9-9:15am **Welcome and introductory remarks**
Jessica Farmer, M.S.,M.P.A., Adult Education Supervisor, UW Botanic Gardens
Christina Owen, Ph.D., Director, UW Botanic Gardens
Gabriela Chavarria, Ph.D., Executive Director, Burke Museum
David Giblin, Ph.D., Collections Manager and Research Botanist, University of Washington Herbarium, Burke Museum

9:15-10am **Western wildfires - adapting to a future with more fire**
Susan Prichard, Ph.D., Research Scientist, UW School of Environmental and Forest Sciences

Under a warming climate with longer fire seasons, large, high-impact wildfires are becoming increasingly common in the Pacific Northwest. The wildfire smoke from these events is affecting all of us. In this talk, I will describe why many forests in Washington and Oregon are becoming more vulnerable to large wildfires under climate change. We will also explore how fire used to be a much more frequent part of many forested landscapes and that fire can be harnessed to make forests and our communities more resilient to future wildfires.

10-10:10am Break

10:10-10:40am **Traditional knowledge of fire use by the Warm Springs Tribes in the eastside Cascades: opportunities and best practices in applying traditional knowledge**
Michelle Steen-Adams, Ph.D., Adjunct/ Graduate Faculty, Washington State University

Traditional knowledge can help guide the restoration of the forest ecological resilience and First Foods – foods that are culturally important to American Indian, Alaska Native, and Native Hawaiian Tribes. Bringing together tribal communities, scientists, and managers to apply traditional knowledge systems is an important restoration strategy, yet one that must be applied with awareness of the partnership context. Considerations include: culturally- and organizationally-appropriate protocols; public lands management agency constraints; and the partnership lifecycle. This talk presents highlights from a U.S. Forest Service – Warm Springs Tribes collaborative study of traditional knowledge of fire use. Come learn about how fire was traditionally used in in the eastside Cascades and opportunities for application today.

10:40-10:50am Break

10:50-11:20am **Shrub-steppe in south-central Washington: Some observations winnowed from several decades of rare plant and vegetation mapping projects across the landscape**
Debra Salstrom, M.S., and Richard Easterly, B.S., Botanists/Ecologists, SEE Botanical Consulting

In central Washington, we've performed multiple landscape-scale rare plant surveys and vegetation mapping projects, and monitored post-fire rehabilitation efforts over roughly a million acres during the last three decades. The Yakima Training Center, Central Hanford, and portions of the Hanford Reach National Monument, which together represent a substantial chunk of the Yakima Fold Belt and the Pasco Basin, received a lot

of attention. Many of these locations have been revisited and/or surveyed several times over the years, allowing us to assess vegetation patterns over time and space, including drought years and years with abundant precipitation. We will describe our methodology for creating vegetation maps that track priority species at a fine scale across the landscape, as well as some of our overarching observations. Finally, we'll touch on cheatgrass die-off circles, which we've previously described in the Pasco Basin and which may reflect an ecological process that has yet to be fully understood and is ripe for further investigation.

11:20-11:50am **If you burn it, will they come? Pollinators respond to grassland restoration**
Susan Waters, Ph. D., Senior Ecologist, Quamash EcoResearch

Restoration of terrestrial ecosystems often focuses on increasing native plant diversity and abundance, presumably prompting responses from an interacting community of pollinators. Yet we still know little about the extent and nature of such responses. We assessed pollinator community responses to restoration in western Washington prairies. We followed six prairie restoration sites (0-12 years of prior restoration) over a four-year period, collecting plant and pollinator interaction data at four seasonal timepoints. We tested effects of prescribed fire, seeding, and plugging on floral diversity, pollinator diversity, and metrics that describe structural characteristics of plant-pollinator networks. Finally, we used the networks to simulate how resilient these plant-pollinator communities might be to plant species losses.

We documented 8,943 plant-pollinator interactions. Interactions were dominated by bees (48.7%) and flies (37.9%). Wasps, beetles, and other flower visitors made up only a modest proportion of observations. Prescribed burning increased floral diversity and abundance, and this in turn increased pollinator diversity. Burning was also associated with (i) changes in plant-pollinator network structure (less nested with more burning) and (ii) reduced impact with loss of a plant species (i.e., fewer predicted secondary extinctions). Future work should establish the longevity of these changes as restoration and management continue.

11:50-12:35pm Lunch break (45 min)
Optional Zoom networking session 12:05-12:35pm

12:35-1:05pm **Bigleaf Maple Decline in Western Washington**
Jacob Betzen, M.S., Biological Technician, US Forest Service Forest Health Protection

*Bigleaf maple (*Acer macrophyllum*) is a prominent component of the western Washington landscape, where it performs important ecological, economic, and cultural functions. Reports of its decline and increased mortality were documented beginning in 2011. Symptoms of this decline include a systemic loss of vigor, loss of transpiration, and reduced photosynthesis due to leaf loss. We conducted a preliminary study in 2014–2015 and observed decline symptoms across the region, but we did not detect any specific biotic causative agents. We subsequently conducted a multi-approach study in 2017 to quantify the spatial and temporal patterns of bigleaf maple decline in western Washington, and to examine biotic and abiotic associations with its decline. We sampled*

plots throughout western Washington, and looked at site specific data, measured foliar and soil elemental concentrations, and conducted a dendrochronological analysis, to determine any associations of site conditions and decline, and to ascertain the spatial and temporal patterns of decline. We reported that bigleaf maple decline is a recent phenomenon, that was positively associated with sites closer to roads and with increased development, and with increases in summer temperatures. We did not detect a consistent biotic agent that could be implicated in bigleaf maple decline.

1:05-1:35pm **Climate Change Vulnerability of Washington Rare Plants: A Preliminary Assessment**
Walter Fertig, Ph.D., Rare Plant Botanist, Washington Natural Heritage Program

Land managers need information on how plant species are likely to respond to future climate change. The NatureServe Climate Change Vulnerability Index (CCVI) is a protocol for assessing the vulnerability of species based on 29 climatic and biological variables, such as temperature, precipitation, snowpack, habitat specificity, dispersal ability, competition, and genetic variability. Using CCVI, I assessed 107 of the states 371 rarest vascular plant species. Thirty-seven species scored as Extremely to Highly Vulnerable and 66 as Moderately Vulnerable. Extremely to Highly Vulnerable species tend to be from alpine or wetland areas dependent on snowmelt and cool microhabitats and have poor dispersal, low genetic variability, or are restricted to uncommon geologic conditions. Species from the Okanogan and Blue Mountains were especially sensitive to climate change. Rare species from the Columbia Plateau tend to score as Moderately Vulnerable due to being pre-adapted to hot and dry conditions, but may still be at risk due to their reliance on uncommon geologic features. More information is needed on climate responses from common or widespread plant species in Washington to put the scores of rare species in perspective, as well as modeled distributions under climate change and genetic variability of rare species in the state.

1:35-1:45pm Break

1:45-2:15pm **Rare and At-Risk Moss Research in British Columbia**
Terry McIntosh, Ph.D., University of British Columbia

Bryophyte research in British Columbia has been ongoing and remains active following Wilf Schofield's extraordinary tenure as western Canada's leading bryologist for many decades. A main objective presently is to inventory areas that have not had thorough surveys and to compliment the already extensive herbarium collections and, thus, better understand species' provincial distributions. Another facet of our research is to investigate the distribution and ecology of rare and at-risk bryophyte species to assist in provincial and federal conservation work. This talk will focus on two provincially rare species, Bartramia aprica (B. stricta) *and* Brotherella roellii*. Both species are found along south-coastal and are listed in the Canadian Species at Risk Act (SARA) as Endangered (a wildlife species facing imminent extirpation or extinction). Brief overviews of the distributions, general habitat characteristics, threats, and ongoing conservation activities for the two species will be provided. A recently derived list of the mosses of British Columbia will also be discussed.*

2:15-2:45pm **Impacts of rock climbing on lichen and bryophyte cliff communities in Eastern Washington, USA**

Giovanna Bishop, M.S. Biology, Eastern Washington University

Saxicolous lichens and bryophytes dominate cliff communities of Eastern Washington State. A recent rise in the outdoor recreation of rock climbing has caused major concerns over its potential negative impacts on cliff-dwelling biodiversity. To better understand how rock climbing is impacting lichen, bryophyte and vascular plant communities in Spokane, WA, I surveyed two sites: McLellan Rocks and Rocks of Sharon, for the abundance, richness and diversity of lichens, bryophytes and vascular plants. Sixteen paired transects consisting of a climbed route and the unclimbed adjacent cliff face, with eight plots per transect for a total of 256, 0.5m^2 plots were surveyed for this study. Climbed and unclimbed communities overlapped but were significantly different from one another. Overall, cover was significantly lower in climbed transects compared to unclimbed transects. Rock climbing routes at McLellan Rocks had reduced plant cover, richness and diversity. Climbing also decreased lichen cover, richness, and diversity, however, it was site specific: lichen cover and diversity decreasing at Rocks of Sharon, while lichen richness decreased at McLellan Rocks. Lichen morphogroups were differentially impacted. Crustose and endolithic lichen cover and richness exhibited a positive response to climbing pressure at McLellan Rocks, and crustose lichen richness was also higher in climbed vs. unclimbed areas at Rocks of Sharon. The remaining morphogroups decreased in cover, richness, and diversity in response to rock climbing. Specifically, foliose cover, fruticose cover, umbilicate cover, richness, and diversity, and leprose cover at Rocks of Sharon were lower on climbed routes, as was fruticose lichen cover at McLellan Rocks. In addition to climbed status, route age, route popularity, approach distance, slope, rock heterogeneity, plot height, and canopy cover significantly influenced community composition. I found 118 lichen, 29 bryophyte and two vascular plant species. Based on my results, I conclude that rock climbing mainly impacts cliff-dwelling lichen, bryophyte and vascular plant communities at my studies sites in decreasing cover, richness, and diversity. However, different patterns of impacts were observed at the two sites surveyed here, suggesting that unique management plans must be developed for each climbing area.

2:45-2:55pm Break

2:55-3:25pm **Additions, Deletions, and Changes to Washington's vascular plant flora**

David Giblin, Ph.D., Collections Manager and Research Botanist, University of Washington Herbarium, Burke Museum

Changes occur to the documented vascular plant flora of Washington each year. These changes come in a variety of forms that include newly described species, existing species newly documented in the state, nomenclatural (name) changes due to sometimes arcane botanical rules, and taxonomic revisions based on contemporary systematics research. Keeping pace of these changes is important to facilitate communication among botanists, whether professional or amateur, to improve understanding of regional biodiversity for conservation purposes, and maintain consistency across online and print

publications. In this talk I will cover recent updates to Washington's vascular plant flora that incorporate findings from field work, the scientific literature, and other sources of information.

3:25-3:30pm **Closing remarks**