Managing *Phytophthora ramorum* at the Bloedel Reserve
The Bloedel Reserve

• Opened to the public in 1988.
• 150 acres of various garden types and forest.
• Located on Bainbridge Island in the Puget Sound of Washington State.
• 50,000 visitors per year.
• Focus is on the visitor’s experience of nature and tranquility.
Undeveloped Forest
Meadows
Bird Marsh
Woodland Plantings
Formal Grounds
Formal Grounds
Formal Grounds
The Bloedel Reserve has been involved with the Sentinel Plant Network since 2011.
Reposition gardens as leaders in the battle against invasive species.

sentinelplantnetwork.org
The Sentinel Plant Network is a collaboration between the American Public Gardens Association and the National Plant Diagnostic Network that is funded by the USDA’s Animal and Plant Health Inspection Service.
Public Gardens as Force Multipliers
590+ APGA member gardens in 11 different countries
9,300+ public garden professionals
100 Million annual visitors
84% of gardens seek assistance with insect ID and 88% with plant diseases\textsuperscript{1}

Our Vision:
A world where public gardens are indispensable

Our Mission:
American Public Gardens Association serves public gardens and advances them as leaders, advocates, and innovators.

Our Mission: Enhance national agricultural security by quickly detecting and identifying introduced pests and pathogens.

Primary mission areas
• Detection and diagnosis
• Training and education
• Communication
Our Mission:
To contribute to plant conservation by engaging public garden professionals, volunteers and visitors in the early detection of serious plant pests and pathogens.

sentinelplantnetwork.org
Summary of SOD at the Bloedel Reserve

- The first positive in March 2015 found on a Pieris.
- By the end of 2015, there were 14 total confirmed positive sites.
- No new positives for the last five months.
- The source of SOD at Bloedel remains undetermined despite trace-back surveys.
- The source is believed to be purchased plant material.
Pieris infected with SOD
Pieris infected with SOD
Initial Response

• April 2015, visit by USDA, WSDA, and WSU.
• Initial inspection of the first positive.
• SOD survey to look for more positives.
• Trace-back survey to determine a possible nursery source
  – No positive sources found.
  – Source remains undetermined.
More SOD Positives

• May 2015 through January 2016 surveys.
  – 13 additional positive sites confirmed.
• February 2016 through May 2016 surveys.
  – No new positives found.
SOD-Infected Genera at Bloedel

- Pieris
- Rhododendron
- Mahonia
- Gaultheria
- Viburnum
- Vinca
- Camellia
- Vaccinium
USDA Mandated Controls

• Destroy plants within USDA-determined eradication zones.
• Destruction by burning to ash.
• Prevent water flow over footpaths from positive sites.
  – Improve trail drainage.
  – Change trail grade.
USDA Mandated Controls

• Access to positive sites strictly controlled.
  – Low fencing.
  – Quarantine procedures for workers.
  – Signage ("Please Stay On Trails").
• Standard Operating Procedures.
  – Define sanitation protocols for workers.
  – Define quarantine procedures for new plants.
Eradication of Confirmed SOD Positives
SOD Material Burned to Ash
Trail Drainage
Low Fencing
SOD-Positive Site Management

• Monthly SOD surveys (USDA/WSDA).
• Soil steaming of SOD positive sites (WSU).
• Post-steaming soil treatment.
  – *Trichoderma*.
  – Organic mulch (wood chips + aged manure).
  – Replant with non-host species.
• Continue sanitation/quarantine procedures.
• Foliar pesticides applied to positive sites and surrounding areas.
• Removal of low-value host species.
Soil Steaming
Soil Steaming
Mulching/Replanting
Site Sanitation
Chemical Controls

• Periodic foliar applications.
• Suppress SOD growth and reproduction.
• Alternate between products with different modes of action.
  – Mefenoxam.
  – Cyazofamid.
  – Dimethomorph.
• Positive sites and surrounding areas.
Looking Ahead

- Assumption: SOD will not disappear from the Bloedel Reserve.
- Continue all controls into the future.
- Future planning will consider SOD-related factors.
Special Thanks

• USDA-Animal and Plant Health Inspection Service.
• Washington State Dept. of Agriculture.
• Washington State University.
• Sentinel Plant Network.
• American Public Garden Association.