

TITLE: Evaluating *Neonectria* in Red Alder on State Lands in Western Washington: Extent, Severity, and Associated Ecological Conditions

LOCATION: Washington State (WA)

DURATION: Year 1 of 1-year project **FUNDING SOURCE:** Base Plan

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PROJECT OBJECTIVES: Evaluate red alder on state lands throughout western Washington to provide data on their condition, e.g. *Neonectria* canker incidence and severity. Gather ecological data, e.g. soil type, biogeoclimatic zone, aspect, elevation, basal area, crown characteristics, tree age, at the stand level and use this information to quantitatively describe red alder status and provide recommendations for management. Develop a visual guide to the *Neonectria* signs and symptoms on red alder.

JUSTIFICATION: This project addresses the Base Evaluation Monitoring project criteria “Insects and diseases – deviations from expected damage levels.” In 2001, red alder dominated non-national forest timberlands were estimated at 1.1 million acres in western Washington. In 2002 and 2005, assessments of *Neonectria* caused cankers and infections in red alder plantations on private lands revealed higher than expected frequencies and severities.

Linkage to FHM Detection Monitoring - the need for the project should arise from an analysis of FHM survey data and/or Forest Inventory Analysis (FIA) plot data. Field assessments of red alder have revealed *Neonectria* at forest stand impact levels, but are not reported in aerial survey data or in FHM/FIA survey plot data. One objective of this study is to develop a visual guide to the signs and symptoms caused by *Neonectria* on red alder in order to enhance the training of FIA crews.

Significance in terms of geographic scale, biological impact and/or political importance of the issue. There are no current surveys that assess the incidence and severity of *Neonectria* caused infections in red alder plantations on state lands in Washington. Stem defects on red alder were first reported in 1998 on private lands in Washington. To date, surveys of the red alder stem defect causal agent, *Neonectria*, have only been conducted on private timberlands. The impacts and ecological conditions contributing to *Neonectria* infected red alder in natural and public lands remain unknown. Red alder is an important forest

industry product, serves a role in Native American cultural practices, and is important ecologically because of its role in nitrogen-fixing, erosion control, and its quick establishment following disturbances.

Feasibility or probability that the project will be successfully completed. There is a high probability that this project will be completed successfully. The Washington Department of Natural Resources Forest Resource Inventory System will provide easily accessible sites that are suitable for plot establishment. Plots have been established and surveyed for other agents throughout Washington in a similar distribution and time frame. Data collection, analysis, and documentation of results should be accomplished within the specified time.

DESCRIPTION:

a. Background: Red alder was historically considered an undesirable weed species in the conifer forests of the Northwest, but has significantly increased in value as a forest product since the late 1980's. Solid red alder wood is used for furniture, cabinetry, and molding, while composite red alder uses range from paper to plywood. Stem defects of red alder (*Alnus rubra*) were first reported in Washington state in 1998, a few years after the proposed introduction of Alderkill™, a red alder fungal bio-control agent. Alderkill™ is no longer available, but was developed using a *Neonectria* species similar to the one currently known to be the causal agent of the stem defects on red alder.

Initial observations of red alder stem defects were noted on privately managed timberlands, ranging in severity from spot-like bark lesions to severe canker-caused tree mortality. The symptoms were commonly found in red alder stands in southwest Washington. After further investigation, a fungal pathogen known as *Neonectria major* was found in association with the cankers on the bole and branches of living and recently killed trees, as well as recently thinned slash.

In 2002 and 2005, approximately 40 total stands of red alder were surveyed by Weyerhaeuser to determine the incidence and severity of *Neonectria* infections in southwest Washington. The surveys confirmed that stands in southwest Washington had varying degrees of canker numbers and severity, with some stands having high levels of incidence and severe cankering.

b. Methods: Sixty units with red alder as the primary management species will be randomly selected across western Washington using the Washington Department of Natural Resources Forest Resource Inventory System. In each of these management units, 30 red alder trees will be visually assessed for *Neonectria* and associated symptoms. The number and location of *Neonectria* signs and symptoms will be recorded for each tree. Stand age, soil type, biogeoclimatic zone, aspect, elevation, and basal area will be determined for each unit. Assessments will be conducted in late spring through early summer, which is the time of *Neonectria* perithecia development.

c. Products: A poster of the results will be presented at the annual Forest Health Monitoring Working Group meeting and a technical report will be produced. The report will include results from this study, as well as management recommendations for red alder in Washington.

d. Schedule of Activities: The units will be surveyed in spring of 2007. Data analysis, report writing, and poster preparation will occur in autumn of 2007.

COSTS:

	Item	Requested FHM EM Funding	Other- Source Funding	Source
YEAR 1				
Administration	Salary	\$13,000	\$13,000	WA DNR
	Overhead	\$1,500	\$1,500	WA DNR
	Travel	\$5,500	\$5,500	WA DNR
Procurements	Contracting			
	Equipment			
	Supplies			
Total		\$20,000	\$20,000	