

## ***Phytophthora alni* subsp. *uniformis* Found in Alaska Beneath Thinleaf Alders**

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*Phytophthora alni* Brasier & S. A. Kirk 2004 causes a lethal root and collar disease of alder species in Europe. This emergent pathogen has multiple variants that have been placed in three subspecies (1). The species has not been previously found in North America, although an isolate tentatively referred to as *P. alni* was reported in a survey of nurseries in Minnesota (4). The potential establishment and spread of this complex of pathogens is perceived to represent a threat to all species of *Alnus* in the western hemisphere. A survey of *Phytophthora* species beneath *Alnus* was initiated following the discovery of widespread dieback and mortality in Alaska. Thirty riparian stands were sampled along a south-to-north transect from Kenai Peninsula through Anchorage and north to beyond Fairbanks (Fig. 1). *Phytophthora* species were baited from saturated rhizosphere soil and watercourses in situ using rhododendron leaves during July 2007. Three isolates of *P. alni* subsp. *uniformis* were isolated from soil beneath *Alnus incana* subsp. *tenuifolia* exhibiting dieback at two sample locations in remote, unmanaged stands hundreds of miles apart on the Kenai Peninsula and near Denali National Park. Species identification of the three isolates is based on DNA sequence homology of ITS and RAS-Ypt molecules (2), and subspecies identification by SCAR profiles (3), and morphology (GenBank EU371544-371553). Caducous sporangia, not previously observed in *P. alni*, were observed in the Alaskan isolates. USDA Forest Service and APHIS laboratories have additionally confirmed the identification. *Phytophthora alni* was not recovered from the other 28 sample sites in 2007. Excavations of nearly total root systems in 2008 revealed that symptoms of root and collar rot were rarely present at the two locations where the isolates of *P. alni* subsp. *uniformis* were obtained. Root rot which occasionally tested positive with ELISA for *Phytophthora* was limited generally to one root (approximately 1-cm diameter) per tree. Alder mortality and dieback were common at many of the 30 sites and were often associated with extensive stem cankers colonized by *Valsa melanodiscus* G.H. Oth 1870, *Cryptosporella suffusa* (Fr.:Fr.) L.C. Mejia & Castl. 2008, and other ascomycetes. Cytospora cankers also are prevalent in the European disease situation, but in Alaska *Cytospora* may be the primary agent. The discovery of *P. alni* in remote regions of Alaska does not match the scenario in Europe of introduction with infested nursery stock. Rather, putative introduction might have occurred from contaminated boots by fishing tourists; alternatively, the subspecies may be native. In European studies, *P. alni* subsp. *uniformis* is reported to be significantly less aggressive than *P. alni* subsp. *alni*, though still considered pathogenic. However, genetic studies indicate that *P. alni* subsp. *uniformis* may have given rise to *P. alni* subsp. *alni* on several occasions by hybridization with *P. alni* subsp. *multiformis* (2).

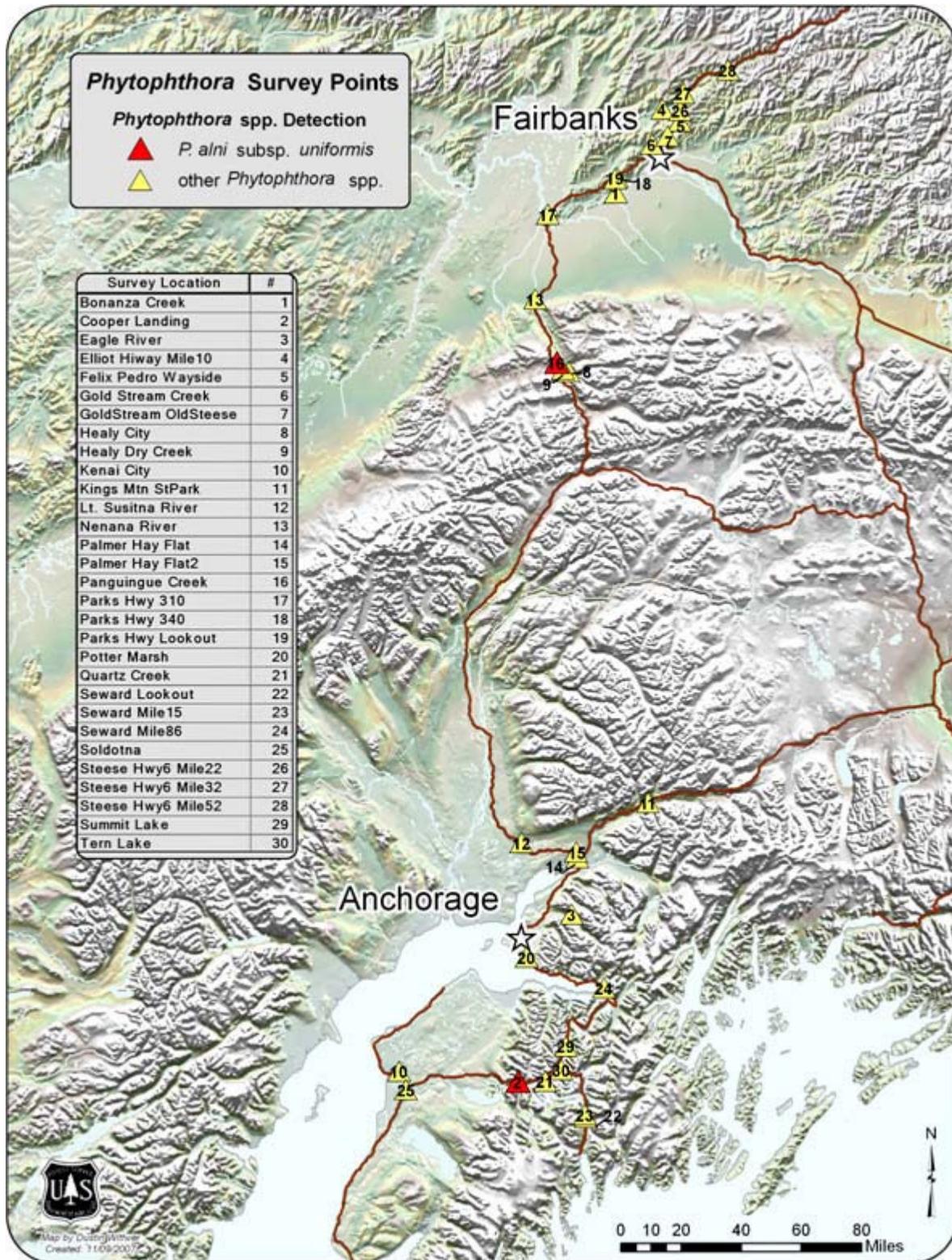


Fig. 1. Location of 30 riparian forests of *Alnus* spp. sampled during the 2007 survey of *Phytophthora* species beneath alders exhibiting dieback and mortality in Alaska.

### Literature Cited

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