Essential Components to Managing and Monitoring for *Phytophthora ramorum*

by Norm Dart (normdart@wsu.edu) and Dr. Gary Chastagner (Chastag@wsu.edu), reprinted with persmission from the authors

Phytophthora ramorum, the causal agent of sudden oak death and ramorum foliar blight, has killed tens of thousands of tan oaks (Lithocarpus densiflorus), California black (Quercus kelloggii), and coast live oaks (Quercus agrifolia) along the central coast of California and infected areas continue to expand in some counties. In the summer of 2003, P. ramorum was discovered outside of California, killing tan oaks in an isolated pocket in southwestern Oregon.

P. ramorum is currently not thought to be established in the Washington landscape, but has been detected in 33 western Washington nurseries since the summer of 2003. In addition it was isolated three times from a seasonal stream as far as 75 feet down from an ornamental nursery on the Kitsap peninsula from which soil below containerized plants tested positive for P. ramorum during previous surveys conducted by the Washington State Department of Agriculture (WSDA). The three stream samples were detected in early 2006 by the WSDA, using the "rhododendron baiting technique" in which rhododendron leaves are submerged in stream water for several days. While submerged under water, spores of *P. ramorum* will colonize leaves if they come into contact with them. Colonized leaves are then isolated by placing pieces of infected leaves on selective media. The WSDA has intensified monitoring of the stream

and surrounding landscape and nursery on the Kitsap peninsula for *P. ramorum* and currently there have been no reports of any wild land plant infections.

P. ramorum is believed to be an exotic pathogen that has recently been introduced to North America and Europe. USDA Animal Plant Health Inspection Service (APHIS) has imposed restrictions on the movement of hosts of *P. ramorum* from Washington, Oregon, and California nurseries to try and minimize the unnatural spread of this disease through the movement of infected plants in the nursery industry. In 2005, 16 plant species were added to the USDA-APHIS host list (www. aphis.usda.gov/ppq/ispm/pramorum). Currently there are over a 100 proven and associated hosts of P. ramorum from 16 different plant families. Some of the native Northwestern plants currently on the USDA-APHIS proven and associated P. ramorum host list include: rhododendron, viburnum, bigleaf maple, vine maple, madrone, grand fir, Douglas-fir, and pacific yew.

As the list of regulated hosts continues to expand, this pathogen continues to be detected in Washington nurseries, even after some of these nurseries have gone through a USDA APHIS compliance program and have been certified to be free of the pathogen. There is a real danger that this organism will spread from nurseries into Washington's natural and urban land-scape if the proper precautions are not

taken. Such an outbreak could trigger a series of quarantines that would have very serious impacts on the state's horticulture and forestry industries. Not only would costly eradication procedures and crop destruction be required, but these industries would be severely crippled by restrictions on export and intrastate shipment of product. The destruction of infected plant material in nurseries has already caused economic losses to the nursery industry in California, Washington, and Oregon.

We recently completed a study in which we estimate that *P. ramorum* eradication efforts in Washington state in 2004 and 2005 have required

continued on page 99

In This Issue

R&E Plants Committee92
Chapter Calendar93
NPSO Items for Sale95
Other Events96
Employers are Matching Your Donation Through Earth Share98
NPSO Contacts101



Native Plant Society of Oregon

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inside of the back page.

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Opinions expressed in this publication are those of the authors of the articles. They do not represent the opinions of the Native Plant Society of Oregon, unless so stated.

Rare & Endangered Plants Committee

regon has ten species on the Federal list of R&E plant species and 29 on the State list (with nine overlaps). The state-wide R&E Committee wishes to monitor these species and to determine which additional species warrant listing. We would like to develop educational programs that describe the state's flora and to increase our conservation activities by providing appropriate and specific information about local plants to city and county committees on management, planning, and parks and recreation.

If you are interested in learning more about R&E plants and helping to increase public awareness of our wonderful flora, contact Les Gottlieb (Siskiyou Chapter) at leslie@ashlandhome.net or 541-488-0731.

Errata

In Lucy Dueck's article on *Spiranthes porrifolia* in the August/September issue, William Baker's middle initial was listed incorrectly as T instead of H (for Hudson). William Hudson Baker (1911-1885) was born in Oregon, educated at OSU, and collected hundreds of specimens in our state. You can read a short biography of Baker by Rhoda Love in the October *Oregon Flora Newsletter*.

In Tanya Harvey's article on the Ochocos, several plants were misidentified. Dr. Ken Chambers of OSU pointed out that *Downingia elegans* is a species not known east of the Cascades. The plants in the Ochocos are actually *D. bacigalupii* (see below). Mark Egger, a Castilleja expert, thinks it is unlikely there is *Castilleja parviflora* in the Ochocos. Thanks for all the corrections—this is how we learn!



Bacigalupi's downingia (Downingia bacigalupii) is named after Dr. Rimo Bacigalupi, longtime curator of the Jepson Herbarium at Berkeley. It is differentiated from the similar westside species, Downingia elegans, by the large egg-yolk-yellow blotches in the center of the lower lip. D. elegans has only white on the lower lip.

NPSO CALENDAR

State

October 14, Saturday, 10 am – 2 pm

State Board Meeting: The Siskiyou Chapter will host the next quarterly state board meeting at Deer Creek Center in Selma. All members of NPSO are welcome. From I-5, take exit 55 or 58 at Grants Pass. Selma is about 25 miles SW of Grants Pass on Hwy 99. Just south of the Selma Market (now Ray's Market), turn right (west) on the Illinois River Road. Deer Creek Center is at 1241 Illinois River Rd., about one mile west of Selma. DCC is an educational facility newly purchased by a consortium of Siskiyou Field Institute, Southern Oregon University and Rogue Community College. After the business meeting, there will be an optional field trip to see Brewers oak on serpentine and a Darlingtonia fen about 2 miles farther along the Illinois River Road. For further information, consult the SFI website (www.thesfi.org) and click on "Deer Creek Center."

Blue Mountain

For information on the Blue Mountain Chapter call Jerry Baker at 541-566-2244.

Cheahmill

October 26, Thursday, 7 pm
Meeting: Little Shops of Horror:
Oregon's Carnivorous Plants. Charlene Simpson, a charter member of the Emerald Chapter, will give a slide show on the lures and traps of flesh-eating plants found in Oregon's bogs and fens. Carnegie Room, McMinnville Library, 225 NW Adams St. For more info contact Susan at 503-538-1865 or helgesusan@comcast.net. See Cheahmill Chapter website: www.oregon-native-plants.com

November 25, Saturday, 1-4pm

Field Trip: Mushroom Foray. Dr. Jack Murphy of the Linfield College Biology Department will lead a mushroom foray for both adults and their children on Saturday, November 25, at a location near McMinnville to be determined. This is the Saturday after Thanksgiving, so plan to walk off some of those calories while enjoying nature and whatever the rain brings! See the November *Bulletin* for more details. For information, contact Marna Porath at 503-835-1042 or marna@ onlinemac.com.

IMPORTANT NOTE TO FIELD TRIP PARTICIPANTS

Field trips take place rain or shine, so proper dress and footwear are essential. BRING WATER AND **LUNCH**. Trips may be strenuous and/or hazardous. Participation is at your own risk. Be prepared to sign a release form indicating this. For a sample copy check out the NPSO website. Please contact the trip leader or chapter representative about difficulty, distance, and terrain to be expected on field trips. Dogs are not allowed. All NPSO field trips are open to the public at no charge (other than contribution to carpool driver) and newcomers and visitors are always welcome. National Forests require a Northwest Forest Pass for many field trip locations. Permits can be acquired at forest headquarters and ranger districts.

NOTICE TO FIELD TRIP CHAIRS AND LEADERS

The Forest Service and other agencies have set policies limiting group size in many wilderness areas to 12. The reason is to limit human impacts on these fragile areas. Groups using wilderness areas should be no larger than 12.

Corvallis

October 7, Saturday, 10 am
Work Party: Avery House Native
Plant Garden. Meet at the Avery
House and bring your gloves, shovel,
clippers, buckets and lots of energy.
We will do a fall cleanup of the garden
and offer cuttings, divisions and plants
from the garden. We'll work till noon.
Bring something to share for a potluck
lunch. Do not forget your raincoat.
Call Esther McEvoy for more information or if you plan to come. 541-7540893.

October 9, Monday, 7:30 pm Meeting: A Brief Photo Essay of Hawaiian Endemic Flowering Plant **Genera.** Dr. Gerald Carr, formerly a professor of plant systematics at the University of Hawaii, will share his many years of Hawaiian plant research. Dr. Carr is now a resident of Oregon and will be taking an active role in the Oregon Flora Project. This is a talk not to be missed. Also come to learn about what we have planned for the upcoming year. Avery House, Avery Park, Corvallis. For more information contact Matt Blakeley-Smith at 541-752-1091.

October 27, Friday, 8 am

Field Trip: Mushroom Hike. Dan Luoma will lead this trip that you won't want to miss. Whether you are a novice or an experienced mushroom enthusiast, this trip with our knowledgeable expert will help improve your identification skills. Trip location depends on the weather and fungi abundance. Bring rain gear, wax paper and lunch. Meet at the OSU parking lot SW of the Beanery, 26th and Monroe, Corvallis, at 8 am. For more information contact Dan Luoma at 541-752-8860.

Emerald

Please note all Emerald Chapter presentations will now be held at the Eugene Water and Electric Board Training Room at 500 East 4th Avenue in Eugene. From the Fifth Street Market go one block north and one block east. For more info call David at 541-746-9478.

October 16, Monday, 7:30 pm Meeting: Planning Native Plant Restoration for Public Parks. Pat French, Willamalane Parks Planner, will describe invasive species control and restoration strategies for Eastgate Woodlands and other public recreation settings. 7:30 pm, EWEB Training Room, 500 East 4th Avenue, Eugene.

November 20, Monday, 7:30 pm Meeting: Iron Mountain: Subtle Habitat Differences Equals Greater Floral Diversity. Bob Ross, retired Professor, Linn-Benton Community College, will use beautiful photography to point out that subtle differences can help us see flowers we often miss. 7:30 pm, EWEB Training Room, 500 East 4th Avenue, Eugene.

High Desert

For information on the High Desert Chapter call Berta Youtie at 541-447-8166.

Klamath Basin

For information on the Klamath Basin Chapter, contact Sarah Malaby, 541-884-5703, smalaby@cs.com.

Mid-Columbia

Thursday, October 12, 7:30 pm Meeting: Annual Meeting Planning. Committee assignments, field trip options and other duties assigned by Mike Igo. The Commodore Building, Downstairs Conference Room, 3rd & Court Street, The Dalles. For Information Call 541-905-3187.

North Coast

Wanted, new members for our group, located in Tillamook County. Trips subject to suggestions. Please phone Janet Stahl at 503-842-8708.

Portland

October 12, Thursday, 7 pm Meeting: Nevada High Country. Jan and Dave Dobak will show and tell about the botanical wonders of the Ruby Mountains and Great Basin National Park (Wheeler Peak) in northeastern Nevada. The trails begin at 9000 feet and climb higher. Room #202, First United Methodist Church, 1938 SW Jefferson St., Portland. Located just uphill from the Goose Hollow MAX stop.

Siskiyou

October 19, Thursday, 7:30 pm Meeting: O, Pioneers! Our Early Northwest Plant Collectors. Eugene Botanist Rhoda Love will introduce a special group of pioneers such as Almeta Barrett, William Cusick, Lilla Leach and Wilhelm Suksdorf. During the 1800s and early 1900s, these pioneer botanists searched the Northwest for new plant species identifying and collecting thousands of specimens. An inspiring and lively speaker, Dr. Love taught botany at Lane Community college for more than 30 years. In 1980, she received a doctorate from the University of Oregon. Room 171 of the SOU Science Building, Ashland. For more information, contact Alex Maksymowicz, 541-482-1964

Umpqua Valley

October 12, Thursday, 7 pm Meeting: Speaker to be announced with business meeting to follow the presentation. Mercy Community Education Center, 2459 Stewart Parkway, Roseburg. For information call Sam Friedman at 541-673-0589.

October 22, Sunday, 9 am Field Trip: Dread and Terror Segment of North Umpqua Trail. Come join us for a hike along the Dread and Terror portion of the North Umpqua Trail near Lemolo Lake. Expect to see brilliant fall colors, mosses, lichens, and early fall fungi. Meet in the NE corner of the parking lot behind the Douglas County Courthouse, west of Fowler Rd., between Hwy. 138 and Douglas Ave. in Roseburg. Bring rain gear if needed. For more information call trip leader Sam Friedman at 541-673-0589.

Willamette Valley

October 19, Thursday, 7 pm Program: Introduction to Nature **Journaling.** Using art and narrative to record observations and feelings in a nature journal can be a powerful way to learn about the world around you. Marilynn Karbonski, Cheahmill Chapter member, who has taught and lectured on field journals for 17 years, will provide a how-to introduction to writing, sketching and painting observations and experiences in the natural world. This special program



Sitka clubmoss (Diphasiastrum sitchense formerly Lycopodium sitchense) is an uncommon plant found mainly near small midto high elevation wet spots in the Cascades.

is co-sponsored by the Willamette Chapter and the Friends of the Straub Environmental Learning Center as part of the Amateur Naturalist series. 7–8:30 pm at Straub Environmental Learning Center, 1320 A St. NE, Salem 97301 (next to Olinger Pool and near North Salem High). Free and open to all. For more information, call 503-399-8615.

October 28, Saturday, 9 am – 2 pm Work Party: Planting at Straub Environmental Learning Center. The Willamette Chapter and the Friends of the Straub Environmental Learning Center are co-sponsoring a work party to plant native flowers, shrubs and grasses around the Straub Environmental Learning Center at 1320 A St. NE, Salem (next to Olinger Pool and near North Salem High). Bring gloves and equipment (picks and shovels). For more information, contact Jon Yoder at 503-391-4145 or John Savage at 503-399-8615.

November 2 and 9, Thursdays, 7 – 8:30 pm

Program: Oregon's Native Conifers.

Oregon is home to nearly 30 species of native conifers. Wilbur Bluhm, professor emeritus of the Oregon State University Extension Service and horticulture expert on plant species native to Oregon, will teach a short course about our native conifers. In this two part session, participants will learn about the uses, distribution and status of conifers and how to identify them. The class, which may include a field trip on a date to be announced, will be held at the Straub Environmental Learning Center, 1320 A St. NE, Salem (next to Olinger Pool and near North Salem High). The class, part of the Amateur Naturalist series, is co-sponsored by the Willamette Chapter and the Friends of the Straub Environmental Learning Center. Free and open to the public. For more information, call 503-399-8615.

William Cusick

For information on the William Cusick Chapter call Frazier Nichol at 541-963-7870.

NPSO Items for Sale

Vascular Plants of Lane County, Oregon: An Annotated Checklist Emerald Chapter, NPSO. More than 1,740 species and varieties representing 39% of the 4,460 plants currently recognized by the Oregon Flora Project are listed with information on habitat, ecoregion, occurrence frequency, and native or non-native origin for every species. To order, send \$15 payable to Emerald Chapter, NPSO to Lane County Checklist, Emerald Chapter, NPSO, PO Box 902, Eugene, OR 97440-0902.

The Atlas of Oregon Carex was NPSO's first Occasional Paper. The Atlas has 128 location maps, one for each Carex taxon in the state of Oregon. Also included are a synonymy, fun facts about sedges, a history of the project, and Oregon geography maps. **Price: \$5.**

Louis F. Henderson (1853-1942): The Grand Old Man of Northwest Botany by Rhoda M. Love. NPSO's second Occasional Paper is the only existing publication with detailed coverage of the long and fascinating life of this John Muir-like western character. Included: 56 pictures,133 notes, chronology, list of plants named for Henderson. Fourth printing, February, 2004. Price \$10.

To order either or both Occasional Papers, send check for the appropriate amount (made payable to NPSO) to: Occasional Papers, Native Plant Society of Oregon, PO Box 902, Eugene, OR 97440-0902.

NPSO Membership Directory lists names, addresses, phone numbers, and email address of NPSO members (April 2005). Available from Jan Dobak, 2921 NE 25th Avenue, Portland, OR 97212-3460. **\$3 postpaid.**

Oregon's Rare Wildflower Poster depicts Punchbowl Falls and three of the Columbia River Gorge's endemic wildflowers. Stu Garrett, 21663 Paloma Drive, Bend, OR 97701, 541-389-6981. **\$12 each**, plus \$3 shipping per order. Posters are mailed in tubes.

NEW Salal T-shirt. Attractive forest green t-shirts with botanical drawing of *Gaultheria shallon* in cream-colored ink by Carlton, OR artist and Cheahmill Chapter member, Marilynn Karbonski. High quality t-shirts, S-XL, short sleeve **\$15 plus \$5 shipping**. To order, call Jennie Sue Dunn-Dixon at 503-472-1745.

"Land of Umpqua" T-Shirt featured at the 2005 Annual Meeting is available again through the Umpqua Chapter. It depicts the delightful *Calochortus umpquaensis* illustrated by Dorothy Schattenkerk and in cream, purple, yellow, and green. Arched over the top in black letters are the words "Land of Umpqua", and underneath it says, "Native Plant Society of Oregon." The shirts are \$16 plus \$5 shipping and come in light gray, beige, pink or light blue in sizes M, L, and XL. To order call Ron Hatt at 541-863-7024.



OTHER EVENTS

Tualatin Hills Nature Park Fall Native Plant Sale

October 7, Saturday, 10 am – 2 pm 15655 SW Millikan Blvd., Beaverton

Fall is the perfect time to plant natives. Select from a wide variety of trees, shrubs and flowering plants in all price ranges for every spot in your garden! Check the Tualatin Hills Nature Park web site, www.thprd.org for "Plants for Sale Guide" or call 503-629-6350 for more information.

Siskiyou Field Institute Courses

To learn more about courses or to reserve your place, visit www.thesfi.org or call 541-592-3777.

Mushrooms! October 27 – 29 Deer Creek Ranch near Selma

NPSO president David Lebo will teach this introduction to the mushrooms (edible and non-edible) of Pacific Northwest forests, with an emphasis on field identification, and each species' ecology: preferred habitat, role in the forest, life cycle, etc. Tuition: \$125.

North Mountain Park Nature Center Events

620 N Mountain Ave., Ashland

To get more information and to register, call 541-488-6606 or visit http://ashland-parks.recware.com or www.ashland.or.us/northmountainpark.

Bear Creek Salmon Festival October 7, Saturday, 11 am – 4 pm

This FREE event will offer activities for all ages and show participants some ways in which they can help protect and enhance salmon habitat—including water and energy saving ideas. Learn about local salmon habitat conservation and restoration efforts, and observe wild salmon up close and personal with the Oregon Department of Fish and Wildlife's 350 gallon salmon tank! Biologists will be on-hand to answer 'fishy' questions. For more information call the Nature Center or visit www.BearCreekSalmonFestival.org.

Nature Drawing w/Irene Brady October; 14, 21 & 28, Saturdays, 9:30 am – 2:30 pm

Join local author and artist Irene Brady for a mini series in Nature Drawing. Irene has worked as a scientific illustrator for National Fish and Wildlife Service Forensics Lab, has illustrated for *Ranger Rick* Nature Magazine and has written and illustrated several award winning books. You will take home a step-by-step workshop guide, bound with several pages of sketchbook paper. \$95 for the series (includes all materials). Ages 12 and up. Register online or call the Nature Center.

Butterflies of Eastern Oregon Talk

Mysteries and Marvels from the Other Side: Butterflies and Habitats of Eastern Oregon October 2, Monday, 7 pm refreshments, 7:30 pm Presentation

North American Butterfly Association Eugene-Springfield Science Advisor, Neil Bjorklund will share photos and stories from his extensive travels in the mountains, deserts, and canyons of Eastern Oregon in search of the weird and wonderful world of butterflies. You will meet many of these butterflies as well as the stark and beautiful landscapes they inhabit. Hold onto your hat, and watch out for rattlesnakes as Neil quips and trips his way through the Oregon that's NOT rainy and green! EWEB Training Center, 500 East 4th Ave., Eugene. Free and all are welcome.



Helianthella uniflora and lupines near Alta, Utah.

Wildflowers of the Wasatch

October 10, Tuesday, 7 pm Medford Congregational United Church of Christ 1801 E. Jackson St., Medford

The Siskiyou chapter of the North American Rock Garden Society (NARGS) will host NPSO *Bulletin* editor Tanya Harvey who will show slides of the fabulous wildflower display at this summer's NARGS meeting in the Wasatch Mountains of Utah. The Wasatch mountains are just outside of Salt Lake City and provide an amazingly accessible way to see alpine and subalpine flowers which were abundant this year. Free and open to the public. For more information contact Phyllis Gustafson at 541-664-1775.

ORNHIC Triennial Review of Rare Plants

October 20, Friday, time TBA Bexel Hall, Room 323, Oregon State University

The triennial review of rare plants (vascular and nonvascular) and fungi for the upcoming 2007 edition of Oregon Natural Heritage Information Center's (ORNHIC) booklet *Rare, Threatened and Endangered Species of Oregon* will be held on Friday, October 20 on the Oregon State University campus, Bexel Hall, Room 323. While the exact time and agenda have not been finalized, we anticipate the meeting lasting from mid-morning to mid-afternoon. We will post the final agenda with starting and ending times on the ORNHIC website (http://oregonstate.edu/ornhic) at least a month prior to the meeting. At our website you can also review the current edition (2004) of the booklet under "Publication and Reports" or "Biodiversity Data."

To be discussed are plants and fungi that have been nominated for addition to or removal from the ORNHIC list, changes in the list placement of species already on one of the lists, changes to a species' Heritage rank and any other comments participants wish to offer.

Please send your recommendations and comments prior to the meeting to Sue Vrilakas (Sue.Vrilakas@oregonstate.edu, 503-731-3070 x105), or John Christy (John.Christy@oregonstate.edu, 503-731-3070 x108). John is the lead for nonvasculars and fungi and will be coordinating information for those species. If you are recommending changes, please include a brief paragraph with the reason for your recommendation. More detailed information may be required and asked for later. A summary of recommendations and comments will be posted on the ORNHIC website and discussed at the meeting. You don't have to send information prior to the meeting—you or someone else may bring it up during the meeting.

If you have further questions, please contact either John or Sue at the Oregon Natural Heritage Information Center, 1322 SE Morrison St., Portland, OR, 97214.



Umpqua mariposa-lily (Calochortus umpquaensis) is a rare endemic of serpentine soils in Douglas county. Its large white flowers have a distinctive deep purple splotch at the base of the widely-spread petals. It blooms in May and early June. Due to its small range and occurrence on unprotected land, it is ranked in the Oregon Natural Heritage Information Center's booklet Rare, Threatened and Endangered Species of Oregon as G1, S1: endangered both globally and statewide. You can find out more about some of Oregon's endangered plants at ORNHIC's website at http://oregonstate.edu/ornhic/plants/index.html.

Mt. Pisgah Events

34901 Frank Parrish Rd. (off of Seavey Loop Rd.), Eugene. For more information or to register call 541-747-1504 or visit www.efn.org/~mtpisgah.

Autumn Elder Walk October 7, Saturday, 1-3 pm

Join Nature Guide Harold Schyberg on a gentle autumn stroll through the Arboretum. Refreshments provided. Meet at the Arboretum Visitor Center, rain or shine. Suggested donation: \$4 (MPA members free!)

Herbal Remedies Workshop October 14, Saturday, 10am-Noon

Join local herbalist Sue Sierralupé and learn to identify medicinal autumn plants for the treatment of human and pets. Learn to make a tincture from Oregon grape root (*Mahonia* or *Berberis* spp.) This class is geared towards students that have a general understanding of herbal medicine. Fee: \$20 (\$15 MPA members.) Pre-Registration is required.

Willamette Valley Fall Ecology Walk October 15, Sunday, 12 – 2 pm

Join botanist Dr. Rhoda Love on an autumn hike along the trails of the Arboretum and Howard Buford Park. Learn about the ecology and natural history of the Southern Willamette Valley. Refreshments provided. Meet at the Arboretum Visitor Center, rain or shine. Suggested donation: \$3 (MPA and NPSO members free!)

Mushroom Festival and Plant Sale October 29, Sunday, 10 am - 4 pm

Don't miss our annual fall celebration of mushrooms and the harvest season, co-presented by Mount Pisgah Arboretum, the Cascade Mycological Society and Lane Community College. This event is one of the largest mushroom displays on the West Coast, a huge plant sale, a scarecrow contest, children's activities, hayrides, craft vendors, incredible mushroom-inspired food, fresh cider, music, wine, and more!Suggested donation: \$5/person or \$10/family. MPA members free!

Berry Botanic Garden Events

11505 SW Summerville Ave., Portland. To register or to get more information, visit www.berrybot.org or call 503-636-4112x102.

Colorful Trails - Great Fall Hikes in the Pacific Northwest October 3, Tuesday, 7 – 9 pm

Hiker, backpacker and award-winning author Douglas Lorain shares his decades of experience through a colorful slide show captured on trips in the Pacific Northwest. Discover some of our area's best kept secrets—where to see hillsides covered with quaking aspens, western and alpine larches, huckleberries, maples, and other fall-color specialists. \$10 (\$8 for BBG members).

Silver Star Mountain Hike October 5, Thursday, 9 am - 4 pm

Re-vegetation of this peak in the Gifford-Pinchot Forest has been slow, due to a history of fires. In the fall, this means a fabulous show of vine maples, huckleberry bushes and other colorful shrubs. The drive includes a rough stretch of road, but the color and the nearly 360° view make it all worth it! Moderate hike of 5 miles, 1000' elevation gain. Free, donations welcome.

Cultivating Captive Carnivores October 12, Thursday,

Scott Vergara will show you how to create a suitable (and beautiful) habitat for growing our native cobra lilies and sundews, as well as Venus flytraps, Sarracenias (hardy pitchers) and other intriguing insectivorous plants. Make a nighttime visit to our bog gardens and take home knowledge of the essentials for cultivating these creepies in your garden or windowsill. Take home a free plant. \$12 (\$10 for BBG members).

Naturescaping for Clean Rivers October 15, Sunday, 1-5 pm

Gardening with native plants, natural landscapes, and healthy gardening practices, uses less water and fewer chemicals, reducing runoff and pollution. Native plants attract birds and butterflies and require less time and energy for their care. This class will help you to make informed choices about what you plant, where best to plant it and how to care for it. You'll receive a

free workbook and native plant to take home. Rain or shine, we'll go outside to study plants in the garden. Free, but pre-registration is required. E-mail naturescaping@yahoo.com or call 503-797-1842. Include your e-mail address, name, address (& zip code) and phone number.

Fall Fungal Hike October 19, Thursday, 9 am - 3:30 pm

Maggie Rogers will combine a solid introduction to the fungi and lichens in the Gifford-Pinchot Forest in SW Washington with a moderate hike on the Pacific Crest Trail and a wealth of fall color. Donations welcome.

Introduction to Botanical Art and Illustration November 18-19, Saturday and Sunday, 9:30 am – 3:30 pm

Raised in Paris, Catherine Watters now lives and teaches in San Francisco, where she documents plants at the Filoli estate garden and serves on the Board of the American Society of Botanical Artists. In this two-day workshop she draws from her extensive artistic education and experience, beginning with a brief history of Botanical Art and moving into an introduction to the time-honored methods of plant illustration. \$150 (\$120 for BBG members).

Seeing Double: Employers are Matching Your Donation Through Earth Share



wouldn't you love it if you made a \$100 donation to NPSO and it suddenly became \$150, or \$200?

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If you work at any of these companies, consider donating to NPSO through Earth Share—your donation will be increased up to 100% without any extra effort from you. And, by giving through payroll contribution, you can give any size gift and spread the payment out over a year's time. No checks to write or credit card numbers to give out...the money is just donated from your paycheck. You can still designate your dollars to come to us—and, when they reach us, there will be many more dollars supporting the programs you love!

To learn more about Earth Share of Oregon and its workplace giving campaigns, contact Ron Shoals at 503-223-9015 or ron@earthshare-oregon.org.

Managing and Monitoring for *Phytophthora ramorum*

continued from page 91

32 nurseries to destroy 17,266 containerized plants worth a retail value of \$423,043. This means that, on average when *P. ramorum* is detected in a Washington nursery, mitigation efforts require each nursery to destroy \$13,200 worth of plants. These estimates do not take into account additional expenses incurred by the nurseries such as disposal fees, labor costs, and in some instances, soil fumigation.

Diseases caused by P. ramorum

It is important to understand that P. ramorum does not affect all hosts the same way and some hosts are potentially more important to the spread of this disease organism than others. There are two major diseases caused by P. ramorum: (1) sudden oak death, and (2) ramorum foliar blight. Sudden oak death is a disease of members of the red oak group (e.g. live oak, and California black) and tan oaks. This disease develops when P. ramorum infects the stem of a tree, causing cankers, which girdle and kill mature trees. Members of the white oak group generally do not develop sudden oak death, including the Washington and Oregon native Garry oak (Quercus garryana). Ramorum foliar blight occurs on most other nonoak hosts including conifers, broad leaf plants, and herbaceous plants. Symptoms of this disease include brown lesions on leaves, and shoot-tip dieback. On certain foliar hosts such as California bay laurel and tan oak P. ramorum is a prolific spore producer, which seems to be crucial for disease spread and establishment in California forests. Spores produced by these epidemiologically important hosts spread by wind driven rain splash and mist that shower the bark of oak hosts, and the foliage of other hosts below in the understory where they germinate and cause disease. To date extensive P. ramorum wild land infestations have been reported in forest communities with associated epidemiologically important hosts such as tan oak (CA & OR), California bay laurel (CA), and/or

coast redwood (CA). It is currently not known if other hosts can produce spore loads capable of sustaining *P. ramorum* and associated diseases in regions of the Pacific Northwest outside of the native range of tan oak, California bay laurel, or coast live oak.

Although aerial dispersal through wind driven rain is known to play an important role in the dispersal of this pathogen, there is still a lot that is not understood about the biology of this organism. Recent laboratory and field research has shown for example, that chlamydospores produced by this organism can persist in a diversity of soil types (sand or potting mix) for over 650 days (Nina Shishkoff, USDA Agricultural Research Service); rhododendron roots have been infected under laboratory conditions (Jennifer Parke, Oregon State University); and P. ramorum has been isolated from streams in watersheds that have no known wild land infections or have been managed extensively to eradicate the pathogen (Everett Hansen, OSU). All of these findings force plant pathologists, regulators, and land mangers to realize the potential importance of soil

inoculum, and root/vasculature infection in the establishment and dispersal of this organism in the native and urban landscape and within nurseries.

WSU Research

With all that is currently not known about this exotic plant pathogen, and the potentially devastating effects it could have on the ecosystem, and economy of Washington state, research and outreach on this pathogen is essential to increase the effectiveness of eradication efforts and to minimize its spread, especially into to our wild lands. Plant Pathologist Gary Chastagner of Washington State University (WSU) Puyallup Research and Extension Center has been actively developing a research and education program during the past three years to help Washington agricultural and forestry professionals cope with *P. ramorum*.

In response to industry concerns, Gary Chastagner secured funding from WSU to build a new, quarter million dollar biocontainment facility at Puyallup, which was completed this winter. This facility will greatly increase continued on page 100



Lesion on a camellia leaf caused by Phytophthora ramorum, note how the lesions (in the upper right corner) have begun to spread along the mid ribs of the leaf.

99

Managing and Monitoring for *Phytophthora ramorum*

continued from page 99

the capacity of WSU to address critical research questions relating to the establishment, spread and management of this pathogen. Additional funding has also recently been secured to purchase equipment for WSU Puyallup that will enable researchers to conduct molecular tests relating to the detection, spread, and genetics of *P. ramorum*.

Additionally, Dr. Chastagner initiated a research project this past spring to examine factors influencing P. ramorum infection in Christmas tree plantations with funding provided by a two-year USDA Forest Service grant. Work on this project is occurring at the Black Road Christmas Tree Farm near Los Gatos, CA. This is a 23-acre U-cut Christmas tree farm that was established in 1966. Conifers being grown at this site include Douglas-fir, grand fir, giant sequoia, scotch pine, white fir, and California red fir. Some known P. ramorum hosts in the forest adjacent to the edge of the farm include: California bay laurel, madrone, big leaf maple, false solomon's seal, toyon, coast redwood and tanoak. Dieback on some of the grand and Douglas-fir along the interface between the infected forest and the Christmas tree farm appears to have occurred at least 4 years ago. This past spring, conditions were very favorable for disease development. Preliminary results from this study indicate that most of the infected Christmas trees occurred within 2 meters of the edge of the P. ramorum infected bay laurel forest canopy. Virtually no infection was evident on Christmas trees that were more than 5 meters away from the forest edge.

The Forest Service, Washington State Pesticide Commission, Pacific Northwest Christmas Tree Association, and the WSDA Nursery Research Program are also supporting research at WSU Puyallup to determine the effectiveness of various fungicides in protecting conifers and rhododendrons from infection by this pathogen. This work has shown that several traditional contact materials, such as mancozeb,



Tip dieback of grand fir (Abies grandis) caused by Phytophthora ramorum in a California Christmas tree plantation. Picture was taken in May shortly after infection following spring rainstorms.

and the systemic material Subdue MAXX, have the potential to provide excellent control of diseases caused by P. ramorum. However, growers and regulatory agencies are concerned that the use of fungicides may be masking symptom development, thus making it harder to prevent the spread of this pathogen on infected nursery stock. Now that the new biocontainment facility is completed, additional studies will be conducted to determine the residual effectiveness of fungicides and determine if any of them have the potential to mask symptom development on infected plants.

WSU State Wide Education

With funding provided by the USDA Forest Service, Dr. Chastagner has also developed a *P. ramorum* education program based at WSU Puyallup. Last summer, Norm Dart was hired to coordinate these efforts. Dart's work is focusing primarily on developing, coordinating, and presenting first detector workshops and research seminars relating to *P. ramorum* throughout

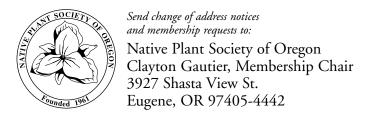
Washington, as well as developing educational material to distribute throughout the state. The goal of first detector workshops is to train nursery and landscape professionals, arborists, natural resource professionals, county extension agents, and Master Gardeners to recognize symptoms potentially caused by P. ramorum in the urban and natural landscape and how to submit samples. Early detection is the key to reducing the risk of widespread outbreaks in Washington and to protecting Washington's nursery, landscape, and forest industries from the potentially devastating economic effects that a P. ramorum outbreak could have. These workshops address the sensitive nature of this disease, and train participants in how to deal with P. ramorum issues and the importance of providing information without causing panic.

For additional information and resources on *P. ramorum* visit the WSU Sudden Oak Death Education Website: www.puyallup.wsu.edu/ppo/sod.html

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A great deal of satisfaction comes from knowing that your contributions to the Oregon Flora Project will be doubled, so we hope that you will give generously. Likewise, we welcome additional matching funds that will contribute to an amount that will truly challenge our supporters. Look for more details in next month's *Bulletin* or the upcoming *Oregon Flora Newsletter*.

For more information on how you can help in this fundraising effort, contact:

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