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

Bryophytes and Lichens from the South Puget Sound Prairies of Western Washington

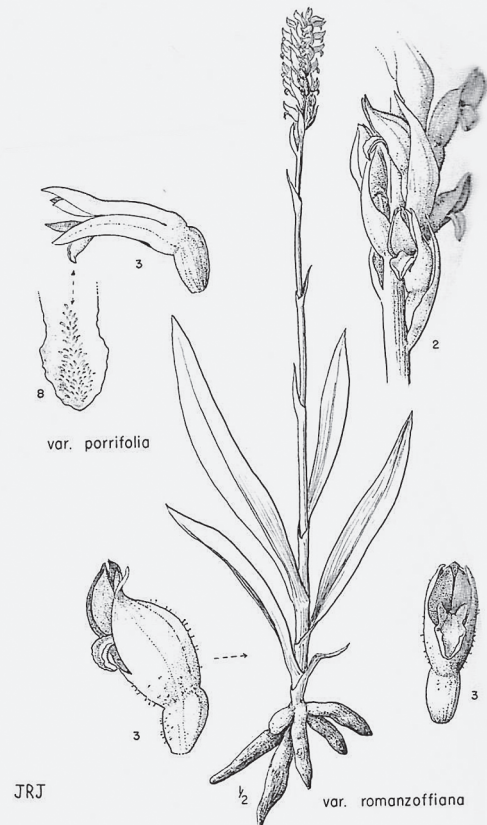
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Spiranthes romanzoffiana

Illustration by Jeanne R. Janish

About This Issue

This past July, I was fortunate to spend some time in Colorado. The area I visited had received ample spring rainfall, so on a hike in the foothills above Boulder, my hiking mates and I were treated to a dazzling display of colorful wildflowers carpeting the meadows and woods. My junior-level ID'ing skills were put to the test, as I learned the names of plants such as white fairy trumpet and miner's candle. Everywhere I looked seemed to reveal yet another species I hadn't seen before.

It's easy to take nature's extravagance for granted with such an over-the-top experience.

Back at home, while reviewing the articles for this issue of *Douglasia*—and with the memory of Colorado wildflowers still fresh in my mind—I couldn't help but notice that several of the articles spoke of plant scarcity, not abundance. Phrases such as “rare lichen,” “listed as sensitive,” “evaluating rarity and risk,” and “confirmation that 1–3 species may be rare” brought me back to reality, reminding me of the ongoing research and conservation efforts that are critical to helping stem the loss of certain plant species—whether a reindeer lichen or a Kamchatka lily—and the ecosystem services they provide. You'll read about some of these efforts in this issue.

Now as the clouds begin to gather and temperatures cool, many of us reach for those books that have gone unread and grown dusty on our nightstands all summer long. After reading the three book reviews included in this issue, you just might want to add one or more books to your pile.

And if some exercise and beautiful coastal views sound appealing, along with the possibility of seeing wildflowers that bloom during the winter months, check out the hike at Ebey's Landing.

Whether you travel far or stay close to home in the upcoming months, take some time to enjoy the natural beauty of wherever you are.

Mary Johnson
Managing Editor

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Members and others are invited to submit material for publication in *Douglasia*. 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 http://www.wnps.org/publications/douglasia/douglasia_contributors.html.

E-mail submissions to Douglasia@wnps.org.

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Front Cover: The illustration of *Spiranthes romanzoffiana* by Jeanne R. Janish was reprinted from *Vascular Plants of the Pacific Northwest* by C. Leo Hitchcock, Arthur Cronquist, Marion Ownbey, and J.W. Thompson.

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President's Message: The View from Here

Planned Giving to Support Your WNPS

Clay Antieau

Dear fellow WNPS members,

Most of us will encounter a time in our lives when we think about leaving a lasting reminder of how we lived and what we loved—how to say thanks, give back, and improve our communities. In that vein, WNPS has been recently honored to accept its first major bequests as the result of the planned giving of two longtime members. As you can imagine, this is exciting news and opens amazing opportunities for the society.

Our current Native Plant Stewardship Program has been focused in King, Pierce, and Snohomish counties since its inception in 1996. During its 18-year history, we have trained and graduated 562 Native Plant Stewards who have committed more than 135,000 volunteer hours. We recognize, however, that the concept of stewardship must extend beyond the Puget Sound area if WNPS is to completely fulfill its mission to promote the appreciation and conservation of Washington's native plants and their habitats through study, education, and advocacy.

The first bequest in the amount of \$131,597.87 was earmarked specifically for the Native Plant Stewardship Program. Those dollars are now enabling the society to deploy our flagship stewardship program on a state-wide basis. As a result, we welcome Jim Evans as State Stewardship Program Manager and look forward to the fruits of this effort as citizens throughout Washington engage in a deeper understanding and appreciation of the native flora and ecosystems in their communities.

The second bequest was for \$30,000 and comes to us unencumbered. This gift will likely be used to build the society's operating reserve, which is intended to provide an unrestricted internal source of funds to maintain orderly business continuity in times of unanticipated financial emergency, such as temporary shortfalls, or to provide a funding resource to respond to an immediate, exceptional opportunity that we otherwise could not meet by established budget revenue.

Obviously, maintaining a healthy operating reserve is a prudent fiscal strategy for any nonprofit organization. The gift of \$30,000 allows us to be in that fortunate position. Any remaining dollars may be used to complete a project that

redevelops the society's central membership database and automates associated administrative processes.

Planned giving is a process whereby the donor and nonprofit work together to achieve the maximum benefit for each party from a current or deferred charitable gift. Perhaps you've already given some thought to adding a bequest or charitable gift to WNPS into your will or estate plan. While WNPS is not in a position to offer legal advice, we would be interested in working with you to discuss our programs, objectives, funding needs, and gift acceptance and endowment policies.

Members of WNPS have always been historically generous donors, and we are truly honored by those donors who have left legacy bequests to support our work.

Clay



Clay and his dog, Kona, at the channeled scablands of Escure Ranch, Whitman County, Washington. PHOTO: NAOMI CHECHOWITZ

Bryophytes and Lichens from the South Puget Sound Prairies of Western Washington

A Summary of Two Seasons of Surveys

by *Lalita Calabria*

The glacial outwash prairies of western Washington are home to a little known, but diverse assemblage of ground-dwelling mosses, liverworts, and lichens. These ubiquitous organisms create a persistent ground cover in grasslands and other terrestrial ecosystems where they function in reducing soil erosion, fixing nitrogen and carbon, regulating soil

temperature and hydrology, and providing food, habitat, and chemical defenses for vertebrates and invertebrates.

Over the course of two field seasons, our research group, including students of the Evergreen State College and a team of professional bryologists and lichenologists, conducted a survey of bryophytes and lichens in burned and unburned areas of seven prairie sites in the South Puget Sound area of western Washington (Figure 1). The purpose of our study was to document bryophyte and lichen species diversity in the South Puget Sound prairies and to report on the distribution of new species.

We hope to raise awareness of this often overlooked group of prairie organisms and assist land managers in developing strategies for protecting and monitoring rare bryophytes and lichen populations and species of concern for the South Puget Sound prairies. A more detailed account of the results from our survey, including a species checklist, is published in the June 2015 issue of the journal *Evansia* (Calabria et al. 2015).

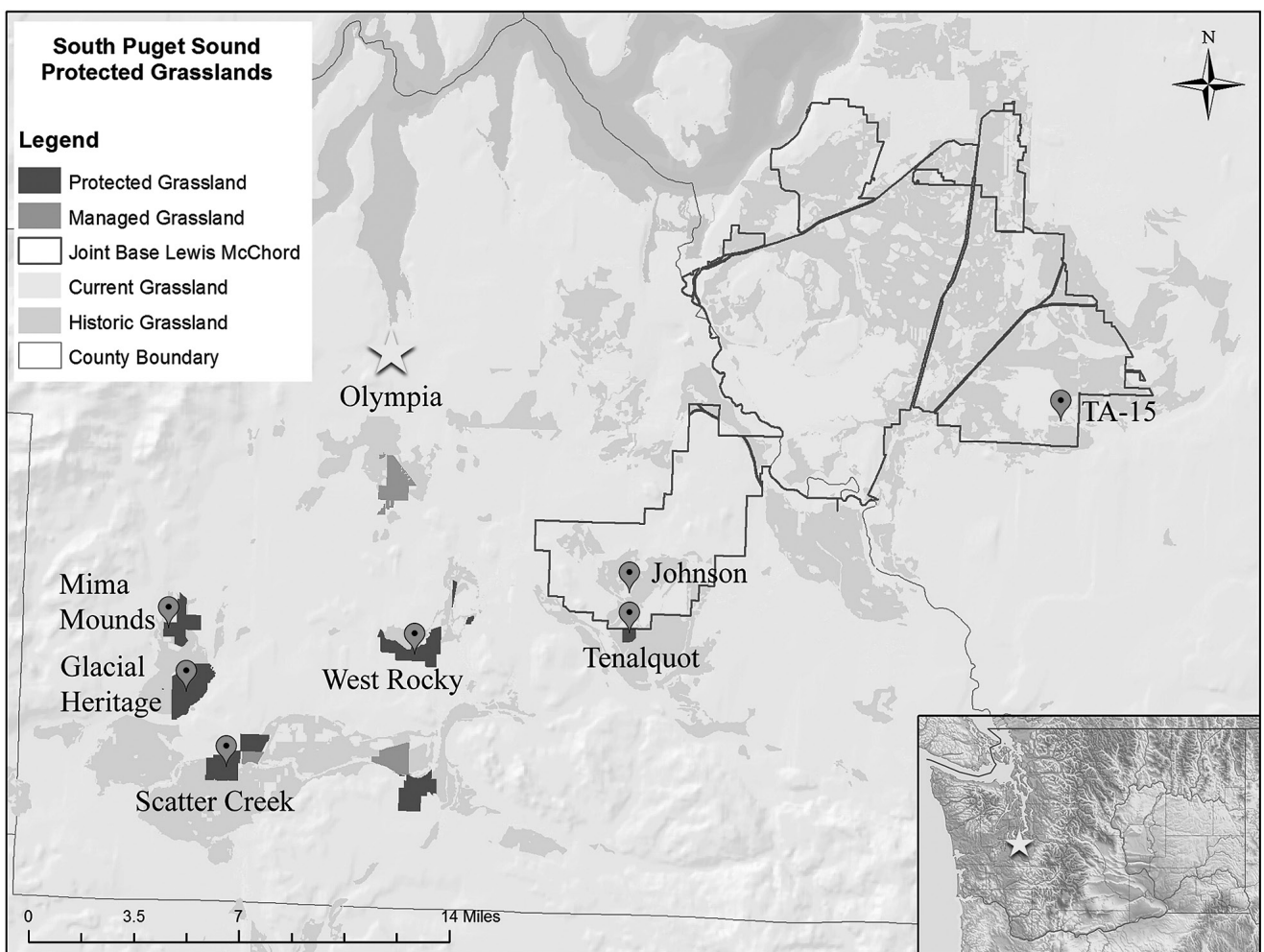


Figure 1. This map shows the seven South Puget Sound prairie sites surveyed for bryophyte and lichen diversity, abundance, and mat depth in our current study: Glacial Heritage Preserve, Mima Mounds Natural Area Preserve, Scatter Creek Wildlife Recreation Area, and three sites located on Joint Base Lewis-McChord–Tenalquot Prairie, Johnson Prairie, and Training Area (TA-15).

Data Collection

During our first field season (spring 2012), we worked closely with site managers to choose study sites and to determine the best methods for recording terrestrial lichen species richness. We used an intuitive sweep control plot survey method modified from the USDA Forest Inventory and Analysis Program (Bechtold & Patterson 2005) where surveyors searched the study area, targeting bryophyte- and lichen-rich microsites until no additional species were recorded.

During our second field season (spring 2013) we expanded our surveys to include terrestrial bryophytes. We also led a day-long field training session for employees and interns at the Center for Natural Lands Management and Washington State Department of Natural Resources in methodologies for documenting bryophyte and lichen species richness, growth forms, and mat depth at Glacial Heritage Preserve and Mima Mounds Natural Area Preserve. Incorporating bryophyte and lichen data into vegetation monitoring of the prairies gives managers a starting point for assessing differences in community structure between burned and unburned areas of the prairie that could affect the seed germination of prairie vascular plants.

After data collection, our research team identified all lichen and bryophyte specimens collected during our surveys using microscopy and chemical testing when necessary. Voucher specimens were deposited in the Evergreen State College Herbarium (EVE). We searched and compiled records from the Consortium of North American Lichen Herbaria (CNALH 2014), the Consortium of North American Bryophyte Herbaria (CNABH 2014), and other relevant literature to gather historical lichen data from Washington prairies.

Summary of Our Findings

Overall, we recorded 32 terrestrial bryophyte species and 32 terrestrial lichen species in our surveys of seven South Puget Sound prairie sites (Calabria et al. 2015). Most notably, we expanded the known distribution ranges for four lichen taxa on the Washington Natural Heritage Program (WNHP) proposed list of rare lichens (WNHP 2014). These lichens include the rare reindeer lichens, *Cladonia ciliata* var. *ciliata*, *C. ciliata* var. *tenuis*, and *C. portentosa* ssp. *pacifica*, as well as the regionally rare and endemic species *C. novochlorophaea*.

Rare Reindeer Lichens

Most visitors to the Mima Mounds Natural Area Preserve in western Washington will recognize the charismatic reindeer lichens that grow in large mint-green to grayish-green clumps scattered among the mounds (Figure 2). We found both



Figure 2. A species of reindeer lichen (*Cladonia*) at Mima Mounds Natural Area Preserve near Littlerock, Thurston County, Washington. PHOTO: LALITA CALABRIA

varieties of *C. ciliata* during our surveys: *C. ciliata* var. *ciliata* (-usnic acid) and *C. ciliata* var. *tenuis* (+usnic acid). Both of these taxa have been assigned a state rank of S1—critically imperiled—in Washington State (WNHP 2014). The statewide distribution of *C. ciliata* is incompletely known due to the taxonomic ambiguity of this species, which can be easily confused with the morphologically and chemically similar *C. arbuscula*. We expanded the known localities for *C. ciliata* var. *ciliata* to include Scatter Creek Wildlife Recreation Area and West Rocky Prairie. For *C. ciliata* var. *tenuis*, we expanded the known localities to include Glacial Heritage Preserve, Scatter Creek Wildlife Recreation Area, West Rocky Prairie, and Joint Base Lewis-McChord (JBLM)—Tenalquot Prairie.

We also found the rare reindeer lichen *C. portentosa* ssp. *pacifica*, which is ranked S2—imperiled—in the state (WNHP 2014). This species is rarely found more than several kilometers inland from the coast with the exception of the South Puget Sound prairies, where it appears to be locally abundant. This species was previously recorded at Mima Mounds Natural Area Preserve (McCune et al. 2009), and we expanded the known localities to include Glacial Heritage Preserve, West Rocky Prairie, and JBLM—Tenalquot Prairie. All were collected in unburned areas.

Other Notable and Rare Lichens

Cladonia novochlorophaea is currently listed as recommended for a state rank of S1 (WNHP 2014). This species can be difficult to distinguish from other members of the *C. chlorophaea* taxon group based on field characters alone, but in general can be characterized by its non-soresiate (lacking powdery propagules), olivaceous to dark-brown podetia (stalk

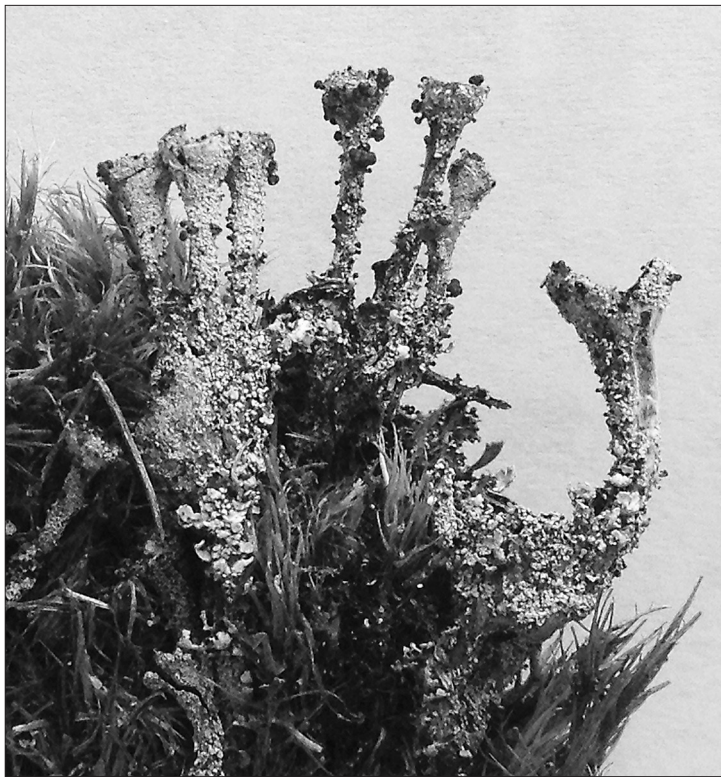


Figure 3. *Cladonia novochlorophaea* collected from the unburned area of the Glacial Heritage Preserve near Littlerock, Washington. PHOTO: LALITA CALABRIA

bearing the spore-producing apothecium) with large corticated granules or peltate squamules (scales) (Figure 3). However, chemical testing is necessary to confirm its identification, making it difficult for nonexperts to evaluate the distribution of this species. Field monitoring of *C. novochlorophaea* will likely require identification by trained lichenologists who can differentiate field characteristics of the *C. chlorophaea* group.

All known specimens of *C. novochlorophaea* from the western United States were collected from a single locality in Washington: Mima Mounds Natural Area Preserve, Thurston County. We expanded the known localities for *C. novochlorophaea* in Washington State to include West Rocky Prairie and Glacial Heritage Preserve (unburned area only), also in Thurston County. A more detailed understanding of the distribution, abundance, and habitat requirements of *C. novochlorophaea* in the South Puget Sound prairies will help assess the conservation status of this species.

We recorded one additional species that was not listed on the WNHP rare lichen list but appears to be rare in Washington: *C. concinna*. In our survey, this species was recorded at Glacial Heritage Preserve in unburned areas of the prairie. Based on the critically imperiled status of prairie habitats in Washington (Chappell 2006) combined with the

limited number of reports for this species in Washington, we suggest that *C. concinna* be added to the WNHP list of rare lichens.

A Non-Native Moss

In our study we noted the occurrence of a non-native moss, *Pseudoscleropodium purum*, which appears to have been introduced to the South Puget Sound prairies. *Pseudoscleropodium purum* is a European moss species that has been documented in several locations throughout North America including in Seattle, Washington, and Vancouver, British Columbia, where it is typically found growing in lawns and cemeteries. This robust, pinnately branching, yellowish-green moss has been recognized as a key species of concern in introduced habitats worldwide where it alters native bryophyte species composition (Essl et al. 2013).

In our surveys, we found it growing in unburned areas at Scatter Creek Wildlife Recreation Area and West Rocky Prairie. It is unclear how this species was introduced to the prairies of South Puget Sound or how widespread it may be. One possible mechanism for spreading this species may be through mowing, which is a commonly used management tool at these sites to control the growth of invasive vascular plant species such as Scot's broom (*Cytisus scoparius*) and various grasses. Mowing creates vegetative moss fragments that can be dispersed from one area of the prairie to another by mowing machines or transported on the mowers to different prairie sites. It is also possible that mowing may also reduce competition with faster growing grasses and forbs that would normally shade out the young moss shoots. Future research efforts should focus on documenting the distribution of *P. purum* and determining whether this species poses any risks to the endemic prairie moss and vascular plant communities, food webs, or soil structure.

Greenhouse Moss

We observed a second moss species, *Funaria hygrometrica*, sometimes referred to as “bonfire moss” because it is often found growing in old campfire rings, growing in discrete rows along with recently planted native vascular plant plugs. We suspect that the *F. hygrometrica* has been introduced along with greenhouse-grown native vascular plant plugs into the burned areas of the prairies we surveyed. *Funaria hygrometrica* is a widespread, weedy moss species associated with bare mineral soil in disturbed habitats, greenhouses, and campfire sites (Figure 4). This species is easily recognizable in the field by its small (<1cm high) light-green gametophyte and twisting, swan-necked seta and capsule. *Funaria hygrometrica* is a fire-adapted species and may also occur as part of the natural succession in disturbed soils and, particularly, in burned

areas of the prairie. More studies are needed to determine the overall distribution of this species as well as other short-lived, ephemeral mosses that typically grow in bare soils of recently burned areas of the prairie.

Acknowledgments

This research was generously supported by the Washington Native Plant Society, the Center for Natural Lands Management and the Evergreen Foundation. Special thanks to the members of Northwest Lichenologists and others who assisted with the identification of lichens: Tom Carlberg, Greg Eide, Katie Glew, Jana Kocourkova, Kerry Knudsen, Bruce McCune, Daphne Stone, and John Villella. We thank Judy Harpel for her assistance in the lab and field with bryophyte identification. We also thank Sarah Hamman, Dave Hayes, Jim Lynch, and Dave Wilderman for consulting on locations and providing access and background information on management activities for the prairie sites we visited. We are grateful to The Evergreen State College and, specifically to the staff and resources provided by the Evergreen Herbarium, for lab space, access to microscopes, and curation support. This study could not have been completed without the resources of the Consortium of North American Lichen and the Consortium of North American Bryophyte Herbaria.

Lalita Calabria is a botanist and visiting faculty at The Evergreen State College in Olympia, Washington. Her research focuses on bryophyte and lichen taxonomy, biodiversity, and conservation, especially in prairies, oak woodlands, and temperate rainforests of the Pacific Northwest. You can reach Lalita at calabril@evergreen.edu.

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Figure 4. The growth habit of *Funaria hygrometrica*. PHOTO: CLIVE SHIRLEY

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WNPS Member Donations at Work.

This research project was supported in part by a grant from the Washington Native Plant Society.



Water Lobelia (*Lobelia dortmanna*)

Washington State Threatened Species

We knew that water lobelia was still there. Rare Care volunteers found it along a northwest Washington lakeshore in 2008 and 2009, at the same sites originally documented in 1992. But one subpopulation remained elusive. Rare plant monitors couldn't relocate the plants around the edge of the island in the lake—until 2014 when I hung over the bow of a rowboat, determined to find it.

by Kate Nowell, Rare Care Volunteer

Volunteering as a plant monitor for Rare Care is a perfect excuse for me to explore Washington's beautiful wild places. But with so many enticing assignments, which adventure should I choose? Driving a pickup with a rowboat perched in the back onto a ferry last August, I felt pleased with my assignment choice. The search for water lobelia (*Lobelia dortmanna*) that followed did not disappoint.

Lobelia dortmanna is a submerged vascular macrophyte found on sandy bottoms of low alkaline lakes in the cool temperate regions of the Northern Hemisphere. The plant is considered an indicator of oligotrophic lakes (those with low productivity and very clear water). Though it has a wide native range, the species is classified as sensitive, threatened, or endangered in many of the states and countries where it occurs.



Lobelia dortmanna is a submerged aquatic perennial. PHOTO: KATE NOWELL.



Hollow cylindrical leaves form basal rosettes. PHOTO: KATE NOWELL.

As my scouting partner gamely navigated our small craft between fallen logs and low branches along a lake's edge, I stretched out over the bow, my head hanging over the water and my eyes scanning the lake bottom. To a lone fisherman across the lake we probably looked crazy, but we didn't care. Bathed in warm, late afternoon light, we found our target population!

Only a few spent flower stalks stuck out above the surface of the water. However, below we observed a dense swath of *L. dortmanna* leaf rosettes. These narrow, cuticle-covered, basal leaves lack stomata as the plant is exceptional in its ability to exchange gases through its roots. A well-developed lacunal system, a network of air chambers within the plant's tissues, transfers carbon dioxide absorbed by the roots to the leaves for photosynthesis. With these physiologically intriguing inhabitants and crystal clear waters, "lobelian lakes" are treasures to preserve.

Learn more about Rare Care's efforts to conserve Washington's rare plants at www.uwbotanicgardens.org/rarecare. To inquire about volunteering or to receive Rare Care's semiannual print newsletter, email rarecare@uw.edu or call 206-616-0780.



Ebey's Landing in Winter

by David Giblin, University of Washington Herbarium,
Burke Museum

Choosing a winter hike for plants in bloom is difficult, though not impossible, if you live in the Puget Sound area. There are a few native species, okay three that I'm confident of, that can be found flowering during the November to February trough of short days and overcast skies. To see them you'll have to head for the coastline where maximum daylight and mostly above-freezing temperatures encourage a few species to throw off a few flowers.

Ebey's Landing on Whidbey Island is my favorite winter hike because you may see gumweed (*Grindelia integrifolia*), harebell (*Campanula rotundifolia*), or hairy false goldenaster (*Heterotheca villosa*) blooming. Additionally, if the weather is nice you have the most remarkable views of the Olympic Mountains and southern Vancouver Island. The distance you'll cover (3 miles round-trip) and elevation you'll gain (about 300 feet) are such that it's a very reasonable walk even if you haven't hiked in months.

I prefer to do the hike in the clockwise direction, so head north along the beach from the parking area. You start out walking through a stand of American dunegrass (*Leymus mollis*) before ending up on the beach. Follow an informal fence of weathered, washed-up logs strewn just above the high-tide line. Tucked among these logs you may find the occasional *G. integrifolia*. Look east to the base of the large bluff for more *G. integrifolia*, along with *C. rotundifolia*, and *H. villosa* (which is found at the base of the bluff a bit north of the parking lot). Those interested in marine algae will find a particularly rich assortment of species either washed up on the cobbly beach or being tossed around in the shallow seawater.

Last November my wife and I did the hike after a particularly large storm, and we found the largely overlooked Torrey's surfgrass (*Phyllospadix torreyi*) washed up along the beach. If you search for this species on the Consortium of Pacific Northwest Herbaria database (www.pnwherbaria.org) you'll see that this was quite an unusual find for Washington (only two prior collections). The species is likely far more abundant than the collecting record suggests because *P. torreyi* grows on rocks in about 5 to 10 feet of cold Puget Sound waters. It is one of a small number of truly marine aquatic plant species in our flora.

The trail ultimately leaves the beach to follow the western shoreline of Perego's Lagoon, a shallow, tea-colored, saltwater



Looking north to Ebey's Bluff with Perego's Lagoon in the upper-left corner.
PHOTO: DAVID GIBLIN

pond. Here you'll find large patches of pickerelweed (*Sarcocornia perennis*), another of our marine aquatic species. It is typically found along coastal mudflats where it experiences periods of total inundation due to tidal fluctuations. *Sarcocornia perennis* lacks leaves, relying on its succulent green stems for photosynthesis. Of greater interest to me in this area is our native beach knotweed (*Polygonum paronychia*), a woody, mat-forming species that I don't often see.

At the north end of Perego's Lagoon the trail switchbacks up to the top of Ebey's Bluff, the only real elevation gain you'll encounter on the hike. Walking south back toward the parking lot you'll pass a remarkable assemblage of twisted, somewhat misshapen, and relatively dwarfed Douglas-fir (*Pseudotsuga menziesii*). These trees provide a great lesson on how steady wind influences tree architecture.

There are similar hikes elsewhere along the Puget Sound coastline providing a similar mix of plants and vistas—this just happens to be the one that I'm most familiar with. Any of them are worth doing if you're hoping to find something flowering in the off-season. You'll need a Discover Pass to park at the Ebey's Landing trailhead. For detailed directions and further trail information, visit the Washington Trails Association website (www.wta.org).



Cultivating Washington's Native *Fritillaria*

by Kathleen Winters, Olympic Peninsula Chapter

Fritillaries are highly prized both in the garden and in the wild, with their delicate display of one to several showy flowers, usually bell-shaped, which tend to hang downward from an unbranched leafy stem, although the seed capsules will stand erect. Our state has three native *Fritillaria* species within its boundaries, the chocolate lily (*Fritillaria affinis*), yellow bells (*F. pudica*), and Kamchatka lily (*F. camschatcensis*), and each has different cultural requirements. Each species is best grown in colonies large enough to not get lost, perhaps even in groupings large enough to permit an occasional harvest for an ethnobotanic meal. All fritillaries are considered palatable after slow steaming, but like other lily family members, have a tendency toward bitterness.

Cultivation

Seed-based propagation of fritillaries native to Washington is similar to the germination techniques used for other species of the native lily (Liliaceae) family. *Fritillaria* seed is harvested when the capsules acquire a shade of light tan and split open to display flat ranks of light brown seed. The seeds germinate best with fall sowing followed by a winter cold stratification. In outdoor treatments, it is easiest to leave the seed flats out, but protected, during a more or less regular winter in the Pacific Northwest. Under controlled conditions, the successful pattern for germination is to mimic the winter cold period by providing six weeks at 40°F followed by a spring-like warming to 70°F degrees. Sow the seeds in flats filled with well-drained humusy sand or a pumice medium. After surface sowing the seed in drills, cover the rows with a light layer of number 2 or 3 chicken grit to reduce stem rot on emergence.

Germination ensues the following spring, and the plants will need ongoing protection. The tiny, single, and strappy monocot leaflets emerge as the only sign of growth for the first year. After the first summer, the young bulbs will go dormant and push their way deeper into the soil. Like other lily family members, there will be several years spent growing ever larger bulbs from seed until flowering. Maintenance should assume a need for protection from slugs and snails. Crows are also fond of pulling out tags—perhaps stapling the tag to the flat will help long-term identification. To encourage faster growth, transplanting the bulblets is best done when the plant is dormant. Adding organic steamed bone meal will improve the bulb's ability to grow large enough to support flowering.

Choosing a *Fritillaria*

Fritillaria affinis, also commonly referred to as checker lily or mission bells, is the most readily grown because it is less rare and not too difficult to grow. The scaly bulbs have many bulblets, which may also be grown into larger plants. The unbranched stems support two to five bell-shaped flowers of a dark purplish shade mottled with green or yellow, giving a checkered appearance to the blossom. The linear to lance-shaped leaves and six angled winged capsules contain many flat seeds that are distinctive when it is seed collecting time. *Fritillaria affinis* is found scattered throughout low to mid-elevations in open forest lands and meadows wherever there is enough moisture. Like its sensitive cousin *F. camschatcensis*, *F. affinis* also smells unsavory, which attracts the flies that pollinate them.

Fritillaria pudica is a small, nodding, yellow fairy flower frequently edged with purple or brown at the base. Spring blooming, it is found in eastern Washington, beginning in drier high-elevation sites east of the Cascade crest, down through the foothills, and across the eastern portion of the state in sage steppe communities. *Fritillaria pudica* is usually less than ecstatic about the wet winters west of the Cascades, so this bulb is best grown *in situ* on the east side. But it also may be successful in west-side rock gardens, where the close-up details allow for showing one or a few bulbs off to advantage, or in alpine houses under more careful cultural conditions.

Fritillaria camschatcensis, commonly known as the black lily, is listed as sensitive by the Washington Natural Heritage Program and has a global endangered status of G5. The bronzy purple flowers are in three main whorls of 5 to 10 blossoms along the unbranched stem and are not mottled. The alternate name of black lily is well suited to the spreading pendant blossoms, which are foetid smelling, indicating pollination by flies. *Fritillaria camschatcensis* is commonly grown *in situ* among the varied wetlands within Washington forests, including streams, meadows, marshes, and bogs. This species is sometimes found in cultivation as well but remains a conservation concern with a restoration focus, rather than a species abundant for harvest.

In summary, once germinated in a fashion similar to other lily family members of Washington, *F. affinis* is the most well adapted for general garden use in the Pacific Northwest. East of the Cascades, the charming *F. pudica* will thrive within its range, and, finally, *F. camschatcensis* is best left to projects of careful restoration and conservation for the near to moderate future. Each species of *Fritillaria* is palatable but slightly bitter and presents its finest display either in massed drifts or in more intimate rock garden settings.



Rare Plants of Washington: Evaluating Rarity and Risk

by Joe Arnett, Washington Natural Heritage Program
rare plant botanist

In the summer 2015 issue of *Douglasia*, I discussed the different ways that rare plant species are distributed across the landscape. In this article I want to describe how the conservation status of these species is evaluated in Washington.

The Washington Natural Heritage Program (WNHP) maintains a statewide database of rare plant occurrences and uses this as a primary reference for assigning a state status of endangered, threatened, or sensitive to species at risk. The WNHP also assigns state ranks, using a national ranking system developed by NatureServe, an international network of natural heritage programs. NatureServe has developed a consistent methodology for ranking based on distribution,

abundance, viability, trend, and threat.

Many land managing agencies (the US Forest Service, Bureau of Land Management, National Park Service, Columbia River Gorge Commission, US Fish and Wildlife Service, and even some county planning departments) also assign conservation status to species on the land they have jurisdiction over. Table 1 shows the variety of systems used to assign rare plant status in Washington. The US Forest Service and Bureau of Land Management also maintain data on rare species on the land they manage, but the WNHP maintains the only statewide database, spanning all ownerships. All of the agencies feed information into this system and rely upon the WNHP for state-level conservation ranking.

Since its formation in 1977, the WNHP has compiled occurrence records and revised the state rare plant list based on data that now includes over 4,500 occurrences. Starting with a preliminary rare plant list assembled by a handful of academic botanists in the early 1970s, the program has reviewed species, assigned status, and recommended additions, deletions, and changes in status.

Our knowledge about the flora is continually expanding; new species are discovered, either new to science or new to

Table 1. The range of rare plant conservation status designations in Washington.

Designations	Responsible Agency	Review Process
State status	Washington Natural Heritage Program	Rare plant status is reviewed every two years, in consultation with the regional botanical community. Selected species are designated as endangered, threatened, or sensitive.
State review list	Washington Natural Heritage Program	Species with insufficient information on distribution and abundance to assign status are put on Review List 1. Species with unresolved taxonomic questions are put on Review List 2.
State rank	Washington Natural Heritage Program	All species with rare plant status are ranked according to NatureServe methodology; ranks range from S1 (critically imperiled) to S5 (demonstrably secure).
Global rank	NatureServe	NatureServe assigns a global rank to all species, in consultation with state natural heritage programs; ranks range from G1 (critically imperiled) to G5 (demonstrably secure).
Federal status	US Fish and Wildlife Service	Species are listed as endangered or threatened under the Endangered Species Act. Review is rigorous, requiring public notification and comment, agency review, and publication in the Federal Register.
Sensitive and strategic species	US Forest Service and Bureau of Land Management	Designations are based on whether species are documented (sensitive) or suspected (strategic) on land managed by the agency. Inclusion on these lists is based on state ranks assigned by the Washington Natural Heritage Program.
Sensitive species	Columbia River Gorge Commission	The Commission designates all species endemic to the Gorge or with state status of endangered, threatened, or sensitive (including US Forest Service sensitive species and species that are federally listed as endangered or threatened) as "sensitive."

Washington, and reclassifications are always in process as our knowledge grows. Molecular analysis has been particularly important in recent classification changes, at the family as well as species levels. The University of Washington is currently revising the *Flora of the Pacific Northwest*, which is bringing a focused and comprehensive examination of the classification and distribution of plant species in Washington and the surrounding region. We know much more about Washington flora than we did in the 1970s, or even two years ago when the rare plant list was last revised, and our knowledge will continue to grow as more study is done and more occurrence records accumulate.

A statewide community of botanists participates in the rare plant list revision by contributing sighting records, suggesting changes or additions, and reviewing proposed lists. Typically in a two-year cycle that corresponds with the biennial revision of the "State of Washington Natural Heritage Plan," the WNHP reviews and revises the state rare plant list. During the two years between Natural Heritage Plans, the rare plant botanist compiles a list of recommendations for potential changes in status, species that warrant review, or taxonomic changes from

botanists around the state. Additional information is gathered from herbarium collection records, current floras, published literature, online resources, and consultation with taxonomic specialists. These comments and recommendations are posted on the Washington Botany Conservation listserv and sent to the individuals who submitted recommendations. After review, additional comments and information are added to this compilation and a revised Washington rare plant list is prepared. The list is reviewed internally and then posted on the WNHP website and notification is sent to contributors and to the Washington Botany Conservation listserv.

Species that were assigned a status of endangered, threatened, or sensitive are considered to be of conservation concern. Species that potentially warrant conservation status but cannot yet be evaluated because of insufficient information on distribution and abundance are placed on Review List 1. Species with unresolved taxonomic questions are placed on Review List 2. This list serves to publicize species that the WNHP would like more biosystematic research done on, and it also denotes their official state status.

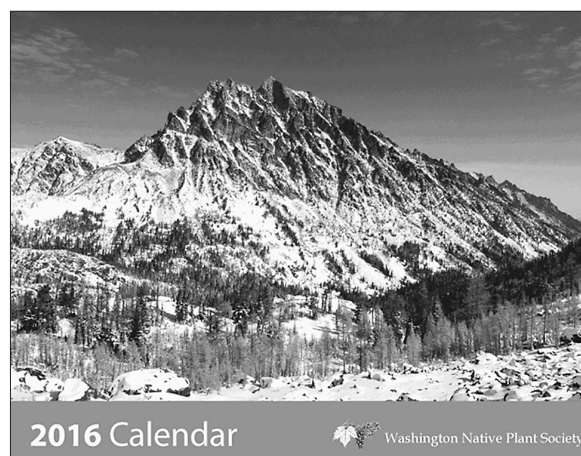
SD

2016 WNPS Calendar

The 2016 WNPS calendar is now available thanks to WNPS member photographers who entered the calendar photo contest and a committee from the Koma Kulshan Chapter that selected the photos and wrote the informative copy. This calendar gives you and your friends who love native plants a year-long reminder of the diversity of Washington's native plants. The state has more than 3,000 native plants that provide habitat and food for birds, butterflies and other pollinators, and other wildlife. To get an idea of the beauty of the calendar, you can view it on the WNPS online store site (see link below).

Your purchase of this calendar helps support the work of WNPS. You may buy it directly from your chapter, which will receive a portion of the \$10 sale price and save you the cost of mailing. If you can't make it to a chapter meeting, you can buy it online at <http://www.wnps.org/store/2016-WNPS-Calendar.html>.

The calendar makes a great gift and publicizes the work of WNPS.



The 2016 calendar cover as a black-and-white image. See the color version at <http://www.wnps.org/store/2016-WNPS-Calendar.html>.

In Memoriam: Donald F. Knoke

by Julia Bent, Central Washington Chapter

Don Knoke, one of the WNPS's most valued and respected members, died peacefully in his sleep on August 1 at the age of 95. A member of the WNPS since 1991, he contributed to the society in many ways.

Don started his botanical career in 1942 when in the summer of his senior year at the University of Washington, he signed up for a summer field class in plant identification taught by C. Leo Hitchcock. He needed just a few more credits to graduate, and this class fit the bill for him perfectly. Not only would he get the credits he needed, he would also be able to spend the summer camping with his classmates and "Hitchy," attend morning lectures on a given plant family, and then spend the afternoons identifying plants in the vicinity.

He persuaded Ruth Vogel, a classmate, to join him for this class.

After graduating from the UW, Don joined the Navy and flew planes both in Alaska and in Washington State (at times out of Sand Point Naval Air Station). He and Ruth married in 1944. After Don's naval service ended they moved to the farm in Thorp, Washington, where Don was born and raised. Their three daughters and one son were born in the late 1940s. Until his retirement in 1992 Don farmed the homestead land that had been in his family for three generations. The botanical knowledge he had gained in Hitchcock's class served him well in identifying the various weeds that plagued him throughout his farming career.

Don joined the WNPS after attending one of its field trips. He soon immersed himself in the activities of the Central Washington chapter, serving as its secretary/treasurer. The chapter had an active field trip schedule, and in addition to organizing its field trips Don led a great many of them. It



Don Knoke, with Mount Stuart in the background: PHOTO: JULIA BENT

was on these trips that he was able to impart his encyclopedic knowledge of Washington's flora to others in the society.

After his retirement from farming, he and Ruth purchased a home in Coupeville on Whidbey Island where they spent their winters. During this time he took on the task of organizing the hundreds of plant lists that had been submitted to the society over the years. He checked them for accuracy and then standardized all their information into a database. From this he was able to create the plant lists that are now available online to both society members and the general public. Ruth remarked that having this project with its computer use and database management kept Don's active mind well occupied during the winters spent on Whidbey.

In addition to compiling the plant lists, Don used his time on Whidbey to travel to Seattle, where he volunteered at the WTU Herbarium at UW. He became involved with the herbarium after first going on one of its annual herbarium forays in 1997. Each summer herbarium employees and volunteers collect the flora of a different area in the Pacific Northwest. After 1997 he missed only one foray until illness prevented him from attending in 2014. Once all the collected specimens had been returned to the herbarium, they had to be identified as to species before they could be catalogued and mounted. Don helped with this process both when on Whidbey and later in Thorp where he spent his winters after Ruth died in 2007. His skills were of such value to the herbarium that they loaned him a dissecting microscope and sent specimens for him to examine during the winter there. Often they sent him the boxes of obscure plants that no one else wanted to attempt to identify. During the spring and summer in Thorp he continued to add to the herbarium by making his own collection of local plants, which he pressed. As a result, of all the counties in the state the flora of Kittitas County is the herbarium's most well-represented.

In recognition of all he had done for the WNPS, Don was made a WNPS Fellow in 2006. He was presented the award at the annual study weekend in Chewelah that summer. The awards dinner was on the occasion of his 86th birthday, and all those present in the dining hall sang him a round of "Happy Birthday" that was actually on key! Don led one of his many field trips that weekend to Calispell Mountain, and then wrote the trip report for the fall issue of *Douglasia*.

Leading field trips was the activity that Don probably enjoyed the most. In addition to those he led for his own chapter, he also led ones advertised for the Central Puget Sound chapter. He was endlessly patient with those who were just learning as well as with those who had studied with him for a long time and still couldn't remember the names of even the most common plants.

Don also participated in the Rare Care program sponsored through the UW Botanic Garden. He took the training as a volunteer Plant Monitor and then participated in various searches for rare plant populations. These trips took him from the headwaters of the Twisp River in Okanogan County to the talus slopes of Yakima River Canyon and the arid lands of Douglas County. Several of these trips involved backpacking into distant sites. He was also a regular participant on the annual WNPS backpack trips that went to different areas of the state each summer. He went on his final WNPS backpack to the Blue Mountains of southeast Washington when he was 91.

The apex of Don's long botanical career was his discovery of a previously unrecognized species of *Lomatium*, named *L. knokei* in his honor. This species was officially added to the Washington flora in a paper published in the fall of 2014 (Darrach 2014). He had discovered the plant on one of his collecting trips in Kittitas County and recognized it as unlike any other species of *Lomatium* with which he was familiar. He was particularly proud of his discovery and pleased that it was named in his honor. With the official recognition of *L. knokei*, Don's contribution to the knowledge of the flora of Washington State will be recognized in perpetuity. [Editor's Note: *Douglasia* ran an article on Don and his discovery in the spring 2015 issue: *Douglasia* 39(1):15–17, Spring 2015.]

All those who knew Don will miss his depth of knowledge of Washington's flora as well as his good humor and tirelessness while in the field. He was both an inspiration to budding botanists who were fortunate enough to attend his field trips and an invaluable resource for professional botanists. He will be sorely missed by plant enthusiasts throughout the state and especially by members of the WNPS.

Literature Cited

Darrach, M.E. 2014. *Lomatium knokei* (Apiaceae), a new, narrowly endemic species from Washington state. *Phytoneuron* 108: 1–12. Published 1 December 2014. ISSN 2153 733X. <http://phytoneuron.net/2014Phytoneuron/108PhytoN-Lomatiumknokei.pdf>



Online Identification Keys from Louisiana State University Herbarium

by David Giblin, *University of Washington Herbarium,
Burke Museum*

The explosion of digital imagery over the past decade has brought significant advances in online tools for plant identification. Traditionally, identifying plants has relied on the dichotomous key system such as that found in Hitchcock and Cronquist's *Flora of the Pacific Northwest*: users are presented with two descriptive statements of technical characters (for example, leaves opposite versus leaves alternate), and then the statement that best describes the plant in hand is selected. This process is repeated until a species name is ultimately arrived at.

Random-access keys have been around for decades but have stayed mostly under most people's radar due to their reliance on computer software. In this system the user selects the technical characters that he or she recognize from a list of all characters, and those species not containing the chosen mix of characters are removed from the list of possibilities.

The drawback to this system has always been the large number of characters that have to be scored for each species

for the key to work effectively (you don't need to use all characters in the dichotomous key system—just the subset required to make your key work). More robust data sets for plant character states, improved online interfaces, and an abundance of images to support the narrowed down list of possible species have enhanced the user-friendliness of random access keys.

Tim Jones, who recently earned his PhD in botany from Louisiana State University, has spent the last several years working on improving random access keys by incorporating images into the process. To see his work visit: <http://www.herbarium.lsu.edu/keys/>. The best example of his efforts can be found in the sidebar on the left. Click **Carices of North America**.

I like what Tim has done with the notoriously difficult genus *Carex* (sedges), and I can envision his approach being applied to any and all groups of plants for which the data and images are assembled. On the image side, we are getting closer each day based on the volume of images being uploaded to various online resources, including the Plants of Washington Image Gallery (<http://biology.burke.washington.edu/herbarium/imagecollection.php>). We will also get there on the data side as more and more species descriptions are published in digital format and legacy publications are scanned allowing for their contents to be harvested and formatted digitally. I'm hopeful—and optimistic—that ultimately all of this work will make identifying plants easier for everyone.



Eugene Kozloff Endowed Scholarship

The University of Washington's Friday Harbor Laboratories has established an endowed scholarship in honor of WNPS member Eugene N. Kozloff, the laboratory's first resident director. Dr. Kozloff turned 95 in September. He is the author of numerous field guides to seashore life, many of which are still in use. Dr. Kozloff also wrote a comprehensive field guide to west-side flora called *Plants of Western Oregon, Washington & British Columbia*, published in 2005.

He was also considered the laboratory's go-to authority for identification of both plants and animals. A history of the Friday Harbor Labs appeared in the Fall 2014 *Douglasia* (p. 10).

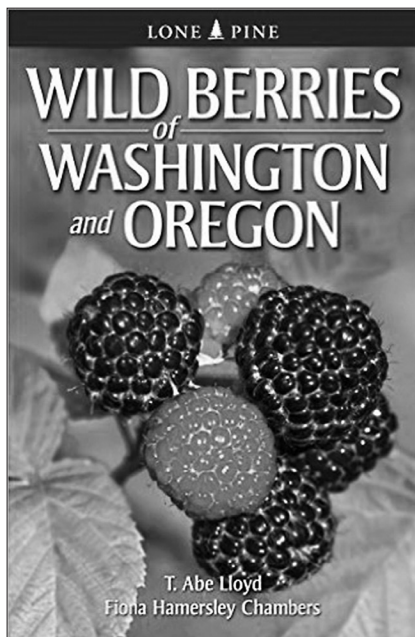
Donations may be made by mail to Rachel Anderson, Friday Harbor Labs, 620 University Road, Friday Harbor, WA 98250 or via the University of Washington Foundation (on line). Designate contributions to the Eugene N. Kozloff Endowed Scholarship at FHL.

Wild Berries of Washington and Oregon

by T. Abe Lloyd and Fiona Hamersley Chambers

Lone Pine Publishing, 2014
Paperback, 256 pages, \$21.95

Reviewed by Pam Camp, Wenatchee Chapter



If you've ever come upon wild berries while hiking in the Northwest and wondered if they were edible or poisonous, this book is for you. Many of us collect the highly sought-after huckleberries, but did you know that you can use the berries of smooth sumac to make pink lemonade? This book covers 200 native and escaped ornamental species found in Oregon and Washington, weaving together identification tips and edibility information with rich notes on historical use, natural history, and mythology. It pulls together publicly available and other interesting information about berries into one convenient guide. Rare and uncommon species aren't covered.

The term "berry" is used in the popular sense and includes any small fleshy fruit. For the botanical minded, in addition to true berries, this book includes pomes, such as serviceberry and hawthorns; simple and compound drupes, such as the bunchberries, raspberries, and blackberries; multiple fruits,

such as mulberries; and accessory fruits, such as strawberries and rose hips. The cone-bearing junipers and cacti are also included. There is an edibility scale that rates a berry in one of five categories—from highly edible to poisonous. Some nutritional information is also included.

The book is beautifully illustrated with some of the best photography and drawings I've seen in a field guide. The illustrations cover the ripe berries, but also included are helpful photographs of leaves, flowers, growth form, bark, the arrangement of the fruit on the plant—whatever is most helpful in identification. The descriptions are plainly written, although a glossary of terms is included.

The book is organized into three sections. The largest section includes trees and shrubs, next are the herbaceous plants, and the last section covers the poisonous plants. To aid in identifying a berry, the Introduction's "Plants at a Glance" section includes a helpful three-page summary of berry photos with names and page numbers. This quick visual identification aid will guide you to, for example, the *Vaccinium* genus (huckleberries, blueberries, and cranberries). Thirteen pages are devoted to an overview of the group as a whole, followed by separate write-ups of each species with photos and tips for differentiating them. The rest of the Introduction is well thought out and full of useful and interesting information, including tips on how to use the guide.

Other features of the book include information on species distribution, and time of flowering and fruit ripening. Scattered throughout are recipes for preparing, preserving, and using berries. The index includes both common and scientific names. A section labeled "Also called" lists other common or scientific names used for a species. This is especially helpful for understanding the rapidly changing scientific names.

I enjoyed exploring this book, found it easy to use and read, and it makes a great addition to my field guide collection. It's also a handy size for including in a field pack. I recommend this book, whether you're interested in collecting and learning how to use wild edible berries or just want to identify and enjoy understanding a little more about the plants around you.

PC

Leaflets Three, Let It Be: the Story of Poison Ivy

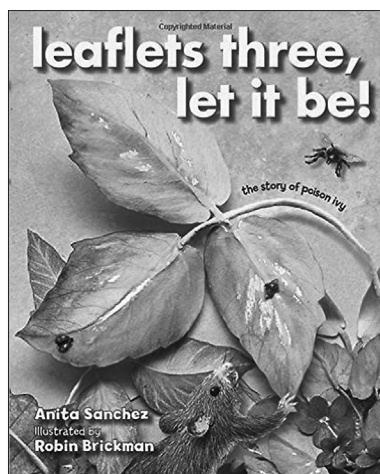
by Anita Sanchez, author; illustrated by Robin Brickman

Boyds Mills Press, Honesdale, PA, 2014

Hardcover, 32 pages, \$16.95

For children pre-K to grade 3 and above

Reviewed by Frank Knight, South Sound Chapter



How do you generate enthusiasm for the plants we love to hate? Writer and environmental educator Anita Sanchez should know: her adult book about dandelions, *The Teeth of the Lion: The Story of the Beloved and Despised Dandelion*, was published in 2006. Here she does it again, this time using a child's inherent interest in animals to create a fascinating page turner. She shares with readers the overwhelmingly beneficial qualities of poison ivy, while cautioning readers about its potential danger. Sanchez convincingly shares her own fascination with this vine.

The book's title has long been the catch phrase warning reminder. The author presents two other rhyming phrases that are less familiar: *hairy vine – a warning sign* describes the hairy roots that attach the vine to the trunk as it climbs straight up a tree. These hairy vines are the main clue to deciduous ivy's presence in winter. *Berries white – take flight* is a reminder that the unusual white-colored ripe fruit warn us not to touch. All parts of the plant—the vines' aerial roots, flowers, fruit, and leaves—contain irritating urushiol.

In each of the four seasons, Sanchez reveals poison ivy's benefits to wildlife. Rabbits, deer, and even black bear relish the tender new leaves, among the first to appear each spring.

Without mentioning ecology, she portrays poison ivy as a significantly beneficial member of its natural community.

Recognizing leaf variability is emphasized as an aid to identification and avoiding contact. Leaf size, seasonal color, and marginal teeth vary considerably. Where ivy grows as a ground cover, its leaves help maintain a moist environment for toads and salamanders, and protective cover from predators searching from above. Hidden away, these amphibians are free to pursue their own insect prey. A bird brings a fat caterpillar to its hungry young secure in a nest lined with poison ivy rootlets. Bees take nectar from tiny white flowers that become overwintering fruit. A host of birds including woodpeckers and turkeys feed on ivy berries.

Compelling illustrations are essential to books for young readers, and Brickman is up to the task. Colorful and detailed poison ivy habitats on every page enrich the narrative by moving the reader's eyes around the page to discover what other plants and animals, not mentioned in the text, share poison ivy's haunts. Brickman describes the unusual technique used to give the illustrations depth. Individual picture components were cut out, glued down, and photographed. Glue-gun drips represent water drops and clear plastic became insect wings.

A wise professor long ago told us natural history students that if we wanted to learn everything about a particular subject, read a textbook. If we wanted to learn what is interesting and important, read a children's book. Since I write essays (and book reviews) on natural history subjects, I follow that advice. My research often includes at least one children's book.

In selecting books, I always look for a page with more information to provide guidance for teachers and parents. Sanchez's "Itching to Know More" pages pose important questions and answers not revealed in the children's text: how we get sensitized, rash duration, remedies, control in our yards, and more. Readers learn the answers to these questions, plus: Can we get poison ivy from honey made from poison ivy flowers? A picture quiz helps readers distinguish poison ivy leaves from four look-alikes. My favorite question is "Why do such bad plants exist?" This is an important concept in our anthropocentric world. Her brief answer is straightforward. Plants are neither "good" nor "bad," they just are. Native to North America and here long before humans came, poison ivy provides wildlife food and shelter, as well as erosion control.

In our increasingly urbanized society, more people fear wild outdoor places. Turning our fears inside out, Sanchez skillfully convinces us that poison ivy is a beneficial plant worthy of our admiration and respect. We need more books like *Leaflets Three* that dispel fears and realistically portray nature as fascinating instead of scary.

FK

The Triumph of Seeds: How Grains, Nuts, Kernels, Pulses, and Pips Conquered the Plant Kingdom and Shaped Human History

by Thor Hanson

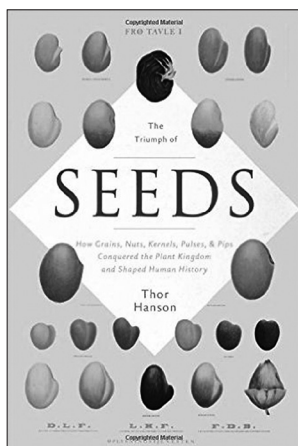
Basic Books, Perseus Books Group, 2015
Hardback, 277 pages, \$26.99

Reviewed by Ellen Kuhlmann, Koma Kulshan Chapter

In *The Triumph of Seeds* Thor Hanson offers the reader a smorgasbord of the science and lore of seeds, or as Hanson calls them “baby plants in boxes with their lunch.” The book is divided into five sections: each section is two to four chapters long and focuses on one area of seed biology. Hanson’s choice of topic order at first seems askew, with the section on evolution and genetics tucked in between a discussion of seed energy storage and one on seed dormancy and seedbanking. He also places seed dispersal at the end of the book after the section on seed defenses.

Although the order of the sections seems counterproductive to building a deeper understanding of the nature of seeds, the book’s structure works due to the links Hanson built between the chapters. The author ends each chapter by introducing the topic of the next chapter, linking the information just presented with what is to come. Also Hanson often revisits information from previous chapters, connecting one aspect of seeds with another. In this way the chapters do build on each other and lead to a deeper understanding of seeds and their place in the world.

Hanson, following the recipe developed in his acclaimed book *Feathers*, breathes life into the sometimes dry topic of seed biology by weaving a colorful tapestry of stories that entertain as well as inform. For example, to introduce a discussion of why seeds have spice compounds, Hanson talks about how Columbus wanted to find black pepper and instead found chili pepper. Some of his stories are about his own experiments, both the exotic, such as his field work in the tropics on almendro trees, and the prosaic, as in his attempts to recreate Mendel’s pea experiments in his home lab “The Raccoon Shack.”



In addition to historical and personal anecdotes, Hanson interviewed and in many cases visited seed biology experts. Particularly interesting were his talk about seed evolution with Bill DeMichele, fossil plant curator for the Smithsonian, and his discussion about seed anatomy and dormancy with seed biologists Jerry and Carol Baskin. DeMichele has postulated that the Carboniferous Period may not have been as swampy as many have thought, while Carol Baskin relayed that the evolution of seed dormancy may be driven more by the requirements of the seedling than those of the seed.

In contrast to several other books on seeds I’ve read that were chock-full of information but had prose so somnolent I could hardly keep my eyes open, *The Triumph of Seeds* is eminently readable. Hanson is a great storyteller and writes in a conversational style, so reading the book is like having an extended conversation with an entertaining friend. The only drawback is that sometimes tales meant to illustrate end up seeming to be the star instead of a supporting character. For example, when discussing the dispersal strategy of cotton, Hanson goes on at length about cotton’s role in the Industrial Revolution and the economics of slavery in the American South. This is interesting stuff, but in the process the reader many lose the track of the reason cotton seeds have fluff: to help the seeds travel.

At times the breath of the book limits its depth; there is only so much space to delve into each topic given all Hanson covers here. This makes the book in a sense a highlight reel. Hanson was most intrigued by the influence of seeds on human history and culture, and spends more space on people-seed relationships than on other aspects of seed biology. However through this focus the reader gains a sense of just how thoroughly seeds permeate our lives.

The Triumph of Seeds is a thoroughly fun read, perfect for anyone wanting an introduction to seeds or for those who enjoy lively natural history. Knowledgeable plant enthusiasts will find much of interest as well and likely will discover new information and interactions they hadn’t previously considered. Through this book seeds are revealed to be marvelously variable and ingeniously designed. This book is valuable by being both scientifically accurate and accessible to the general audience. It deserves to be widely read and reread. I will keep it in my collection, knowing that I will refer to it as a reference for years to come.

Ellen Kuhlmann is a professional botanist who collected native plant seed for six years as Project Manager for Rare Care’s Seeds of Success collection team. For this project she collected seeds from throughout Washington State for the Kew Millennium Seed Bank and the National Native Plant Materials program.



Conservation Report

2015 Excursion to Bumping Lake



by Becky Chaney, WNPS Conservation Committee Chair

Close on the heels of weather-breaking heat, 17 WNPS members and botanizers gathered at Bumping Lake for up to five days of searching out and identifying plants potentially impacted by the planned expansion of the reservoir. The primary goal of the excursion was to identify and photograph different plant species within the 2,000 acres that will be



Long-horned beetles, likely *Xestoleptura crassicornis*, enjoy the sunshine from their perch on Lyall's angelica (*Angelica arguta*) on the edge of Deep Creek, at the edge of the proposed Bumping Lake inundation area. PHOTO: BECKY CHANEY

inundated if the dam is raised. Additional research and study goals included collecting plants for the University of Washington Herbarium, practicing field identification, keying plant species under the direction of expert botanists, and furthering member understanding of natural and disturbed ecosystems. Spending time together while appreciating the remarkable environment of the eastern Cascade forest was paramount.

With maps and a general overview of the area provided by the Conservation Committee, attendees ventured out in small groups to targeted focus areas of mutual interest. Explored habitats ranged from disturbance areas such as campgrounds, roadsides, and reservoir edges to nearly pristine river beds, wetlands and creeks, and a portion of the 1,000 acres of old-growth forest. Evening gatherings at the American River Guard Station, a historic Forest Service cabin built by the Camp Naches Civilian Conservation Corp crew in 1941, included tales of off-trail encounters (unmarked waterfalls, massive ant hills, dubious roads), group ID of baffling plants, and sing-alongs.

Accomplishments came from both new and longtime WNPS members. Yen Flanagan, WNPS Stewardship Class of 2014, delighted everyone in enthusiastically keying out Lyall's angelica (*Angelica arguta*) and adding it to the growing plant list. Stalwart volunteer Janka Hobbs honed skills gained from last year's Sedge Identification Workshop; we are confidently waiting herbarium confirmation of her work. New member Kathy Pendas (who, with Howard Langeveld, successfully descended the Bumping River waterfall only to find the downstream course blocked with windfalls necessitating a trickier return trip back up) commented: "If I have to choose a favorite experience it would be the time in the field with Joe and Clay. It was a privilege to participate in keying out species and trying to see through the eyes of a plant scientist, especially with the backdrop of inundation in the near future and possible loss of something rare or brand new in the plant world."

Although heat and drought had desiccated a number of plants, blooms were found along streams and lake edges. Fields of hooded ladies'-tresses (*Spiranthes romanzoffiana*) were scattered near the campground. Rattlesnake plantain (*Goodyera oblongifolia*) beckoned from the cool of the forest. Three different monkey-flowers, seep, purple, and sticky, (*Erythranthe guttata*, *E. lewisii*, and *E. moschata*, all *Mimulus* in *Flora of the Pacific Northwest*) brightened cobble streambanks. Many plants were already in fruit, enabling identification of grasses and sedges.

Assembling data from the trip is nearly complete. The Bumping Lake plant list now includes over 200 species. This



Ed Lisowski finds *Peltigera*, a genus of lichen, and shares identification methods with Howard Langeveld and Kathy Pendas above the shores of Bumping Lake. PHOTO: JANKA HOBBS

is significantly more than the 54 documented for the area that David Giblin graciously assembled for us from herbarium records. Work is continuing on photo documentation, 93 records so far. Approximately 20 species were collected and sent to the University of Washington Herbarium. Our initial analysis confirms that a large number of species exist in a variety of habitats within the Bumping Lake study area. Some of these species are not documented in herbarium records for Yakima County. Confirmation that 1–3 species may be rare, threatened, or sensitive is expected pending herbarium review. Beyond research, the Bumping Lake excursion delivered a good time for all: new friendships were formed, connections renewed, and, yes, songs were sung.

An excursion of this nature takes dedicated volunteer effort. Much thanks to Don Hardin (Suksdorfia Chapter Chair)

for all-around support; Ed Lisowski (Central Washington Chapter) for providing leadership and local botanical expertise; Clay Antieau, Joe Arnett, and Rory Denovan (WNPS directors) for their expert assistance; Virginia Hassinger (Central Puget Sound Chapter) for captaining the kayak fleet; Raelene Gold (Central Puget Sound) for bringing the Bumping Lake issue to WNPS attention; and Cindy Spurgeon (Central Puget Sound) for her good-natured, good advice and a much appreciated efficient camp stove. Thanks to the family members who participated and helped make this such a happy event.

Becky can be reached via email at becky@chaney.org. She welcomes responses to her articles.

JD

Welcome New Members

(Memberships received 6/01/15-9/11/15)

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Join the conversation on the Washington Native Plant Society blog, Botanical Rambles. You can find posts about botanical destinations, pollination, edible plants, events and opportunities, weeds, and whimsy at wnps.org/blog. Other topics include book reviews, gardening tips, and an annual look at botany in the movies. Sarah Gage, curator of the blog, is a past president of WNPS and managed the University of Washington Herbarium from 1988 to 2001.

Botanical Rambles welcomes your ideas, your contributed pieces, and especially your comments. Take a look at wnps.org/blog and sign up for notification of the weekly posts. Let's ramble!

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