

## **Converting Biology into Regulations: U.S. *Phytophthora ramorum* Quarantine as a Case Study**

Susan J. Frankel, USDA-Forest Service, Pacific Southwest Region, State and Private Forestry, Forest Health Protection, 1323 Club Drive, Vallejo, CA, 94592; 707-562-8917; sfrankel@fs.fed.us; Steven W. Oak, USDA- Forest Service, Southern Region, State and Private Forestry, Forest Health Protection. P.O. Box 2680, Asheville, NC 28802

Regulation of *Phytophthora ramorum*, cause of Sudden Oak Death and other diseases, has resulted in endless challenges for regulators, and the forest and nursery industries in the United States. This paper outlines the process used to design U.S. *P. ramorum* quarantines and explores some of the biological paradoxes presented by having to develop regulations for a recently discovered pathogen. Disregard for Koch's postulates, limitations of PCR and cultural diagnostic techniques, perils of basing rules purely on published literature, and the precautionary principle are discussed. The current status of U.S. and California regulations are compared to demonstrate the difficulties of limiting pathogen spread using generally accepted regulatory processes. The economic and social impacts of the U.S. *P. ramorum* quarantine are also presented along with suggested steps to improve quarantine procedures.