

Douglasia

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WASHINGTON
NATIVE PLANT
SOCIETY

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

The Annual *Mentzelia*

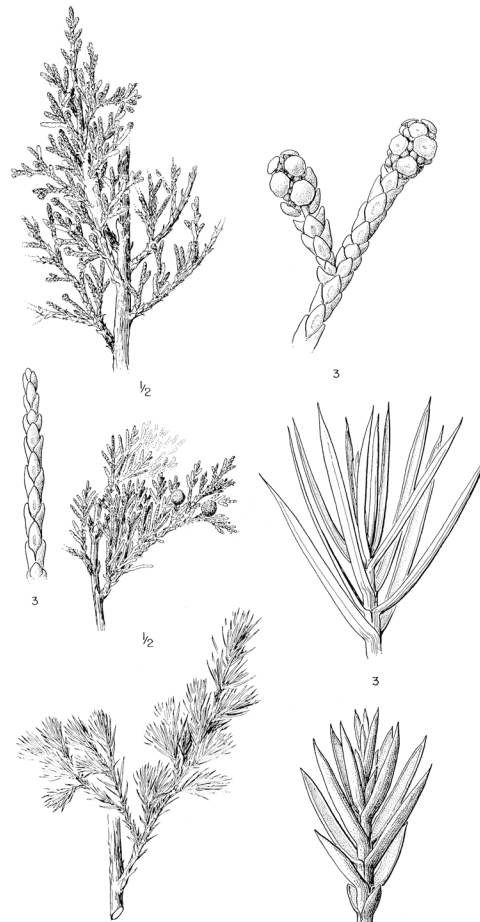
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J. scopulorum

JRJ

Illustration by Jeanne R. Janish

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A Note About This Issue

It has often been expressed in this column that the interests of our members are varied and wide-ranging and that fact is amply illustrated in this issue. It is fascinating to read about the projects of two of these talented people. Jim Duemmel writes about a puzzling botanical mystery surrounding native junipers, and Josh Brokaw explores the evolutionary past of *Mentzelia* species. We also have our regularly occurring feature from the busy folks at Rare Care, highlighting the efforts of a group of dedicated volunteers who monitor Washington's rare and sensitive plant species. As well, we are attempting to keep you up-to-date about occurrences of invasive plants with articles in every issue from the state Weed Control Board. We hope that you find these topics useful in your own efforts on behalf of our native flora.

We encourage submissions from members, and we would like to hear from you if you have areas of interest that you would like to see explored in *Douglasia*. We hope that *Douglasia* serves to keep Native Plant Society members informed about issues that affect the things we care about, conservation of native plants and their habitats.

Cindy Spurgeon

Managing Editor

Front Cover: The illustration of *Juniperus scopulorum* by Jeanne R. Janish was reprinted from *Flora of the Pacific Northwest* by C. Leo Hitchcock and Arthur Cronquist. See page 10 for an article by Jim Duemmel on this potential new species in Washington and British Columbia.

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Thoughts on Conservation

by John H. Browne, Jr.

Conservation Committee Co-Chair



The first flower that I can remember attracting my attention without the outside intervention of another human being was a tiger lily that I realized I was standing under. I looked up into the freckled miracle of bright orange, recurved petals, swaying gently on its stem and saw others, just like the first one, poking out into the air above my head. I went home to find my mother, determined to bring her with me to the woods behind our house, show her this orange flower, and find out what it was called. I was five that summer and in the fall would be headed to school for the first time.

It turned out to be a flower with which she was familiar, and both my parents knew its name. They had both lived for part of their young lives in rural Washington, although beyond some camping out and a bit of stream fishing, few of the amenities of rural living were part of our lives as I grew up. They were of a generation that had seen the advantages of urban living after World War II and they were willing to raise their family in that milieu—or on the edge of it—near a good-sized industrial center on Puget Sound. They embraced the vision of affordable housing, new schools, new roads, plenty of jobs, good city water, cheap electricity, nearby stores, milk deliveries to the door, a neighborhood with many young people with families, just like them. It was a time of great optimism and progress.

There were farms and dairies, right at the edge of the greater urban expanse that prospered with the advent of urban revitalization that followed our national (and local) recovery from the Great Depression. A diverse agricultural community was a vital and intrinsic part of the economy, for obvious reasons. People needed to eat, and generally speaking, the nearer to home that food was grown, the fresher it was likely to be. And much of the country was developing new ideas for home menus, based in part on the food that had been provided to the soldiers and sailors during the war. For them, meat, especially beef, had become a regular part of their expectations. My father, who grew up on a farm near Tacoma, told me once that the most common meat in his neighborhood was rabbit, and that “we occasionally had beef, if someone’s cow died.” The progress that provided jobs, new schools, and higher protein diets expanded incrementally over

decades. More roads were needed, more power, more water, larger landfills, more housing, more room for industry. The close-in farms and smaller dairies became housing developments. Average house sizes grew, even as yard space became smaller, around this new wave of construction. The interstate highway system began to spread, and with it, truck and bus traffic. Trains cut back on passenger service, moving mostly freight. Cheap gas and oil provided fabulous mobility at little cost. Fruits and vegetables that had once been seasonally available began to be present year-round.

Despite an economic warning with regard to energy consumption some 30+ years ago, very little has changed in real terms of our cultural momentum. Relative scarcity and the resulting increased costs, have affected some things, but much more is “below the radar.” Our urban footprint, however, continues to expand, although not necessarily close to home, which means that there is less pressure to change our behaviors.

When we can have fresh strawberries 12 months of the year, it means that our footprint includes estuarine and riparian zone conversions in Southern California and Mexico. When there are raspberries available in January, highland forests in Guatemala have been cleared for that purpose. The long, slow freight that pulls out of Seattle every Wednesday, bound for a swale in Eastern Washington or Oregon, provides us an amenity—at someone’s ecological expense. Some valleys flooded to provide hydro are “ours,” as well, along with the deforested corridors that bring it “home.” The failing runs of salmon in the rivers of central California pay a price for our appetites for out of season vegetables. The last of our close-in agricultural land disappears under the warehouses that are needed to facilitate the transfer of goods—and wealth—that global trade provides. Our “footprints” may be smarter; but perhaps no wiser.

About 52 years after finding myself beneath a flower, I found myself on hands and knees just a stone’s throw from a stream less than 3 miles from the former home of that tiger lily. I was digging up layers of sod that grew above the gorgeous chocolate-colored prairie soil, just a few inches thick where it lay upon the glacial gravel. The mix of sizes in the camas bulbs crowded into that 3” soil horizon told me that they’d been coming up here for a good, long time. The sign out along the former rural arterial, now a suburban 4-laner, announced the “future home of...” a commercial building that would be planted here, on this place that the bulbs were inhabiting. Hopefully, they’d leave the huge old oak, over there on the property line. Hopefully...

Evolution and Ecology of the Annual *Mentzelias* in the Pacific Northwest

by Joshua Brokaw, Marion Ownby Herbarium,
Washington State University

“On arid sandy plains of the river Columbia, under the shade of *Purshia tridentata* Douglas. Mr. Douglas seemed to be doubtful whether this new plant should be referred to as *Bartonia* or *Mentzelia*. It partakes, indeed, in some characters of the one, and some of the other.”

These words from Sir William Hooker (1832) recount David Douglas’ introduction of *Mentzelia albicaulis* to Western science, the first described species of what would become *Mentzelia* section *Trachyphytum*. In his journals Douglas (1914) recounts the setting of his discovery of *M. albicaulis* (first published as *Bartonia albicaulis*) near the Great Falls of the Columbia River (Celilo Falls) in the summer of 1825:

From the Grand Rapids to the Great Falls... The hills gradually diminish in elevation, and are thinly clothed with stunted timber, the shrubs only a few feet high. We are no longer fanned by the huge pine... As far as the eye can stretch is one dreary waste of barren soil thinly clothed with herbage... I could not this season go higher than a few miles above the Falls, but was amply repaid by *Purshia tridentata*, *Bartonia albicaulis*...and by seeds of many desirable plants.

Here we see the first recorded meeting of two lineages, a European man and a polyploid annual *Mentzelia*, far from the places of their evolutionary origins. Much focus has already been placed on the circumstances allowing European humans to colonize and spread across the American continents (Diamond, 1997). One of the goals of my research is to address the evolutionary processes leading to geographical expansions of species of *Mentzelia* section *Trachyphytum*.

Section *Trachyphytum* contains all of the annual species of *Mentzelia* that are native to the Pacific Northwest. The common name, stick-leaf, referring to Velcro-like hairs on fruits and leaves, seems more appropriate for these diminutive herbs than blazing star, which most often refers to the perennial *M. laevicaulis* of section *Bartonia*. Among the annuals, the widespread *M. albicaulis* and *M. dispersa* are familiar to botanists as inhabitants of roadsides and other disturbed habitats throughout the Inland Northwest. Also included in *Trachyphytum* are *M. mollis* and *M. packardiae*, rare endemics to volcanic terrain in the Owyhee Desert. Polyploidy (the state of



M. albicaulis. PHOTO: BEN LEGLER

having more than two sets of chromosomes) has been an important factor in the evolution of the section (Zavortink, 1966) and distinguishes *Trachyphytum* from *Bartonia* and other closely related sections of *Mentzelia* (Hufford et al., 2003). Species in *Trachyphytum* occur throughout the western United States but with greatest richness in California. All but one of the diploid (only two sets of chromosomes) species occur in southern California, and diploid populations rarely appear as far north as Oregon. The polyploids have the largest and most northern ranges. It has been suggested that the correlation between polyploidy and latitude can be partly explained by cycles of climate change in the Pleistocene (the ice ages) (Stebbins and Major, 1965; Dynesius and Jansson, 2000). The history of Pleistocene vegetation movement recorded by pollen deposition and packrat middens provides a context for the interpretation of data that I have collected. As part of my dissertation research at Washington State University, I have begun to investigate the relationship between polyploidy and ecological change in the evolution of section *Trachyphytum* in the Pacific Northwest and throughout its geographical range.

In order to understand the evolutionary history of polyploidy in section *Trachyphytum*, I have reconstructed



M. dispersa. PHOTO: BEN LEGLER

a hypothesis of phylogeny (evolutionary genealogy) for all 25 or so species using DNA from chloroplasts and the nucleus. I sampled DNA from approximately 100 populations. I determined DNA sequences for five spacer regions between chloroplast genes (*psbA-trnH*, *trnS-trnG*, *trnS-trnfM*, *ndhF-rpl32*, *rpl32-trnL*) that have been found to be informative in evolutionary studies. I also used sequences from part of the nuclear gene, isocitrate dehydrogenase, which exists in several copies in species of section *Trachyphytum*. Patterns of shared mutations in these DNA sequences allowed me to reconstruct well-resolved phylogenetic trees.

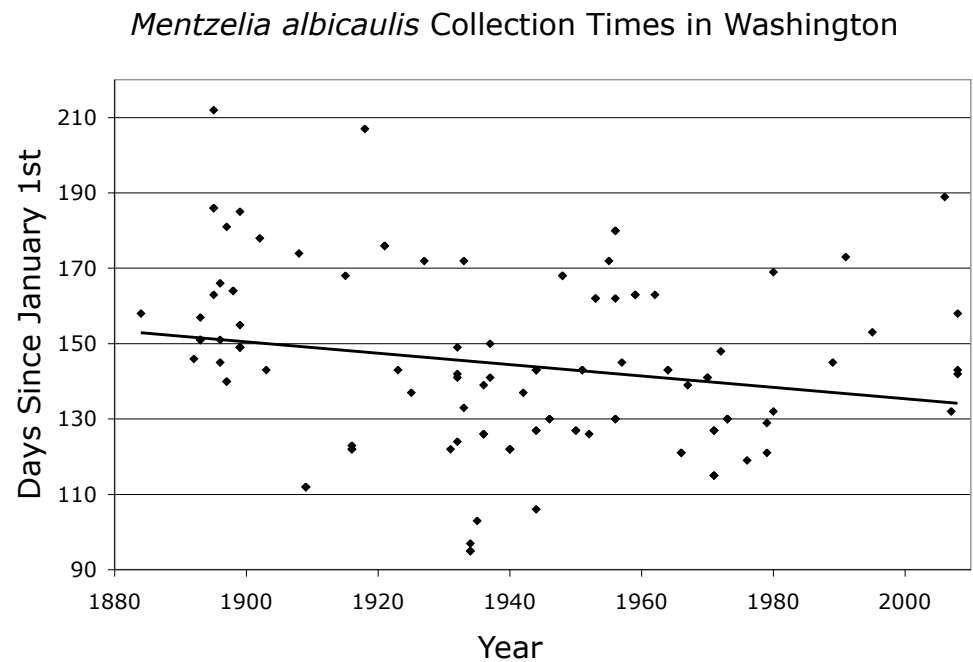
We expect that polyploids form from the doubling of chromosomes of one species (autopolyploids) or by the combination of chromosomes from two different species (allopolyploids). The process is generally considered to be irreversible, i.e., lineages with low ploidy do not evolve from higher ploidies. Given this assumption, the phylogenetic reconstruction provides two basic kinds of information for use in interpretation of polyploid origins. First, we can observe patterns of shared ancestry. For example, polyploids that have evolved from certain diploid lineages will be attached to branches of those diploid species in the phylogenetic tree. Second, we can estimate

the relative ages of lineages by comparing the numbers of mutations that have occurred in them as represented by the lengths of each branch of the reconstructed tree. Many of the polyploids in *Trachyphytum*, including *M. albicaulis*, are connected to more than one diploid lineage in phylogenies by short branches. This suggests that these species are allopolyploids formed by recent hybridization events between the separate diploid lineages. In contrast, a few polyploid species are connected to the rest of the *Trachyphytum* phylogeny by long branches. For example, phylogeny reconstruction suggests that the rare endemic *M. mollis* is a hybrid of two evolutionary lineages that formed separate branches early in the history of *Trachyphytum*. No extant diploids are connected to these *M. mollis* lineages, suggesting that *M. mollis* has an old origin.

Given the evolutionary relationships of species, I undertook an extensive survey of habitats for each species in section *Trachyphytum* in order to understand evolutionary changes in ecology. This data consisted of habitat measurements for 277 populations. These included 1) several temperature and precipitation variables provided by the Oregon State University PRISM Group for the locations of each population, 2) estimated community biomass, and 3) many chemical and physical substrate properties (e.g., pH, salinity and soil texture). Using discriminant analysis I chose variables that significantly explained overall differences in species habitats. The set of chosen variables from all of the populations for each species represents an estimation of species habitat niches. I compared species habitat niches using principal components analysis (PCA) and analysis of similarity (ANOSIM). PCA suggested variation in niche size among species. Most pairwise ANOSIM comparisons indicated that species had significantly different niches.

In order to understand the relationships between polyploidy and ecology we must consider ecological differences in the context of evolutionary relationships. As a comparison for polyploid evolutionary ecology, I first considered ecological change during diploid evolution. Strikingly, closely related diploids always had significant ecological differences and did not occur together. Further, closely related species were consistently less similar than distantly related species. Thus recent diploid speciation in *Trachyphytum* appears to be strongly associated with ecological divergence. In contrast, distantly related diploid species have sometimes converged on similar habitat niches and may even occur in mixed populations. When polyploid species are considered, patterns of evolutionary ecology become more complicated. As expected, many allopolyploids exhibited ecological niches intermediate to

Figure 1: *Mentzelia albicaulis*
Collection Times in Washington
Since 1880: Trend shows decrease
in the number of days since
January 1st for collections times
between 1880 and 2008.



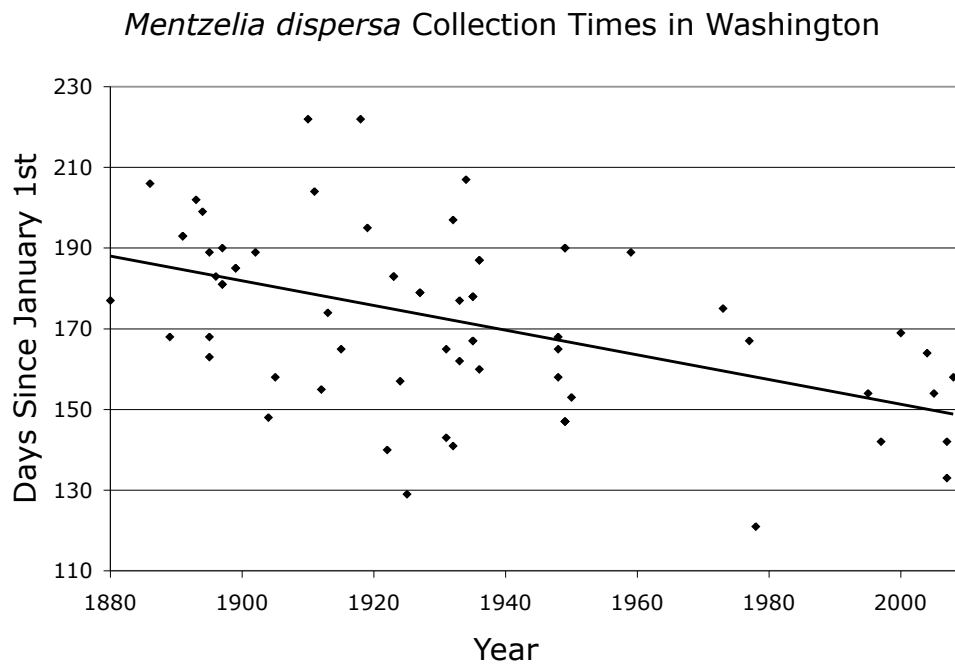
their most likely parents. Some like *M. albicaulis* appeared to have broader niches than their parents. Niches of polyploids were often significantly different from those of parental lineages. However, a few polyploids were not shown to be significantly different from parents, and several occur in mixed populations with diploids from one of the parental lineages. For example, the habitat niche of *M. montana* was not significantly different from that of one of its diploid relatives, *M. congesta*, and the two are commonly found growing with intertwined roots. Also, polyploids with similar genetic origins often had similar ecologies. *Mentzelia albicaulis* lacked significant differences from closely related polyploids in California. Habitat niche differences between *M. albicaulis*, *M. veatchiana*, and *M. montana* were significant, but these species are commonly found growing together. All of these patterns suggest that the creation and establishment of polyploids is not as strongly associated with habitat shifts as diploid speciation in *Trachyphytum*.

To help explain the geographical distributions of different species, I have compared ecological shifts to geographical change. Habitat requirements play an important role in determining the distributions of species and assemblages of biological communities. It is also important to understand the evolutionary processes under which those requirements evolved and to consider historical factors (i.e., geographical origins) that provide additional explanation of species distributions (Wiens and Donoghue, 2004). Based on current geographic

distributions, it is most parsimonious to conclude that southern California is the geographic origin of section *Trachyphytum*. Further, all of the widespread polyploids have formed recently and have at least one ancestor restricted to the Southwest, suggesting a southern origin of these species as well. However, during their brief existences, these polyploids have exceeded the geographical distributions of their parental lineages, colonizing much of the Pacific Northwest. We also know that many cycles of change in the distributions of plant communities have been forced by fluctuations in the North American climate during the Pleistocene. Although much of the Pacific Northwest was free of glaciers in the Pleistocene, desert vegetation was rare and probably restricted to the Southwest during the last glacial maximum (Thompson and Anderson, 2000). This rapid geographic change has been superimposed over the history of species' niche evolution and has likely affected the trajectories of new adaptations.

As we consider the combination of factors contributing to polyploid range expansions, let us return to the meeting of Douglas and *M. albicaulis* on the "arid sandy plains of the river Columbia." Was the meeting of these two particular lineages among the many groups of humans and *Mentzelias* predestined by their genetic superiority? In the case of the man, our best scholars would say: no, complex geographic and cultural factors could just as easily explain the invasion of the Pacific Northwest by European explorers (Diamond, 1997), and, in truth, native

Figure 2: *Mentzelia dispersa*
Collection Times in Washington
Since 1880: Trend shows
decrease in the number of days
since January 1st for collections
times between 1880 and 2008.



American people were already well-aware of *M. albicaulis* (Zigmond, 1981). However, the adaptive superiority of allopolyploids remains an influential viewpoint (Grant, 1981; Rieseberg et al., 2007). Do recent investigations support this classical viewpoint? In support, Marion Ownbey's famous *Tragopogon* (salsify) allopolyploids have become invasive and are replacing their parents in parts of the Pacific Northwest (Soltis et al. 2004). In contrast, the notorious diploid *Bromus tectorum* (cheatgrass) is more widespread and more ecologically dominant than any of its allopolyploid offspring (Fortune et al., 2008). Although ecological transitions must have happened to explain the rapid expansion of polyploids beyond the ranges of their diploid relatives in *Trachypytum*, these differences are not clearly explained by expansions or adaptive shifts in habitat niches. The great botanist, G. L. Stebbins (1984), first suggested that proportions of polyploids in regional floras are better explained by patterns of glaciation than habitat conditions. Previous workers thought that polyploids generally live further north than diploids because they had superior cold tolerance. However, Stebbins showed that diploids are common in cold, unglaciated regions of Alaska and that polyploids are more numerous in previously glaciated regions of southern Canada with milder climates. These patterns suggest that polyploids have increased ability or opportunity to colonize newly opened habitats following climate change. A similar pattern appears to exist in *Trachypytum*.

Wide ranges do not necessarily correlate with ecological

dominance or adaptive superiority. Many of the narrowly distributed diploids in *Trachypytum* occur in large, stable populations, while widespread polyploids often occur in small colonies in disturbed and marginal habitats. *Mentzelia albicaulis* has been found in a few surprisingly harsh soils, suggesting broad tolerances, but it is possible that its realized niche is larger than its parents' due to increased dispersal to new habitats rather than inherently higher tolerance of extremes. At the edges of its range in the Pacific Northwest *M. albicaulis* is generally found in dry, sandy or disturbed habitats similar to its original habitats in the Desert Southwest. Polyploids may have increased dependence on colonization because colonization favors the establishment of new polyploids. A well-known suggestion has been that many polyploids have shifted reproductive ecologies towards self-fertilization (Stebbins, 1957). Polyploids must contend with competition from parental diploids, and the few new polyploids that escape by dispersal have less trouble reproducing if they can self-fertilize. It has also been suggested that climatic oscillations select for dispersal ability and generalism as well as polyploid speciation (Dynesius and Jansson, 2000). Pleistocene climate changes likely contributed to the contact and hybridizations of diploid parental lineages and selected for generalized, colonizing polyploids. In support of increased mobility of widespread species, *M. dispersa* and *M. montana* have diploid relatives with similarly sized habitat niches and northern distributions, but the polyploids are more common within their

ranges and more geographically widespread. A potential ecological generalization that has been suggested to me by greenhouse experiments is that germination requirements have become relaxed in some polyploids. Several of the diploids have proven to be difficult to germinate, but polyploids are germinated more easily. At different latitudes *M. albicaulis* appears to germinate within the same range of climatic conditions but probably experiences a wide variety of seasonal daylight patterns. If diploid species use day length signals to ensure proper germination times, it is possible that habitable, northern sites have not been colonized because the required germination cues were not present.

Current changes in the climate of the Pacific Northwest will provide an important test for the adaptability of plant species. Herbarium records are indispensable assets to our observations of contemporary trends in plant evolution. Recent studies have already demonstrated changes in plant flowering times in New England (Primack et al., 2004). For comparison, I have assembled records of *M. albicaulis* and *M. dispersa* collections in Washington since 1880 from the herbaria of Washington State University and the University of Washington. Both species show a significant trend (*M. albicaulis*: $P = 0.03$, Fig. 1; *M. dispersa*: $P < 0.0001$, Fig. 2) towards earlier collection times during the last century. Further, Pearson correlations between collection times and annual global temperatures (EPA, 2009) were significant (*M. albicaulis*: $P = 0.009$; *M. dispersa*: $P = 0.004$). I have also found similar patterns in species of glacier lily (*Erythronium*), Indian paintbrush (*Castilleja*), and balsamorhiza (*Balsamorhiza*) in Washington (unpublished data). Over greater periods of time, we might expect these responses to include measurable northward shifts in distribution. For *M. albicaulis*, adaptation to dry communities such as sagebrush steppe may limit further expansion in the Pacific Northwest in the absence of new niche evolution. In contrast, *M. dispersa* often occurs in moister mountain valleys on disturbed slopes. Currently, the two species have similar northern range limits, but if their habitat niches are conserved during climate change, it seems likely that *M. dispersa* will continue to move north in the Canadian Rockies while northward expansion of *M. albicaulis* remains restricted to the few pocket deserts in British Columbia.

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References

- Diamond, J. 1997. *Guns, Germs, and Steel: The Fates of Human Societies*. W.W. Norton and Company, New York.
- Douglas, D. 1914. *Journal Kept by David Douglas During His Travels in North America, 1823-1827*. William Wesley and Son, London.
- Dynesius, M. and Jansson, R. 2000. Evolutionary consequences of changes in species' geographical distributions driven by Milankovitch climate oscillations. *Proceedings of the National Academy of Sciences* 97:9115-9120.
- EPA. 2009. http://www.epa.gov/climatechange/science/recenttc_triad.html. Retrieved 10 February 2009.
- Fortune, P.M., Pourtau, N., Viron, N., and Ainouche, M.L. 2008. Molecular phylogeny and reticulate origins of the polyploid *Bromus* species from section *Genea* (Poaceae). *American Journal of Botany* 95:454-464.
- Grant, V. 1981. *Plant speciation*. Columbia University Press, New York.
- Hooker, W.J. 1832. *Flora Boreali-Americana*, Volume 1. Henry G. Bohn, London.
- Hufford, L., McMahon, M.M., Sherwood, A.M., Reeves, G., and Chase, M.W. 2003. The major clades of Loasaceae: phylogenetic analysis using the plastid matK and trnL-trnF regions. *American Journal of Botany* 90:1215-1228.
- Primack, D., Imbres, C., Primack, R.B., Miller-Rushing, A.J., and Del Tredici, P. 2004. Herbarium specimens demonstrate earlier flowering times in response to warming in Boston. *American Journal of Botany* 91:1260-1264.
- Rieseberg, L.H., Kim, S.C., Randell, R.A., Whitney, K.D., Gross, B.L., Lexer, C., and Clay, K. 2007. Hybridization and the colonization of novel habitats by annual sunflowers. *Genetica* 129:149-165.
- Soltis, D.E., Soltis, P.S., Pires, J.C., Kovarik, A., Tate, J.A., and Mavrodiev, E. 2004. Recent and recurrent polyploidy in *Tragopogon* (Asteraceae): cytogenetic, genomic and genetic comparisons. *Biological Journal of the Linnean Society* 82:485-501.
- Stebbins, G.L. 1957. Self fertilization and population variability in the higher plants. *The American Naturalist* 91:337-354.
- Stebbins, G.L. 1984. Polyploidy and the distribution of the arctic-alpine flora: new evidence and a new approach. *Botanica Helvetica* 94:1-13.
- Stebbins, G.L. and Major, J. 1965. Endemism and speciation in the California flora. *Ecological Monographs* 35:1-35.
- Thompson, R.S. and Anderson, K.H. 2000. Biomes of western North America at 18,000, 6000, and 0 ¹⁴C yr BP reconstructed from pollen and packrat midden data. *Journal of Biogeography* 27:555-584.
- Wiens, J.J. and Donoghue M.J. 2004. Historical biogeography, ecology and species richness. *Trends in Ecology and Evolution* 19:639-644.
- Zavortink, J.E. 1966. A revision of *Mentzelia*, section *Trachyphytum* (Loasaceae). Ph.D. dissertation, University of California, Los Angeles, California, USA.
- Zigmond, M.L. 1981. *Kawaiisu Ethnobotany*. University of Utah Press, Salt Lake City.

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WNPS Member Donations at Work

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False Brome (*Brachypodium sylvaticum*)

by Alison Halpern, Washington State Noxious Weed Control Board

False brome, *Brachypodium sylvaticum* (Huds.) P. Beauv., is an invasive understory grass species that has been proliferating in western Oregon, and we are trying to keep it from gaining a foothold in Washington State. Native throughout much of Europe, northern Africa, and temperate regions of Asia, this perennial grass species appears to be woefully well-adapted to our coastal Pacific Northwest climate. According to Thomas Kaye, the first documented specimen was collected in 1939 from the Eugene, Oregon area. Unfortunately, *B. sylvaticum* has been expanding rapidly throughout western Oregon, and has been sampled from various locations in San Mateo County, California, in 2003.

This grass species is capable of dominating forest understories but can also thrive in full sun in woodland clearings and prairies, and it spreads along roadsides. Seeds are capable of germinating right through dry, compacted, dirt roads. It has little value as a forage species and, like our nemesis garlic mustard, is capable of rapidly invading undisturbed habitat where it displaces native flora. It lacks rhizomes but can grow in tight clusters that give the appearance of dense, rhizomatous mats.

Brachypodium sylvaticum is a perennial, cespitose graminoid with ascending or erect culms and noticeably pilose blades, sheaths, and nodes. The grass is often described as having a distinctive lime-green coloration, which persists when many other grass species go dormant. The leaf blades are flat and relaxed, giving them an arched or nodding appearance, and they are between 8-35 cm long and 4-12 mm wide. The dorsal and ventral surfaces of the blades are sparsely covered with hairs 0.8-1.8 mm in length, and these long hairs are quite noticeable along the leaf margins. Ligules are membranous. The inflorescence consists of a single, bilateral raceme, 6-20 cm long, and is comprised of 5-10 spikelets with short-to-absent pedicels. Each spikelet is between 1.5-4 cm, cylindrical, narrowly oblong or lanceolate, and consists of 7-13 flowers. According to Thomas Kaye, *B. sylvaticum* can be differentiated from native perennial bromes by the open sheaths (sheaths of native bromes are closed 1/4 of



Left photo: Blade hairs of false brome. Right photo: False brome in its habitat. PHOTOS: ALISON HALPERN

length) and by the short-to-absent pedicels (native bromes have prominent pedicels).

Because grasses are not the easiest species to identify and because this species is (happily) not well known in Washington, I believe we will have to rely heavily on the vigilance of natural resource stewards and botanically savvy hikers and outdoor enthusiasts to detect new establishments of *B. sylvaticum*. In fact, both of our two known Washington populations, one at the Beacon Rock State Park and the other at a northbound I-5 rest area, were discovered by Oregon botanists. Because of its limited distribution in Washington and the threat it poses to our forest ecosystems, *B. sylvaticum* is now a Class A Noxious Weed for 2009.

The Institute for Applied Ecology (www.appliedeco.org) is an excellent resource for additional information on *Brachypodium sylvaticum*. If you suspect you have encountered this species in Washington State, please contact me at ahalpern@agr.wa.gov or at (360)-902-2053.



2009 Washington State Noxious Weed List

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. **Eradication of all Class A plants is required by law.**

Class B Weeds: Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. Please contact your County Noxious Weed Control Coordinator to learn which species are designated in your area.

Class C Weeds: Noxious weeds which are already widespread in WA or are of special interest to the state's agricultural industry. The Class C status allows counties to enforce control if locally desired. Other counties may choose to provide education or technical consultation.

Class A Weeds Eradication is required

buffalobur	<i>Solanum rostratum</i>
common cuprina	<i>Crupina vulgaris</i>
cordgrass, common	<i>Spartina anglica</i>
cordgrass, dense flower	<i>Spartina densiflora</i>
cordgrass, salt meadow	<i>Spartina patens</i>
cordgrass, smooth	<i>Spartina alterniflora</i>
dyers woad	<i>Isatis tinctoria</i>
eggleaf spurge	<i>Euphorbia oblongata</i>
false brome	<i>Brachypodium sylvaticum</i>
floating primrose-willow	<i>Ludwigia pepioides</i>
flowering rush	<i>Butomus umbellatus</i>
garlic mustard	<i>Alliaria petiolata</i>
giant hogweed	<i>Heracleum mantegazzianum</i>
goatsrue	<i>Galega officinalis</i>
hawkweed, European	<i>Hieracium sabaudum</i>
hawkweed, yellow devil	<i>Hieracium floribundum</i>
hydrilla	<i>Hydrilla verticillata</i>
johnsongrass	<i>Sorghum halepense</i>
knawweed, bighead	<i>Centaurea macrocephala</i>
knawweed, Vochin	<i>Centaurea nigrescens</i>
knudzu	<i>Pueraria montana var. lobata</i>

meadow clary	<i>Salvia pratensis</i>
purple starthistle	<i>Centaurea calcitrapa</i>
reed sweetgrass	<i>Glyceria maxima</i>
ricefield bulrush	<i>Schoenoplectus mucronatus</i>
sage, clary	<i>Salvia sclarea</i>
sage, Mediterranean	<i>Salvia aethiops</i>
shiny geranium	<i>Geranium lucidum</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Spanish broom	<i>Spartium junceum</i>
spurge flax	<i>Thymelaea passerina</i>
Syrian bean-caper	<i>Zygophyllum fabago</i>
Texas blueweed	<i>Helianthus ciliaris</i>
thistle, Italian	<i>Carduus pycnocephalus</i>
thistle, milk	<i>Silybum marianum</i>
thistle, slenderflower	<i>Carduus tenuiflorus</i>
variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
velvetleaf	<i>Abutilon theophrasti</i>
wild four o'clock	<i>Mirabilis nyctaginea</i>

Class B Weeds

Austrian fieldcress	<i>Rorippa austriaca</i>
blackgrass	<i>Alopecurus myosuroides</i>
blueweed	<i>Echium vulgare</i>
Brazilian elodea	<i>Egeria densa</i>
bugloss, annual	<i>Anchusa arvensis</i>
bugloss, common	<i>Anchusa officinalis</i>
butterfly bush	<i>Buddleia davidii</i>
camellion	<i>Alhagi maurorum</i>
common catsear	<i>Hypochaeris radicata</i>
common fennel	<i>Foeniculum vulgare</i>
common reed (nonnative genotypes)	<i>Phragmites australis</i>
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
fanwort	<i>Cabomba caroliniana</i>
gorse	<i>Ulex europaeus</i>
grass-leaved arrowhead	<i>Sagittaria graminea</i>
hawkweed oxtongue	<i>Picris hieracioides</i>
hawkweed, mouseear	<i>Hieracium pilosella</i>
hawkweed, orange	<i>Hieracium aurantiacum</i>
hawkweed, polar	<i>Hieracium atratum</i>
hawkweed, queen-devil	<i>Hieracium glomeratum</i>
hawkweed, smooth	<i>Hieracium laevigatum</i>
hawkweed, yellow	<i>Hieracium caespitosum</i>

herb-Robert	<i>Geranium robertianum</i>
hoary alyssum	<i>Berteroa incana</i>
houndstongue	<i>Cynoglossum officinale</i>
indigobush	<i>Amorpha fruticosa</i>
knawweed, black	<i>Centaurea nigra</i>
knawweed, brown	<i>Centaurea jacea</i>
knawweed, diffuse	<i>Centaurea diffusa</i>
knawweed, meadow	<i>Centaurea jacea x nigra</i>
knawweed, Russian	<i>Acroptilon repens</i>
knawweed, spotted	<i>Centaurea stoebe</i>
knotweed, Bohemian	<i>Polygonum bohemicum</i>
knotweed, giant	<i>Polygonum sachalinense</i>
knotweed, Himalayan	<i>Polygonum polystachyum</i>
knotweed, Japanese	<i>Polygonum cuspidatum</i>
kochia	<i>Kochia scoparia</i>
lawweed	<i>Silva sessilis</i>
lepyrodiclis	<i>Lepydolichus holostoides</i>
longspine sandbur	<i>Cenchrus longispinus</i>
loosestrife, garden	<i>Lysimachia vulgaris</i>
loosestrife, purple	<i>Lythrum salicaria</i>
loosestrife, wand	<i>Lythrum virgatum</i>
oxeye daisy	<i>Leucanthemum vulgare</i>
parrotfeather	<i>Myriophyllum aquaticum</i>
perennial pepperweed	<i>Lepidium latifolium</i>
perennial sowthistle	<i>Sonchus arvensis</i> ssp. <i>arvensis</i>
policeman's helmet	<i>Impatiens glandulifera</i>
poison-hemlock	<i>Conium maculatum</i>
puncturevine	<i>Tribulus terrestris</i>
rush skeletonweed	<i>Chondrilla juncea</i>
saltcedar	<i>Tamarix ramosissima</i>
Scotch broom	<i>Cytisus scoparius</i>
spurge laurel	<i>Daphne laureola</i>
spurge, leafy	<i>Euphorbia esula</i>
spurge, myrtle	<i>Euphorbia myrsinites</i>
sulfur cinquefoil	<i>Potentilla recta</i>
swainsonnea	<i>Sphaerophysa salsula</i>
tansy ragwort	<i>Senecio jacobaea</i>
thistle, musk	<i>Carduus nutans</i>
thistle, plumelless	<i>Carduus acanthoides</i>
thistle, Scotch	<i>Onopordum acanthium</i>
water primrose	<i>Ludwigia hexapetala</i>
white bryony	<i>Bryonia alba</i>
wild carrot	<i>Daucus carota</i>
wild chervil	<i>Anthriscus sylvestris</i>

yellow floating heart	<i>Nymphaea peltata</i>
yellow nutsedge	<i>Cyperus esculentus</i>
yellow starthistle	<i>Centaurea solstitialis</i>

Class C Weeds

absinth wormwood	<i>Artemisia absinthium</i>
babysbreath	<i>Gypsophila paniculata</i>
black henbane	<i>Hyoscyamus niger</i>
cereal rye	<i>Secale cereale</i>
common groundsel	<i>Senecio vulgaris</i>
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
curly-leaf pondweed	<i>Potamogeton crispus</i>
English ivy - four cultivars only	<i>Hedera helix</i> 'Baltica', 'Pittsburgh', and 'Star'; <i>H. hibernica</i> 'Hibernica'
evergreen blackberry	<i>Rubus laciniatus</i>
field bindweed	<i>Convolvulus arvensis</i>
fragrant water lily	<i>Nymphaea odorata</i>
hairy whitefoam	<i>Cardaria pubescens</i>
hairy willow-herb	<i>Epilobium hirsutum</i>
hawkweed, common	<i>Hieracium lachenalii</i>
hawkweeds, nonnative and invasive species not listed elsewhere	<i>Hieracium</i> spp.
Himalayan blackberry	<i>Rubus arvensis</i>
hoary cress	<i>Cardaria draba</i>
jointed goatgrass	<i>Aegilops cylindrica</i>
old man's beard	<i>Clematis vitalba</i>
reed canarygrass	<i>Phalaris arundinacea</i>
scentless mayweed	<i>Matricaria perforata</i>
smoothseed alfalfa dodder	<i>Cuscuta approximata</i>
spikeweed	<i>Hemizonia pungens</i>
spiny cocklebur	<i>Xanthium spinosum</i>
thistle, bull	<i>Cirsium vulgare</i>
thistle, Canada	<i>Cirsium arvense</i>
white cockle	<i>Silene latifolia</i> ssp. <i>alba</i>
yellow archangel	<i>Lamium galeobdolon</i>
yellow flag iris	<i>Iris pseudacorus</i>
yellow toadflax	<i>Linaria vulgaris</i>

● New additions to the 2009 Noxious Weed List

■ Change in Noxious Weed Class

Noxious Weeds are non-native plants introduced to Washington State that can be highly destructive, competitive, and difficult to control. These plants invade our croplands, rangeland, forests, parks, rivers, lakes, wetlands, and estuaries causing both ecological and economical damage that affects us all. Noxious weeds can:

- Lower crop yields
- Reduce forage quality
- Destroy plant and animal habitat
- Displace native plants
- Reduce recreational opportunities (e.g., fishing, hunting, swimming and hiking)
- Clog waterways
- Decrease land values
- Increase erosion and wildfire risk
- And some are toxic to humans and livestock

To help protect the State's resources and economy, the Washington State Noxious Weed Control Board adopts a State Noxious Weed List each year (WAC 16-750). This list classifies weeds into three major classes – A, B, and C – based on the stage of invasion of each species and the seriousness of the threat they pose to Washington State. This classification system is designed to:

- Prevent small infestations from expanding by eradicating them when they are first detected
- Restrict already established weed populations to regions of the state where they occur and prevent their movement to un-infested areas
- Allow flexibility of weed control at the local level for weeds that are already widespread.

To learn more about noxious weeds and noxious weed control in Washington State, please contact:

WA State Noxious Weed Control Board
P.O. Box 42560
Olympia, WA 98504-2560
(360)-725-5764

Email: noxiousweeds@agr.wa.gov

Website: <http://www.nwcb.wa.gov>

Or

WA State Department of Agriculture
21 North First Avenue #103
Yakima, WA 98902
(509) 225-2604

Or

Your local County Noxious Weed Control Board



Shiny geranium, *Geranium lucidum*, a new Class A noxious weed

Figure from Deutschlands Flora in Abbildungen at <http://www.biolib> by Johann Georg Sturm in 1796. Image taken from Wikimedia Commons

Please help protect Washington's economy and environment from noxious weeds!

Recent Additions to the Flora of Washington

by David Giblin, University of Washington
Herbarium at the Burke Museum

One interesting aspect of floras everywhere is that they are dynamic, always changing. Plant species appear and disappear from particular regions due to both natural and anthropogenic (human-based) causes. Sometimes a particular plant species has been simply overlooked, while other times new occurrence records represent recent range expansions. There have been several notable additions to our flora over the last couple of years that are worth mentioning.

The new Indian paintbrush species from the San Juan Islands/Vancouver Island area, *Castilleja victoriae* (Victoria's paintbrush), is certainly one of the most exciting recent developments regarding our native flora. British Columbia botanist Matt Fairbarns and Mark Egger from the University of Washington Herbarium (WTU) realized that this species had been collected and misidentified several times over the last century. Recent collections from the San Juan Islands confirmed this fact, and Matt and Mark published this species in the Oct.-Dec. 2007 issue of the botanical journal *Madrono*.

Peter Zika has been doing a lot of field and herbarium research on new species that have arisen from hybridization between a native species and one of its introduced relatives. In addition to the *Impatiens* (jewelweed) hybrid that Peter covers in his article in the spring 2009 issue of *Douglasia*, he and Arthur Lee Jacobsen have described a new *Prunus* (cherry) species that is the result of hybridization between native *P. emarginata* (bitter cherry) and introduced *P. avium* (bird cherry). The new species, *Prunus* $\times$ *pugetensis* is found throughout lowland western Washington where the two species co-occur. Based on the size of some of the trees that Peter has documented, this cherry species has been around for quite some time, but has been simply overlooked.

I was recently updating the genus *Triglochin* (seaside arrow-grass) treatments on the Washington Flora Checklist (<http://biology.burke.washington.edu/herbarium/waflora/checklist.php>), and that led me to start looking at the specimens here at the herbarium. I realized that two of the collections were misidentified and actually belonged to a species (*Triglochin striata*) that was included in neither Hitchcock and Cronquist's *Flora of the Pacific Northwest*



Castilleja victoriae (Victoria's paintbrush), a new species of paintbrush recently added to the flora of Washington.
PHOTO: MARK EGGER

nor the Flora Checklist. These specimens, both collected in Pacific County, are the only two known occurrences for this species here in Washington

Some additions to our flora are definitely recent arrivals, such as *Geranium lucidum* (shining geranium). As noted by Jane Wentworth in the spring issue of *Douglasia*, this nonnative is now on the Washington Noxious Weed List on the basis of the damage it has done to the native flora in California and Oregon. There were no records of this species in Washington prior to 2005, and now it is known from at least Clark and Skagit counties. Another 2005 nonnative addition to our flora is *Paulownia tomentosa* (princess tree), which was recently collected as an escape along railroad tracks in Skamania County.

Other additions to the flora are waiting in the wings. I am aware of at least one new *Lomatium* (desert-parsley) species from Washington that researchers are currently writing up for publication. A separate *Lomatium* collected by Don Knoke cannot be keyed in Hitchcock and Cronquist, suggesting that it too may be a new species. Collectively these examples point to the need for work to begin on updating *Flora of the Pacific Northwest* so that we can have a more contemporary catalog of, and keys for, Washington's flora.

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dg

That New Juniper Species

by Jim Duemmel, Koma Kulshan Chapter

There are strong reasons to consider the junipers that grow on the shores of the Salish Sea in Washington and British Columbia as a new species. However, it is not easy to separate visually the new species from the old species, and some questions remain.

The old situation: In Washington there are two populations of small, tree-size junipers that traditionally have been assigned to the species Rocky Mountain juniper (*Juniperus scopulorum*). One population is found in central and eastern Washington while the other occupies the shores of the Salish Sea. Perhaps I should have said three populations: junipers grow on the north and northeast Olympic Peninsula from high to low elevations. The relationship of this population to that growing along the shores of the Salish Sea, as at Washington Park in



Figure 1. Mature Rocky Mountain juniper foliage.

PHOTO: DON KNOKE



Figure 2. Foliage on vigorously growing twig of Rocky Mountain juniper. PHOTO: DON KNOKE

Anacortes, Deception Pass State Park and the San Juan Islands, is not clear.

Other juniper species, common juniper (*Juniperus communis*) and western juniper (*Juniperus occidentalis*), also occur in Washington. These are easily distinguished from each other, and from junipers traditionally classified as Rocky Mountain juniper.

The Rocky Mountain juniper occurs in Washington, northeastern Oregon and generally in the Rocky Mountain states. A similar species, eastern red cedar (*Juniperus virginiana*) occurs in the eastern United States westward to the Great Plains. All juniper species are dioecious, with (usually) separate staminate and pistillate trees.

Figures 1 and 2 show the foliage of Rocky Mountain juniper. Figure 1 illustrates the scale-like foliage on mature twigs (with staminate cones in this example). Figure 2 shows the needle-like foliage on vigorously growing twigs.

The new situation: In a recent journal article (*Phytologia*, December 2007) Robert P. Adams, an international juniper expert, proposed that the junipers growing along the shores of the Salish Sea in Washington and British Columbia be considered a new species, *Juniperus maritima*, the seaside juniper. (Professor Adams is the author of the treatment of the genus *Juniperus* in the *Flora of North America* and the book *Junipers of the World: the Genus Juniperus*, 2nd Edition 2008.) The initial impetus toward this proposal came from a 1983 study of the hydrocarbons, terpenes, in the leaves of the junipers. The terpenes present in the Salish Sea junipers more closely resembled those in the eastern red cedar than those in the Rocky Mountain juniper. This surprising result suggested subsequent DNA studies of the two species and the Salish Sea population, studies which supported the earlier conclusion.

Investigation of the ages of some trees in the Salish Sea area eliminated the possibility that they were in fact eastern red-cedars that had been introduced by explorers or settlers—the trees were too old. In summary: The Salish Sea junipers differ from Rocky Mountain junipers in their DNA and leaf chemistry. In these characters they are closer to the eastern red-cedars, but are not an introduced population of that species. So, there is strong evidence in support of recognizing the Salish Sea juniper population as a separate species.

But how, encountering individual trees in the field, do we separate this new species from its close relative, Rocky Mountain juniper? Terpenes and DNA are not characters easily determined in the field. Do we have to rely on location?



Figure 3. Rocky Mountain juniper. Pistillate plant on the left, staminate on the right. PHOTO: DON KNOKE

In his proposal and his book Adams does suggest some morphological characteristics that might help. These are summarized in this table.

	Seaside Juniper	Rocky Mountain Juniper
seed cones mature	1 yr (14-16 months)	2 years
exserted seeds	very common	rare
scale leaf tips	obtuse	acute to obtuse
branchlets	smooth, reddish-brown	smooth, bright reddish-brown

The maturity of the cones might be difficult to use at certain times of the year. The exserted seeds are the result of insect damage. How does one know if the insects are present in large enough numbers to produce the effect? Both of these characteristics would apply only to about half the population, those trees that bear pistillate cones.

The distinction between “reddish-brown” and “bright reddish-brown” is somewhat vague.

Only the third characteristic in the list seems practical to me. The difference between “obtuse” and “acute” is something I feel I can manage. To test the distinction I gathered specimens from eight locations: two Salish Sea areas, Three-o-clock Ridge in the Olympics, three locations in central Washington along the Columbia River, one other central Washington location (Don Knoke’s yard!), and one location in Montana (a plant that had been transplanted to Twisp).

For these specimens, what shape were the ends of the leaves, obtuse or acute? I could detect no difference. They were all acute. I selected six of my specimens and asked the opinion of other people. Several persons agreed with my conclusion. Several did not, finding from one to all but one specimen to be obtuse. However, those who found obtuse specimens did not agree on which ones were obtuse! My survey seemed somewhat of a failure. Yet it does suggest the shape of the leaf tips is NOT a

useful and reliable field characteristic. (Admittedly, eight specimens may be insufficient for this conclusion.) If we accept seaside juniper as a new species then it forms with Rocky Mountain juniper a pair of cryptic species, species which cannot be easily differentiated by obvious visual characteristics. Adams notes this in his paper.

The Olympic junipers: The population of junipers in the Olympics is not mentioned in Adams' paper in *Phytologia*. A map in the second edition of his book, *Junipers of the World*, does indicate the presence of the new species on the Olympic Peninsula. However, apparently trees from the Olympics were not included in the terpene and DNA analyses. On the basis of their leaf characteristics I cannot separate junipers found on the Olympic Peninsula from the Salish Sea junipers or the junipers of central Washington or Montana. Using their place of origin I would assign my two Salish Sea specimens, from Washington Park and Deception Pass State Park, to the new species, while my specimens from central Washington and Montana should be Rocky Mountain junipers. But what about the specimen from Three-o'clock Ridge in the Olympics, collected at over three thousand feet in elevation? In his original proposal Adams describes the new species in this way: "Called the seaside juniper, it grows on rocky areas (rarely sand dunes) near the sea, in Puget Sound." In his book the habitat description is "near the seashore on s and w exposed rock, on sand, on rock in the rain shadow of Mt. Olympia [sic]". Are trees at over three thousand feet in elevation and about 8.7 miles from the nearest salt water "near the sea"? Are they in "Puget Sound"? And what about the specimen in the UW herbarium collected at Deer Park, almost five thousand feet above sea level and about eleven miles from salt water? In other genera, for example, hemlocks (*Tsuga*), we do find species with different altitudinal preferences. Could this be true of these junipers?

Maps in Adams' paper and book suggest that this new species colonized the Salish Sea area from an ice age refugium in western Oregon (where apparently no similar juniper species presently occurs) while the Rocky Mountain juniper spread from an ice age refugium in eastern Oregon (where that species presently does occur).

The thoroughly researched book *Flora of the Olympic Peninsula* contains a very interesting discussion on the possible relationship of the Olympic junipers to the Salish Sea junipers. The authors put forward a plausible scenario that implies the Olympic Peninsula and Salish Sea populations are the same species. After mentioning Adams' early study of juniper terpenes the authors

suggest that the Olympic Mountains were the true ice age refugium of the Salish Sea juniper population. It is really unfortunate that the terpene and DNA studies did not include specimens from the Olympic Peninsula so that the precise relationship between these populations would be clear. If a close study of the chemistry and DNA of the Olympic peninsula junipers shows that they should be grouped with the Salish Sea junipers then perhaps an exchange of purported ice age refugia is called for. But if the Olympic and Salish Sea populations are actually different species a really interesting biogeographic question then arises.

What is a "species"? Proposing a new species inherently uses a definition of the word "species." Adams cites a definition, given by Marion Ownbey, involving three parts: a species is (1) a group of plants with distinctive morphological characteristics, (2) reproducing naturally, and (3) without gene interchange with similar species. Adams modifies part (1) of this definition by adding "and/or chemical/DNA features" to morphological features. When I first read this it made good sense to me. If two groups of plants differ significantly in their chemistry, they probably should be considered different species. However, some questions arose the more I thought about it. Are these particular chemical differences really significant? What is their importance to the survival of the trees? Are they chemical defenses against the insects that cause the noted damage to the seeds? Are these differences far outside the range of variation of terpenes in Rocky Mountain juniper? Why would a previous definition of "species" have to be altered? Is this the very first time someone has proposed a new species on the basis of chemical/DNA differences? And while the status of the Olympic peninsula junipers seems unresolved can we be confident about a lack of gene interchange? Perhaps we are just coming down to a "lumper" versus "splitter" situation here. The concept "species" can indeed be a slippery one.

Miscellany: I enlisted Don Knoke's help in locating a specimen of Rocky Mountain juniper that I had seen several years ago just south of Wanapum Dam along the Columbia River. As we drove around looking for the right road it quickly became apparent that my memory of that single tree was not as good as I thought. But we were lucky. We spotted a grove of junipers at the intersection of Highway 243 and the Lower Crab Creek Road. There was plenty of material from which to select a specimen. In addition, we made an interesting discovery. The pistillate trees were loaded with cones (berries), enough so that they were different in color, a definite bluish tone, than the staminate trees. (Unfortunately this difference does not show up as

well in a black and white picture (Figure 3) as in a color picture.) At first we thought this color difference was due entirely to the cones but when we closely compared the foliage we saw that the leaves themselves on the pistillate plants were definitely bluer than those on the staminate plants. This same phenomenon was present but not as striking for the younger specimens I found at a boat launch along the Columbia River five miles south of Pateros. Despite careful searching I have not found any such color difference among plants in Washington Park.

My specimens of Rocky Mountain juniper from south of Wanapum Dam and south of Pateros were both growing very close (within six feet for the Pateros group, twenty yards for the Wanapum Dam group) to the bank of the Columbia River. That's not quite the "dry rocky" soil reported as typical for Rocky Mountain juniper.

Part of the basis for proposing that the Salish Sea population of junipers comprises a new species is its isolation from other populations. Apparently the Rocky Mountain junipers closest (that I know of) to the Salish Sea junipers are about 83 miles away (along the east bank of Ross Lake near Lightning Creek). That does seem far for pollen or seeds to be transported. However, juniper seeds are often spread by birds. The recently reported migration exploits of bar-tailed godwits and of "Winnie the Whimbrel" should cause everyone to think again about the capabilities of birds. Neither godwits nor whimbrels, shorebirds, would likely be eating juniper cones, but their unexpected capabilities should give us pause. Do we know the real capability of birds to spread seeds? And how far can the wind effectively spread pollen?

I first saw the junipers on Three O'clock Ridge in the Olympics while on a June 2008 trip with members of the Olympic Chapter. In September I returned to the ridge to gather a specimen. I could not recall exactly where the junipers were and expected I might have to hike up the ridge quite a way. On a sunny dry day I parked my car and threw some extra water into my pack. At nine in the morning it was already hot on the southeast facing ridge and I was tired from a long hike the previous day. Somewhat reluctantly I started up the ridge. Everything underfoot was dry and crumbly; I carefully watched where I was putting my feet. Suddenly, a tree snagged my pack. I wiggled, ducked, and shook my pack until the tree released me. I moved three or four steps up the slope and turned to cast a disapproving eye on the tree that had tried to stop me. It was a juniper! It was exactly what I had come to find, and I was still within easy sight of the road. On Three O'clock Ridge, junipers are very easy to find.

Because the eastern red-cedar entered into the discussion I thought it would be interesting to examine some specimens of that species. But where would I find some? A cemetery filled with ornamental trees seemed a likely spot. So I spent several hours walking around Bayview Cemetery in Bellingham. I found no eastern red-cedars (as far as I know) but did find a frustratingly bewildering variety of strange conifers that I could not identify. My recommendation to all botanists: avoid cemeteries as long as you can.

Acknowledgements: I want to thank Helen Treser who supplied my specimen from Montana, clearly the plant most assuredly assignable to Rocky Mountain juniper, to Don Knoke for help in finding my specimens from south of Wanapum Dam and for photographs of the junipers in his yard and to Eugene Kozloff for the loan of a copy of the book *Junipers of the World*. Special thanks to Phil Green, caretaker on Yellow Island, who brought the new species proposal to my attention.

*Here are the technical names of the species mentioned above:

Common Juniper	<i>Juniperus communis</i>
Eastern Red-cedar	<i>J. virginiana</i>
Rocky Mountain Juniper	<i>J. scopulorum</i>
Seaside Juniper	<i>J. maritima</i>
Western Juniper	<i>J. occidentalis</i>

To contact the author by e-mail: JimDuemmel@q.com



Plant Lists Available Online

Before you set out on your next hike, check out the "Native Plant Lists" link at the WNPS web site www.wnps.org. Here you'll find plant lists from more than 500 sites throughout the state, compiled by some of the most respected names in Washington botany. Updates will be done once a year and members are invited to contribute their own lists. If you have suggestions about the plants lists or would like to contribute a plant list, please contact Don Knoke at donknoke@yahoo.com.

Trail of the Cedars and Other Native Plant Walks in Newhalem, Whatcom County

by Kathy Murray, Salal Chapter

This column is intended to provide information about short walks and gardens that feature plants native to the State of Washington. Readers are invited to submit their favorite Botanical Destination to the Douglasia managing editor.

When I gathered notes for this piece during the summer of 2008, my original intent was to write about the Trail of the Cedars but I soon realized I would be remiss if I didn't mention other short walks of botanical interest in the area.



Access the Trail of the Cedars by suspension bridge at the foot of Main Street in Newhalem. PHOTO: KATHY MURRAY

Newhalem, on Highway 20, is an unincorporated company town owned by Seattle City Light. It is also the headquarters of the North Cascades National Park. Technically, Newhalem is in the Ross Lake National Recreation Area, which bisects the park. The town dates to about 1920 when the Skagit Project was developed to dam the Skagit River and create hydroelectric power for Seattle. Today, most residents are City Light employees and their families.

The North Cascades National Park Headquarters is at the west end of Newhalem. If you're visiting from the west side of the state, it makes sense to begin your visit here where there are several well-marked short walks that showcase native plants. However, don't be surprised if you see invasives. The park has had budget cuts and didn't open until May this year.

Both the Trail of the Cedars and Ladder Creek Falls, two walks within Newhalem itself, are open year-round. When you enter the town, you see immediately how the early hydro project developers envisioned transforming the untamed forest. There are tennis courts and tidy cookie cutter houses with metal roofs and acres of grass. During the summer high-tourist season, Newhalem's main street is adorned with beds of colorful annuals and hanging baskets on the light posts.

To access the half mile Trail of the Cedars, park anywhere on Main Street and cross the suspension footbridge over the Skagit River. This nearly level trail was developed by City Light and the University of Washington's Department of Forest Resources. It winds through an old forest grove and passes the Newhalem Creek power plant. The first powerhouse on this site burned and started a small forest fire, the remnants of which can still be seen. This walk meanders through a typical Western Washington lowland mixed forest with numerous huge Western redcedar (*Thuja plicata*), paper birch (*Betula papyrifera*), Douglas-fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and Western hemlock (*Tsuga heterophylla*), some growing on nurse logs. There are also vine maples (*Acer circinatum*), trilliums, and ferns. All plants are well marked. Near the power plant, the trail connects to a National Park Service trail to an early Native American rock shelter. This is not well marked so inquire about it at the park service visitor center.

At the east end of Newhalem, the Ladder Creek Falls trail offers a contrasting view of the forest along with stunning views of a thundering waterfall. (You can walk from the main street or park along the river). Here the intent was to create a botanical garden with imported

exotic plants. Most, of course, didn't make it. To access the 0.4-mile loop trail, cross another suspension bridge. The forest has filled in since the gardens were created between 1929 and 1941 and now has a dense canopy. Because the walkway along the falls is frequently wet from spray, as might be expected, there are numerous mosses and ferns. The dominant tree is the Western red cedar, many of which cling tenaciously to rocks and lean precariously over the creek.

At the bottom of this trail, you'll pass a curious pool (once painted bright blue) that looks like something from a 1950s *Sunset* magazine. The "father" of the Skagit Hydro Project, J. D. Ross, described in some publications as an "avid horticulturist," obviously wasn't into native plants. He is said to have believed that any plant could be naturalized and he used the Gorge Powerhouse rock gardens to try out his theories, planting exotics from throughout the world. Few have survived, mostly rhododendrons. I've visited the Ladder Creek Falls garden numerous times and have noted the garden's ongoing decline. Thus, I was surprised to learn from City Light that the garden is considered "historic" and is listed on the National Register of Historic Places. I was told the deterioration is age- and weather-related and the garden is undergoing a several-year renovation. To date the irrigation system has been replaced to make upkeep easier. A lighting plan is being developed and the area will be replanted in a way that mirrors the intent of the original gardens. Plantings will include but not be limited to natives. This loop trail also provides access to the Gorge Powerhouse visitor gallery, which overlooks the generators and historic memorabilia (worth a stop), and perhaps the cleanest restrooms in the park.

Of the trails mentioned, the Trail of the Cedars and those at the national park visitor's center are the most accessible. The Ladder Creek Falls trail has numerous stairs and considerable elevation change.

If you're continuing into the North Cascades National Park, you'll find numerous rewarding hikes. Plant lists for some can be downloaded from the WNPS website.

Information Sources:

Newhalem walks: <http://www.seattle.gov/light/printdocs/Newhalem.pdf>

North Cascades National Park: <http://www.nps.gov/noca/>

Seattle City Light: http://www.seattle.gov/light/tours/skagit/sk5_sght.htm#Cedars

Kathy Murray is the WNPS Editorial Board Chair. To contact the author by e-mail: kandmmurray@verizon.net



Thuja plicata, as expected, dominates the Trail of the Cedars. PHOTO: KATHY MURRAY

Sign Up for WNPS List Serve

Want to get involved with discussions about native plants and related issues with other WNPS members? The WNPS list serve offers announcements, news, and discussion relevant to native plants and the WNPS membership.

How to sign up: Email wnps@wnps.org and ask Catherine Hovanic to be added to the list. You must be a current WNPS member. Catherine will forward your request to our list provider who will add you to the list and email you with instructions for posting and unsubscribing.

A Look at Washington's Rare Plants: Few-flowered Sedge (*Carex pauciflora*)

Washington State Sensitive Species

by Katie Messick

There are nearly two dozen rare species of Carex in Washington State, potentially many more if you count those under review, and they're not exactly the most popular choice when it comes to rare plant monitoring assignments. So Washington Rare Plant Care & Conservation was delighted when Katie Messick volunteered to monitor two King County occurrences of few-flowered sedge in 2006 and 2007. This is fourth in a series by Rare Care featuring Washington's rare plants.

As sedges go, *Carex pauciflora* is easy to identify, assuming you can find it in the first place. Few-flowered sedge is a denizen of low- to mid-elevation sphagnum bogs in the Pacific Northwest, with fewer than 20 known populations in Washington. Each thread-like stem can reach about 15 inches high, which isn't particularly helpful when you're searching among waist-high hummocks of Labrador tea and bog laurel. Fortunately, once you find it, few-flowered sedge is unmistakable. Those few flowers, or perigynia, when I've seen them in mid-summer, are one to three (up to seven) brown flecks hanging off the top of the stem at odd angles, almost comically tiny.

I chose few-flowered sedge for my first assignment as a Rare Care volunteer because I love bogs and appreciate the complexity of graminoid identification. With around 250 *Carex* species in Washington, it's a wonderful challenge. I was lucky to have veteran botanizer Fred Stark accompany me to two bogs in search of our diminutive sedge. Since he was familiar with both the species and the bogs, I got to concentrate on my surroundings rather than concentrate on not getting lost. We found healthy populations of *Carex pauciflora* in both bogs, a good sign that this sensitive species has a chance of making it.

Learn more about conserving Washington's rare plants and the Rare Care program at <http://www.depts.washington.edu/rarecare/>. For more information about volunteering with Rare Care or to receive our semi-annual newsletter, e-mail us at rarecare@u.washington.edu or call 206-616-7080.



Carex pauciflora. PHOTO: KATIE MESSICK



Close-up of *Carex pauciflora*. PHOTO: KATIE MESSICK

Noxious Weed/Invasive Plant Online Mapping Tool Now Available

by David Giblin, *University of Washington Herbarium (WTU), Burke Museum*

I am pleased to announce the creation of an online mapping tool for displaying the distribution of noxious weeds and invasive plants in Washington. The mapper can be found at the following URL: (<http://biology.burke.washington.edu/waweeds/>). Inspiration for this project came from a presentation given by Les Mehrhoff at a conference on invasive plants organized by UW's Sarah Reichard at the Center for Urban Horticulture in September 2006. Les leads a project called the Invasive Plant Atlas of New England (IPANE: <http://nbii-nin.ciesin.columbia.edu/ipane/index.htm>), where part of their work involves providing an online map for the distribution of invasives in New England. I thought that a similar tool would be both possible and valuable to develop here in Washington.

I encourage first-time visitors to the site to use the "Help" tab in order to gain a basic understanding of how the site works. Users have a variety of ways in which to search for their favorite (or most loathsome) weeds: 1) pull down list of noxious weeds in Washington; 2) pull down list of selected invasive or potentially invasive plants in Washington; 3) scientific name entry fields; and 4) common name entry field. The mapper compiles its results from two internal databases—WTU's specimen database and a second database that only contains observational data (i.e., no specimens). By going to the "Data Sources" tab, users can select just specimen records, just observation records, or both data sources combined (default setting). Regarding specimen data, you can choose to view introduced records or both introduced and native records combined (in effect, all of WTU's georeferenced specimens can now be mapped). Results are displayed on a Google Maps-based interface. The ability to zoom in and out of particular areas allows you to either get a general sense of the distribution of a species around the state or get a more precise idea of the particular localities where a weed is found.

For me, one of the most exciting features of the mapper is the ability to use the zoom tool (click the icon in the upper left labeled "zoom") to select a specific geographic location and get a list of all of the species that occur there (associated information with each record

appears in a list in the right-hand sidebar; links to a variety of external resources are provided in the left-hand sidebar after clicking on an individual record). The mapper also allows you to pan over geographic areas (e.g., from Colville to Vancouver), after which it will recalculate the list of species in the new area that you have chosen to view. I'm grateful for the hard work of Michael Giddens at Silver Biology (<http://www.silverbiology.com>) who developed the mapping interface and built the database that hosts the observation records.

The mapper can only display records for which there are latitude and longitude values, and these values must be in decimal degrees format (e.g., 48.91576° N 121.56166° W). The majority of specimens at WTU lack these values because GPS units did not become commercially available and affordable until the 1990s (WTU has specimens dating back to the 1860s). As part of this project, we have been using georeferencing software (GeoLocate; <http://www.museum.tulane.edu/geolocate/>) and online georeferencing tools (BioGeoMancer; <http://www.biogeomancer.org/>) to retroactively assign geocoordinates to specimens. The most efficient way to do this is to georeference localities in our database because many localities have multiple specimens associated with them. To date, we have georeferenced approximately 10,000 localities from 10 counties in Washington, translating into an additional 15,000-20,000 specimens available for mapping. Our goal is to georeference every Washington locality in our database (37,000+).

Including a database capable of hosting observation records is a critical part of this project because far more observation records exist than herbarium specimens of weeds and invasives. We are working with local, state, and federal agencies to see what types of records are available for inclusion in this database and how we can facilitate the integration of this information. To date, we have received more than 2,000 records collectively from King County Noxious Weed Control Board, Washington State Parks and Recreation Commission, U.S. Forest Service, and The Nature Conservancy.

Generous support for this project was provided by the U.S. Bureau of Land Management, Central Puget Sound Chapter of Washington Native Plant Society, a Research Grant from the Washington Native Plant Society, and the Society for Ecological Restoration Northwest Chapter. Thanks to Pam Camp, Catherine Hovanic, Trevor Anderson, Naomi Yoder, Erica Nees, Maria Yousoufian, John Bassett, Rob Fimbel, Peter Dunwiddie, Sasha Shaw, Dennis Chambreau, and Dean McFetridge for their assistance with the development of the mapper.

In Memory of Wilfred Borden Schofield

July 19, 1927 – November 5, 2008



Dr. Wilfred Schofield. PHOTO: SHONA ELLIS

It is with great sadness that we mark the passing of Canada's leading and most celebrated bryologist, Professor Emeritus Wilfred Borden Schofield. Wilf passed away on November 5, 2008, having succumbed to cancer. He was 81.

Wilf earned his BA from Acadia University in Nova Scotia, Canada, where his love of plants was nurtured by his mentors, Chalmers Smith and J.S. Erskine. He went on to pursue graduate studies in both bryology (taxonomy) and vascular plants (ecology). The University awarded him an Honorary Doctorate of Science in 1990 in recognition of his lifelong contributions to botany.

He completed his MA at Stanford University where he studied under W.C. Steere, a well-known American bryologist. His thesis was a taxonomic work on a difficult genus entitled "The Relationships and Geographic Distribution of Canadian and Alaskan species of *Hypnum*." Wilf's lifelong interest in this genus eventually resulted in the publication of a North American revision for the Bryophyte Flora of North America.

Wilf met his wife, Margaret, at Stanford, and they were married in 1956. After completing his MA (and Peggy completing hers in Music) they moved to North Carolina, where Wilf began his PhD studies with the plant ecologist, H.J. Oosting at Duke University. He completed his studies in 1960, and with his wife moved to British Columbia where he had accepted a position in the Department of Botany at the University of British Columbia. There he began a long and outstanding career as the foremost bryologist in Canada. He retired in 1992, and was appointed Professor Emeritus shortly thereafter.

In the early years, Wilf published many papers on the floristics and distribution of bryophytes in British Columbia. Later, he contributed numerous taxonomic papers on the genera *Hypnum*, *Taxithelium*, *Brotherella*,



Dr. Schofield and students. PHOTO: WYNNE MILES

and the family Sematophyllaceae, among others. In addition, he contributed extensively to the Bryophyte flora of North America.

Wilf had a deep love of field work which lasted to the end of his life; he had spent the summer in Alaska before his passing later that fall. He believed that to truly understand and know the bryophytes, one had to see and study them in their natural habitat. His direct and extensive experience with bryophytes in the field was reflected not only in his works, but also in his reputation. He was considered by colleagues, students, and acquaintances to be a wealth of botanical knowledge.

Wilf's accomplishments in bryology will be remembered and will influence the science for many years, but it will be the person himself that many will remember most. He was a generous and welcoming person. Everyone that he welcomed to his office, students, colleagues, or professors was treated equally and with sincere hospitality. Wilf will be dearly missed.

Article excerpted from a longer article by Rene Belland which appeared on-line at Botanical Electronic News (www.ou.edu/cas/botany-micro/ben)

RB



Dr. Schofield and students. PHOTO: WYNNE MILES



Dr. Schofield and student. PHOTO: WYNNE MILES

WNPS Annual Backpack

by Jim Riley

This year's annual WNPS backpack trip will take you to the mountains. Join us for a trip to Copper Creek, in the Okanogan National Forest in the north Cascades. July 17-20, 2009

We will meet at 9:00 am at the Bridge Creek trailhead (parking passes required) on Highway 20 between Rainy and Washington Passes. For a total of a little less than five miles we will hike south on the Pacific Crest National Scenic Trail and then take the Copper

Creek Trail #426 to establish a camp below Copper Pass. From that camp we can explore nearby areas; Copper Point, Copper Lake, Stiletto Lake, the ridge on the north side of Copper Creek and others. The valley of Copper Creek is in the Okanogan N.F. and borders the North Cascades N.P. The Green Trails Stehekin map covers the region except for a short part of our route on the Pacific Crest Trail. Many maps do not show the Copper Creek Trail. For more information **and to sign-up** contact: Jim Riley, Box 458, Randle, WA 98377, e-mail: dalife@juno.com or phone (360) 497-5193.

2009 WNPS Research and Inventory Grant Awards

by Pam Camp, Plant Inventory and Research Committee Chair

The following Research Grants were awarded for 2009:

Illustration of NW Castilleja species for Flora of North America, Mark Egger

Systematics and Taxonomy of the North American species of Schoenoplectus (Cyperaceae), Rucha Pendke

Systematics and Edaphic Endemism in Eriogonum, Brad Grady

A Digital Library of Pacific Northwest Native Seeds, Dale Cross

Effects of the Invasive Blackberries on Native Pollination Webs in Whatcom County, Natasha Johnson



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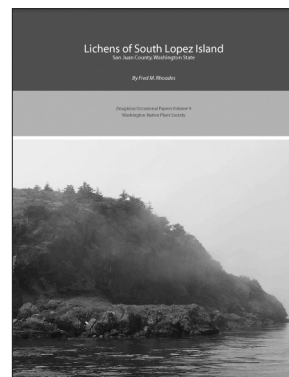
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OCCASIONAL PAPERS

The Washington Native Plant Society is pleased to announce publication of the ninth in its series of "Occasional Papers." These monographs, published in soft cover book form, are intended to increase appreciation and awareness of the incredible diversity of Washington's flora.



Lichens of South Lopez Island, San Juan County, Washington State by Fred Rhoades provides an in depth glimpse of lichens as they occur in the San Juan Islands. Dr. Rhoades, instructor and mycologist/lichenologist at Western Washington University, conducted a survey in 1998 of the lichens he found on two Bureau of Land Management properties (Point Colville and Iceberg Point) on the southern reaches of Lopez Island. This paper is an update of that survey. It features a general background on lichens, including a glossary of commonly used terms, background on the geology and vegetation of the area, and site descriptions which depict the variety of habitats at these locations. The text reviews some 190 species of both "macrolichens" and "crusts," including comments on each species' habitat, any special status or rarity, and comparisons to other studies in the region. The report documents the first occurrence of 17 crustose species for Washington State (or from the area west of the Cascades) and one new to North America. Dr. Rhoades also discusses human impacts upon this very special ecosystem.

The book is richly illustrated with some 89 color images of habitats, and several of the common and not so common lichen species. Copies can be ordered at the WNPS website (www.wnps.org) where a link to this publication will appear under What's New. You can purchase online with a credit card utilizing PayPal or order by mail or telephone to the WNPS office. The cost, including shipping and handling, is \$15.

ORDER ON-LINE AT:

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(Expect delivery within two to three weeks)

Information for Contributors

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 professional botanist to the interested enthusiast. For more information about how to contribute, see http://www.wnps.org/douglasia/douglasia_contributors.html.

Email submissions to: cspurgeon@msn.com

Deadlines for submission

Deadline	Issue	Members receive approximately
January 1	Spring	March 1
March 1	Summer	May 1
June 1	Fall	August 1
September 1	Winter	November 1

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ton State (including UW and WSU), King County, City of Seattle and other governmental agencies also sponsor giving campaigns that include WNPS as a charitable option. For a complete list of participating companies check out the Earth Share of Washington web site at www.esw.org. If your company has only a United Way giving campaign, you can still contribute to WNPS by designating Washington Native Plant Society in the "specific organization" or "donor option" section of the United Way pledge form.



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