## A. Sporulation on **B.** Twig infections infected leaves of foliar host C. Dying crown of a bole canker host D. Necrotic lesion in inner bark under bleeding canker in outer bark California Bay 6 Fallen leaves Tanoak (bole canker Laurel Understory and foliar host) Illustration by N. Ochiai Trees & Shrubs Primary inoculum (sporangia) produced (3) Secondary inoculum produced in the Pathogen propagules likely enter (1)(6) canopy is also splashed or blown on infected leaves is carried to new the soil through decomposing litter or are carried into soil by rainwater. hosts via rain splash and air currents. onto understory tree and shrub hosts causing local intensification of The soil phase of the disease cycle Secondary inoculum (sporangia or (2) is poorly understood, but it is clear disease. E. Sporulation on zoospores) is carried down stems by that the pathogen can persist in soil fallen leaves (4) Infected leaves fall to the ground rainwater to infect lower portions of the for several months. Chlamydowhere they also serve as a source of tree. The pathogen infects the inner bark pores are presumed to have a role inoculum. and sapwood, resulting in a bleeding in long-term survival although the canker. It is uncertain how the pathogen (5) Sporangia produced on fallen leaves triggers for germination are not infects the bole, although zoospores are carried to lower stems and known. There is little evidence of applied to unwounded bark are capable leaves of trees and shrubs by rain root infection in the forest. of causing cankers. splash and possibly air currents.

## Proposed Disease Cycle for Phytophthora ramorum in Forests (Parke and Lucas, 2008)