPAM Committee has received great support from our staff, Denise Mahnke, Bridget McNassar, and Alaina Kowitz. The theme this year is "Prairie Preservation." The NPAM committee has arranged five Zoom webinars.

When I moved here from the Philadelphia area, I learned that there were prairies in this state. I learned of their importance to the First Peoples and as habitat for many native plants and animals. I saw the prairie on the west side of the Cascades near JBLM in full bloom, a sea of blue with pops of color here

and there. I also learned of the importance of the rare plants and endangered butterflies that depend on these grasslands and the restoration work being done on the prairies. Now the NPAM Committee would like to share this information with you. Register for the wonderful webinars about the prairies across our beautiful state.

Chapters' activities are an important part of building a sense of community. Chapters have planned many hikes and plant sales during NPAM in April. So put on your hiking boots and plan to purchase beautiful native plants! We should not forget that Monday, April 22, 2024, is Earth Day. Check out chapter hikes, plant sales, and celebrate Earth Day with your fellow WNPS members.

WNPS has two wonderful full weekend opportunities for native plant enthusiasts to gather with like-minded WNPS members. The first, Botany Washington, is being held at the Columbia River Gorge, the weekend of April 26–28, 2024. This event is the result of a partnership between WNPS and the University of Washington Herbarium at the Burke Museum under the leadership of David Giblin and Denise Mahnke. WNPS is grateful for the partnership of eleven years. This event is filled for 2024. The second, Native Plant Study Weekend, is on June 14–16, 2024, and will be held at the 7 Cedars Hotel in Blyn, near Sequim. It is sponsored by the Olympic Peninsula Chapter and the theme is "Exploring Olympic Peninsula Flora: Sea to Summit." The Olympic Peninsula chapter worked hard to provide many engaging activities and hikes that folks can register to attend. This event is now full.

We are getting ready for the 50th anniversary celebration of WNPS in 2026. A new committee will be forming soon to plan events. We hope to have people volunteer to serve on this committee who know the history of WNPS, but welcome newcomers too. We have so much to celebrate, including the stewardship program, YEER, Conservation Committee victories, grants won by the Fundraising Committee, the Starflower program growth by the Education Committee, beautiful and educational *Douglasia* issues, and the eNews that keeps members informed. Our website is a beautiful creation where members and nonmembers alike can learn so much, register for webinars across the state, and watch or rewatch recorded programs.

All of these accomplishments and changes are only possible when WNPS members get involved. Your participation is very important at the state and local chapter level. There is no better way to learn more about WNPS than getting involved. You don't have to take a big role to start—just join and attend a meeting and see if there is a job you could do to support a plant sale, for example. Also, greet new attendees at in-person meetings. Welcoming them could lead to them joining and getting involved. WNPS grows as people gain a sense of community.

Spring is coming, so put on your hiking shoes, join a work party, or plant some of Washington state's beautiful native plants. Your participation makes a difference and is what makes WNPS a special organization. Happy spring!



Some Botanical Notes from Mount Rainier

by Peter F. Zika

In 2022 and 2023 I wrote to the National Park Service (NPS) for permission to collect additions to the known vascular plants of Mount Rainier National Park. With NPS approval, I set off on park trails, visited shorelines and roadsides, and scrambled around on ridges and talus slopes. My immediate challenge was determining what was an addition to the well-known flora. From a practical standpoint, I relied on David Biek's (2000) excellent *Flora of Mount Rainier National Park*. I carried his book and the collecting permit with me everywhere. If I encountered a plant absent in Biek's catalog, I gathered a specimen for the Park Service herbarium (MORA is its official acronym in botanical literature) in Ashford, and a duplicate for the University of Washington herbarium in Seattle, part of the Burke Museum and abbreviated as WTU.



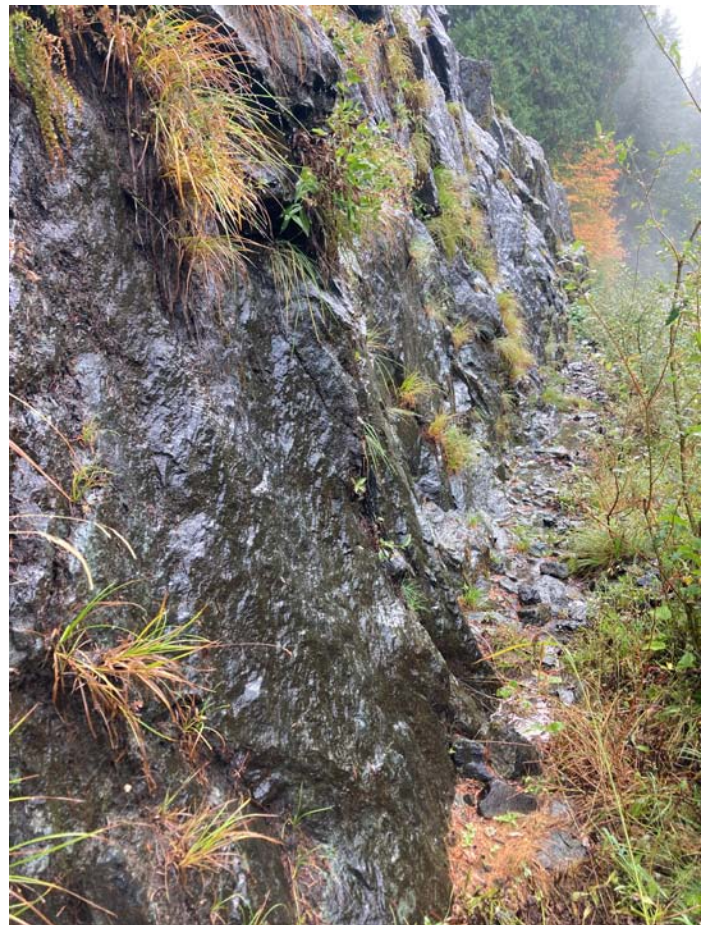
Chinook Pass, steer's head (*Dicentra uniflora*), usually east of the crest.
PHOTO: PETER ZIKA

The entire park is in Pierce and Lewis counties, west of the crest of the Cascades. Yet a few plants typically found east of the crest were present, at places like Cayuse Pass and Chinook Pass. One delightful easterner was steer's head (*Dicentra uniflora*). Another was sticky currant (*Ribes viscosissimum*), on the trail to Crystal Peak. Rocky Mountain iris (*Iris missouriensis*) grows in the marsh at Longmire. There was a remarkable record of western wheatgrass (*Pascopyrum smithii*) from the old Lake Allen Trail on Mt. Wow. The Frank Warren specimen was identified by Agnes Chase, so its identity is unquestioned, but the colony has not been seen since its discovery in 1932. Some inconspicuous native annuals, with eastern affinities, were discreetly pressed and added to the park flora, such as diffuse collomia (*Collomia tenella*), slender cryptantha (*Cryptantha affinis*), dwarf groundsmoke (*Gayophytum humile*), and Harkness' linanthus (*Leptosiphon harknessii*).

Muddy feet and frogs don't bother me, so I spent quite a bit of time in park wetlands. Small ponds and tarns are widely scat-

tered across the glaciated terrain. I got lucky at Louise Lake in mid-August, because hundreds of submerged aquatics had been uprooted (presumably by foraging ducks), and floated to the surface, where the wind had deposited the remnants on the lee shore. At the high-water mark, among the shattered remains of bristle-like quillwort (*Isoetes echinospora*), were diminutive but fertile plants of autumnal water-starwort (*Callitriche hermaphroditica*). The latter was noted by St. John & Warren (1937) at Reflection Lakes, but no voucher was ever found to confirm the report. I was also able to tally an additional quillwort (*Isoetes bolanderi*), and two new pondweeds (*Potamogeton berchtoldii*, *P. gramineus*) at Mt. Rainier.

I have an intense interest in grasses, sedges, and rushes. Mt. Rainier's graminoid flora is dominated by the sedge group *Carex*, with 48 species. Of all the flowering plants and ferns, this is the most diverse genus in the park (*Poa* spp., the blue-grasses, are a distant second with 18 taxa). I highly recommend the color field guide to all *Carex* in Oregon and Washington, available as a second edition (Wilson *et al.* 2014). Using that handy book, I was able to verify half a dozen new sedges for the park, like russet sedge (*Carex saxatilis*), Shasta sedge (*Carex stramineiformis*), and green sedge (*Carex viridula*). The sedge family (Cyperaceae) includes another little-studied genus, *Eleocharis*, the so-called spike-rushes. Among them I was able to voucher several new records for the park, including an extensive population of another plant usually found in eastern Washington, the walking spike-rush (*Eleocharis rostellata*). It has a unique growth



Wet cliff with quill spike-rush (*Eleocharis nitida*). PHOTO: PETER ZIKA

form that looks like green croquet hoops, as the tips of some long fertile stems arch to the ground and root.

An even more unexpected record came from a wet cliff. There was a small and inconspicuous colony of quill spike-rush (*Eleocharis nitida*), not previously seen in Washington, but known in British Columbia from the Cascade Range, less than a dozen miles north of the international border.

Several fascinating hybrids turned up in my surveys. I'm still trying to work out some of the presumed hybrids in the rockcress genus *Boechea*. Near Panorama Point were stands of pink mountain-heath (*Phyllodoce empetriformis*) and yellow mountain-heath (*Phyllodoce glanduliflora*), both in bloom, with flowers of different shape and color. A creeping shrub with flowers of intermediate shape and color was apparently their hybrid offspring (*Phyllodoce* × *intermedia*).

Based on leaf shape, one bush near Cayuse Pass appeared to be the seldom-seen natural cross between choke cherry and bitter cherry (*Prunus emarginata* × *virginiana*). Some of the leaves resembled choke cherry (large and obovate), others resembled bitter cherry (narrowly elliptic), and some leaves were intermediate (broadly elliptic).

The National Park Service (Anonymous 2023) maintains a comprehensive *Species Checklist for Mount Rainier National Park*, based on previously published lists, as well as relying on the contents of the MORA herbarium. Many of the oldest MORA specimens are gems, carefully gathered and pleasingly pressed by Oscar Allen in the 1890s. As you would expect, some of those specimens from the 19th century have outdated names. An 1896 Allen specimen, databased as Siberian mountain-ash (*Sorbus sambucifolia*), would be a stunning range extension of a species native to the Aleutians and Russian Far East. Thus, it is no shock to learn that the material is actually a common resident, Rocky Mountain or Cascade mountain-ash (*S. scopulina*). Park reports of golden paintbrush (*Castilleja levisecta*) were based on MORA specimens of obscure paintbrush (*C. cryptantha*), as discussed by Biek (2000, p 470). A MORA collection labeled as Barrett's penstemon (*Penstemon barrettiae*) was recently annotated to woodland beard-tongue (*Nothochelone nemorosa*). Similarly, the MORA voucher for velvet-leaf blueberry (*Vaccinium myrtilloides*) was globe huckleberry



Four leaves from one shrub near Cayuse Pass, presumed to be the hybrid between bitter cherry and choke cherry (*Prunus emarginata* × *virginiana*). The leaf on the left looks like typical bitter cherry, the leaf on the right looks like typical choke cherry, the two middle leaves intermediate. PHOTO: PETER ZIKA

(*V. membranaceum*). Two species of mock-orange (*Philadelphus confusus*, *P. lewisii*) were credited by the Park Service (Anonymous 2023) to Mt. Rainier, but only *P. lewisii* is recognized by modern authors, with *P. confusus* a mere synonym. Several specimens from the 1800s, at WTU and MORA, were called starry saxifrage (*Micranthes stellaris*, syn. *Saxifraga stellaris*), a species of the eastern Canadian arctic, some 2000 miles distant. The identification keys in current floras bring them, instead, to a common Cascades species, rusty saxifrage (*Micranthes ferruginea*). Park specimens labeled as dwarf bilberry (*Vaccinium cespitosum*) were recently reidentified as one of my favorite mountaintop snacks, Cascades huckleberry (*V. deliciosum*). As Arnie Peterson has pointed out (2021), there is a wealth of abandoned synonyms and misleading names on older museum labels. The untangling of the herbarium records remains a formidable task, and is on-going. Still, it is possible to point to some trends. The documented flora of Mt. Rainier continues to increase. In Table 1 is an approximate summary of that progress. As discussed above, there are caveats with the numbers, as each of the authors had different standards for including (or excluding) members of the flora.

Acknowledgments

I am grateful to the enthusiastic botanists who walked mountain trails with me, especially David Biek, Peter Dunwiddie, David Giblin, Ben Legler, Susan McDougall, and Sharon Rodman. Biek and McDougall were generous in sharing many exact plant localities for species they detected since the publication of the 2000 flora. Numerous National Park employees, present and past, were a pleasure to work with and provided invaluable suggestions. Brooke Childrey, Arnie Peterson, and Crow Vecchio were particularly helpful. The collections of numerous museums were essential in this study, and I thank their staff members for their courtesy. For his assistance and annotations, Walt Fertig at the herbarium of Washington State University in Pullman (WS) deserves applause.

Peter Zika, one of the co-editors of the Second edition of the Flora of the Pacific Northwest, is an expert on the flora and fauna of Washington State and based in Seattle.



Table 1. Documented vascular plants of Mount Rainier National Park, over the last century.

Author	Total taxa	Native taxa	Non-native introductions
St. John & Warren (1937)	695	630	65
Jones (1938)	729	651	78
Dunwiddie (1983)	804	713	91
Biek (2000)	871	723	148
Anonymous (2023)	922	783	139
Current approximations	circa 1000	circa 800	circa 200

Botanical Surveys at Washington Natural Areas

by Wendy Gobble,
UW Botanic Gardens Rare Care Program Manager

On a cool spring morning in late April, a small line of cars piled up on the shoulder of Highway 2 next to a pocket of tall sagebrush amidst a sea of farm fields. Twenty people spilled out, grabbing hand lenses, plant lists, guidebooks, plant presses, and lunches to spend the day documenting the flora of Two-Steppe Natural Area Preserve (NAP). This outing was the first of five field trips Washington Rare Plant Care and Conservation (Rare Care) conducted over a 3-year period to update plant lists for three natural areas in central and eastern Washington.

While Rare Care's activities typically focus on relocating and monitoring rare plant populations statewide, we embarked on an effort to update the flora of three natural areas. We selected three sites where rare plant populations had not recently been monitored or where a botanical survey had not yet been completed. Botanical surveys provide important documentation of plant diversity at a site in a moment in time. Through these surveys, botanists gain a better understanding about local and statewide distribution of native and non-native plants and how they are changing, aiding conservation and management efforts.

Very few of Washington's natural areas have benefited from botanical surveys, including sites set aside for conservation such as Two-Steppe NAP. Even at locations where past surveys have been completed, there is a tremendous value in repeating surveys to understand how species and plant community diversity is changing. Human activities and climate change have altered the state's vegetation over the past several decades and will continue to do so. Ideally, surveys include multiple visits over the growing season to increase the likelihood of visiting during the flowering periods of all species present at the site. Time constraints often require compromise, however. Our goal was to visit twice, once early in the season and once mid-season.

Two-Steppe NAP

Two-Steppe NAP protects 394 acres of high-quality shrub-steppe ecosystem in Douglas County where much of the land has been converted to agriculture. Prior to our survey, Washington Department of Natural Resources (DNR) staff provided a plant list of 88 species they had observed at the site, but a systematic floristic survey of the site had not been completed. Most of the site is dominated by a big sagebrush/bluebunch wheatgrass (*Artemisia tridentata*/*Pseudoroegneria spicata*) vegetation community with areas of lithosols supporting stiff sagebrush/Sandberg's bluegrass (*Artemisia rigida*/*Poa secunda*) and thyme-leaved buckwheat/Sandberg's bluegrass plant communities (*Eriogonum thymoides*/*Poa secunda*). We also obtained a species list compiled by The Nature Conservancy for nearby Moses Coulee that, although it encompassed a much larger area



Vegetation community at Two Steppe NAP. PHOTO: WENDY GIBBLE

containing a greater diversity of ecosystems, provided a list of possibilities that aided field identification.

Finally, we consulted Washington Natural Heritage Program's database of rare plant occurrences, not only for the preserve but for the immediate vicinity. There is only one species of conservation concern known at the Two-Steppe NAP: DNR staff observed a population of coyote tobacco (*Nicotiana attenuata*) at the northwest edge of the preserve in the summer of 2016 after the 2015 South Sulphur wildfire burned nearly the entire preserve. While we planned to look for this rare annual, we knew the chances of observing it were unlikely because its seeds need fire to germinate. We also identified up to 20 other rare plant taxa found in the Waterville Plateau area, but only about five of these seemed possible based on the habitat present at Two-Steppe NAP.

Our surveys at Two-Steppe NAP represented the first concerted effort to compile a species list for the site. We visited twice, April 19 and May 13, 2019, and our group included Rare Care staff and volunteers, Washington Natural Heritage Program (WNHP) botanist Walter Fertig, DNR staff, and



Susan Ballinger and Richard Fleenor pressing specimens to document the flora at Two Steppe NAP. PHOTO: STACY KINSELL

volunteers from the Wenatchee Chapter of the Washington Native Plant Society. A good grounding in the flora of the habitat is essential for a thorough survey and we were grateful to have many knowledgeable botanists in our group.

To make sure we covered the entire area, we subdivided the preserve into three areas and assigned groups to survey each of these areas. Each group tallied taxa on DNR's species list as we went and added species we could identify in the field. When plant identity was unknown or in question, we collected a voucher specimen for later identification. We were able to find and confirm approximately two-thirds of the 88 species on DNR's list and added an additional 60 species.

We found a nice diversity of buckwheats and biscuit-roots at Two-Steppe NAP. We added four buckwheat species to the list, bringing the total recorded at the site to nine. Our additions included arrow-leaf buckwheat (*Eriogonum compositum*), Douglas's buckwheat (*E. douglasii*), Great Basin slender buckwheat (*E. microtheca*), and snow buckwheat (*E. niveum*). We also added four species of biscuit-roots to the list: Canby's biscuit-root (*Lomatium canbyi*), fern-leaved biscuit-root (*L. dissectum*), northern biscuit-root (*L. farinosum*), and nine-leaf biscuit-root (*L. simplex*). Large-fruit desert-parsley (*L. macrocarpum*) and triternate biscuit-root (*L. triternatum*), previously documented at the site, rounded our count out to six biscuit-root species observed.

We did not find any rare plants listed on WNHP list of Species of Conservation Concern, including coyote tobacco; however, that species may well reappear after the next wildfire and flowers later in the summer. Most of the species represented at the site are widespread and secure across their range. The site did hold two Washington endemic species, fragile onion (*Allium scilloides*) and Lyall's milk-vetch (*Astragalus lyallii*). Fragile onion occurs from Douglas County south to Klickitat County and is found on dry, rocky areas with thin basaltic soils. Lyall's milk-vetch occupies the same range but is found on deeper, sandier soils and with its small fruit might be confused with buckwheat milk-vetch (*Astragalus caricinus*). These species were new for many in our survey team. While not restricted to Washington, surveyors were also excited to observe freckled milk-vetch (*A. lentiginosus* var. *lentiginosus*) with its distinctive inflated fruit that tapers to a flattened point. We observed only these two milk-vetches, which seemed a low number given the diversity of milk-vetch species found in the Columbia Basin.

Unsurprisingly, we added several more non-native species to the list. Crested wheatgrass (*Agropyron cristatum*), Japanese brome (*Bromus japonicus*), bulbous bluegrass (*Poa bulbosa*), and intermediate wheatgrass (*Thinopyrum intermedium*) were all new additions but not unexpected given their ubiquity in shrub-steppe ecosystems. Areas of denser cheatgrass (*Bromus tectorum*) were also observed, possibly expanding its cover after the 2015 wildfire. All in all, we came away with the impression that the site still boasts a high diversity of native flora despite a recent wildfire but annual invasive grasses pose an increasing risk.

In addition to Two-Steppe, we also visited Marcellus Shrub Steppe NAP and Middle Fork Snoqualmie Natural Resource Conservation Area (NRCA). NAPs and NRCAs are designations given to state-owned lands set aside for conservation and restoration of important habitat. NAPs are sites of outstanding quality that hold ecologically significant and often unique features such as rare ecosystems and species. The primary purpose of these sites is to preserve the natural heritage of Washington State for generations to come and many are closed to the public. NRCAs also protect high quality ecosystems and rare species, but provide opportunities for recreation and education where such activity does not compromise its ecological integrity.



Fragile onion (*Allium scilloides*) PHOTO: WENDY GIBBLE

Marcellus Shrub Steppe NAP

At Marcellus Shrub Steppe NAP, we were excited to visit another example of high quality shrub-steppe ecosystem in a county where most habitat has been converted to agriculture. The Adams County preserve includes 386 acres of native shrub-grasslands that were once widespread in the Columbia Basin. Vegetation communities present at the site include big sagebrush/Idaho fescue (*Artemisia tridentata*/*Festuca idahoensis*), threetip sagebrush/Idaho fescue (*Artemisia tripartita*/*F. idahoensis*), and stiff sagebrush/Sandberg's bluegrass (*Artemisia rigida*/*Poa secunda*) as well as vernal pools. Vernal pools are seasonal wetlands that form in depressions in winter and spring but are dry in other seasons. They support an unusual suite of plant species that are dependent on the ephemeral moisture. We were excited for the possibility of observing American pillwort (*Pillularia americana*), hybrid mouse-tail (*Myosurus* × *alopecuroides*), inch-high rush (*Juncus uncialis*), and miniature monkey-flower (*Erythranthe suksdorfii*), all state sensitive species that had previously been observed at the site.

Our success at finding these vernal pool species required a degree of luck—in many years spring rainfall amounts and distribution are inadequate for water to pond and these tiny annuals do not make an appearance. They also require a keen eye. These species are what I like to call belly-crawlers, best observed with a hand lens and the tip of your nose inches from

the ground. Of these, American pillwort might be the least well known and most unusual: a fern with grass-like, coiled leaves and spore-bearing bodies at ground level or below.

At Marcellus Shrub Steppe NAP, we started with a fairly comprehensive species list developed by many botanists over the years. A species list was first created in the 1980s by WNHP and expanded by The Nature Conservancy staff and volunteers. Additionally, two university students completing Masters' theses on vernal pools contributed to the list. These past surveys resulted in a site list of approximately 174 species. Our goal was to see whether we could re-locate the rare annuals of the vernal pools as well as update the existing list. We visited the site on May 6 and June 24, 2022 and were joined by Rare Care volunteers, DNR staff, and WNHP Botanist Walt Fertig.

Our May visit occurred on a wet cold spring day, but despite the weather our survey was well timed to observe early-spring flowering species. We were lucky to see a variety of annuals and appreciated the opportunity to study lineleaf miner's lettuce (*Montia linearis*) side by side with dwarf montia (*M. dichotoma*). Eager to see if we could relocate any of the vernal pool species, we spent quite a bit of time combing through the depressions in the vicinity where the rare vernal pool species were last recorded. Unfortunately, during both visits the vernal pools were quite dry and our target species were no-shows. This was not unexpected as timing is key for finding these species, but a disappointment for our survey team. We did observe and collect a specimen of bristly mouse-tail (*Myosurus apetalus*), a more widespread mouse-tail found on moist soils throughout the Columbia Basin. Fortunately, in 2023 Rare Care volunteer Lorna Emerich made another attempt to find the hybrid mouse-tail, and her search was successful. She counted 52 plants on May 20, 2023 on dry cracked soils in one of the depressions.

We ended up with 90 species on our list after two surveys at Marcellus Shrub Steppe NAP, well short of the complete list tallied over previous years. Our list included only three species of buckwheats, same as previous surveys recorded, but far short of the nine we observed at Two-Steppe NAP. The site holds a nice diversity of biscuit-roots, and we added northern biscuit-root to the site list for a total of six species observed. No new introduced species were added to the list, although we found a few small but dense patches of tumble mustard (*Sisymbrium altissimum*).

Middle Fork Snoqualmie NRCA

We rounded out our surveys with a visit on August 16, 2019 to Middle Fork Snoqualmie NRCA, a site for which we had no species list. Located in King County, this 9,200-acre site consists of wetlands, low and mid-elevation Douglas-fir/western hemlock (*Pseudotsuga menziesii*/*Tsuga heterophylla*) forests, and sub-alpine forest, shrubland and meadow. Clearly such a large tract of land will take years to survey and document, so we decided to start with a hike up Granite Creek to Granite Lakes.

The trail started in the valley floor of the Middle Fork Snoqualmie NRCA at just under 1,000' elevation and ascends to

3,000' at the lakes. The 4.4-mile trail provided a nice progression of western Washington habitats that yielded a diversity of conifers and ferns and a good assortment of Cascade Mountains flora. Three true firs occurred along the hike and at the lakes, with noble fir (*Abies procera*) a nice addition to the more widely distributed grand fir (*Abies grandis*) and Pacific silver fir (*Abies amabilis*). Surveyors also observed seven species of ferns, including the less common narrow beech fern (*Phegopteris connectilis*). This species range in western North America extends from Washington and Idaho to Alaska. Copperbush (*Elliotia pyrolifera*), another species at the southern end of its distribution, was also a nice find. In total, our survey team tallied 170 taxa along 4.4 miles of trail and lakes in the Granite Creek drainage, making it a worthwhile destination for a botanical hike.

Protection of Washington's NAPs and NRCAs is a vital tool for preserving Washington's natural heritage, but setting aside these lands is only the first step in their stewardship. Human influences bring disturbances such as wildfire and invasive species. Climate change will inexorably push some species out and new species in. Inventory, species monitoring, and research at these sites will help scientists understand the impacts of these forces on the states flora and will aid in management of these natural areas. To find out more about DNR's Natural Areas Program, visit www.dnr.wa.gov/managed-lands/natural-areas.

Acknowledgements

The Rare Care program is grateful for funding provided by a Washington Native Plant Society Conservation Grant to support our travel costs. These surveys leaned on the expertise of many knowledgeable botanists familiar with the flora of Washington, including 20 volunteers with the Rare Care Program and the WNPS Wenatchee Chapter, former WNHP botanist Walter Fertig and DNR staff Keyna Bugner, Molly Jennings, and Ethan Coggins among others. We are especially grateful for Walter Fertig's co-leadership for this effort and help with compiling the plant lists.

Wendy Gible is Associate Director at the University of Washington Botanic Gardens and the Manager of the Rare Care Program. In her 18 years with the program, she has conducted research on rare plant ecology to support recovery of endangered species, overseen the seed banking program, developed propagation protocols for rare native plants and conducted outplantings to establish new populations in the wild. She completed her master's thesis in plant ecology at the University of Washington.



Rose Creek: A Hidden Gem on the Palouse

by Maddy Lucas

Among thousands of square miles of rolling, wheat-covered hills, small pockets of land holding a secret treasure are nestled between the rises and falls. These small blips in the landscape are infrequent, yet they boast the Palouse's most valuable element—Palouse Prairie.

Comprised of bunchgrasses, shrubs, and forbs, the Palouse Prairie is a stunning cacophony of colors and textures in the spring and summer. Like many other prairie ecosystems, though, it is rather unremarkable to the untrained eye and is overlooked by many, especially in the fall and winter as plant life lies dormant. Incorrectly deemed “nothing” to those who have not taken the time to know it, the Palouse Prairie has been almost entirely destroyed through agriculture and urban development, with less than 1% of native Palouse Prairie remaining. What is left faces pressure from nonnative species that grow prolifically in the region, such as *Tragopogon* sp., diffuse and spotted knapweeds (*Centaurea* sp.), and cheatgrass (*Bromus tectorum*).

Nearly hidden within a small nook of the Palouse, 22 acres of native Palouse Prairie break up the wheat fields. Located about ten miles from Pullman, WA, this prairie paradise is Rose Creek Nature Preserve, also known as RCNP. It is owned and maintained by the Palouse-Clearwater Environmental Institute (PCEI), a non-profit organization located within the Palouse region that focuses on issues related to the environment. Native flora thrives here and the land has become a haven for local wildlife, especially feathered friends.



Western stonecrop (*Lithospermum ruderale*). PHOTO: MADDY LUCAS

Like many of the other remaining pieces of Palouse Prairie, the land RCNP calls home has a distinct but important advantage—farmers do not want it. As the name of the preserve suggests, Rose Creek runs through the center of the property, creating a rich riparian zone and wetland meadow, which is ill-suited for the wheat farming in the area. Further, the physical

nature of the slopes on the land creates a natural defense barrier to their decimation, with the topography creating challenges for farming practices.

The land that would one day become RCNP was purchased by Dr. George and Bess Hudson in the 1950s, where they lived and raised their children. George, a Washington State University professor and researcher, used the vegetation on the preserve to aid his research, specifically on hawthorn (*Crataegus* sp.). Tom Lamar, Executive Director of PCEI, describes some of the work Dr. George Hudson performed.

“He discovered that the birds were eating the hawthorn seeds and they get kind of scratched up when the birds are biting on them. Then they go into the gut of the bird where they get a bath of acid and then they get pooped out and fertilized,” Lamar said. “It is that mechanism that he did a lot of research around and did testing on. It ended up being really important information for other plants that we as humans try to grow—the method of scarification, acidification, and fertilization in facilitating germination.”

While Dr. George Hudson was focused on his research, Bess Hudson was also busy. In 1978, she published *Windows to Nature*, a naturalist book, which was inspired during her time living at the preserve. She would also bring groups of schoolchildren around the preserve on nature walks, showing them the beautiful and fascinating species the native Palouse had to offer.

Lamar explains that this is just the beginning of RCNP's interesting history. In recognition of the land's importance, the Hudsons donated 12 of their 22 acres to The Nature Conservancy in Washington in the late 1960s and RCNP received its current-day name. (If you visit RCNP, Lamar explains that you enter onto the originally-donated acreage when you cross the first footbridge. A bronze sign also marks the location.) The Hudsons continued living on the remaining ten acres of land while allowing guests to cross their property to visit the preserve.

In the 1980s while The Nature Conservancy owned RCNP, the National Park Service designated the preserve as a National Natural Landmark, a program that promotes conservation of places with “outstanding biological and geological resources,” according to the National Park Service's website (www.nps.gov). This further put RCNP on the map as an area of interest to naturalists.

When The Nature Conservancy originally took ownership of the 12 acres of land, an emphasis was placed on the removal of invasive species to allow native plant diversity to thrive. A volunteer based out of Pullman, WA would visit the preserve and remove nonnative plant species under direction of the organization.

“They made lots of headway on that,” Lamar said. “After a while, their volunteer could not keep up and they contacted [PCEI] around the early 2000s.”

At this point, PCEI was hired to continue management of the preserve, with one big incentive - if, after a few years, The Nature Conservancy was happy with the work PCEI had performed, they would donate those 12 acres of land to the organization.

“We worked with them for a few years and they had specific things they wanted us to do to control weeds and to maintain the pathways, so we followed those guidelines,” Lamar said. “Managing vegetation included primarily fencing and protecting aspen trees from both beavers and deer—small sprouts of aspen trees were getting mowed down by the deer and the beavers were eating some of the larger ones.”



Showy phlox (*Phlox speciosa*). PHOTO: MADDY LUCAS

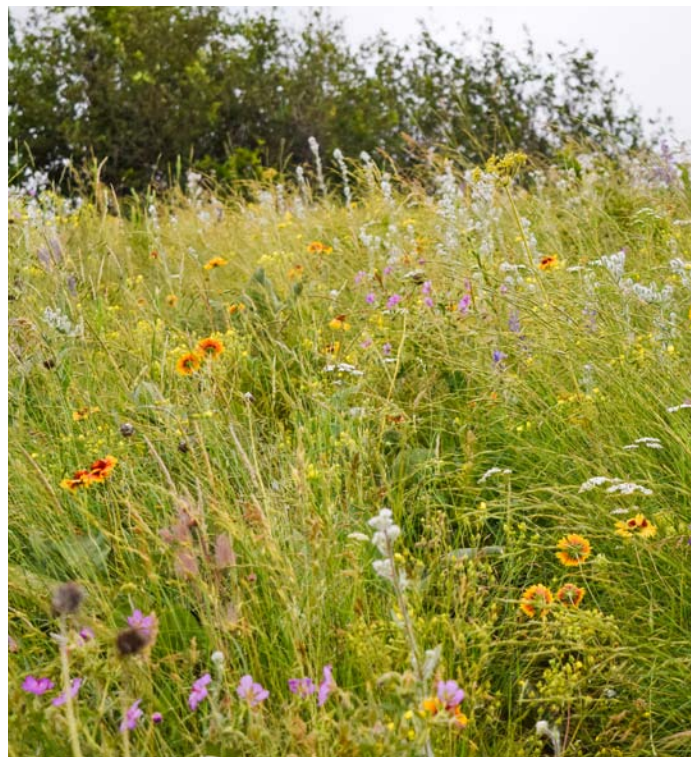
After three years of successful plant protection work by PCEI, The Nature Conservancy donated the 12 acres to the group in 2008. The remaining ten acres of the preserve were still owned by Fred Hudson, the son of Dr. George and Bess Hudson. While Fred originally planned to sell the land, he ultimately decided to donate it to PCEI, making RCNP the 22-acre preserve it is today.

The final ten-acre donation included the house located on the land, which is now named the Bess Hudson Interpretive Center. Downstairs, guests can visit the interpretive center by appointment, which includes a small library and other educational materials. Upstairs lives the preserve’s caretaker family, who also run a native plant seed business (Rose Creek Seeds).

Today, PCEI focuses on reestablishing plants in areas where native vegetation should be, such as along Rose Creek, and performing some tree management.

“That is primarily funded by efforts to mitigate nonpoint source pollution, such as bank erosion and so forth,” Lamar said. “By doing work to reestablish vegetation, it helps the water quality in the area.”

Educational groups or other community events are held at the preserve and community members are allowed to visit on their own accord. Whether there for birding, to enjoy the native plants, or to just get out in nature, RCNP has much to offer. For wildflower lovers, there is plenty of vegetation to see.



Palouse prairie near Pullman, Washington with blanketflower (*Gaillardia aristata*), sticky geranium (*Geranium viscosissimum*), and silky lupine (*Lupinus sericeus*). PHOTO: MADDY LUCAS

When visiting the preserve in the springtime, you’ll first walk through a distinct lowland prairie, including native plants such as cow parsnip (*Heracleum maximum*), Fendler’s waterleaf (*Hydrophyllum fendleri*) and purple trillium (*Trillium petiolatum*). As you exit this thicket, you will encounter a footbridge—passing over this bridge takes you to the upper prairie, where colorful forbs abound. Blue-flag irises (*Iris missouriensis*) and large-flowered *Triteleia* (*Triteleia grandiflora*) dot the lower portion of the hillside, standing tall in the moist soil along the creek. Traveling uphill, sticky geranium (*Geranium viscosissimum*), showy phlox (*Phlox speciosa*), arrowleaf balsamroot (*Balsamorhiza sagittata*) and western stonecrop (*Lithospermum ruderale*) thrive. If you look closely, you may even catch a glimpse of the tiny early blue violet, *Viola adunca*, peeking out from its protected home beneath grasses and other vegetation. Hawthorn and aspens grow tall around the preserve and native bunchgrasses abound.

Lamar shares that to date, over 80 different plant species have been documented on the preserve.

Rose Creek is located just a short 20-minute drive outside Pullman, WA and is a day-use area only. Camping, hunting, fishing, and plant collection is prohibited. Canine companions should also be left at home to protect this ecologically-fragile land. For more information about visiting the preserve, visit pcei.org/rose-creek/.

Maddy Lucas is a native plant enthusiast, photographer, and writer based in Pullman, WA.





NATIVE PLANT APPRECIATION MONTH

PRAIRIE PRESERVATION | APRIL 2024



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April 4 - First People's Panel Discussion | William Thoms, Cultural Resource Specialist at the Confederated Tribes of the Chehalis Reservation & Shannon Adams, Fisheries Resource Management Habitat Section Coordinator for the Yakama Nation

April 9 - Managing for Grasslands in a Sea of Forests | David Wilderman, M.S., Program Ecologist at the Washington Department of Natural Resources

April 15 - Rare Plants and Their Pollinators | Susan Waters, Ph.D., Senior Ecologist at Quamash EcoResearch

April 24 - Remnant Plant Communities in the Palouse and Their Restoration | Becky Brown, Ph.D., Professor of Ecology at Eastern Washington University

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Counting Down Washington's 50 Rarest Plant Species

by Walter Fertig

In honor of the 50th anniversary of the Endangered Species Act, I compiled the following list of what I think are the 50 rarest vascular plant species in Washington State. These species are prioritized by their range-wide abundance and distribution, degree and imminence of threats, and downward trends. A number of worthy species just missed the cut, and the actual number of high priority plant taxa in Washington is probably closer to 75–100. As with any compilation (such as best sports teams, greatest movies, or favorite entertainers), readers are likely to disagree with my assessment and I welcome the opportunity to have a robust and friendly debate.

It is notable that only two of the top 10 species are currently listed under the Endangered Species Act, while one other is a candidate for listing and one was recently delisted. About one-quarter of the species in the top 50 ought to be designated as candidates for potential listing under the ESA, while the remainder would benefit from additional field surveys to assess their current status.

1. *Eriogonum codium* (Umtanum buckwheat). USFWS: **Threatened**; WA State **Endangered**. G1/S1. Endemic to the Hanford region of central Washington and known from a single native population, first found in 1993 and named as a species in 1995. Monitoring since 1997 has documented a decline of nearly 60% due to several severe wildfires, long-term drought, and poor recruitment. Only 2,300 plants were observed in the latest census in 2023. Out-plantings in potential habitat in the vicinity and at higher elevation sites are being attempted with mixed success (mortality is high, but some plants have survived for several years and flowered).



Eriogonum codium. PHOTO: WALTER FERTIG

2. *Artemisia campestris* var. *wormskioldii* (Wormskiold's northern wormwood). USFWS: **none**, former **Candidate**; WA State **Endangered**. G5T1/S1. Endemic to the Columbia

River, this taxon is currently known from only two remaining wild populations in Washington (historical occurrences in Oregon and elsewhere in Washington are extirpated). Var. *wormskioldii* flowers in early spring, traditionally before mid-summer flooding of the Columbia would inundate its shoreline habitat. Regulation of river flows from a series of dams has allowed the more common var. *scouleriana* and many weedy species to become established in the same habitat and displace *wormskioldii*. Washington populations have declined from about 2,000 individuals in the early 2000s to between 20–60 since 2017 (one year after USFWS found listing this taxon under the ESA “unwarranted”). Six out-plantings have been established in Washington and Oregon, though population numbers remain small.



Artemisia campestris var. *wormskioldii*.
PHOTO: WALTER FERTIG

3. *Hackelia venusta* (showy stickseed). USFWS: **Endangered**, WA State **Endangered**. G1/S1. Endemic to Tumwater Canyon near Leavenworth, white-flowered showy stickseed is currently known from a single native population that has varied from 200–500 individuals over the past 13 years. Additional populations of blue-flowered plants from higher elevations in the Wenatchee Mountains are now considered a separate species, *H. taylorii* (see #21). Low population numbers may be impeding pollination and seed production, and fire suppression is leading to long-term increases in shrub density in its habitat. The University of Washington Rare Care program has been attempting reintroductions at several sites in its historical range but getting plants to germinate and survive remains a challenge.

4. *Castilleja victoriae* (Victoria's paintbrush). USFWS: **none**. WA State **Endangered**. G1/S1. Described as a new species in 2007, Victoria's paintbrush is a yellow-flowered annual endemic of the San Juan and Gulf Islands in Washington and British Columbia where it occurs in small vernal pools. The single population from Washington declined by 99% from 2013 to 2019. Populations are threatened by rising sea levels and impacts from Canada geese.



Castilleja victoriae. PHOTO: MARK EGGER

5. *Penstemon hesperius* (tall beardtongue). USFWS: **Candidate, WA State Endangered. G1/S1.** *Penstemon hesperius*

was recognized as a species in 1932 (though first collected by David Douglas in the 1820s) and is endemic to the Columbia River in the vicinity of Portland, OR and Camas, WA. It was later synonymized under *P. rydbergii*, a species more typical of the Rocky Mountains and then not observed in the wild for nearly 75 years until being relocated in 2008. It is currently known from three small extant populations in Oregon and one in Washington on lands protected by the Washington Department of Natural Resources (DNR). Additional unsurveyed habitat may occur on private lands near the Columbia River or at Camp Bonneville, a former military base. This species occurs in small openings in moist oak/ash forests in Washington, but historically might also have been found in open, wet meadows. Populations are threatened by habitat loss from reservoirs and urban sprawl.



Penstemon hesperius. PHOTO: WALTER FERTIG

6. *Oreocarya* (*Cryptantha*) *leucophaea* (gray cryptantha). USFWS: **none, WA State Threatened. G2G3/S2.** This central Washington endemic is restricted to shifting sand dunes mostly near the Columbia River and its tributaries. Historically, it was known from as many as 45 occurrences, of which over one-quarter are now historical or extirpated. Most remaining populations are extremely small and highly impacted by inva-

sion by annual weeds, dewatering, loss of pollinators, or dune stabilization. Mark Darrach and Katy Beck revisited the most well-known sites in 2023 and found population numbers to be significantly lower than in the 1990s.

7. *Astragalus australis* var. *cottonii* (Cotton's milkvetch). USFWS: **none; WA State Threatened. G2Q/S2.** A local endemic of alpine limestone outcrops in the Olympic Range, this species is highly vulnerable to impacts from predicted climate change. Tom Kaye established demographic monitoring plots in the 1980s that showed a downward trend and estimated the total population at about 4,300 individuals. Site visits by Wendy Gibble and Rare Care staff in recent years have found a sharp decline in total numbers.

8. *Astragalus sinuatus* (Colockum milkvetch). USFWS: **none; WA State Endangered. G1/S1.** This endemic of sagebrush grasslands in the foothills south of Wenatchee is known from a single occurrence on Colockum Ridge. Most of the habitat is protected within the Upper Dry Gulch Natural Area Preserve and adjacent private lands. The entire area has been subjected to several wildfires in recent years which have eliminated much of the sagebrush cover and resulted in invasion of introduced annual grasses and weeds. Population numbers can vary from year to year (suggesting the species may exhibit prolonged below-ground dormancy) but have averaged about 32,000 plants.



Astragalus sinuatus. PHOTO: WALTER FERTIG

9. *Delphinium leucophaeum* (pale larkspur). USFWS: **none; WA State Endangered. G4T2/S1.** Pale larkspur is a prairie endemic restricted to the southern Puget Trough and Willamette Valley in Washington and Oregon. These grasslands

have been highly fragmented by conversion to farmland, urbanization, and competition from invading woody shrubs and trees or non-native annuals. Prior to 2023, it was known from a single remnant population in Lewis County with less than 30 plants (the population had formerly contained over 1,000 individuals until part of it was converted to a blueberry farm). A second population was discovered in 2023 on Washington Department of Fish and Wildlife lands south of Olympia. Long-term trends remain poor, however, without protection of additional populations or active management to maintain prairie conditions.



Delphinium leucophaeum. PHOTO: WALTER FERTIG

10. *Castilleja levisecta* (golden paintbrush). USFWS: formerly Threatened, delisted in 2023; WA State Threatened. G2/S2. Thanks to efforts spearheaded by USFWS, 10 new golden paintbrush populations have been established in Washington and over 30 in Oregon (where the species had become extinct in the 1930s). Ten other native populations remain in Washington (as well as a few small sites in British Columbia). The success of the out-plantings prompted USFWS to propose delisting golden paintbrush in 2021 (the ruling was made official in 2023). Unfortunately, the total number of native and out-planted individuals has declined by over 50% since reaching a peak of 560,000 individuals in 2018. Most out-planted populations initially experience exponential growth but then decline sharply to lower, but more sustainable numbers and densities. More worrisome is the continued decline of the remaining native occurrences, which have decreased by 78% since 2000 despite efforts to augment numbers with additional seed or plugs. Rocky Prairie, once the largest native occurrence (and the seed source for most introductions) has declined from over 15,000 plants in 1983 to just 350 last year (a drop of 97%). Although 28 of 52 populations of golden paintbrush in Washington and Oregon are formally protected, threats to the species remain extremely high from hybridization with harsh paintbrush (*C. hispida*), loss of pollinators and reduced seed production, and extreme weather events and drought (such as the May-June heat domes in the Pacific Northwest in the past five years). Golden paintbrush, like many other rare prairie species, is highly dependent on human management to control encroachment of woody vegetation and invasive non-native weeds. Without ESA protection, costly management actions and monitoring are less likely to take place, and the species loses its few legal protections on federal lands. Premature delist-

ing threatens to undo the years of conservation efforts that have benefited this species.

11. *Silene spaldingii* (Spalding's catchfly). USFWS: Threatened. WA State Threatened. G2/S2. Spalding's catchfly is a grassland endemic of Palouse and Channeled Scabland regions of eastern Washington and remnant prairies of NW Montana, W Idaho, NE Oregon, and southern British Columbia. Forty-six extant and eight historical occurrences are found in Washington, most containing 1–100 individuals. This species has been impacted by conversion of grasslands to agriculture, wildfire, herbivory, competition from invasive plants, and habitat fragmentation (potentially impeding pollination, seed production, and gene flow). USFWS has identified 9 key conservation areas in Washington to focus management and recovery efforts. Out-plantings have been attempted at several sites but have been hampered by vole herbivory.



Silene spaldingii. PHOTO: WALTER FERTIG

12. *Lomatium knokei* (Knoke's biscuitroot). USFWS: none; WA State Endangered. G1/S1. Described as a new species in 2014, *Lomatium knokei* is still only known from a single seasonally wet meadow in the mountains south of Cle Elum. This population is bisected by a two-track road and is periodically impacted by aphids and gall-forming insects. It is locally abundant, but may number less than 1,000 individuals in total (the whole patch is less than five acres in size). This species is a high priority for additional survey work in wetlands on the east flank of the Cascades.

13. *Sidalcea oregana* var. *calva* (Wenatchee Mountain checkermallow). USFWS: **Endangered**; WA State **Endangered**. G5T1/S1. Var. *calva* is endemic to seasonally flooded meadows and drainages in conifer or aspen forests underlain by clay soils in the Wenatchee Mountains near Leavenworth and Peshastin. Only two large extant populations remain and six others are historical or extirpated. The largest population is protected within the Camas Meadows Natural Area Preserve (managed by the DNR). A 12-year census and mapping effort initiated by David Wilderman was completed in 2022 and recorded over 41,000 individuals. This taxon remains highly threatened by weevil predation on seeds, encroachment of woody vegetation from fire suppression, potential loss of pollinators, changes in hydrology, and climate change.



SEM image of the tip of a calyx lobe showing the diagnostic ciliate hairs of *Sidalcea oregana* var. *calva*. PHOTO: ZOE SCHAEFFER

14. *Rubus nigerrimus* (Northwestern raspberry). USFWS: **none**; WA State **Threatened**. G2/S2. This species is endemic to canyons along the Snake River in SE Washington, though it has also been reported from adjacent Idaho and Oregon. It is closely related to the widespread whitestem raspberry (*R. leucodermis*) and considered a variety of it by some authorities. Intermediate individuals suggest there may be hybridization. Populations have declined significantly in the past 15 years as Himalayan blackberry (*R. bifrons*) has become especially prevalent along the Snake River. New surveys are needed to assess the current status of *R. nigerrimus*, as well as genetic studies of its relationship with *R. leucodermis*. Efforts to control *R. bifrons* with herbicides could result in unintended mortality of Northwestern raspberry.

15. *Lupinus oreganus* var. *kincaidii* (Kincaid's lupine). USFWS: **Threatened**. WA State **Endangered**. G4T2/S1. Another prairie endemic restricted to the southern Puget Trough in Washington and Willamette Valley of Oregon, Kincaid's lupine is also the primary host plant of the federally endangered Fender's blue butterfly (*Icaricia icarioides fenderi*). Kincaid's lupine is currently known from six occurrences in Washington ranging in size from one to 1,500 plants. All known populations are on private or tribal lands, two of which are being actively managed for the species though not formally protected. In 2022, USFWS and staff of WA DNR and the Institute for Applied Ecology of Oregon State University identified several new sites for potential out-plantings in Washington.

16. *Calochortus nitidus* (broad-wing mariposa lily). USFWS: **none**; WA State **Endangered**. G3/S1. This showy pink-flowered species is endemic to moist swales in the Palouse grasslands of southeastern Washington and west-central Idaho. In Washington, most of its historic habitat has been converted to farmland or subdivisions. Only two small populations are currently extant in the state. It is somewhat more common in Idaho, though threatened by habitat loss there, too.

17. *Sisyrinchium sarmentosum* (pale blue-eyed grass). USFWS: **none, former candidate**; WA State **Threatened**. Pale blue-eyed grass is restricted to seasonally flooded meadows in southern Washington and northern Oregon between Mount Adams and Mount Hood. This species is known to hybridize with the darker purple-flowered Idaho blue-eyed grass (*S. idahoense*) at five of 14 extant sites in Washington. Other threats include changes in hydrology, loss of habitat to agriculture, grazing, erosion following timber harvest, residential construction, and habitat succession in the absence of periodic disturbance. Most populations appear to be stable in the short term, though monitoring is challenging due to problems identifying plants in dense vegetation or if the flowers are closed due to weather. USFWS was petitioned to list this species in 2009 but ruled in 2018 that listing was not warranted.

18. *Physaria douglasii* ssp. *tuplashensis* (White Rim bladderpod). USFWS: **Threatened**; WA State **Endangered**. G5T1Q/S1. This subspecies of the wide-ranging *Physaria douglasii* is restricted to a narrow band of the Ringold Formation that extends for about 11 miles along the east bank of the Columbia River in the Hanford Reach National Monument and adjacent private lands. Population numbers may vary widely from year to year based on census data of reproductive plants, but such counts have not included vegetative individuals. Long-term demographic monitoring is needed to better determine population fluctuations and potential threats from drought and competition from invasive annual weeds. Wendy Gobble of Rare Care has attempted to start new satellite populations in similar areas along the Columbia River, but the long-term success of these colonies is not yet assured.

19. *Sidalcea nelsoniana* (Nelson's checkermallow). USFWS: **formerly Threatened, delisted 2023**; WA State **Endangered**. G2G3/S1. Nelson's checkermallow is found primarily



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opos of Arrowleaf Balsamroot (*Balsamorhiza sagittata*) turn yellow in spring as the blooms lift their heads toward the sun. Photograph by Jurgen Hess.

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in wet prairies in the Willamette Valley of western Oregon, but two wild populations were discovered on private lands in SW Washington in the early 1990s. Two additional out-plantings have been established at Ridgefield and Steigerwald National Wildlife Refuges in Clark County. Populations in Oregon are sufficiently large to meet recovery goals and the species was officially delisted in October 2023. Washington populations remain small and vulnerable to habitat loss, hybridization with other *Sidalcea* species, de-watering, herbicides, and mowing. Shortly after USFWS announced its intention to delist this species last year, one of the unprotected private land sites in Washington was mowed, resulting in mortality to most of the population.



Sidalcea nelsoniana. PHOTO: WALTER FERTIG

20. *Spiranthes diluvialis* (Ute ladies'-tresses). USFWS: **Threatened; WA State Endangered.** G2G3/S1. When it was first listed in 1992, Ute ladies'-tresses was known from only 10 extant and seven historical occurrences in Colorado, Utah, and Nevada. Over the next decade it was discovered in over 50 additional locations in Idaho, Montana, Nebraska, Washington, Wyoming, and British Columbia. The species is found in a variety of early successional habitats along stream, river, and lake shores and sub-irrigated meadows. Four populations are now known in Washington from the vicinity of the Columbia River and a small alkaline lake in northern Okanogan County. Populations are stable to declining mostly due to impacts from non-native weeds or vegetation succession. Like several other wetland or prairie species, Ute ladies'-tresses needs long-term

intensive management to maintain appropriate habitat conditions. Such management is greatly enhanced by listing under the ESA, which helps provide funding and legal support. Premature delisting of such species can have the unintended effect of actually making conservation more difficult.

21. *Hackelia taylorii* (Taylor's stickseed) USFWS: **no status; WA State Endangered**

22. *Howellia aquatilis* (water howellia) USFWS: **formerly Threatened, delisted in 2021; WA State Threatened**

23. *Trifolium douglasii* (Douglas' clover) USFWS: **no status; WA State Endangered**

24. *Isoetes minima* (least quillwort) USFWS: **no status; WA State Endangered**

25. *Arenaria paludicola* (swamp sandwort) USFWS: **Endangered; WA State Extirpated**

26. *Lathyrus holochlorus* (thin-leaved peavine) USFWS: **no status; WA State Endangered**

27. *Castilleja chambersii* (Chambers' paintbrush) USFWS: **no status; WA State Endangered**

28. *Lomatium roneorum* (Leavenworth biscuitroot) USFWS: **no status; WA State Endangered**

29. *Erigeron peregrinus* var. *thompsonii* (Thompson's fleabane) USFWS: **no status; WA State Endangered**

30. *Geum rossii* var. *depressum* (Wenatchee avens) USFWS: **no status; WA State Endangered**

31. *Delphinium viridescens* (Wenatchee larkspur) USFWS: **no status; WA State Threatened**

32. *Astragalus asotinensis* (Asotin milkvetch) USFWS: **no status; WA State Endangered**

33. *Oxytropis campestris* var. *wanapum* (Wanapum loco-weed) USFWS: **no status; WA State Endangered**

34. *Arabis olympica* (Olympic rockcress) USFWS: **no status; WA State Endangered**

35. *Oxytropis campestris* var. *columbiana* (Columbia locoweed) USFWS: **no status; WA State Endangered**

36. *Ranunculus tritermatus* (obscure buttercup or Dalles Mountain buttercup) USFWS: **no status; WA State Endangered**

37. *Sabulina sororia* (Twin Sisters sandwort) USFWS: **no status; WA State Endangered**

38. *Symphotrichum jessicae* (Jessica's aster) USFWS: **no status; WA State Endangered**

39. *Pyrrocoma scaberula* (Palouse goldenweed) USFWS: **no status; WA State Endangered**

40. *Polemonium pectinatum* (Washington Jacob's ladder) USFWS: **no status; WA State Threatened**

41. *Phacelia lenta* (sticky phacelia) USFWS: **no status; WA State Threatened**

42. *Rorippa columbiae* (Columbia yellowcress) USFWS: no status; WA State Threatened

43. *Meconella oregana* (white meconella) USFWS: no status; WA State Endangered

44. *Sullivantia oregana* (Oregon coolwort) USFWS: no status; WA State Endangered

45. *Pedicularis rainierensis* (Mt. Rainier lousewort) USFWS: no status; WA State Sensitive

46. *Astragalus riparius* (Piper's milkvetch) USFWS: no status; WA State Threatened

47. *Erythronium quinaultense* (Olympic fawn-lily) USFWS: no status; WA State Threatened

48. *Dodecatheon austrofrigidum* (frigid shooting-star) USFWS: no status; WA State Endangered

49. *Lomatium bradshawii* (Bradshaw's lomatium) USFWS: formerly Endangered, delisted 2021; WA State Endangered

50. *Navarretia leucocephala* ssp. *diffusa* (Washington pincushion-plant) USFWS: no status; WA State Endangered.

For the complete list and discussion of all the species in the top 50, visit the WNPS website in April.



A Population Viability Assessment of the Threatened Washington State Endemic Species Gray Cryptantha

by Katy Beck and Mark Darrach

Introduction

We received a plant conservation research grant from WNPS to undertake a population viability assessment of the Washington narrow endemic plant species gray cryptantha—*Oreocarya leucophaea*. During the last couple of decades we have both witnessed (and heard rumors from other botanists) an on-going population decline of this species. In addition to assessing population numbers and habitat quality, we were excited to investigate other aspects of gray cryptantha's natural history, including its mating system, life history, seed set, pollination ecology, longevity, associated plant species, and threats to its remaining populations and habitat.

Background

Gray cryptantha (*Oreocarya leucophaea*) is a Washington Natural Heritage Program (WNHP) state Threatened species and classified as globally rare. It is a showy, white-flowered perennial in the Borage family. Year after year, it produces prolific numbers of inflorescences. The genus name *Oreocarya* probably sounds unfamiliar to most as the name was, until recently, a subgenus under *Cryptantha*. Molecular evidence clearly

indicates that *Oreocarya* is in a separate sister clade to *Cryptantha* (Hasenstab-Lehman and Simpson 2012). Thus, the name *Oreocarya* now applies strictly to only the perennial members that were previously assigned to *Cryptantha*.

There are 45 Element Occurrences of gray cryptantha in the WNHP database (an occurrence is a biologically defined population where a species is, or was formerly, present) (WNHP 2023a). We evaluated maps and descriptions of the 45 occurrences and determined that approximately 25 of them (56%) are likely to be, or are known to be, extirpated. Another 8 (18%) are in decline. Of the remaining 12 occurrences, we decided to focus most of our field efforts on five that we suspected might still have the potential for long(er) term population viability and successful plant recruitment.

Habitat

Gray cryptantha is a sand dune obligate. It is restricted to low elevation sandy substrates and partially stabilized sand dunes that occur in the lower Columbia Basin, primarily along and near the Columbia River. Precipitation within its range averages 18–23 cm per year (WRCC 2023). Gray cryptantha is usually found growing on bare sand with few other associated species in the immediate vicinity.

Sand dune habitats require reliable replenishment of sand-size particles and a consistent wind regime to persist on the landscape. Frequent high velocity winds are a salient feature of the weather in the lower Columbia Basin. Prior to European settlement, there was an abundant regional-scale sand supply available as the ice-age floods left copious amounts across much of the landscape. It follows that there must have been a considerably larger suite of gray cryptantha populations occupying suitable sites. Following European settlement, large swaths of this sand-dominated landscape were converted to industrial scale agriculture, massive hydropower projects, housing and other types of development. Thus, major sources of sand for the establishment and maintenance of dune fields have largely been eliminated. This dramatic reduction in the source of sand has at least in part resulted in a decrease in dune activity and allowed for an invasion of other native and nonnative vascular plant species which have stabilized most of the dunes and dramatically decreased viable habitat for gray cryptantha.

The areal extent of active inland sand dune systems in Washington State was assessed in 1970 to be approximately 181,371 hectares (Hallock et al. 2007). A comprehensive reassessment of these dune habitats in 2006 tallied 43,282 hectares—a 76% reduction (Hallock et al. 2007). The extent of inland sand dune systems in Washington has certainly been further significantly reduced since 2006. Most people are probably unaware that inland sand dune habitats even exist in Washington.

Wildfire Effects

After wildfires repetitively sweep across inland sand dune habitats, the vegetation invariably converts to cheatgrass-dominated annual grasslands with scattered shrubs, bunchgrasses and a small suite of resistant forbs. Thus, both plant diversity



Gray cryptantha (*Oreocarya leucophaea*) sand dune habitat. PHOTO: KATY BECK

(species richness) and vegetation community structure are radically altered. Individual gray cryptantha plants rarely survive wildfire as the buds of the next year's growth are entirely above ground. These wildfire and weed degraded sites do not recover and appear to be incapable of supporting successfully reproducing gray cryptantha populations. Recent rapid increases of catastrophic landscape-scale wildfires across the western U.S. and in shrub-steppe ecosystems of the interior Columbia Basin is very well-documented (Higuera & Abatzoglou 2021; Shinneman and McIlroy 2016; Brooks et al. 2015, Bunting et al. 2003).

Mating System

Observations of numerous gray cryptantha flowers indicate that it is an obligate outcrossing species characterized by a heterostylous mating system. In this situation, each plant has either short-styled 'thrum' flowers with the stigma situated below the stamens or long-styled 'pin' flowers with the receptive stigmas usually well exerted beyond the stamens. Both corolla morphologies do not occur on the same plant. This arrangement ensures that plant self-fertilization does not typically occur—even though, on rare occasions, it may. Species with this mating system are thus dependent on insects for reproduction.

Life History

Our observations indicate that gray cryptantha recruitment is in general poor. A total of 65 individual seedlings were noted amongst all of the occurrences we investigated. Nearly all seedlings are spatially associated with mature plants suggesting that seed dispersal distances are typically limited. Mature plants are also often distributed in distinct closely-spaced clumped distributions. Seeds are primarily dispersed by wind, although occasional dispersal by animals (zoochory) is likely as well, indicated by the stiff hairs on the abscised calyces that envelope the mature nutlets. It is likely that mature seed is rapidly buried in the mobile sand environment which likely explains the evidence of short dispersal distances. We suspect that larger numbers of seeds germinate and ultimately successfully recruit during spring seasons with favorable moisture and temperature

conditions. Conversely, larger numbers of seedling plants die or fail to germinate entirely during seasons with unfavorable climatic conditions. There is no information available that indicates whether the species has a seed-banking reproductive strategy, but we suspect that it does not have a long-lived viable seed bank.



Oreocarya leucophaea Pin Flower, Hanford Dunes, Benton Co. WA. PHOTO: KATY BECK

In order to get a general sense of pollinator efficiency, two to three infructescences with mature seed were collected from at least two separate plants at each occurrence we studied. All flowers on each infructescence were then evaluated under the microscope for seed set success. We counted how many of the 4 ovaries in each flower developed into mature fruit (nutlets); 0, 1, 2, 3, or 4. Though this element of the study did not have a statistically meaningful sample size, nor did it adhere to standard statistically valid sampling procedures, we did note a strong anecdotal trend that populations with fewer observed pollinators had a lower average seed set.

Interestingly, we observed that unlike most other perennial forbs lacking any woody above ground anatomy, the roots of gray cryptantha are distinctly woody. We collected, cross-sectioned and polished several roots of dead gray cryptantha plants, which revealed well-developed and easily counted annual growth rings. These few samples indicate that the species has an apparent maximum lifespan of approximately 10 years.



Cross section of *Oreocarya* root crown. PHOTO: KATY BECK

This relatively short lifespan apparently plays an important role in the rapid decline of the species.

Pollination

One of the more interesting aspects of our fieldwork was the incidental observation of pollinator visits to gray cryptantha flowers at each of the occurrences we visited. Most of the pollinators we observed were native bees in the genera *Bombus*, *Osmia*, and *Anthophora*. Non-native European honeybees (*Apis mellifera*) also provide pollination services at some of the populations, particularly those near agricultural sites. Several butterfly species and at least one diurnal moth species was also noted. Pollinators were very rare to largely absent at several of the occurrences.

At the limited number of occurrences we visited, we observed that there were very few pollinating insects in areas that have burned during the last 20 years. After wildfires, sand dune vegetation communities typically convert to cheatgrass-dominated annual grasslands. These burned weedy habitats are thus largely devoid of pollinators. Conversely, ecologically intact occurrences that are characterized by structurally complex vegetation and a diversity of native graminoid, forb, and shrub species invariably possess higher numbers (and more diverse suites) of pollinators. A positive and important result of our research is that even relatively small patches of intact sand dune

habitat harbor elevated pollinator species richness. Preserving these patches from burning should be a conservation priority.

Another factor that almost certainly plays a significant role in the decline of sand dune native plant habitats and gray cryptantha populations is that they are largely embedded within an industrial-scale agricultural landscape. These developed lands have insect pests and weeds that are primarily managed with numerous agricultural chemicals whose presence on and across the landscape is typically poorly constrained (Maggi et al. 2023; Tang et al. 2021). Pesticide drift distances can be significant, persistent, and diverse in highly managed agricultural landscapes (Coscolla et al. 2010). Additionally, pollinating insects can be expected to forage into pesticide impacted areas and return contaminated pollen and nectar to the nesting or hive site (Knapp et al. 2022). It can be reasonably assumed that pollinator decline at most sites can be traced, at least in part, to the long history of agricultural pesticide usage in the area. Insects with restricted foraging distances may be less susceptible to pesticide impacts, while pollinators with more extensive foraging ranges such as bumblebees (*Bombus*), and various butterfly species are very likely to be more severely affected (Knapp et al. 2022).

Plant Species Associates

Common associated native plant species include a combination of shrub-steppe generalists and sand dune obligates, including: bitterbrush (*Purshia tridentata*), big sagebrush (*Artemisia tridentata*), needle-and-thread grass (*Hesperostipa comata*), Sandberg's bluegrass (*Poa sandbergii*), Indian ricegrass (*Achnatherum hymenoides*), pale evening primrose (*Oenothera pallida*), crouching milk-vetch (*Astragalus succumbens*), and lemon scurfpea (*Ladeania lanceolata*). In addition, these habitats support a diverse suite of annual forbs, including several WNHP listed and review list species. Common weed species include cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola tragus*), tumblemustard (*Sisymbrium altissimum*) and filaree (*Erodium cicutarium*). Of these, cheatgrass is the most widespread and problematic as it can reach an estimated cover of over 90% in sandy areas with burned and degraded habitats.

Population Surveys

In order to optimally evaluate population size and observe pollinators, our gray cryptantha surveys occurred in May when most plants were at or near peak flowering. All plants were individually mapped with a GPS unit and had their life stage recorded (juvenile, vegetative, flowering or deceased). Our primary goal was to evaluate whether any of the putatively five best remaining gray cryptantha occurrences could be considered to have the potential for long term viability. This viability assessment was subjectively based on a combination of factors, including: plant numbers, the areal size of the occurrence, presence of juvenile plants, diversity and relative numbers of native pollinators, land ownership, overall habitat quality, and whether we thought a persistent sand supply for the dunes was present or not. We determined that only two or possibly three of the five still extant occurrences surveyed had most of the factors conducive to long term population viability. We



Bee approaching gray cryptantha (*Oregocarya leucophaea*), Grant Co., WA. PHOTO: KATY BECK

were alarmed to discover that the recently large and apparently healthy gray cryptantha population near Potholes Reservoir in Grant County had decreased from at least 2,429 plants in 2015 to approximately 250 plants—a 90% decline in only 8 years. It is unclear what factors have caused this precipitous population decline as the area has not burned. A massive contraction in pollinator abundance is strongly suspected, but unrecognized factors may play a role as well. The apparent collapse of this population highlights the urgent need to enact immediate conservation measures.

Discussion/Conclusions

The reasons for inland sand dune habitat degradation and loss and gray cryptantha population declines are complex and interrelated. Causative factors include combinations of: large-scale loss of the sand supply necessary for natural sand dune maintenance, ongoing habitat conversion to industrial scale agriculture and other types of development, increasingly frequent wildfires with the attendant spread of non-native vegetation, and apparently precipitous declines in insect pollinators.

It is apparent that an entire ecosystem element of the landscape in eastern Washington is at serious risk of collapse and outright disappearance with gray cryptantha and other sand dune obligate plant and animal species in tow. This year, we will be drafting and submitting a petition to have gray cryptantha listed under the Federal Endangered Species Act. Much of what we have learned about this fascinating and strikingly beautiful species has led to more questions about its life history and specialized habitat. We hope there are future opportunities for us to study it and to participate in active conservation measures in the near future.

Gratitude

We are very grateful to have spent time in the iconic inland sand dune habitat of Washington and to have studied gray cryptantha. We would like to thank the WNPS for its support and interest. We would also like to thank: Debra Salstrom and Richard Easterly of SEE Botanical Consulting, Walt Fertig of the WSU Marion Owenby Herbarium, Jesse Miller of WNHP, the Washington Rare Plant Care and Conservation Program, and the BLM Spokane field office. Lastly, thanks to our hardy fieldwork assistants John Hatten, Frieda Hatten-Beck and Lisa Beck, and, of course, Tsuga the always eager Bernese Mountain Dog.

Katy Beck has been a rare plant botanist for more than 40 years. Though her botanical wanderings have ranged from the Mojave Desert north to the Alaskan tundra, her heart lies in the shrub-steppe of Eastern Washington! Mark Darrach is a former USFS botanist and geologist who has been enamored with our native flora since his teenage years over 50 years ago. He has been studying the flora of the PNW since 1977 and has botanized all over the western U.S., and a bit in Latin America. He specializes in the genus Lomatium and allied genera and is author of the Lomatium treatment in the Flora of North America and Flora of the Pacific Northwest.



Our Gardens and Beyond: Why Truly Native Plants Matter More Than Ever

by Jim Evans

Native plants are the foundations of our ecosystems and, for many of us, our foundations of inspiration and hope. But our ecosystems, and the biodiversity they support, are in trouble. Because of habitat loss, the spread of invasive species, climate change, and other factors, both the numbers and diversity of insects (Wagner et al. 2021), songbirds (Rosenberg et al. 2019), amphibians (Luedtke et al. 2023), mammals, and more (United Nations 2019) are experiencing alarming declines. As native plant enthusiasts and stewards, we have an important role to play in helping to address these threats through promoting the contributions of native plants to landscapes large and small. For us to rise to this challenge, it's critical that we recognize what a real native plant is and fully appreciate the foundational role that native plants play in our ecosystems, and learn how to use them to help heal damaged habitats. An important part of this is to understand why introduced species and cultivars are not the ecological equivalents of native plants.

What is a native plant?

As members of a science-based organization founded to promote, appreciate, and conserve native plants, we should be in general agreement about what the term “native” really means when applied to plants and other organisms in our ecosystems. As cited in a recent *Douglasia* article, a WNPS working group in 2008 provided a practical definition:

“Washington native plants are those species that occur or occurred within the state boundaries before European settlement *based upon the best available scientific and historical documentation*” (Weinmann 2008). [Emphasis added]

This definition is significant both for the species that it includes and for those that it excludes, a distinction that matters greatly to all the other organisms, from soil microbes to large mammals, that share an evolutionary history with the plants we understand to be native.

An article in the Summer 2023 issue of *Douglasia* suggests that a definition of a native plant is a social construct, not a scientific one, and that gardeners can define for themselves what is native based on a loose set of criteria including aesthetics and personal preference. But such interpretations not only ignore the definition WNPS carefully crafted 15 years ago, they also ignore a growing body of scientific evidence regarding the co-evolution of native plants with other organisms in our ecosystems and how that co-evolution has resulted in the distinctive biological communities we see in the Pacific Northwest today.

Gardeners can, of course, select whatever plants they want in their home gardens or landscapes. But there is ample evidence that those of us who care about biodiversity and ecosystem

health—indeed, the health of the planet—should favor bona fide native species as much as possible in our home landscapes.

Is the concept of what is native an artificial construct?

In evolutionary terms, the species that were present in the Pacific Northwest before European settlement developed complex, often specialized ecological relationships with the rest of the organisms in their ecosystems (Tallamy et al. 2021, Forister et al. 2015). Understood from this perspective, a species' nativeness is not an artificial construct to the other species it has coevolved with in a community or ecosystem; it is a vital factor in ecological relationships that can make the difference between life and death, successful reproduction or the winking out of local populations. Native plants are intimately woven into the network of relationships that support food webs of complex interdependency, which in turn support the biodiversity, functions and processes of our ecosystems. They are not interchangeable with species that have not formed these relationships.



Bumblebee on trailing blackberry (*Rubus ursinus*). PHOTO: JIM EVANS

Mounting scientific evidence indicates that native plants provide a far more complete set of vital services to our ecosystems than non-native plants, including ornamentals. This is the case not only for native plants' role as pollinator resources (Seitz et al. 2020, Salisbury et al. 2015) but also for their under-appreciated role as hosts for insects and their larval stages (Tallamy et al. 2021, Richard et al. 2018, Yoon and Read 2016, Burghardt et al. 2010). Insects—"the little things that run the world" (Wilson 1987)—are vital processors and conveyers of energy in complex food webs, the strands of which we barely fathom but which are fundamental to the health of our ecosystems and to our own survival. Because of insects' irreplaceable roles in these food webs, the presence or absence of appropriate, co-evolved native host plants and their impacts on insect populations ramify throughout the rest of the ecosystems, most notably affecting populations of songbirds and small mammals (reviews in Tallamy et al. 2021 and Wilde et al. 2015).

While the plights of salmon and orcas are well known to most Northwesterners, far fewer of us are aware that insects

are exhibiting large-scale population declines in many taxonomic groups that are key to the health and functioning of our ecosystems. Leading entomologists consider habitat loss and alteration, including the increasing dominance of non-native plant species in our landscapes, among the factors contributing to these declines in important insect populations (Wagner et al. 2021, Forister et al. 2019). In response, leading entomologists, the Xerces Society for Invertebrate Conservation, and respected wildlife conservation organizations recommend increasing native plant species in our managed landscapes as one of the key strategies for supporting these populations (Kawahara et al. 2021, Shepherd 2022, National Audubon Society no date, National Wildlife Federation no date, Bramen, L. 2020).

Non-native plants have not been around long enough to have formed the kinds of specialized relationships that native plants have developed with their ecosystem neighbors over thousands of years (Forister et al. 2015, Burghardt et al. 2010). This can be true even for cultivars derived from native species, sometimes referred to as "nativars." Selective breeding for traits that are attractive to people can result in unintended genetic changes that make nativars unattractive, unpalatable, indigestible, or otherwise inappropriate hosts for native insects and their larvae. In addition, the loss of genetic diversity associated with the mass cloning of nativars in the nursery industry may reduce the fitness and adaptability of plant populations (Tangren 2019, Baisden et al. 2018, Wheeler 2017, White 2016, Wilde et al. 2015).

If specialized insects can't find the host plants and other resources they need, they'll disappear from those portions of the landscape. If songbirds can't find the large numbers of caterpillars and other insects they must have to feed their nestlings, that next generation will fail and local populations will wink out. And when similar problems are occurring across large areas, the chances of population replenishment from nearby habitats become more and more unlikely.

There is no call to remove all non-native plants from our gardens and managed landscapes (unless the species are invasive in natural areas). However, our neighborhoods and urban parks are typically already so dominated by non-native plants and cultivars (Kramer 2013) that it is vital for new plantings to be bona fide, wild type natives in order to increase the proportion of plants that provide critical support of every kind to the local ecosystem.

Fortunately, we in WNPS have some tools to help address these threats.

What do we mean by restoration?

"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed"
—(Society for Ecological Restoration 2023).

There is much misunderstanding about what ecological restoration is and is not. The aim of ecological restoration is not to turn back the clock to a pre-colonial past but to invest in a fu-



Insert herbivory on salmonberry (*Rubus spectabilis*) foliage. PHOTO: JIM EVANS

ture that benefits everyone by healing damaged and fragmented ecosystems. Knowing the vegetation a site or area supported in the past is one of the tools that can help guide these efforts, but only one of many. Planting—and celebrating!—native plants, whether in a window box garden or a large natural area, is a statement of hope that we can learn from past mistakes and recover as much of the life-sustaining functions of habitats and ecosystems as possible to support wildlife and ourselves.

Why choose native plants?

“To cultivate a landscape that adds to the local ecology rather than diminishes it, native plants are the way to grow the future.”
The Pacific Northwest Native Plant Primer (Currin and Merritt 2023).

However we perceive our gardens and home landscapes, they’re not static displays but part of the surrounding ecosystem. As stewards of our ecosystems, we have compelling reasons for selecting wild type native plants for our gardens and landscapes as much as for our natural areas. This matters. With our ecosystems stressed and challenged as never before, wild type native plant material provides for the most complete set of interactions with all the other components of our ecosystems and makes our home landscapes allies in the effort to support complex food webs, biodiversity, and ecological resilience in the decades ahead. In selecting plant materials for these landscapes, our best choices will be those guided by the best available science, not personal preferences unsupported by scientific evidence or expert opinion. WNPS has been, and should continue to be one of the sources of that guidance.

Jim Evans is an ecologist and educator on Vashon Island, a member of the South Sound Chapter of WNPS and a former WNPS Native Plant Stewardship Program Manager. Jim is actively involved in restoration of bird and wildlife as a volunteer with the Vashon-Maury Island Land Trust and on the board of Vashon Audubon. He can be reached at frangula54@gmail.com.



Chasing After Rare Plants of the Olympic Peninsula

by Patrick Loafman

Eight years ago, I began writing a flora for Washington State’s Coastal Range. Each summer, I have chased after plants; each winter, I have written and rewritten keys and plant descriptions. From this research, my best estimate is there are 1,584 plant species on the Olympic Peninsula. According to the University of Washington’s Burke Herbarium “Washington Flora Checklist” there are 3,702 species known for Washington State, so 43% of the state’s flora can be found on the peninsula. This is impressive when you consider that the Olympic Peninsula is only 5% of Washington’s total area.

Of the 1,584 plant species on the peninsula, 1,116 are native. How many species are rare? The plants endemic to the peninsula are rare globally, but many are common locally. The notable exception is the Olympic fawn-lily, *Erythronium quinaultense*, known from one area in the Quinalt. The Thompson’s wandering fleabane, *Erigeron peregrinus* var. *thompsonii* and the *Corallorhiza maculata* var. *ozettensis* are two endemic varieties that are also rare on the peninsula. How many other species are rare, at least locally, for the Olympic Peninsula? 168 species (15% of the native flora) have only been collected once, or have not been collected but are noted in Nelsa Buckingham’s 1995 *Flora of the Olympic Peninsula*, or documented by a photo posted on the Burke Museum’s web page. Many of these species are common elsewhere and some are more common than the collections suggest.

Some whole groups of species are rare, like the moonworts, Family Ophioglossaceae. Three of the nine species have only been collected at one locale (*Botrychium lanceolatum*, *B. pinna-tum*, *B. viride*) and the Northern Adder’s-tongue (*Ophioglossum pusillum*) is believed to be extirpated from the Olympic Peninsula. It was collected in 1925 in an area now flooded by the dam forming Lake Cushman and has never been documented since. Buckingham also reported the common moonwort (*Botrychium neolunaria*) and the little grapefern (*Botrychium simplex* var. *compositum*) as present, but there are no collections. Moonworts are renowned for being difficult to see. I went to a known site of northwestern moonworts (*B. pinna-tum*) a few years ago. I walked back and forth but could not see any. Then, I stood still, looking down, and below the other plants one seemed to materialize. Then, I saw another and another, and in the end, about a hundred moonworts of two species surrounded me.

Sometimes rare plants can be found in surprising places. A few years ago, I saw a grass growing beside Highway 112 by my house. I did not recognize it, and assuming it was a weed, I pulled it to ID later. It turned out to be a tufted lovegrass (*Eragrostis pectinacea*), a plant related to the grain teff, a native grass of Washington’s East Cascades, but not known for the peninsula. We know that weeds travel our roadsides, but native

plants do this too. If this native grass arrived via a car wheel, does that make it non-native? If it traveled in a bird crop, then it is native, right?

Lincoln Park in Port Angeles has two ponds stocked with trout and teems with ducks begging for bread; there's a disc golf course, green lawns, weeds and...rare plants. The dwarf montia (*Montia dichotoma*) is one of those plants. It lives up to its name, towering one centimeter tall. Early spring, hundreds of these tiny plants bloom, though no one seems to see them. They grow in what looks like a "waste land" heavily trampled beside hole #2 on the disc golf course. This is the only spot on the Olympic Peninsula where the dwarf montia is documented; it is typically east of the Cascades, but also on the San Juan Islands.

The bank of this park's eastern pond is covered with duck poop, trash, and a spurge, *Euphorbia serpillifolia*. Most spurges are exotic, but this one is native and is only known from this one spot on the Olympic Peninsula (it is another species more common east of the Cascades). Why here? Also at Lincoln are several other native plants uncommon for the peninsula (though not statewide): lineleaf miner's lettuce (*Montia linearis*), tiny mouseltail (*Myosurus minimus*), skunkweed (*Navarretia squarrosa*), Scouler's popcorn-flower (*Plagiobothrys scouleri*), and tall woollyheads (*Psilocarphus elatior*). All of these species are annuals. Throughout the year different species bloom, one after another, all tiny and unnoticed unless you lie on your belly.

Lincoln Park and the airport were named "Cook's prairie natural park" on an 1891 map. I have yet to find that name mentioned anywhere else, but the area looks like it was once a prairie. Prairie is used to describe everything from peatlands like Roose's Prairie near Lake Ozette, to the drier prairies of Thurston County. We think of camas (*Camassia*) when we think of prairies, but many other species live in these naturally open areas. These plants at Lincoln Park are a remnant of what once was here, like a history written by the flora.

When most people think of clovers, they picture the clover that grows in everyone's backyard, but there are thirty-eight species of clover (*Trifolium*) in Washington and twenty-five of these (65%) have been seen on the Olympic Peninsula. Not all clovers are weeds; ten of these are native, and three have only been recorded from one locale on the peninsula.

Last year while organizing my thousands of plant photos, I discovered a clover that was not labeled. Out came my Hitchcock and I keyed it to *Trifolium bifidum*, the notch-leaf clover. I checked the Burke Museum web page and discovered only two collection sites for Washington: one from Seattle area in 1889 by C. V. Piper; the other near the Oregon border in 1881 (and again in 1911) by Wilhelm Suksdorf.

Even though my picture was a few years old, I knew exactly where I took it. It's not far from home, so off I went, driving half-an-hour, hiking another hour, into a rocky bald. I looked around, and began thinking it's too late in the year. Then I saw

one, mostly dead (they're annuals) and then another in flower. I double-checked my ID, then rolled around in the dirt, photographing them. There were only two plants, so I was not going to collect a specimen. I grabbed a handful of seeds, spread them out, covered them with fine soil, then took out my water bottle and watered them. Next year, I will come back and hopefully find more than two plants.

Some say learning science is important because it teaches people to be rational and logical, but to me, the main benefit of learning biology is empathy. When you learn the names of the plants surrounding you, they become personalized. You start seeing the world from the view of a tiny flower, or a moonwort, or a nearly dead clover.

I aim to have my book finished in a year. I look forward to winters without endless book edits. But my summers will not change. I will always chase after plants.

Patrick Loafman is a life-long seasonal biologist researching plants, herpetofauna and birds since 1988. For the past thirty years he has worked at Olympic, Mount Rainier, and North Cascades National Parks. He has seen 84% of the flora of the Olympics and is still actively searching for that last 16%.



2024 American Penstemon Society Annual Meeting in Southeast Washington

The American Penstemon Society is a nationwide organization founded in 1946 by gardeners and naturalists who love Penstemons. The Society is holding its annual meeting and field trip in Washington on the weekend of June 21-24 in Pullman. Evening programs on Friday, June 21 and Saturday, June 22 will feature slide shows by Walter Fertig on "Penstemons and other interesting plants of the Blue Mountains" and Mark Darrach on "Geology of the Blue Mountains and how it affects plant species." Field trips on Saturday and Sunday will explore the Penstemon-rich flora of the Blue Mountains and vicinity in Washington and Idaho. WNPS members are encouraged to participate. For more information and to register for the meeting, see the APS website at <https://penstemons.org>.



Blue Mountain penstemon (*Penstemon pennellianus*), endemic to the Blue Mountains of SE Washington and NE Oregon. PHOTO: WALTER FERTIG



***Salmon, Cedar, Rock & Rain:*
Washington's Olympic Peninsula
by Tim McNulty with Wendy
Sampson, Loni Greninger,
Gary Morishima, Maria Parker
Pascua, Francine Swift, Jamie R.
Valadez, and Lynda V. Mapes.**

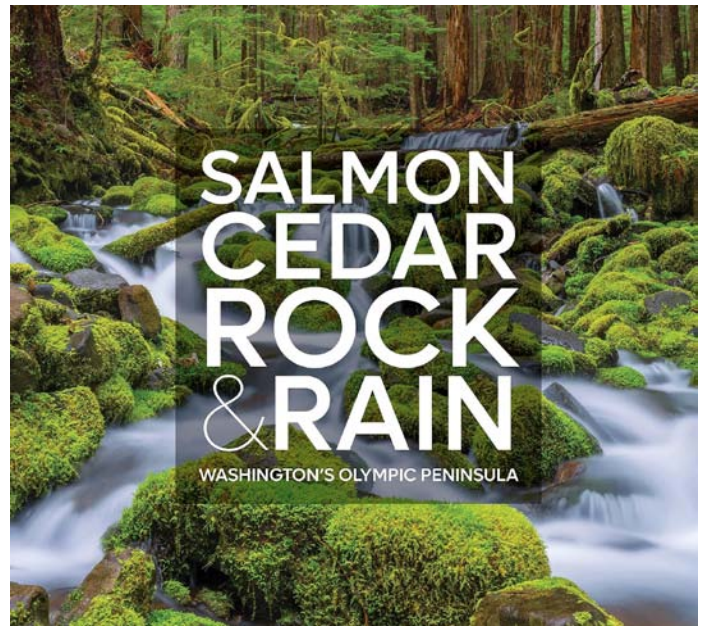
Reviewed by Cheryl Lowe, Olympic Peninsula Chapter

I was introduced to this book when I attended a book reading at our local library. It was standing room only, of course. People who live near here love this corner of the world. The featured speakers were a few of the contributors to this book, each one passionate, articulate, and gracious as they shared their perspectives.

At first glance, *Salmon, Cedar, Rock & Rain* looks like a beautiful coffee table book with evocative photos interspersed with essays about the Olympic Peninsula. It is certainly that, but so much more. The book, published by Braided River, a conservation imprint of Seattle's nonprofit Mountaineers Books, is a thought-provoking collection of voices and perspectives about the Olympic Peninsula. The book weaves together highlights about the Olympic Peninsula's natural beauty, distinctive geology, native flora and fauna, and complex history with the voices of the Indigenous Tribes who were part of this landscape for millennia before European explorers arrived. Stunning images contributed by over two dozen photographers trigger fond memories of places I've been and also encourage a closer look at small intricate details of new and familiar places.

This book has changed how I see and experience the diverse forests, river valleys, alpine meadows, and dramatic coastlines of the Olympics. As I explore the trails of the Olympic Peninsula, I notice that my default observation mode is usually to identify familiar native plants by name (or at least try to). But a label is only one of many ways to understand things.

After reading this book, a forest walk is no longer just about which native plants and birds I might see; I now think about how grazing elk herds have redirected forest habitat structure and composition. The names of trails and camps on my maps are no longer just a hiking destination; they become questions about the naming of things and European hubris and pondering what Indigenous names for these places might tell me about cultural traditions and spiritual connections. I am inspired by the efforts of the Lower Elwha Klallam Tribe and its sister tribes to reconnect their language to the landscape, to focus on place-based learning, teaching the Klallam language in community schools and using traditional Klallam names for sacred places, seasonal camps and harvest areas.



Now when I look out from Hurricane Ridge at the vast landscape of mountain peaks stretching across the horizon, I think about Tim McNulty's essay called "A Wild Broken Confusion." With photos and words, he has given me a fresh way of thinking about the geology of the mountains, valleys, and shorelines of the Olympic Peninsula.

Consistent with the mission of Braided River's conservation focus, the various essays and photos are not just about beauty, but also history and the future. The various writers acknowledge the exploitations and tragedies of the past and the challenges of the present, always while looking to the future. Stories of restoration, whether it be the well-known Elwha River transformation or the return of sea otters to the Coast, introduce the many collaborations and commitments to continue protecting and preserving into the future even as the challenges of climate change grow.

For me, the essays that resonated the most are those written by the Indigenous People who have lived here and cared for this land "since time immemorial." Gary Morishima, speaking for the Quinault Indian Nation, but in many ways, for all the Tribes, acknowledges that each Tribe continues "to evolve as it contends with legal, economic, and political challenges; vagaries of federal policy; broken promises; and shocking duplicity. Their story is one of adaptation, vision, persistence, determination, healing and action to assume the responsibility to serve as agents of change. The past is prologue; the future is a work in progress."

Cheryl Lowe is a member of the Olympic Peninsula Chapter of the WNPS. She lives in Port Townsend, WA.



Remembering Helen and Richard McCammon

by Don Schaechtel

WNPS was grateful to receive a gift of \$6,074 from Richard McCammon prior to his death last year at age 90 at his home in Sequim. He and his wife Helen, who passed away in 2019, were longtime WNPS members.

Executive Director Denise Mahnke fondly remembers meeting them at the 2018 Botany Washington on the Long Beach Peninsula. Denise recalls: “Richard and Helen were the first to arrive and they shared with me pleasant memories of attending WNPS events over the years. They were both over 85 at this time, and had to define their own pace for participation. They walked slowly, but remained together for ongoing support throughout the weekend. You could see this lifelong practice of attending study events together was a highlight for them. I was struck by their kindness, appreciation, and desire to be out in the natural world together.”

Richard and Helen met as geology graduate students at the University of Michigan, when they both held assistantships at the Museum of Paleontology. They were married and moved to Indiana, where they completed PhDs at the University of Indiana. They raised two children and traveled worldwide as they pursued various research, teaching, and government positions.

Prior to retiring in Sequim, they lived in Washington D.C., where Richard led the Branch of Resource Analysis at the U. S. Geological Survey and Helen was the Director of Ecological Research for the Department of Energy.

They retired to Sequim in 1998, where they pursued their interests of hiking, travel, and hobbies. Helen's interest in gardening led her to become a Master Gardener. She later served on the Board of the Master Gardener Foundation.

Estate gifts from members like Richard and Helen help WNPS fund projects and day-to-day operations and are put to use in the service of the WNPS mission. Many thanks to the McCammons for helping to ensure that native plants in Washington have a voice.

For more information on planned giving call Executive Director Denise Mahnke or visit our planned giving webpage at www.wnps.org/donate/planned-giving.



Helen and Richard McCammon on a visit to Antarctica in 2006. COURTESY PHOTO

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Knowing your Grasses

June 26-28, 2024

University of Washington, Seattle

with Clayton Antieau, MS, PhD

Registration is now open for the Knowing your Grasses workshop. This Workshop focuses on both native and naturalized grasses, with an emphasis on the field identification of genera and species commonly observed in habitats of the maritime Pacific Northwest. The Workshop explores the adaptive characteristics, habitat affinities, and restoration role of grasses; most grasses are informative indicator species. Find more information and register online: <https://www.wnps.org/events/grasses-workshop>.

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Kincaid’s lupine
(*Lupinus oreganus* var. *kincaidii*)
at Boistfort Prairie.
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