

Douglasia

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Journal of the
WASHINGTON NATIVE PLANT SOCIETY

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



Editorial Notes

by Jim Kling, Editorial Committee Chair

When Beck Weathers woke up from a coma on the slopes of Mount Everest, alone, frost-bitten and half-dead, one of his first thoughts was: "...the cavalry wasn't coming so I better do something about it myself." (Krakauer 1999) He summoned the reserve to stand up and get out of the storm.

I have tried to adopt Weathers' attitude high on that mountain, and I bring it to my new position as chair of the WNPS editorial committee after a lengthy career as a science writer and over 15 years of editing the print and email newsletters of the Koma Kulshan chapter.

I have the privilege of taking the reins of an experienced, talented committee and I intend to, as another adage puts it, "let them cook." I hope to empower them to do that good work to continue the great tradition of *Douglasia*. I also see this magazine as a means to empower, inform, and inspire you, our statewide membership, to carry out the good work of our organization.

Because, my friends, the Cavalry isn't coming.

We are the Cavalry.

Literature Cited

Krakauer, J. 1999. *Into Thin Air*. Vintage.



Correction: In the 2025 Spring Issue, the President's Message misspelled Kristin Kloc's first name. Kristin Kloc is the Salal Chapter Chair.

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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On the cover: Shrubby cinquefoil (*Dasiphora fruticosa*) on Church Mountain with Mount Baker on the horizon in mid-July.
PHOTO: MARK TURNER

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President's Message: The View from Here

by Gail Sklar

Dear WNPS Members,

Happy Summer to all!

Spring is the season of renewal, which prepares us for the glory of summer in Washington. Washington Native Plant Society (WNPS) has been working hard to prepare. It has been a very busy year of preparation so far with much more to do! Three stewardship classes have graduated, two 30-hour stewardship classes and a 100-hour master steward class. Stewards will go back to their communities and make a difference. The 100-hour class graduated in 2024 in Federal Way, but the new stewards are working hard to complete their volunteer time working with Joe Albrecht, Stewardship Program Coordinator. Spokane's coordinator, Sarah Verlinde-Azofeifa, finished the 30-hour stewardship program in April! Bellingham finished another 30-hour program with Abe Lloyd as their coordinator in May. We celebrate and congratulate all the new stewards!



Native Plant Appreciation Month (NPAM), April 2025, *Exploring Biodiversity: Exercises in Community Science*, was very successful. The committee offered four wonderful webinars. The kick-off webinar was presented by Catherine Chang on *Using iNaturalist*. The next was *Community Science in Cascadia—A Two Part Program*, presented by Berry Brosi, on *MeadoWatch*, and Regina Rochefort, on *Monitoring Subalpine Butterflies as Indicators of Climate Change*. The third webinar was presented by Wendy Gible entitled, *Plant Conservation Through Citizen Science in Rare Care*. The fourth and last was *Five Needle Pine Citizen Science, Monitoring in the North Cascades, Washington* by Aaron Wells. For the first time, a Bioblitz was offered as a part of NPAM. All twelve chapters were invited to participate. Eight chapters participated. The chapter with the most observations was Central Washington. I am glad to see that this was such a successful event for WNPS. If you would like to view any or all these webinars, please go to wnps.org. Click on "Get Involved," go to "Recorded Events", and enjoy! Chairing NPAM since the end of 2018 has been a joy for me. However, I am stepping off this committee to let someone with fresh ideas take over. Is that someone you? If you are interested, please email wnps@wnps.org and let Denise Mahnke, WNPS Executive Director, know.

The Strategic Planning Committee has been working hard on a plan to help make WNPS even more effective. The committee developed suggested strategies including objectives and activities, and it is now working on developing five aspirational goals that will serve as a roadmap for WNPS over the next five years. All the suggested objectives and activities came from

those WNPS members who participated in a retreat in November. Each WNPS committee will determine how they will align with the goals and focus of the Strategic Plan over the next five years. The Strategic Planning Committee has been chaired by Heather Wendt, and the retreat was facilitated by Bob Steelquist. They deserve our sincere and deep gratitude.

As you know, we are entering a period of unprecedented challenges. You, our WNPS members, are the organization. WNPS is amid its annual renewal and donation campaign. This is very important right now as federal funds and many grant sources have been cut by the current administration. Your additional contributions are appreciated. I write a thank you note to each person or family who contributes \$250 or more, and I look forward to spending a large amount of time handwriting many thank you notes to many donors. I thank all the donors for your generosity, both of time and for your membership, and your generosity in giving to WNPS.

Heather Wendt asked me to remind all of you who are out hiking and enjoying our stunning native plants in their habitats and their animal companions, to be aware of your surroundings. You don't want to bend down to observe a plant and startle a snake as Heather did on her last hike. I am not sure who was more startled, Heather or the snake.

Enjoy your summer and please renew your membership!

Warmly,

Gail



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<https://bit.ly/3WUN0zq>

New Northern Range Extension for *Arnica discoidea* (rayless arnica)—Darland Mountain, Yakima County, Washington

by Thomas R. Belfield



Rayless arnica (*Arnica discoidea*) plant, June 19, 2023. PHOTO: THOMAS R. BELFIELD

Rayless arnica (*Arnica discoidea*), a member of the Asteraceae (Composite Family) is a western US endemic (geographically restricted to this area) found from Washington to California, east to Nevada. It first appears in the herbarium records in Washington from seven collections made in the Falcon Valley in Klickitat County from 1885 to 1926 by Wilhelm N. Suksdorf. A single collection of *A. discoidea* was made by David Biek with Susan McDougall on the northwest side of Mt. Adams in Skamania County in 2005. They speculated that plants at this location were an accidental introduction (Biek, pers comm. 2023).

Specimen records at the Consortium of Pacific Northwest Herbaria online database (www.pnwherbaria.org/data/search.php) indicate that *A. discoidea* var. *eradiata* was collected on August 5, 1974, in Pierce County at the Crystal Mountain Recreation Area. Examining the specimen image suggests that the plant is Parry's arnica (*A. parryi*). Another collection of *A. discoidea* is dated August 11, 1978, in Okanogan County from the south slope of Mt. Chapaka at 6,900 feet (2,103 meters) "in wet seepage," and in 1982 this specimen was determined to be *A. parryi*. An August 20, 2022, voucher of *A. discoidea* from Kittitas County collected at the trail head parking lot to Taneum Lake in "disturbed areas and dry hillsides in *Pinus contorta* forest" has not been determined; however, the examined specimen image suggests that it, too, is *A. parryi*. The similar rayless *A. parryi* has narrower leaves, and the heads are nodding in bud.

The *A. discoidea* site on Darland Mountain, Whites Ridge, in Yakima County is located in the managed ponderosa pine (*Pinus ponderosa*) forest occurring on lithosols and associated with pinemat manzanita (*Arctostaphylos nevadensis*). This location represents a new northern range extension of *A. discoidea*. A survey of the site on June 14, 2023, resulted in a count of 139 plants, both single plants and clusters of plants. The largest cluster was 24 plants. Surveys conducted on July 5th resulted in an additional 157 plants counted, for a total of 296 plants. Additional plants may be present (Belfield 2025).

This site was visited multiple times in 2023; plants were in full bloom in June and produced seeds in August. The site was visited again on May 1, 2024, as the plants were just emerg-



Rayless arnica (*Arnica discoidea*) inflorescence detail, June 19, 2023. PHOTO: THOMAS R. BELFIELD



Rayless arnica (*Arnica discoidea*) emergent spring leaves, May 1, 2024. PHOTO: THOMAS R. BELFIELD

Thomas R. Belfield is an unaffiliated botanist with a combined twenty years of experience working in that capacity for the US Forest Service in the Pacific Northwest and Alaska; the Bernice Pauahi Bishop Museum, Amy B.H. Greenwell Ethnobotanical Garden, Captain Cook, Hawai'i; and the National Park Service at Hawai'i Volcanoes National Park where he specialized in rare and endangered plant surveys, monitoring, and restoration. His education is that of a geographer: Master of Arts degree awarded by Department of Geography, University of Hawai'i, Mānoa, 2012.



Plant Profile:

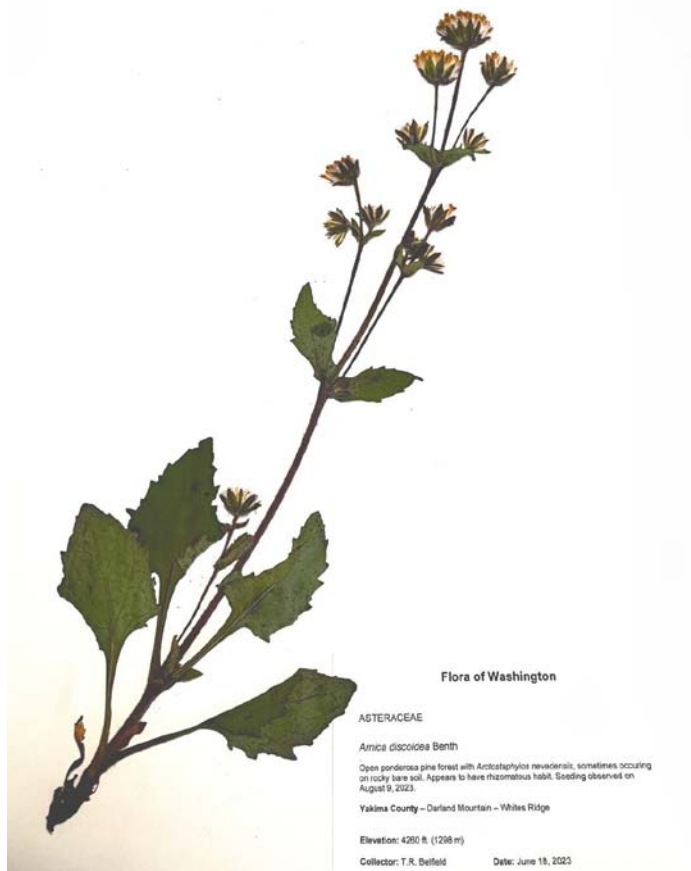
A Rose of Many Names: Shrubby Cinquefoil (*Dasiphora fruticosa*)

by Katherine Darrow

If I were granted a wish to live my next incarnation as a plant, shrubby cinquefoil (*Dasiphora fruticosa*) would suit me just fine. In that life, I might spend my days perched on a high, rocky, alpine ridge in the Olympic Mountains, blooming profusely mid-July. Or I might live in the gardens of a Tibetan monastery, doted on by a Buddhist monk who tends me daily



Shrubby cinquefoil (*Dasiphora fruticosa*) on a ridge near Buckhorn Mountain Trail, Olympic National Forest. PHOTO: KATHERINE DARROW



Rayless arnica (*Arnica discoidea*) voucher specimen. PHOTO: THOMAS R. BELFIELD

ing from the ground. In the accompanying image of emergent spring leaves, these plants share the same root system.

Arnica discoidea appears to have a rhizomatous habit as the plant grows in clusters of stems that are clearly connected to the same root systems. Given the size of the population, this species may be a relatively recent arrival to Darland Mountain. Somewhere to the south, it is only 60 miles as the raven flies from the Falcon Valley to Darland Mountains, seeds from *A. discoidea* were lofted into the air and travelled to land at a suitable site to germinate. Plant species at the edge of their ranges have long been of interest to botanists and plant ecologists. This category of plants has also been studied as climate change indicators (McNichol 2023). Two voucher specimens were collected in 2023 and were submitted to the University of Washington Herbarium, Burke Museum in 2024.

Literature Cited

- Belfield, TR. 2025. A Botanical Exploration of Darland Mountain, Yakima County, Washington. A Raven's Shadow Production.
- Consortium of Pacific Northwest Herbaria. 2024. <https://www.pnwherbaria.org/data/search.php>.
- McNichol BH, Russo SE. 2023. Plant species' capacity for range shifts at the habitat and geographic scales: A trade-off-based framework. *Plants (Basel)*. 12(6):1248. <https://doi.org/10.3390/plants12061248>.
- Wolf, SJ. 2006. *Arnica*. In: *Flora of North America* Editorial Committee, editors. 1993+. *Flora of North America North of*



Potted shrubby cinquefoil (*Dasiphora fruticosa*) ready to go for a spa treatment from a bonsai artist. PHOTO: KATHERINE DARROW

as part of his bonsai practice. Or perhaps I would be at home on a sandy bank of an interdunal pond along the shores of Lake Michigan in Illinois, where I first felt the inspiration to be a botanist as a child in this life. And so, as I do in my human life, I would prefer life as a shrubby cinquefoil to reside in the cooler climates of the northern boreal and temperate regions.

My cheerful five-petaled yellow flowers would attract numerous butterflies, bees, and many kinds of flies who would come to collect pollen or nectar. Thankfully, very few animals would find my foliage or twigs very tasty, so I would only occasionally be browsed or eaten by livestock, wildlife, or insects. However, I would gladly provide edible seeds and safe shelter for small mammals and nesting birds.

In Russia, all across China, as well as Tibet, and other Himalayan countries, I might be near some of my wild indigenous relations, the other ten shrubby cinquefoils that are also known as *Dasiphora*, our common genus. But if I were to stay here in Washington, I would be the sole species of *Dasiphora*, though I might have many neighbors also called cinquefoils, or *Potentilla*. I think I would like to live on Tahoma (aka Mount Rainier) up on Skyscraper Pass, where I could feel the cool winds rush down from the ancient glaciers of the mountain, and if plants can see, enjoy splendid views of the surrounding landscape.

In Washington, shrubby cinquefoil is most commonly found on rocky, alpine slopes throughout the state, but it also grows

wild in wet meadows and shorelines of lakes in the Palouse prairies, and among ponderosa pines east of the Cascade mountains. Some still call me shrubby potentilla, harkening back to the days when I was known as *Potentilla fruticosa* in botanical literature and still am by most horticulturists. Others have called me by the Latin binomial *Pentaphylloides floribunda*; unfortunately, this lovely, fluid name is considered “illegitimate” and “superfluous” by ardent taxonomists and systematists. I am told that these are not derogatory terms, but academic ones used in the International Code of Nomenclature for algae, fungi, and plants, a set of rules by which Latin binomials are validated and documented.

Interestingly, some botanists have called shrubby cinquefoil by the name *Fragaria fruticosa*, referring to close relatives, the strawberries. *Dasiphora* is one of twelve genera of roses that are members of the botanical Subtribe Fragariinae, rather than the Subtribe of *Potentilla* (Potentillinae). *Dasiphora* species don't have a delicious fleshy fruit like the strawberries; instead, they have dry hairy fruits called achenes, but they do share other traits at the molecular level. This is all more than I would like to think about while basking in the mountain sun, but it is comforting to know who I would be related to, and who my ancestors were. (If we go back far enough, I'm told, every living thing is related somehow!)



Shrubby cinquefoil (*Dasiphora fruticosa*) on Cathedral Peak in the Pasayten Wilderness. PHOTO: MARK TURNER

Being domesticated would not be my preference, but like many relatives in the vast Rose family (Rosaceae) (think apples, pears, plums, raspberries), there are dozens of hybrids and cultivars of wild *Dasiphora* species. Today they are planted in gardens around the world, living in urban and suburban areas throughout Europe and Asia, and across North America, maybe even in cooler climates in the southern hemisphere too. Some have fancy sophisticated names like “Day Dawn Viette” or “Vilmoriniana” or “Chelsea Star.” More than 130 of my kin have been recognized with the Royal Horticultural Society Award of Garden Merit in the UK.



Shrubby cinquefoil (*Dasiphora fruticosa*) flower, Blue Mountain Trail, Olympic National Park. PHOTO: SUSAN MCDUGALL

There are at least seven other botanical names that people have dubbed for what is currently legitimized as *Dasiphora fruticosa*. But that is nothing compared to all of the probably hundreds or thousands of common names people call shrubby cinquefoils, since, being a circumboreal species, it has a natural distribution all around the northern hemisphere in many different countries. Golden hardhack, shrubby five-finger, widdy, and tundra rose are some of my favorites. In Sweden, for instance, they call me *buskig fingerört*, which means “shrubby finger-herb” in English. In French-speaking regions, the common name is *potentille arbustive*.

You could make up your own name if you like. In my next life as a shrub, I would invite you to come sit beside me. Pluck some of my leaves, maybe a few slender twigs and some flower buds too, and make tea. In southeastern Russia, shrubby cinquefoils are also known as “kuril tea” for a soothing medicinal beverage that has been part of some traditional cultures throughout east Asia for thousands of years. Like the fresh flowers and leaves, the tea (or more correctly, an herbal infusion or “tisane,” since it is not made with true tea, *Camellia sinensis*), has very mild to no aroma. According to herbalists, the infusion is quite potent (hence the name of the genus *Potentilla*), strong enough to cure or at least stave off numerous ailments and is especially helpful for skin health. Some people today use it in shampoo for healthier hair! But be forewarned: I’ve read that the leaves have been used as an ingredient of arrow poison in some North American cultures.

If you’re feeling chilly and want to build a fire, gather some of the flaky bark from my trunk and stems for tinder to help

build the flames. This is another gift my kin have shared with humans since time immemorial.

I’m not ready to be a shrub yet but having visited with shrubby cinquefoils on many alpine slopes and valleys, as well as studying the extraordinary resilience and diverse ecological adaptability of this species, am looking forward to the possibility for my next journey into the great beyond.

Selected Resources

Many thanks to Potentilleae scholar, Dr. Barbara Ertter, for graciously responding to my inquiries about the nomenclature of *Dasiphora fruticosa*. Barbara is Curator of Western North American Flora, co-author for the species in Flora of North America, as well as author of many genera in the Rosaceae for the Jepson Manual of California.

Biota of North America Program (BONAP): bonap.net/TDC/Image/Map?taxonType=Species&taxonId=21302&locationType=County&mapType=Normal

Burke Herbarium Image Collection: www.burkeherbarium.org/imagecollection/

Flora of North America:

www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=109323

Manitoba Museum; Prairie Pollination:

prairiepollination.ca/fr/plante-plant/potentille_arbustive-shrubby_cinquefoil/

Missouri Botanical Garden Plant Finder: www.missouribotanicalgarden.org/PlantFinder/PlantFinderSearch.aspx

Potentilla fruticosa Bonsai: [/www.youtube.com/watch?v=uPfdTy6-vIY](https://www.youtube.com/watch?v=uPfdTy6-vIY)

Range plants of Utah, Utah State University Extension: extension.usu.edu/rangeplants/shrubs-and-trees/cinquefoil-shrubby

Siberian Health: Kuril Tea: de.siberianhealth.com/en/blog/prosiberia/post59750/

World Flora Online: www.worldfloraonline.org/taxon/wfo-0001017396#synonyms

Katherine Darrow is an active member and current newsletter editor of the Olympic Peninsula Chapter of WNPS and lives in Port Townsend, WA. She was inspired by the fig tree’s narrative in The Island of Missing Trees, a novel by Elif Shafak (2021), as a storytelling form for this article. You can e-mail her at kathydyndt@gmail.com with any questions, comments, or suggestions for future Plant Profiles.



WNPS Elections Coming in September

Elections for positions on the WNPS Board of Directors will be held in September 2025, via a special announcement with an electronic survey.

Paper ballots are made available to members by request. Please contact the office at info@wnps.org or call 206-527-3210 and a ballot will be mailed to you. Results will be posted online and in the Fall/Winter *Douglasia*.

The Critical Role That Herbaria Play in Plant Conservation

by David E. Giblin, Ph.D., University of Washington Herbarium, Burke Museum

In light of last year's 50th anniversary of the Endangered Species Act, I thought the timing was right to highlight the many ways that herbaria (botanical research collections of dried specimens) have and continue to contribute to the conservation of vascular plant taxa (species, subspecies, and varieties) here in Washington and elsewhere in North America. Successful plant conservation is a multi-faceted endeavor involving scientists, dried and living collections, collections databases, federal, state, and non-profit land management agencies, educators, legislators, and private landowners. The interdependency among these constituents is extensive. At the core of these conservation efforts are the localities, taxonomic identities, and scientific names (nomenclature) of the plants being conserved. It is in each of these contexts, but not only these contexts, that herbaria serve an invaluable role.

Herbarium collections in the US date back to the early 19th century on the East Coast, with many Pacific Northwest herbaria subsequently founded in the late 1800s and early 1900s. Dating back prior to even the time of Linnaeus (mid-1700s), botanists and naturalists have archived specimens of both common and rare plants in herbaria. The fundamental value of these specimens is that they are scientific evidence documenting a plant's occurrence in a particular place at a particular time. Of equal importance is that the identification of each specimen can be confirmed, corrected, or changed for as long as the specimen exists.

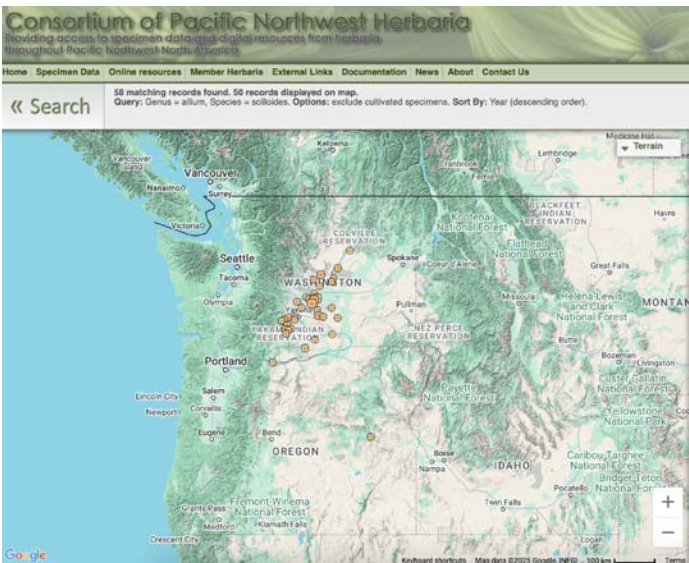


Figure 1. Distribution of scillalike onion (*Allium scilloides*) specimens, a species listed as sensitive by the Washington Natural Heritage Plan in its 2024 Washington Vascular Plant Species of Conservation Concern document, as viewed in the Consortium of Pacific Northwest Herbaria online database.

The First Rare Plant Lists

Passing of the Endangered Species Act contributed to the creation of state-level agencies and organizations (natural heritage programs) responsible for monitoring rare species, including plants. One of the first things that natural heritage program botanists did to create rare plant monitoring lists was visit herbaria to compile locality information from herbarium specimens. The practice continues today, though natural heritage program botanists do not need to visit the collections in-person due to many herbaria having been digitized (databased, imaged, assigned latitude and longitude values), thus enabling access to many of their specimens (Fig. 1).

Producing Floras and Describing New Rare Species

In both past and present times, herbaria have been the home of phytogeography and plant alpha taxonomy researchers. Phytogeographers study the distribution of plant taxa over space (e.g., western North America) and time (i.e., when did something arrive or how long has it persisted in a particular place). Plant alpha taxonomists study fine-scale diversity in ways that result in the description of new genera, species, subspecies, and varieties. Historically that work was done exclusively through the study of morphological characters (e.g., hairs, glands, simple vs. compound leaves, petal size, etc.) preserved in herbarium specimens, but increasingly alpha taxonomists are relying on molecular data to confirm their morphology-based findings.

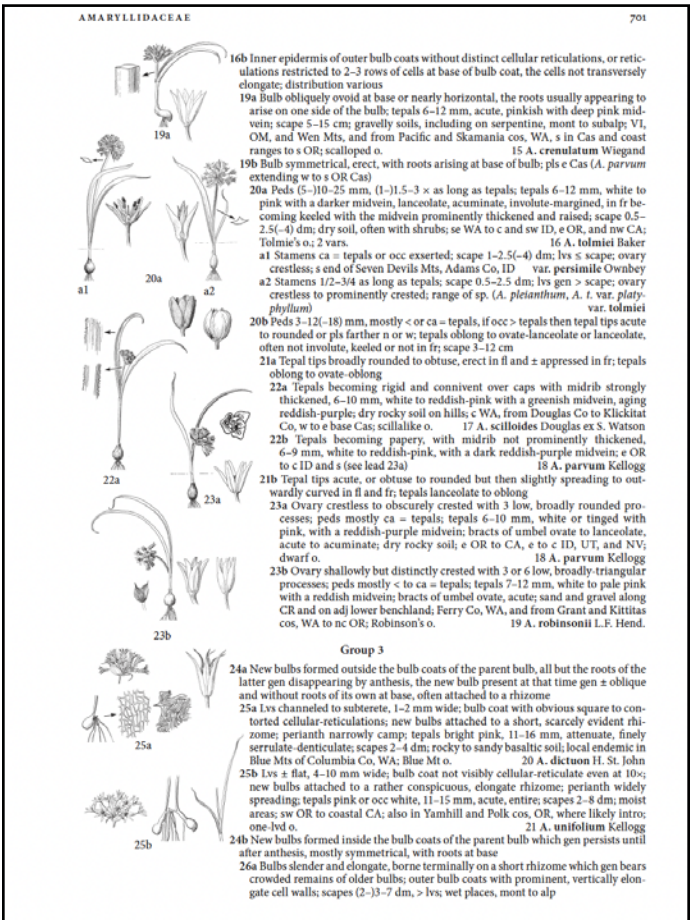


Figure 2. A page from *Flora of the Pacific Northwest*, 2nd ed. showing part of the identification key for the genus *Allium*.

The most conspicuous publications produced from phyto-geographic and alpha taxonomic research are local, regional, and continental floristic manuals (floras) (Fig. 2). Floras enable users to identify the plants of a region, have access to detailed species descriptions, learn which plants are rare, and become familiar with species distributions and habitat preferences. All floras are written based on herbarium specimens, past and present. The emergence of digital photography and the internet have elevated the supporting role of field-based photos. Through extensive field collecting and the examination of specimens to produce such floras, many new species have been discovered and described, including rare ones. A few quick examples, one historic and two recent, illustrate this point.

J. William Thompson, the fourth author listed on the 5-volume *Illustrated Flora of the Pacific Northwest*, was a phytogeographer and alpha taxonomist who worked out of the University of Washington Herbarium in the 1920s and 1930s. He collected extensively throughout Washington, but particularly in the Olympic Mountains and Wenatchee Mountains. His specimens supported the description of several species endemic to (i.e., restricted to) these areas and provided the locality information critical for present-day monitoring activities by the Washington Natural Heritage Program, Rare Care Program, US Forest Service, US Fish and Wildlife Service, and National Park Service (International Plant Names Index 2025, Miller et al. 2024).

In the mid-2000s Peter Dunwiddie and I conducted extensive surveys of small islands throughout the San Juan Islands. One trip generated a specimen that looked like something in the Orobanchaceae family but was unfamiliar to everyone (Fig. 3). Back at the University of Washington Herbarium of the Burke Museum, Research Associate Mark Egger, whose expertise is in the genus *Castilleja* (paintbrushes) instantly recognized it as an undescribed species from the southern Vancouver Island area that he had been contemplating with colleague Matt

Fairbarns. The discovery of this population in Washington contributed to their publication of the new species Victoria's paintbrush (*Castilleja victoriae*), and it remains one of the rarest plants in Washington (Fairbarns and Egger 2007) (Fig. 3).

While writing *Flora of the Pacific Northwest*, 2nd edition, University of Washington Herbarium volunteer Peggy Hudson, PhD, noticed that a group of specimens in the genus *Sabulina* consistently did not work in the key to Caryophyllaceae genera written by Ben Legler. Ben confided that he had noticed this issue as well, and Peggy's observation encouraged Ben to do the fieldwork needed to resolve this issue. This ultimately led to Ben describing two narrowly endemic species—basalt sabulina (*S. basaltica*) of the eastern Olympic Mountains and Twin Sisters sandwort (*S. sororia*) from The Sisters and adjacent North Cascades area (Legler 2018) (Fig. 4).



Figure 4. Twin Sisters sandwort (*Sabulina sororia*), endemic to the North Cascades and Mount Baker in Washington. PHOTO: ABE LLOYD



Figure 3. Victoria's paintbrush (*Castilleja victoriae*), endemic to the San Juan Islands and adjacent southern Vancouver Island. PHOTO: MARK EGGER

Facilitating Accurate Identification of Rare Species

Some common and rare species pairs look incredibly similar such that it is difficult for even skilled botanists to distinguish them in the field. Examples that come to mind include just about any rare sedge (*Carex*) growing among other common sedge species. Woodrushes (*Luzula*) also come to mind because the common spiked woodrush (*L. spicata*) can have an arcuate inflorescence like that of rare, curved woodrush (*L. arcuata*).

Observation-based checklists and online image repositories contain many erroneous *L. arcuata* localities, thereby compounding the challenges of knowing where it occurs and how best to protect it. Access to a number of accurately identified *L. arcuata* specimens in an herbarium, along with microscopes for making comparisons, makes accurate identification of these two species much easier.

Molecular Data Repository

In the 1980s scientists developed the ability to extract DNA from plant and animal tissue and use that information to better understand evolutionary relationships at multiple taxonomic ranks*. Prior to this, scientists had mostly used morphology to understand evolutionary relationships and to distinguish among taxa. While this system worked well for maybe 70% of the plant world, the plant world is huge (over 400 families, over 10,000 genera, and 350,000 species), so 30% is still a big number.

A couple of local examples of how DNA is being used in support of rare plant conservation highlight this point nicely. The genus desert-parsley or biscuitroot (*Lomatium*) is endemic to (restricted in its distribution to) central and western North America, and only recently has the true diversity of this genus been fully appreciated. There is incredible morphological similarity among several species that only DNA studies have been able to distinguish. Many of these species are rare and have ended up on state and federal rare plant lists. This notion of “cryptic species” is quite common in *Lomatium*, and the leaf tissue for these studies has been obtained through a combination of contemporary field work and using tissue of specimens in herbarium collections.

Refuge biscuitroot (*Lomatium refugianum*) was first collected by Gary Brill near Fife’s Peak in Yakima County in 2015 (Fig. 5). A team of researchers spread across the University of Wisconsin, Boise State University, College of Idaho, and the University of Washington Herbarium have been conducting DNA-based taxonomic research on *Lomatium* and have



Figure 5. Refuge biscuitroot (*Lomatium refugianum*), endemic to the mountains of Yakima County in Washington. PHOTO: MARK DARRACH

developed robust protocols for distinguishing among species based on DNA. Using tissue from Gary’s and other collections, they were able to confirm that *L. refugianum* is a distinct species with a very narrow distribution currently known only from western Yakima County (Darrach et al. 2024) (Fig. 5).

Documenting and Understanding Invasive Species That Threaten Plant Diversity

A major threat to some rare plant species and populations of rare species is the introduction, spread, and invasiveness of certain introduced species. Many invasive species were first documented in a region through the deposition of herbarium specimens, and specimens have been the basis for understanding the invasion dynamics of some invasive species. Waxy geranium (*Geranium lucidum*) was first documented in Clark County, Washington in 2005 by Carlo Abbruzzese of the Washington Department of Natural Resources (Consortium of Pacific Northwest Herbaria database 2025) (Fig. 6). Since that time, this introduced species, which has degraded large areas of prairies in Oregon’s Willamette Valley, has been documented throughout Washington’s I-5 corridor, and is now listed as a Class B Weed by the Washington Noxious Weed Control Board (Washington Noxious Weed Control Board 2025). With any luck, land managers will be able to keep it from spreading to Washington’s lowland western Washington prairies that are home to several rare plant species (Fig. 6).

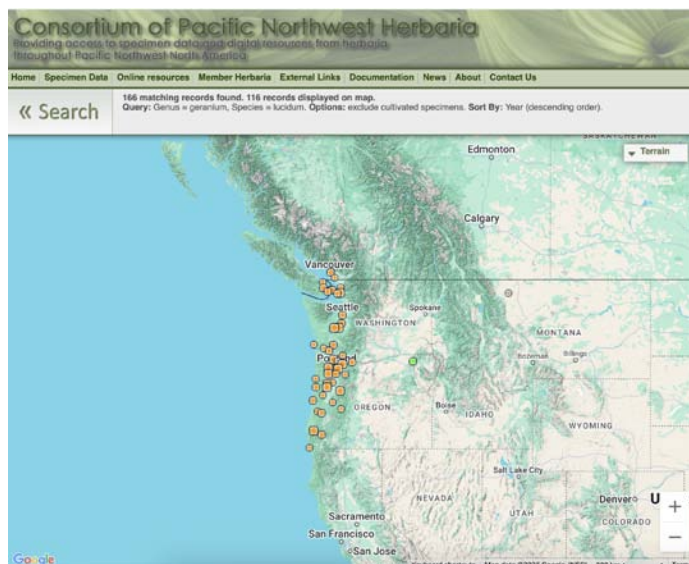


Figure 6. Distribution of waxy geranium (*Geranium lucidum*) from southern British Columbia to southern Oregon (Consortium of Pacific Northwest Herbaria 2025). Note the occurrence from northeastern Oregon based on a collection made in 2019, which shows how far east the species has spread.

Washington State University plant ecologist Richard Mack wrote a number of seminal papers explaining the introduction and invasion history of cheatgrass (*Bromus tectorum*). Perhaps no other introduced species in Washington threatens more rare plants than cheatgrass. This is because cheatgrass does best in Washington’s arid inland habitats, which also happens to be the home of a high percentage of Washington’s rare plant species. Cheatgrass emerges early and outcompetes native species for

limited water in the soil, and it helps increase the frequency and intensity of wildfires such that locally adapted rare plant species and populations can be driven to local extinction (extirpation).

Using specimens from herbaria across North America, Richard Mack was able to show how quickly cheatgrass spread once it became established, and by using molecular tools he was able to show that there were multiple introductions of cheatgrass populations rather than the current spread resulting from a single introduction (Mack 1981).

Final Thoughts

Conserving plants is a challenging, complex task. Many hands, minds, and resources are required for successful outcomes. The examples above highlight how herbaria in our region, and the researchers associated with them, contribute to these efforts using the collections available to them. The connection between herbaria and conservation is not unique to our area—herbaria exist across the globe and similarly contribute to plant conservation in those areas and beyond.

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*Not all systematists use nested hierarchical taxonomic systems such as the Linnaean one (e.g., species, genera, family, order, etc.), but for the purpose of this article the Linnaean system is used. Google “PhyloCode” or “rankless taxonomy” if you are interested in learning more.

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David Douglas, Botanical Explorer: Part 2

by Ed Alverson

(continued from the previous issue)

Recognizing the floristic differences between the east and west sides of the Cascade Mountains, Douglas felt a need to spend more time collecting in the drier lands east of the Cascades. Thus, most of the spring and summer of 1826 was spent working out of Walla Walla, and on up the Columbia River to Fort Colville, near Kettle Falls. From Walla Walla, Douglas explored the Blue Mountains to the east, where he was pleased to find a new peony, brown's peony (*Paeonia brownii*), and a yellow-flowered lupine, Sabin's lupine (*Lupinus sabinii*), that was found “...covering the whole face of the country, and at the distance of a few miles appears much like *Spartium scoparium*¹ [*Cytisus scoparius*] on the wild and beautiful heaths of England.” (Douglas 1959/1914, p. 193) Eventually, in August 1826 Douglas returned to Fort Vancouver to pack his seeds and specimens for shipment on the *Dryad* back to England.



Brown's peony (*Paeonia brownii*), Miss Drake (illustrator), G. Barclay (engraver), Edwards's Botanical Register, plate 30, 1839. PHOTO: COURTESY OF BIODIVERSITY HERITAGE LIBRARY

Where possible, Douglas moved about the country in the company of brigades associated with the Hudson's Bay Company, either regular detachments of the annual express across western Canada, or special expeditions sent out from Fort Vancouver. In September, once the fruits of Douglas' 1826 season's collecting efforts were safely on their way to England, he joined a hunting party traveling southward from Fort Vancouver to the Umpqua Valley, hoping to collect the sugar pine (*Pinus lambertiana*). The previous winter, John Baptiste McKay had brought Douglas a single cone of the sugar pine, which measured 16 ½ inches long, but had not been able to find any seeds. In addition, McKay provided a description of this tree that must have tantalized Douglas: 170 to 220 feet tall, 20 to 50 feet in circumference, producing edible seeds, and when injured by fire, exuding a sugar-like substance that the Indians used as a sweetener. Douglas could not pass up the opportunity to introduce this pine to European gardens.

The expedition's route took Douglas through the Willamette Valley, which was filled with smoke and nearly entirely burned over, as was the seasonal custom of the Kalapuya Indians. On October 1st, the party passed a group of Kalapuya people digging bulbs of camas (*Camassia quamash*) on one of the low plains. He noted that the bulbs were larger than any he had seen. Further south, he encountered the golden chinquapin (*Chrysolepis chrysophylla*) for the first time but was disappointed to find no seeds.

Once the party passed from the Willamette Valley into the Umpqua River drainage, he encountered the myrtlewood or California bay (*Umbellularia californica*) (he called it his "smelling tree") and had to cut down a large tree to obtain a quantity of seeds. The party finally reached the Umpqua River on October 16th. Starting up the Umpqua to search for the sugar pine, Douglas fell into a gully and injured himself and had to return down river to the



Myrtlewood or California bay (*Umbellularia californica*), W. Fitch (illustrator), Vincent Brooks (engraver), Curtis's Botanical Magazine, plate 5320, 1862. PHOTO: COURTESY OF BIODIVERSITY HERITAGE LIBRARY



Common camas (*Camassia quamash*), Miss Drake (illustrator), S. Watts (engraver), Edwards's Botanical Register, plate 1486, 1832. PHOTO: COURTESY OF BIODIVERSITY HERITAGE LIBRARY

main camp. His treatment reflected the state of medicine at the time: "I had a little tea made me and bled myself in the left foot, and since I feel somewhat relieved." (226) A week later, Douglas had recovered, and in the company of an Indian guide, retraced his steps upstream. On October 26th, 1826, after leaving his Indian guide at camp, Douglas was surprised by a lone Indian, to whom Douglas made a peace offering of a smoke of tobacco. Drawing a picture of a sugar pine cone, Douglas was able to communicate his intentions to the Indian, who then guided Douglas to

a stand of the giant pine. But the only means Douglas had to gather fresh cones was to shoot the branches off with his rifle, and the noise attracted a band of seemingly hostile Indians to his location. Douglas explained his intentions to these Indians as best he could, and as a ruse, promised to trade tobacco if they would gather additional cones. As soon as they were out of sight, Douglas quickly retreated to his camp, carrying with him only three cones and a few boughs of the sugar pine.

The rigors and rewards of the early years of botanical exploration in the west are apparent in Douglas' journal entries from this expedition. Douglas describes his difficulties on October 25, 1826:

Last night was one of the most dreadful I ever witnessed. The rain, driven by the violence of the wind, rendered it impossible for me to keep any fire, and to add misery to my affliction my tent was blown down at midnight, when I lay among [bracken fern] rolled in my wet blanket and tent till morning. Sleep of course was not to be had, every ten or fifteen minutes immense trees falling producing a crash as if the earth was cleaving asunder, which with the thunder peal on peal before the echo of the former died away, and the lightning in zigzag and forked flashes, had on my mind a sensation more than I can ever give vent to; and more so, when I think of the place and my circumstances. (Douglas 1959/1914, p. 229)

After his encounter with the sugar pine, Douglas' journal entry for the next day further describes his perspective on the hardships experienced, during this expedition in particular, but also more generally throughout his adventures:

When my people in England are made acquainted with my travels, they may perhaps think I have told them nothing but my miseries. That may be very correct, but I now know that such objects as I am in quest of are not obtained without a share of labour, anxiety of mind, and sometimes risk of personal safety. (Douglas 1959/1914, p. 229)

Returning northward, Douglas reached Fort Vancouver on November 19th. On his return trip, the Santiam River was swollen by the autumn rains, and in trying to cross, most of Douglas' collection was either lost or damaged—journals conflict on this matter. Fortunately he was able to save his sugar pine cones and confirm to the outside world that this wonderful pine, the largest species of its genus, did indeed exist.

The success of Douglas' first visit to the Northwest was a result of many factors—physical stamina, a single-minded focus on natural history, and an ability to survive the rough and tumble social environment of trappers, explorers, and Native Americans. Among some Native Peoples, Douglas apparently cultivated an image of an eccentric botanist because he realized that it provided him with a certain persuasive advantage. At one point in his journal he described an example:

I learned that Young Wasp [Douglas' Indian guide] ...had been told that I was a great medicine-man, which is always understood as a necromancer, or being possessed of or conversant with evil spirits, and had the power of doing great wonders;...if he did not do as I wanted...I would turn him into a grisly bear to run and live in the mountains, and he should never see his wife again, which of course acted powerfully on him. (Douglas 1959/1914, p. 195)

In the 21st century we may view field botany as a rather obscure occupation, but in the 19th century, there was a much more direct connection between botany and medicine, healing, and powers of life and death. It is not too difficult to understand how Douglas might encourage the impression that he was a man of great power, to enable him to survive certain dangerous circumstances. Another excerpt from his journal describes an incident in which his only knife was stolen:

At last I commenced a search [for the knife] and found it secreted under the belt of one of the knaves.... as he did not give it on the first application, I paid him,

Nat-cleh

The story of David Douglas' "discovery" of the sugar pine exposes a blind spot often associated with the early days of natural history exploration. While Douglas was procuring specimens, seeds, and roots of plants previously unknown in Britain and Europe, he was travelling through a land that had been peopled for over 10,000 years. The land was home to people with a great knowledge of their environment, who managed the land and shared its bounty under long-standing traditions. In the lowlands west of the Cascades, much of the landscape was managed with fire in ways that increased production of important foods such as bulbs, roots, and nuts or seeds.

The tree we now call sugar pine (*Pinus lambertiana*) was known to the local Umpqua people Douglas encountered as nat-cleh and was highly valued by Native People as a food source. When Douglas was greeted by a not-so-friendly group of Umpqua as he worked to collect

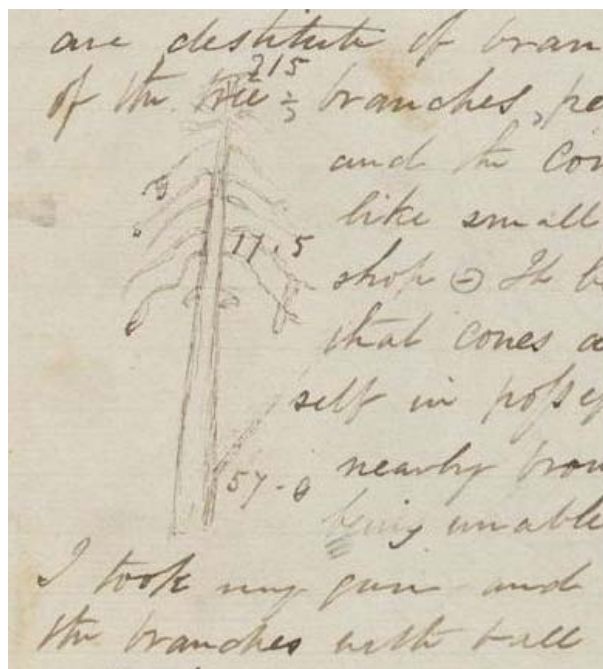


Trunk of sugar pine (*Pinus lambertiana*), Sugar Pine Ridge. PHOTO: ED ALVERSON

foliage and cone samples to document his "find," he perhaps was not aware that this was a tended grove of trees whose productions were the property of these Native People. From their perspective, Douglas' collecting of samples was theft, which was only somewhat assuaged by Douglas providing a bit of tobacco in return.

Today it is possible to reflect on these issues by visiting Sugar Pine Ridge, southwest of Roseburg, Oregon, the site of Douglas' 1826 encounter with the sugar pine and its keepers. While the broader landscape here has been heavily altered by agriculture and logging over the past 200 years, there is a narrow band of old growth sugar pine on a parcel of public land managed by the Bureau of Land Management. The surveys of adjacent townships were misaligned, so this strip of land was never claimed or taken out of the public domain. Sugar pines are

the largest trees here but are densely crowded with younger conifers of other species that have established with the exclusion of fire. If one visits at the proper time of year it is still possible to see the large nat-cleh seeds nestled on the ground, waiting, perhaps, for the pine tenders to return fire to the land.



Scan of Douglas' original hand-written journal that includes his observations of sugar pine, including a field sketch of sugar pine. PHOTO: ED ALVERSON



Seeds of sugar pine (*Pinus lambertiana*), Sugar Pine Ridge. PHOTO: ED ALVERSON

and paid him so well, with my fists that he will, I dare say, not forget the Man of Grass for some days to come. (Douglas 1959/1914, p. 198–199)

Although in today's language the term "Man of Grass" may not convey any particular sense of extraordinary skill beyond the ability to use a dichotomous key, on the 19th century frontier it may have been interpreted as a title of great power and strength. Being a man of rather slight build, this name surely served Douglas well on numerous occasions during his travels.

Douglas' return journey to England began on March 20, 1827, with the departure of the "annual express" across the continent. Douglas had decided to return by land across Can-

ada and then catch a ship from Hudson's Bay back to England. Though more physically taxing than returning by sea, the route was well known to the Hudson's Bay Company staff, and Douglas looked forward to the possibility of encountering other naturalists, such as Thomas Drummond and John Richardson, who were exploring the regions of northern Canada. Wilson (1919) noted that "...owing to his own stock of clothes being worn out, before starting his overland journey, the Hudson's Bay people furnished him with a suit of bright red Royal Stewart tartan (coat, vest and pants) and it was in this gaudy outfit that Douglas made his way across the continent, much to the surprise, no doubt, of the Indians whom he met on the way." (14–15)

Tall Western Penstemon

With their showy purple, pink, yellow, or white flowers, the *Penstemon* genus (beardtongues) was a particular focus of David Douglas' collecting efforts. He described 13 new species that are currently accepted and introduced 17 species to cultivation for the first time.



Tall beardtongue (*Penstemon hesperius*), W.J.H. (illustrator), Swan (engraver), Curtis's Botanical Magazine, plate 2954, 1829.

PHOTO: COURTESY OF BIODIVERSITY HERITAGE LIBRARY

On May 31, 1825, Douglas was travelling up the north side of the Columbia River from Fort Vancouver. Along the way he encountered a beardtongue with purple flowers in whorls, stems 2 ½ feet to 3 feet tall, growing in "low places of the Columbia near the Quick Sand River" [presumably the Sandy River]. He provided an herbarium name, *Penstemon procerus*, to this species. But when the name was eventually published it was applied to a different species altogether, which is now well known as the widespread (and ironically short-statured) *Penstemon procerus* (small-flowered penstemon). Although Douglas had sent seed back to England and it was successfully propagated, his tall western penstemon was left without a scientific name.

A small number of additional collections of this plant were made in the Portland area between 1894 and 1930, but their identity remained a mystery. In 1930, Morton Peck from Willamette University collected it in Washington County, Oregon, and in a 1932 paper described it as a new species, *Penstemon hesperius* (tall beardtongue). The species was again collected in 1934 but was unseen for over 60 years. When local botanists began to search for it again, unsuccessfully, they feared that it had become extinct.

It was by chance in 2008 that a US Fish and Wildlife Service employee encountered a population of *Penstemon hesperius* on the Tualatin National Wildlife Refuge southeast of Portland, growing

in a wet meadow near the Tualatin River. Subsequently the species was also discovered growing in a Washington Department of Natural Resources Natural Area Preserve in Clark County, Washington, outside of

Vancouver, as well as several other locations in the Portland area.

Penstemon hesperius, the tall western penstemon, is one of the rarest native plants in the Pacific Northwest, with five known extant natural populations, and a limited geographic range confined to one of the most populous urban areas in the Pacific Northwest. In addition to urban development, the spread of invasive species such as reed canary-grass (*Phalaris arundinacea*) is a major threat. A petition to list the species has been submitted to the US Fish and Wildlife Service, and the species has also been propagated for species recovery purposes. And to think that *Penstemon hesperius* was growing in gardens in England in the 1820s, thanks to Douglas' collecting efforts!



Tall beardtongue (*Penstemon hesperius*). PHOTO: ED ALVERSON

The party traveled up the headwaters of the Columbia River and crossed the continental divide at Athabasca Pass on May 2nd. Douglas spent the remainder of the spring and summer exploring his way across northern Canada to Hudson's Bay. Departing on the Prince of Wales on September 15th, he was back in England by October 11, 1827. He had been away from home for over three years and had suffered extensive injury, hardship, and misery. By his estimation, Douglas' overland travels had covered more than 7,000 miles. Through his enthusiasm, persistence, and tolerance of hardship, Douglas had achieved the goals of his expedition; most of his seeds and specimens had arrived safely in England, and the collections were distributed widely for propagation and study. Accordingly, Douglas' decision to disobey his instructions and prolong his stay in North America for an additional year was forgiven.

In London, Douglas was received as a returning hero and feted by scientists and nobility alike. His tales of adventure and discovery must have seemed quite fantastic to the learned and landed classes of England. Douglas received numerous awards

and honors, including membership in the Linnaean Society and the Zoological Society of London. John Lindley of the Horticultural Society stated that the seeds of a single species, red currant (*Ribes sanguineum*), alone paid for the cost of the entire three-year expedition. This perhaps was not quite as stupendous as it might seem, since the cost of the expedition, including Douglas' salary, was only £400.

To increase Douglas' financial return from the expedition, arrangements were made for him to receive the profits from publication of his journal, and he set about to prepare the journal for publication. Following in the Romantic tradition of Andre Michaux and William Bartram, which emphasized the sublime beauty of wild nature, Douglas' journal might have become a literary classic of natural history exploration, had Douglas lived to see it to publication.

Unfortunately, work on the journal did not go well. Having a limited formal education, Douglas may not have been well prepared to undertake such a task. Furthermore, Douglas

Douglas' Lilies

Wherever he traveled, Douglas was always on the lookout for flowering bulbs. While he noted the use of bulbs as food by native people—camas, fritillary, blue-lily, onion (*Camassia*, *Fritillaria*, *Triteleia*, *Allium*, etc.), his quest was for ornamental garden plants. Douglas is credited with introducing 13 species of our native bulbs to gardens in Britain, including species of *Allium*, *Calochortus*, *Dichelostemma*, *Erythronium*, *Fritillaria*, and *Triteleia*.

His approach is illustrated by several examples quoted in his journals. On May 22, 1825, Douglas recorded encountering the large-flowered blue-lily (*Triteleia grandiflora*):

...one of the finest and earliest flowering plants; will the bulbs keep to England? (try). This splendid bulbous plant is plentiful...on the banks of rivers, rarely to be found in seed; 18 inches to 2 feet high. Seeds are sent with a quantity of bulbs in a jar among dry sand. I hope they may reach England in a good state... (Douglas 1959/1914, p. 122)

The glacier lily (*Erythronium grandiflorum*) is another example. On April 27, 1826, Douglas was exploring the area around Fort Colville, on the Columbia in northeast Washington:

Erythronium grandiflorum of Pursh; this exceedingly beautiful plant came under my notice fifteen or sixteen days ago, but being not then in blossom I took it for *Fritillaria*; abundant over all the undulating country, under the shade of solitary pines...it has a most splendid effect in conjunction with *Dodecatheon*...omit not to procure seed and roots of such a desirable plant. (Douglas 1959/1914, p. 167)

Later that spring his journal noted *Erythronium* among the seeds that he had collected and packaged for shipment. Then in April of 1827, Douglas again found himself at Fort Colville, while travelling with the annual express across the continent to return to England. This time he mentioned collecting *Erythronium* bulbs, noting "although in a bad season for removal, I cannot forbear making a trial" (Douglas 1959/1914, p. 246).

In 1836 (after Douglas' death), *Erythronium grandiflorum* was illustrated in Edwards's Botanical Register, accompanied by the comment "Of this extremely rare plant, a single bulb was received by the Horticultural Society from North West America eight or nine years ago; it has continued to grow slowly in a peat border, and at last put forth its beautiful flowers last May. It has not however produced any seed, and it will probably be many years before it can possibly be distributed" (Edwards et al. 1836). It seems likely that this flowering individual was a bulb that Douglas had dug near Fort Colville in 1827 and then carried with him all of the way back to England.



Glacier lily (*Erythronium grandiflorum*), Miss Drake (illustrator), S. Watts (engraver), Edwards's Botanical Register, plate 1786, 1836. PHOTO: COURTESY OF BIODIVERSITY HERITAGE LIBRARY

apparently rejected offers of assistance, cooperating only with Hooker. More significantly, most of Douglas' botanical collections remained unstudied, with new species and genera yet to be described, a task that would need to be undertaken before a scientifically accurate botanical travelogue could be published. Again, lacking training in the methods of systematic botany, Douglas was unable to accomplish this, at least at the pace that would have been necessary to make significant progress. Perhaps his sense of pride kept him from admitting that his interests, as well as the interests of science, would be better served by cooperating more widely with the leading systematists of the day. In fact, it was not until 1914 that his full journal was published.

However significant his botanical accomplishments were, Douglas was still only employed by the Horticultural Society as a gardener. As is the case for many who have become accustomed to life in the wilds, he began to feel uncomfortable and out of place in the company of his privileged surroundings. As a result, Douglas behaved in a difficult, disagreeable, and discourteous manner toward nearly everyone. Royal Horticultural Society archives hold a memo from April 16, 1829, documenting a conversation regarding Douglas' behavior between Douglas and John Lindley, who at the time was assistant secretary at the Horticultural Society. Douglas was accused of saying that Joseph Sabine (secretary of the Horticultural Society) and others were not his friends and had not provided Douglas with the support he required. Furthermore Lindley stated that "...if there was any cause for complaint it was on the part of the Council, for his (Douglas') long promised journal had no existence, his plants were not half arranged, and he refused to complete his collections". Furthermore "...he had no right whatever to say that Mr. Sabine and...other persons were not his friends inasmuch as they had all along been doing all in their power to assist him".

Hooker, in his article on Douglas' life, recalled that while Douglas was initially flattered by the attention his discoveries brought him, ultimately the novelty subsided, and at that point Douglas "...began to realize that he had been pursuing a shadow instead of reality..." (Hooker 1905).

Perhaps it was to escape this uncomfortable environment that Douglas began to think about undertaking a second expedition to western North America. Initially the Horticultural Society had little interest—they were still overwhelmed with growing the seeds collected on the first expedition. Finally, perhaps at the urging of W. J. Hooker, the Horticultural Society relented, and with additional support from the Colonial Office (by providing geographical data) and the Zoological Society (for collection of animal specimens), Douglas was outfitted for a second expedition. This time he was planning to focus his botanical energies on gathering herbarium specimens and seeds from California, a region whose botanical riches were known primarily from exploratory visits to the coastal region. As Douglas was equipped and trained to use sophisticated equipment to determine latitude and longitude of specific locations,

Morwood (1973) speculates that Douglas was, at least in part, somewhat surreptitiously sent to gather geographic data on the Columbia River region to bolster England's territorial claims for this region.

(to be continued in the next issue)

Correction: In part one (Spring 2025), Fort Vancouver was initially located atop the bluff above the river, but in 1829 it was relocated to the prairie at the base of the slope, though still above the high-water mark.

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Tiger Canyon in the Blue Mountains Near Walla Walla, WA

by Emil Doyle

We celebrate nature through its tapestry of plant life, and local getaways help to clear our heads and recharge our senses. If you enjoy what mountains offer and you live around Walla Walla, Tiger Creek Canyon is a sure bet. Pullouts for explorations are numerous along its 2,400-foot elevation gain on the basalt roadcuts of USFS 65 Road (FS65) on the 7-mile route to what locals call the “third hairpin.”

The Mill Creek Watershed sinuously skirts back and forth across that artificial boundary between Washington and Oregon in the Blue Mountains Ecoregion. Tiger Creek is absorbed into it and bears the footprint of a complex human history. For thousands of years Native Peoples foraged its bounty of first foods such as the “cous” biscuit-root (*Lomatium cous*); the land’s earliest stewards are still here. By 1860, more recent human waves were arriving on this scene from across the US, and even China, to carve out new lives. By 1880 the demand for lumber and firewood was not keeping up with this pace. A local entrepreneur erected 1.25 miles of flume up Tiger Creek’s main fork, but nature reclaimed it via a seasonal “fresher” storm within a year of completion, and buried the portable sawmill above the Tiger Creek forks under 30 feet of debris.

We cannot separate the stories of people and the lands we love. Dr. J. Drew Lanham tells a story of his “home place,” but the metaphor applies universally and to Tiger Canyon—it “is yet a hidden gem, a source of biodiversity that is easy to pass by on the way to somewhere else.” You should come here if you can!

I am not a plant “life-lister, but I do keep track. On this journey you’ll find *at least* 25 shrubs, 11 trees, 10 ferns, 10 graminoids, 70 herbs, many bryophytes, and easily 13 genera of macrolichens if you like those too. I am biased, and the plants



Indian’s dream fern (*Aspidotis densa*) is a serpentine indicator species but is at home in the basaltic and loess soils of the Blue Mountains.

PHOTO: EMIL DOYLE

I will discuss are the ones intertwined with my own plant journey.

Indian’s dream fern (*Aspidotis densa*) was my first Tiger surprise because I only knew it as a “serpentine indicator” rather than by its general adaptability. Growing out of a basalt cliff, it sloughed off in a freeze-thaw event—it took two years to discover another, and with the help of my friend Bob, we scrambled up a treacherous slope and found a population which I now know extends in a thin, sporadic band, all the way up the south-facing canyon slope to the crest of Indian Ridge. And, it is always in the presence of a beautiful cohort, Wallace’s spikemoss (*Selaginella wallacei*).

The Blues become predictably dry as snow disappears, rain ceases for months, and temperatures climb. At the first hairpin of FS65 at 2,800 feet, there is an unmaintained “social trail” (down and up a narrow gully) on which you can safely parallel the creek for almost a mile. Crowe and Clausnitzer (1997) defined this mid-montane wetland plant association as “Red Alder/Pacific Ninebark” (*Alnus rubra*/*Physocarpus capitatus*). It is very “west side-like” in appearance. Seasonal maritime moisture delivery into the steep, V-shaped creek bottom, along with steady groundwater inputs, makes for a cool, shady microclimate where you also find western yew (*Taxus brevifolia*), sword fern (*Polystichum munitum*), a stunning density of wild ginger (*Asarum caudatum*), and many other moisture and shade-loving species.



A lush population of wild ginger (*Asarum caudatum*) is one of the treats on the Tiger Creek “social trail”. PHOTO: EMIL DOYLE

Proceeding up FS65 between the second and third hairpins, many springs have been exposed by the roadcut, creating new spheres of discharge. Plants include common seep monkey-flower (*Erythranthe guttata*), Clayton’s saxifrage (*Micranthes fragosa*), stream violet (*Viola glabella*) and pretty shooting star (*Primula pauciflora*). One spring is of the dripping “hanging garden” type and covered with a thick population of the easy-to-recognize apple seep moss (*Filonotis fontana*). This portion of the drive will also reveal some patchy scars from the US Forest Service’s October 2024 controlled burn.



The Indian Ridge high point is great place to take in Tiger Canyon, its botanical beauty and history, and ponder its future. PHOTO: EMIL DOYLE

At the third hairpin, view the canyon that's been in your rearview mirror on the way up. Even better, drive another 1.2 miles to a right-hand pullout and an unmarked trailhead on the left (except for a yellow watershed boundary sign), and stroll for 0.75 mile to the high point of the Indian Ridge Trail at 5,562 feet while gaining about 370 feet. In early summer forest meadow openings are covered with grass-widow (*Oksynium douglasii*) and the poorly developed ridgeline soils are covered with Hood's phlox (*Phlox hoodii*) and many other species.

This spot is often my point of reflection. If I squint, I can almost see the People gathering 'cous around me and the steam plume from that 1880 sawmill down at the Tiger forks confluence. As Drew Lanham notes, "the memories run deep" and the legacies are laid out before me to the wheat fields in the Walla Walla Valley on the horizon. Today's stewards need to evaluate the USFS's Tiger-Mill Project Plan to protect the city water supply, remain connected to the Revised Blue Mountains Forest Plan process that seems stalled, and an attempt to sell much of these forests to private interests. By definition the future is uncertain. It's our watch and the management of these lands, our collective "home places," require the very long view, far beyond just the generation of our grandchildren.

Directions from Walla Walla:

Navigate on Mill Creek Road about 3.4 miles past Kooskooskie, WA and go right, across the one-lane Mill Creek bridge onto FS65 (shortly past this is the locked watershed gate.) FS65 follows Tiger Creek and Indian Ridge. From the bridge, approximate driving distances are: first hairpin, 1.5 miles (pullout for "social trail"); second hairpin, 2.5 miles; third hairpin, 7.0 miles; Indian Ridge high point trailhead, 8.2 miles (pullout on right unmarked trailhead on left).

Related Resources

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ww2020.net (Go to: History Websites/History Websites Sponsored by Walla Walla 2020/Chinatown and/or Upper Mill Creek Historic Site).

Troubles Encountered in Effort to Build Flume. June 18, 1944. Walla Walla Union Bulletin.

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US Geological Survey. 1995. Quadrangles: (1) Big Meadows, OR and (2) Bone Spring, OR. 1:24,000. 7.5-Minute Series. Denver, CO: US Department of the Interior, USGS.

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A Phytochemical Investigation of the Roots of *Dalea ornata* (Fabaceae)

by Gil Belofsky, Trevor Ridley, Ryan Galperin, Ericka DuBore, and Celeste La Place, Department of Chemistry, Central Washington University

Introduction

Natural Products Chemistry and the Focus of Our Research Group

The classical field of pharmacognosy, usually called natural products chemistry, is the practice of the extraction, purification, and structural characterization of organic molecules from living organisms. These molecules very often have associated biological activities that have led to new biomedical or agricultural applications. Natural products from plants encompass the majority of active components of therapies used throughout history in folk and traditional medicine. A flagship example of a valuable plant natural product is the life-saving cancer drug taxol, from the bark of the Pacific yew (*Taxus brevifolia*). The first collection of plant material for this purpose was in 1962 near Packwood, Washington, and the structure of taxol was reported in 1971. Decoctions of *T. brevifolia* bark were used by Native American cultures of the Pacific Northwest for treating a variety of medical conditions. The Tsimshian, in fact, reportedly used the plant for treating cancer.

Our research group has been focused on the chemistry of the plant genus *Dalea* (prairie clovers), which is distributed throughout the Americas, with a particularly high species diversity in the US Southwest. *Dalea* spp. have proven to be prolific sources of natural products with unique chemical structures and diverse biological activities. This track record of success led to this study of Blue Mountain prairie-clover (*Dalea ornata*)



Collection of Blue Mountain prairie-clover (*Dalea ornata*). Clockwise from lower left: inflorescence, collecting at the Richland, WA site, aerial parts, whole plant. PHOTOS: GIL BELOFSKY

(Hitchcock and Cronquist 2018), which is the only member of the genus that is established in Washington State. In Washington, *Dalea ornata* is largely restricted to the Columbia-Snake River basin, aside from a few other scattered populations (Gucker and Shaw 2018). The full range of the species is Washington to California, east to Idaho and Nevada.

Prior Chemical Work on *Dalea ornata*

Our group completed and published a prior study on components of *D. ornata* (Deardorff et al. 2016). The study goals were to identify the anthelmintic activity (ability to treat

infections caused by parasitic worms) that was found, through biological screening, to be present in the aerial portions of the plant. Specifically, there was toxicity to the human pathogenic hookworm, *Ancylostoma ceylanicum*. The study was funded by the National Institutes of Health, Center for Complementary and Integrative Health. The work was successful in isolating the anthelmintic compounds tephrosin and deguelin. The root extracts were not evaluated further at that time, having no such activity.

Collection of *Dalea ornata* in Order to Study the Root Metabolites

This project, with a new focus on antimicrobial natural products and with the support of the Washington Native Plant Society, began with the re-collection of *D. ornata* on June 12, 2023. Three whole plants were collected along Horn Rapids Road in Richland, WA. An additional large whole plant was collected nearby. Roots were separated from the aerial parts with clippers. Two pressed specimens were prepared, and one was sent as a voucher specimen to the University of Washington Herbarium, Burke Museum where its identification was confirmed by Dr. David E. Giblin and assigned the accession number WTU: 456160 and image number WTU-V-105656.

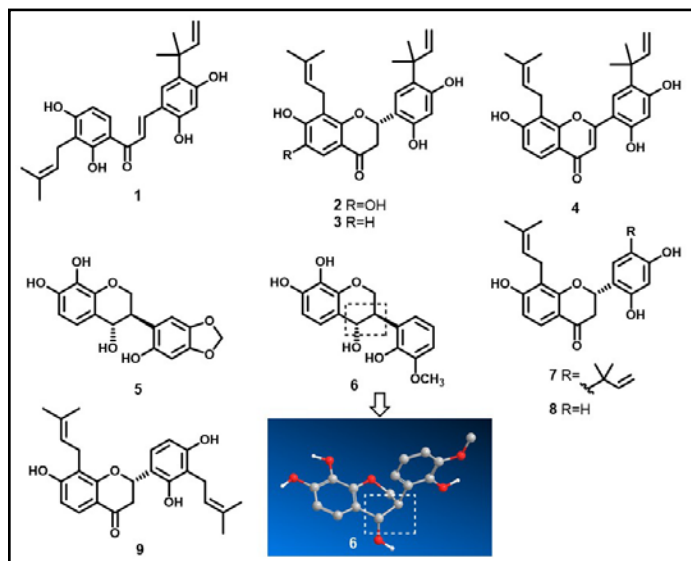
Methods

The Science of Chromatography Was Used to Purify Metabolites in Successive Steps

The *D. ornata* roots (1.3 kg) were washed in distilled water and air-dried (72 hours). The material was then chopped into ~3 x 3 cm pieces and blended, dry, in a Waring blender. The material was stirred in methanol (8 liters) for 24 hours, filtered, and the resulting liquid extract dried to a solid residue (276.6 g) using a rotary evaporator. This extract represented a complex mixture of many organic compounds. In any phytochemical investigation, the next stages of the project entail successive stages of separation of the extract using the science of chromatography. The methods of chromatography applied in this study all involve classical techniques of passing the plant materials through a glass column packed with a bed of solid material, the stationary phase. There are many different stationary phases, and when these are wetted with solvents they take on the consistency of a gel. The plant materials are run through the packed gels with a series of organic solvents. Structural differences of the compounds in the mixture govern their travel through the columns at different rates, leading to their separation as a series of bands that are collected at the column exit. Another chromatographic technique, called thin layer chromatography (TLC), is invaluable for visualizing the progress of the separations toward increasingly pure materials.

The progression, pictured below from left to right, is of a mixture of *D. ornata* components put through a gradient chromatography method that produced a linear, continuously changing composition of solvents (A and B) of increasing polarity. This resulted in a dramatic spread of the components over many fractions collected. Final purification over silica gel in several small columns resulted in pure compound **2**.

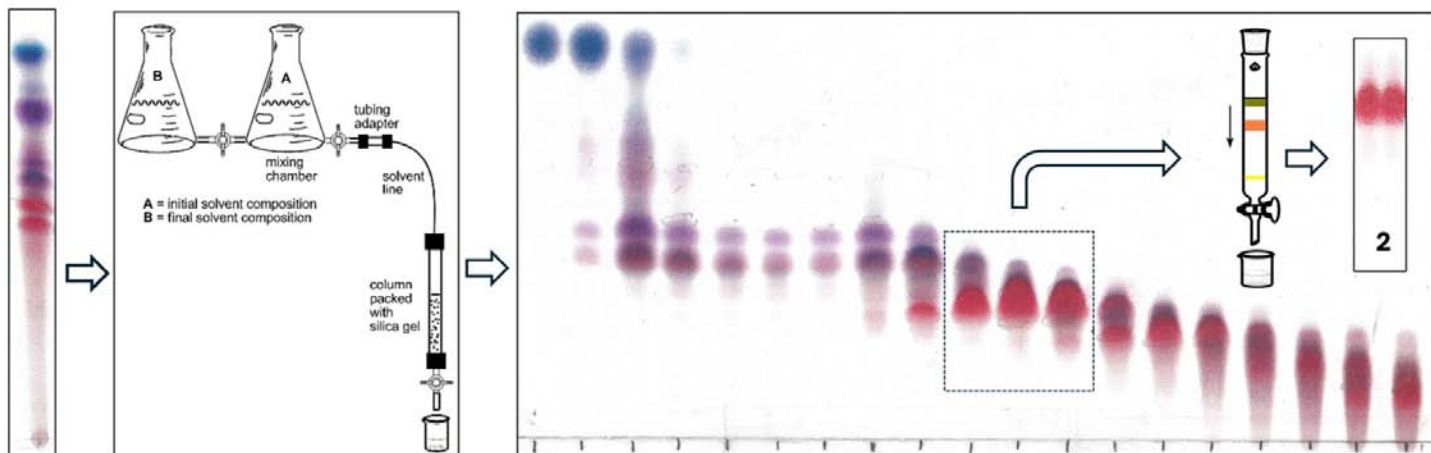
The specific column chromatographic techniques used to purify *D. ornata* root compounds were, in succession, vacuum liquid chromatography (VLC), Sephadex LH-20 size-exclusion chromatography, and methods of linear- and step-gradient column chromatography. These successive purification steps have resulted in a set of nine pure compounds in amounts ranging from 2–22 mg.



Molecular structures of Blue Mountain prairie-clover (*Dalea ornata*) root compounds 1–9. The 3D view of 6 shows the orientations of the groups in the dashed box.

Determination of the Complete Chemical Structures of *Dalea ornata* Metabolites

The next stage of the project was the elucidation of the molecular structures of the pure compounds using spectro-



Successive stages of column chromatography, as visualized by thin layer chromatography (TLC), led to the pure compound **2**. The colors seen on the TLC are produced by a chemical spray reagent (vanillin/H₂SO₄ conc.; 1:100, w/v). PHOTO: GIL BELOFSKY

copy. The primary tool for this is a nuclear magnetic resonance (NMR) spectrometer, which is unique among such techniques in that it provides unambiguous connectivity between sets of atoms in the molecule. Those experienced in the art of NMR interpretation liken the process of recognizing groups of atoms to that used by chess players, who recognize patterns of pieces, thereby reducing the number of possible outcomes. This ‘chunking theory’ as it is known, is purely a result of years of experience in the specific type of problem solving (Simon and Chase 1973). Aside from this, state-of-the-art techniques in NMR spectroscopy allow for the determination of structure, even where familiar patterns do not exist. Since organic compounds contain many carbon and hydrogen atoms, NMR spectra can, for these atoms, reveal where they are directly connected to each other and also where they neighbor each other, but are not directly connected.

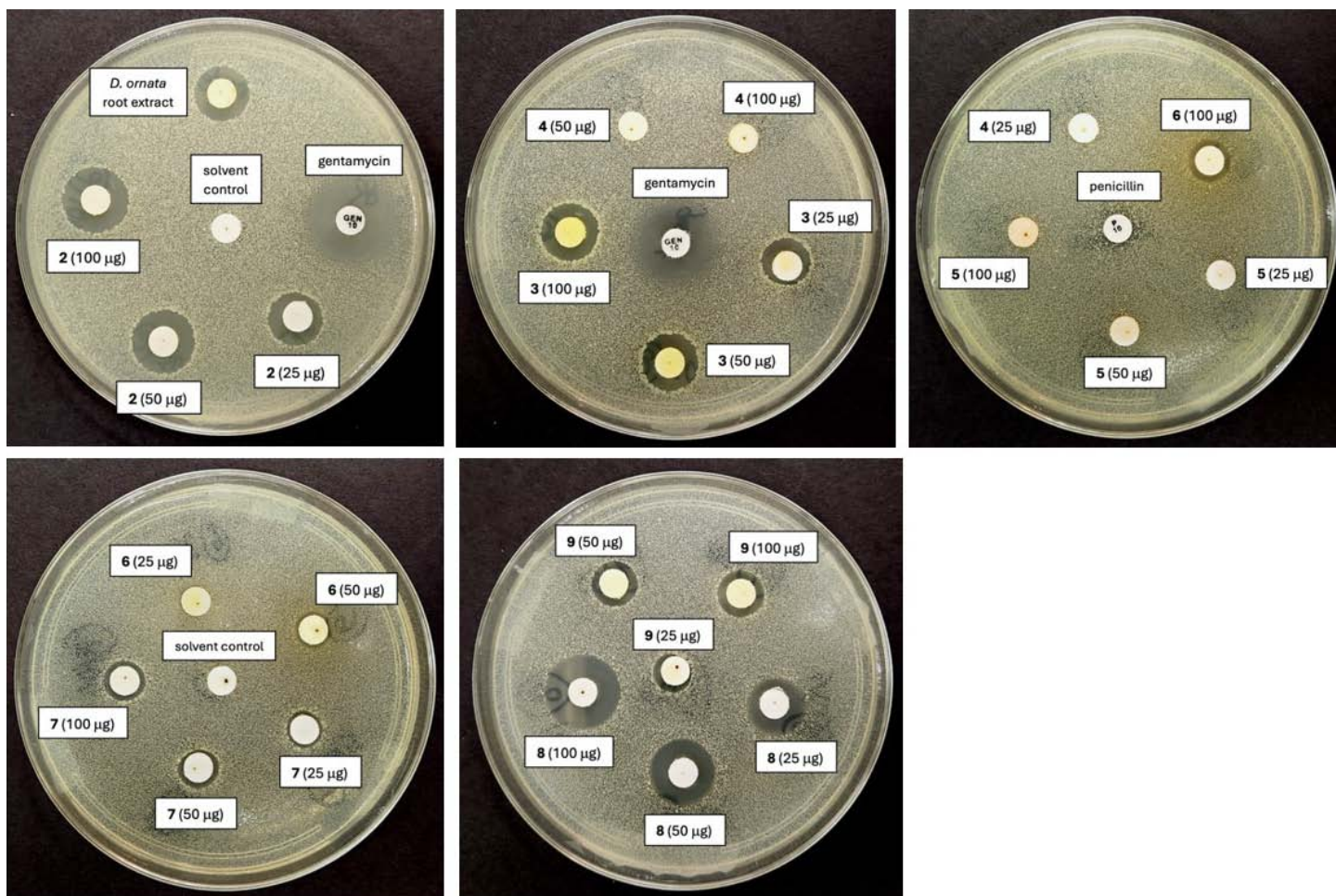
The Classical Disk Diffusion Method Was Used to Evaluate Antimicrobial Activity

The *D. ornata* compounds were evaluated for their antimicrobial potential in preliminary testing against the bacterium *Bacillus cereus*, which commonly causes intestinal illness, in our research laboratory. This was accomplished using a disk diffusion assay. In this method, compounds are

pipetted in solution onto paper disks that, following drying, are placed upon agar gel plates that are infused with bacteria. After an incubation period, an even “lawn” of bacteria will grow, but if antibacterial compounds are present, these will diffuse into the surrounding surface and inhibit growth of the bacteria in zones around the paper disk.

For the preparation of the paper disks, the compounds were each dissolved in 2:1 dichloromethane-methanol to a concentration of 10 µg/µL. From these solutions, 10, 5, and 2.5 µL were pipetted onto the disks resulting in the 100, 50, and 25 µg amounts tested. Solvent control disks were prepared by adding 10 µL of the same solvent. All disks were allowed to dry for several hours prior to placement on the agar.

Two sterile agar jars (125 mL each) were placed in a boiling water bath (~30 minutes) and then cooled in the same bath to 45°C. This melted agar was inoculated with 2.5 mL of *B. cereus* culture (in tryptic soy broth); the solution swirled and poured into sterile petri plates, each about half full. The agar solidifies quickly, and the paper disks are then placed on their surfaces. The plates were placed in a 30°C incubator. The resulting zones of inhibition were measured in millimeters after 42 hours of incubation.



Results of the disk diffusion assays revealing zones of inhibition. *Bacillus cereus* susceptibility to the Blue Mountain prairie-clover (*Dalea ornata*) root extract, compounds 2–9, and the positive control antibiotics gentamycin and penicillin were evaluated. The lack of clear edges for the zones for gentamycin may be due to some bacterial resistance or motility. PHOTO: GIL BELOFSKY

Results

The Complete Structures of Nine Compounds Were Elucidated

The structures of **1–9**, as depicted, were deduced by extensive NMR spectroscopy. Only compounds **3** and **7** were previously known. The remaining seven isolated compounds are new. This is a promising ratio of new to known compounds for the additional planned purification efforts of the root extract materials.

The specific compound types seen here are highly varied. They can be categorized as follows: Compound **1** is a chalcone; **2**, **3**, and **7–9** are flavanones; **4** is a flavone; **5** and **6** are isoflavanols. All are of the broader flavonoid class of compounds.

An important aspect of the structures of **2**, **3** and **5–9** is shown using **6** as an example. The dashed box draws attention to groups of atoms that can lead to alternate forms of the molecule called stereoisomers. Many pharmaceuticals exhibit this phenomenon and must be sold as only one stereoisomer, as the alternate form may be toxic. In this specific case, the OH group and the ring are pointed “down” and “up,” respectively. However, these orientations could be reversed, leading to a different molecule. Determination of the exact configuration requires special techniques. The technique used to accomplish this was circular dichroism (CD) spectroscopy, performed with the aid of our collaborator, Professor P. Clint Spiegel at the Department of Chemistry, Western Washington University.

The overall structures of the compounds were also supported by high resolution mass spectrometry (HRMS), which provides an accurate molecular formula. The HRMS result for **1**, for example, revealed a formula of $C_{25}H_{28}O_5$, which perfectly matches the numbers of these atoms in the structure shown.

Disk diffusion assay results for susceptibility of *B. cereus* to *D. ornata* compounds and controls.^a

compound	inhibition zones (mm) at tested amounts		
	100 µg	50 µg	25 µg
root extract	12	NT	NT
1 ^b	NT	NT	NT
2	14	14	12
3	12	12	10
4	0	0	0
5	0	0	0
6	9	8	0
7	9	8	8
8	16	14	12
9	10	10	8

^aThe positive control gentamycin (10 µg) expressed an average zone of inhibition of 17 mm. The control penicillin (60 µg) was inactive. NT = not tested. ^bInsufficient amount due to decomposition.

The results of the disk diffusion assays for the *D. ornata* compounds **2–9** tested are pictured. Unfortunately, the existing supply of compound **1** decomposed and insufficient material was available for biological testing.

Discussion

Why Do All of This and Where Might It Lead?

A phytochemical study of this type can be a starting point for further investigations. Antimicrobial activity can be evaluated against other microorganisms and experiments done to determine structure-activity relationships. Pharmacological work can be done to elucidate the specific biological target molecule(s) (e.g., enzymes, receptors) associated with the activity. Eventually, a natural or synthetically modified compound may be identified as a drug candidate, potentially leading to human testing.

What Did We Discover So Far, and How Does It Relate to Other Work in the Field?

A computational structure-activity study was reported for a prenylated flavonoid of *Dalea elegans* where the specific fit of the compound, abbreviated as 8PP, in an enzyme binding site was modeled (Santi et al. 2023). The *D. ornata* compounds found here, other than **5** and **6**, share a feature with 8PP, which is the presence of one or two five-carbon side chains called prenyl groups. These were found to be of significance for enzyme binding in the 8PP study.

Prenyl groups are otherwise known to enhance bioavailability, presumably due to their affinity for the fatty, or lipophilic, structures in cells (Mukai 2018). In theory, this should allow such compounds to diffuse more easily into cells. The results here are not entirely consistent with this. Compound **7**, for example, should be more active than **8** since it possesses an additional prenyl group and is otherwise identical. But **7** is less active than **8** at every dose. Compound **8** was in fact the most active isolate, with a level of potency approaching that of the gentamycin positive control. Compound **4** contains two prenyl groups but was completely inactive. Other structural differences between the eight compounds tested clearly must have significant effects on their activities. One could even speculate that other interactions, such as those that might take place on the cell surface, rather than penetration of the cell membrane, result in the observed activities.

Several compounds, notably **2** and **8**, were isolated that expressed inhibitory activity greater than that of the crude extract of the roots. This confirms the expectation that potency increases with purity.

Future Work Planned and Hoped For

All pure compounds from this study, including those still present in mixtures at the time of this writing, will be fully evaluated for antimicrobial activity in more sophisticated assays against a panel of human pathogens. These include susceptibility tests with methicillin resistant *Staphylococcus aureus* (MRSA)

and vancomycin resistant *Enterococcus faecalis*, *Cryptococcus neoformans*, and *Candida albicans*. These bioassays will be conducted in the laboratory of our collaborator, Professor Christine Salomon at the University of Minnesota's Center for Drug Discovery.

This work, on a plant indigenous to the state of Washington, contributes to our knowledge of another small part of the natural world. From an ecological point of view, it raises questions about the reason for the localization of antimicrobial compounds in the roots of the plant. The same levels of antimicrobial activity and chemical diversity have not been observed in extracts of aerial parts of *Dalea* spp. (Belofsky et al. 2014, 2023, 2024). An investigation into the natural microbial population of the root environment of the plants would be of great interest. In this present study, antimicrobial activity is merely coincidental.

There is also a need for more phylogenetic work on the genus *Dalea*. There has been only one published article that describes genetic-based taxonomic relationships for 24 *Dalea* spp. (McMahon and Hufford 2004). These specific relationships are unknown for the majority of *Dalea* spp., which number at least 165 species (Estrada-Castillón and Villarreal-Quintanilla 2008). With additional phylogenetic data, closely related *Dalea* spp. could be effectively mined for compounds similar to active ones of interest. Distantly related species may be likely sources of novel metabolites, since genetic diversity leads to compound structural diversity. Perhaps there will be a new urgency for such efforts in light of the anticipated effects of anthropogenic global warming that will likely lead to species decline and the loss of valuable diversity.

Acknowledgements

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Voucher specimen of Blue Mountain prairie-clover (*Dalea ornata*) held at the University of Washington Herbarium, Burke Museum. PHOTO: COURTESY OF UNIVERSITY OF WASHINGTON HERBARIUM, BURKE MUSEUM

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Hyperlocal Seed Collection

by Kelsey Kelmel, Heritage Garden Coordinator for Benton Conservation District and Franklin Conservation District

Introduction

The conservation of native plants is crucial for maintaining biodiversity, preserving genetic diversity, and fostering sustainable ecosystems. In Benton and Franklin counties, the preservation of native plant species faces numerous challenges, including habitat loss, climate change, and limited accessibility to native plant materials. The hyperlocal seed collection initiative, undertaken by the Heritage Garden Program in Benton and Franklin counties, aims to address these challenges through ongoing collaboration with local partners on collecting, cleaning, and distributing native plant seeds within our region. Through a grant from the WNPS Conservation Committee, the Heritage Garden Program was able to secure the initial supplies needed to help facilitate hyperlocal seed collection and distribution efforts (Table 1).

Events	Participants	Date	Community Partners
Seed Collection	10	9.4.24	Washington Department of Fish and Wildlife (WDFW)
Seed Collection	12	12.5.24	WDFW, Benton County Parks Department
Seed Collection	13	11.30.24	Tapteal Greenway, Columbia Basin WNPS
Seedball Event	45	12.7.24	Columbia Basin WNPS, Richland Public Library
Planting Event	30	10.27.24	Heritage Garden Fall Workshop
Seedball Event	75+	4.9.25	Columbia Basin College Arbor Day Festival
Planting Event	10	4.13.25	Girl Scouts, City of Kennewick Parks Department
Seedball Event	40	4.29.25	Runners of the Sage, Columbia Basin WNPS
Planting Event	12	5.10.25	Heritage Garden Workshop, Tri Cities Food Co-Op

Table 1. Events facilitated by staff and/or partners incorporating hyperlocal seed collection.

Plant Accessibility

We aimed to increase accessibility to native plant materials for Conservation District partners, local and regional native plant producers, interested landowners, and the public. Over the course of this grant period, staff, volunteers, and partners collected an estimated 158.38 oz (nearly 10 lbs.) of native seeds. Of that, approximately 124 oz of seed were dispersed locally to three educational organizations, three partner organi-



Sagebrush (*Artemisia tridentata*) seed collection in partnership with WA Department of Fish and Wildlife and Benton County Parks Department. PHOTO: KELSEY KELMEL

zations for restoration and educational programming, and 16 landowners pursuing native plant conservation plantings on their lands.

Preservation of Genetic Diversity

Through the collection of seeds from local native plant populations, we aim to preserve genetic diversity within Benton and Franklin counties. Over the course of this grant period, ongoing seed collection permissions were obtained from 11 entities including organizations (Table 2) and private landowners resulting in the collection of seed from 33 different native species (Table 3).

Seed Collection Permissions + Partnerships
Washington Department of Fish and Wildlife – Benton and Franklin counties
Benton County Parks Department
City of Richland Parks Department – Leslie Groves North
Tapteal Greenway
Benton County Mosquito Control Board
Kennewick Parks Department – Hansen Park Heritage Garden
Master Gardeners of Benton County – Demonstration Heritage Garden
North Yakima Conservation District Heritage Garden
Port of Pasco
McNary Wildlife Refuge Heritage Garden

Table 2. Organizations and partners from which seed collection permissions were obtained.

Conclusion

Seed stewardship connects people to the landscape in an intimate way, while increasing redistribution of local genetics into restoration efforts. Seeds are future flora, adaptable and resilient to the unknown into which they’re sown. They hold within them genetic information that may be adapted to future environments. Some will lie dormant for years until conditions are just right to emerge and take root. Some will never meet

Species	Common Name	Amt Collected (oz)
<i>Achillea millefolium</i>	yarrow	17.8
<i>Achnatherum hymenoides</i>	Indian ricegrass	0.4
<i>Artemisia tridentata</i>	big sagebrush	24.55
<i>Asclepias speciosa</i>	showy milkweed	16
<i>Astragalus succumbens</i>	Columbia milkvetch	1.39
<i>Balsamorhiza careyana</i>	Carey's balsamroot	0.2
<i>Castilleja thompsonii</i>	Thompson's paintbrush	0.25
<i>Cleomella lutea</i>	yellow beeplant	1.94
<i>Crepis atriobarba</i>	slender hawksbeard	2.05
<i>Cymopterus terebinthinus</i>	turpentine desert parsley	0.4
<i>Dalea ornata</i>	Blue Mountain prairie-clover	0.74
<i>Dieteria canescens</i>	hoary-aster	5
<i>Ericameria nauseosa</i>	common rabbit-brush	9.71
<i>Erigeron pumilus</i>	shaggy fleabane	0.13
<i>Erigeron speciosus</i>	showy daisy	0.71
<i>Eriogonum heracleioides</i>	Wyeth buckwheat	0.26
<i>Eriogonum niveum</i>	snow buckwheat	4.52
<i>Eriogonum strictum</i>	strict buckwheat (white flowered)	0.5
<i>Eriogonum strictum</i>	strict buckwheat (yellow flowered)	0.21
<i>Gaillardia aristata</i>	blanket flower	10.13
<i>Grayia spinosa</i>	spiny hopsage	5.09
<i>Helianthus annuus</i>	common sunflower	11.87
<i>Hesperostipa comata</i>	needle-and-thread	1.16
<i>Heterotheca villosa</i>	hairy goldaster	3.43
<i>Leymus cinereus</i>	Great Basin wildrye	18.79
<i>Linum lewisii</i>	wild blue flax	4.42
<i>Oenothera pallida</i>	pale evening-primrose	0.29
<i>Penstemon acuminatus</i>	sand dune penstemon	0.25
<i>Phacelia hastata</i>	silverleaf phacelia	0.25
<i>Plantago patagonica</i>	woolly plantain	8.96
<i>Purshia tridentata</i>	antelope bitterbrush	2.71
<i>Salvia dorrii</i>	purple sage	1.11
<i>Sphaeralcea munroana</i>	Munro's globemallow	2.41
<i>Sporobolus cryptandrus</i>	sand dropseed	0.75
	Total amount of seed collected	158.38

Table 3. Species, common name, and the amount of seed collected in ounces over the course of the grant period.



Sagebrush (*Artemisia tridentata*) seed collected in partnership with WA Department of Fish and Wildlife and Benton County Parks Department. PHOTO: KELSEY KEMMEL

the conditions in which they were meant to grow. Some will mature to become the next generation to disperse their genetic information and their imprints of the landscape. Those seeds that do not sprout and mature still play a role in the ecosystem as forage for fauna, microbes, or pollinators. To gather seed is to form a relationship with a plant beyond its blooms, fostering a deeper understanding of species. To disperse and sow seeds is to create space for a future where flora, fauna, and peoples continue to grow and thrive together.

Our sincerest gratitude to WNPS Conservation Grant Committee for their financial support in these localized conservation efforts. Conservation only succeeds with community support. Special thanks to all our partners and volunteers who continue to share their time and space with us and to the Columbia Basin WNPS Chapter for their support and engagement in local native plant appreciation, education, and conservation efforts.

Kelsey Kimmel is the Heritage Garden Program Coordinator in Benton and Franklin Counties and also works for a native plant nursery where she grows native and drought tolerant species. She loves to connect folks to the local shrub-steppe flora and is actively involved in the Columbia Basin Chapter of the Washington Native Plant Society. The Heritage Garden Program offers technical advice on gardening with native plants in the Columbia Basin. Program services are offered free of charge in participating counties and include site visits, custom plant lists and planting plans to help folks implement waterwise gardening practices with native plants. To learn more about the program and its services, check out the Heritage Garden Website: www.hgcd.info



Botany Washington 2025

Late Spring in the East Cascades, headquartered at Ingalls Creek Enrichment Center, Peshastin, Washington



Botany Washington 2025 participants. PHOTO: John Bolivar



Botanical drawing in the air-conditioned cabin. PHOTO: CRYSTAL SHIN



Saturday with Ted Alway and Fayla Schwartz—1st Botany WA! PHOTO: REGINA JOHNSON



Herbarium specimens for taxonomy workshop. PHOTO: DENISE MAHNKE



Atop Tronson Ridge. PHOTO: TED ALWAY



Keying with Wendy, Jim and Trish. PHOTO: DENISE MAHNKE



Pondering Upper Naneum Meadow with Richard Ramsden. PHOTO: TED ALWAY



Botanizing on Burch Mountain. PHOTO: MOLLY BOYTER



Grasses identification with Clay Antieau. PHOTO: JOHN BOLIVAR



Crystal Shin, botanical drawing instructor. PHOTO: DIXIE LLEWELIN



Carrie Tribble, Saturday evening speaker. PHOTO: JOHN BOLIVAR

Little Carey's Wetland Restoration 2024

by Alison Studley, Skagit Fisheries Enhancement Group

Skagit Fisheries Enhancement Group (SFEG) is a non-profit that focuses its efforts on ensuring that the Skagit River is a salmon-rich place for future generations. Skagit Fisheries has a 30-year history of implementing successful habitat restoration projects through partnering with public and private landowners, schools, and other environmental entities across Skagit Valley. Last year, our volunteers, staff, AmeriCorps crews, and students helped plant over 40,000 native plants along waterways in the Skagit Watershed. These native plants are helping to restore habitat for salmon as well as many other important wildlife species, while making our communities resilient to climate change.



Two volunteers preparing to plant a shrub at Carey's Wetland in October 2024. PHOTO: COURTESY OF SKAGIT FISHERIES ENHANCEMENT GROUP

Funds from the Washington Native Plant Society were specifically used to purchase plants for volunteers to plant at the Little Carey's Wetland site near Hamilton, WA approximately 10 miles east of Sedro-Woolley. The site was purchased for conservation by Forterra, a Seattle-based nonprofit in 2019. The 38-acre parcel encompasses a rich array of habitats with significant ecological value including upland pasture, wetlands, and mature second growth forest. In 2021, SFEG began devel-



Volunteer planting native trees at Carey's Wetland Oct 2024. PHOTO: COURTESY OF SKAGIT FISHERIES ENHANCEMENT GROUP

oping a multi-phase project to restore habitat for salmon on the property. The following year, SFEG received funding from the Department of Ecology to plant a riparian and wetland buffer composed of native trees and shrubs over 13 acres, realign the stream channel associated with Little Carey's Creek to create more habitat complexity, and restore natural processes. Before the installation of native plants, this site was dominated by invasive reed canary grass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus bifrons*). After two years of site prep, in the spring of 2024 SFEG staff, AmeriCorps members, and community volunteers planted 12,000 native trees and shrubs over 11.5 acres. Restoring these wetland and riparian areas will ensure that Washington native fauna have high-value habitat to spawn and migrate through the foothills and floodplain that surround the site. In the summer of 2024, SFEG staff and interns monitored the health of the installed plants. In the fall of 2024, SFEG held a weekend planting event where volunteers planted an additional 300 native plants throughout a 0.5-acre area along the northern boundary of the site where Himalayan blackberry control efforts are ongoing. SFEG also utilized some of these plants to replace trees or shrubs that did not survive from the initial planting.



Advocacy

by Katherine Darrow, Conservation Committee Member

"One final paragraph of advice: do not burn yourselves out. Be as I am...a reluctant enthusiast...a part-time crusader, a half-hearted fanatic. Save the other half of yourselves and your lives for pleasure and adventure. It is not enough to fight for the land; it is even more important to enjoy it. While you can."

-Edward Abbey in *Desert Solitaire* (1968)

During a recent WNPS Conservation Committee meeting, guest speaker Clay Antieau zoomed in to offer helpful tips on how we can be effective advocates for native plants and their habitats, which is an important part of our mission. Among the "12 Steps" offered were these: "Be aware of threats to native plants;" "Form coalitions with like-minded organizations and people;" "Integrate conservation efforts with other WNPS activities." Last on the list was "Enjoy and share your passion for native plants and their habitats." I'm proposing that we move this last bit of advice to the first step of advocacy as important fuel against burn-out. This was stridently expressed by Edward

Twelve-step Program for Native Plant Conservation Advocacy

by Clay Antieau, WNPS Past President

1. **Be aware** of threats to native plants and their habitats.
2. **Don't just "wait and see"**: take action early when a threat is recognized.
3. **Speak truth to power**: be clear, direct and powerful with language when addressing issues.
4. **Resist**: take action in as many forms as you can.
5. **Benchmarking**: learn how related native plant advocacy organizations are interacting with agencies and responding to issues.
6. **Form coalitions** with like-minded organizations and people.
7. **Provide members with tools and information** for advocacy.
8. **Interact purposefully** with elected government representatives.
9. **Make public comments** regarding government issues, as an individual or organization.
10. **Integrate conservation efforts** with other WNPS activities, such as field trips and invited speakers or workshops.
11. **Find and support other organizations** that share elements of our mission.
12. **Enjoy and share your passion for native plants** and their habitats wherever you are to support your own joy and hope in the present and for the future.

Abbey (1927–89), who many of you may remember as one of our most ardent crusaders for wildlands in the western United States. An anonymous person papered East Jefferson County with the entirety of Abbey's well-known quote earlier this spring in response to increasing threats to federal public lands.

Summer is prime time in many regions of Washington to get out and witness the flourishing of our native plants along our coastlines, on alpine ridges, and everywhere in between. WNPS is offering many field trips in and around the state to botanize together and build up our energy, just as the plants are, to carry us through the year in our advocacy efforts. There are plenty of ongoing restoration and conservation efforts to participate in as well that are listed in the events pages and within each Chapter. Please join us!

The Conservation Committee continues the work since Becky Chaney's resignation. Please visit the website to review the advocacy actions on behalf of WNPS in 2025, wnps.org/advocacy. While leaderless, the Committee is a committed group from around the State of Washington with representation of six regional chapters currently. Prospective new members are encouraged to inquire. As a group, we continue to search for the chairperson to support the work of the Committee and Board, and to build upon Becky's legacy. The Committee meets on the second Tuesday, monthly. Contact wnps@wnps.org for more information or an invite to attend a meeting.



Becky Chaney, WNPS Conservation Committee Chair Steps Down

by Clay Antieau, WNPS Past President

On April 27, 2013, at the State Board of Directors meeting in Ellensburg, WNPS President Dean Longrie appointed Becky Chaney as Chair of the WNPS State Conservation Committee—and the WNPS State Board of Directors approved this appointment unanimously. Thus began Becky's long and successful tenure as Chair of the WNPS Conservation Committee. Prior to that appointment, Becky was a longtime member of the WNPS State Conservation Committee, served as the Central Puget Sound Chapter's Conservation Chair, and graduated from the WNPS Native Plant Stewardship Program.

I'm personally thankful for the opportunity to work with Becky on the State Board of Directors and WNPS Conservation Committee over many years. I and WNPS have benefitted from Becky's diverse background and interests in landscape architecture, environmental design, urban planning, forest stewardship, and ecological restoration. She has been a long-time Board member for King County Noxious Weed Board and the Snoqualmie Watershed forum. With her partner, Martin, Becky has worked tirelessly for many years as a local and State advocate for voter education and political and social change.



Becky enjoying time with grandchildren. PHOTO: MARTIN CHANEY

In June 2024, after 12 years, Becky resigned as Chair and then retired from the Conservation Committee in May 2025, leaving a legacy of excellence, compassion, and friendship. Under Becky's leadership, the WNPS Conservation Committee tracked and responded to countless challenges and threats to the State of Washington's biodiversity and habitats. Becky forged the Committee's Conservation Grants Program and efficiently worked to award and curate more than \$55,000 in grants for projects supporting important conservation efforts across the State. She rigorized the Committee's work by drafting a "job" description for the Chair position; drafting the approved WNPS Conservation Statement that outlines WNPS Conservation Principles and includes the Committee's Charter; and developed the approved WNPS Policy on Conservation and Endorsement Activities. Members always looked forward to her Conservation Corner columns in *Douglasia*. As a member of the Committee, I observed and appreciated Becky's hard and time-consuming work to prioritize competing demands and then recruit, engage, organize, and motivate members of her Committee—which I know must have often felt like swimming upriver during a flood! As an *ex officio* member of the State Board of Directors, Becky could always be counted on to speak forthrightly with strong commitment to equity and advancing the WNPS mission.

Indeed, she has been a remarkably effective and passionate leader in WNPS. Our Society owes Becky much gratitude. Good luck in your future pursuits, Becky! Thank you for your passion, commitment, contributions, and decades of dedicated volunteer work advocating for Washington's biological diversity and habitats.



Support Our Work

The Washington Native Plant Society depends on your support to deliver the mission of the society. Your help can make the difference and sustain the impact of WNPS into the future.

Become a Member

Join our community of plant lovers and be the first to learn about the programs in your area. Contact the office or go online at www.wnps.org/store-membership/membership.

Donate Online

You may donate any amount online through our secure website at www.wnps.org/donation/make-a-donation.

Donate through Your Workplace

- Workplace giving is an easy way to support WNPS.
- Benevity Giving Portal—If your employer is registered with Benevity, your gifts to WNPS could be matched by your employer.
- Federal Employees may donate through the Combined Federal Campaign—CFC # 69374.
- Washington State Employees may donate through the Combined Fund Drive—CFD # 0315051.
- King County Employee giving—WNPS agency code #9600.
- Workplace matching gifts: Your employer may offer to match your charitable donations.

WNPS Endowment Fund Giving

Endowment gifts are kept as permanently restricted funds as designated by the donors. This fund provides annual distributions that support the WNPS Grant programs in Research and Plant Inventory, Conservation, and Education. Donations may be made in the following ways:

- Online at www.wnps.org/donation/endowment.
- By mail: Please make checks payable to WNPS Endowment Fund.

Make A Planned Gift

Making a gift through your estate is a powerful way to express your values, care for the earth, and ensure a lasting impact. "*One generation plants the trees, another gets the shade.*" —Chinese Proverb

Here are examples of how to make a planned gift:

- Name the Washington Native Plant Society in your will.
- Make the Washington Native Plant Society a beneficiary to your IRA or life insurance policy.
- Name the Washington Native Plant Society as the beneficiary of a charitable remainder trust.

Make a Contribution with Stock

WNPS can now support a transfer with a brokerage account. Contact the WNPS office for our FAQ sheet that provides information to share with your broker.

Learn all the ways you can support WNPS at www.wnps.org/donate. For more information on giving options, call the WNPS office 206-527-3319, or email wnps@wnps.org.

Washington Native Plant Society State Board Directory

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(Director's term follows name)

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* Denotes a voting position

** Ad hoc committees are formed to address society business and are not defined by WNPS bylaws, as are standing committees.



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Blue Mountain prairie-clover (*Dalea ornata*). blossom.
PHOTO: MARK TURNER

