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### Abstract

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Biotic properties of forest soil are the linkages connecting forest vegetation with an inert rooting medium to create a dynamic, functioning ecosystem. But despite the significance of these properties, managers have little awareness of the biotic world beneath their feet. Much of our working knowledge of soil biology seems anchored in myth and misunderstanding. To correct this, a conference sponsored by the California Forest Soils Council was held February 23-24, 1996, in Sacramento, California. These peer-reviewed papers of practical significance to forest managers comprise the updated proceedings of that conference. They describe the most important features of soil invertebrates and microbiota—including those affecting soil fertility and those with food value for both wildlife and humans. Just as importantly, they discuss how such organisms respond to management. Guidelines are given to managers for sustaining soil health and productive forests.

*Retrieval Terms:* soil biota, mycorrhizae, nitrogen fixation, soil fauna, truffles, forest management

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### Cover:

The cover illustrates a three-dimensional soil structural unit (ped) of a functioning forest ecosystem. Soil peds—microcosms of a large soil whole—are formed by physical and biological factors that profoundly affect plant development and forest health. Detrital shredders (such as the ant) and comminuters (such as the earthworm) live in the forest floor and the underlying peds. The feeding and movement of soil fauna create burrows or tunnels (biopores) that allow respiratory gases to escape from the soil and permit both water and atmospheric oxygen to penetrate the soil. Many fungi form a symbiosis with plant roots (thereby increasing absorptive area and improving the biological availability of nutrients such as phosphorus [P]). Fungi also may produce edible fruiting bodies (for example, a morel mushroom). Some species of plants can form root symbioses with actinomycetes, which fixes atmospheric nitrogen (N), improves the nutrition of the host plant, and enhances the fertility of the soil.

*Original sketch by R. F. Powers.*