CALIFORNIA NATURAL HISTORY GUIDES

PESTS of the NATIVE CALIFORNIA CONIFERS

DAVID L. WOOD, THOMAS W. KOERBER,
ROBERT F. SCHARPF, and ANDREW J. STORER

DIAGNOSING PEST-DAMAGED TREES: SEVEN BASIC STEPS

Diagnosis of tree health problems involves identifying the cause from the symptoms (expressions of damage to the tree), signs (evidence of the cause), and patterns of occurrence. Each of these provides clues that can be useful in making a diagnosis. The following sequence of investigative steps may assist in diagnosing a tree health problem.

1. *Locate the damage.* Determine the part of the tree that is actually affected. Note, for example, whether the impact is on one-year-old needles, scattered branches, or the entire tree crown; is the damage limited to the lower or upper part of the crown, or one side of the crown?
2. *Identify the species.* Note what species are affected and whether some individuals are less affected than others. Check the condition of adjacent trees.
3. *Observe the pattern of occurrence.* Is the problem more severe in some areas than others, and are there differences between these areas? Are the problems limited to a particular environmental zone or related to a particular cultural activity? For example, some diseases are more prevalent along stream courses or lake shores.
4. *Look for obvious causes.* These include damage by large or small animals, frost, lightning, injuries, fire, and so on.
5. *Look for the presence of fungi, insects, or parasites, such as mistletoes.* Try to determine whether the organisms found are the main cause of the problem or just secondary. For example, insects will frequently infest trees that are weakened by disease. Trees can be affected by insects and pathogens over a long period of time before they succumb to one of these biological agents.

6. *Examine the roots.* If the whole tree is dead or exhibits symptoms (e.g., yellowing of needles), and nothing is found above the ground to indicate a cause, expose the roots and root crown for examination. Also, a small patch of bark can be removed to observe the condition of the phloem and sapwood.
7. *Determine when the problem was first noticed in the area.* Inquire about cultural practices in the area, such as the use of herbicides, fertilizers, irrigation, road salting, and so on. Also determine whether there have been recent, unusually severe weather conditions.

With some or all of the above information, it should be possible to make a preliminary determination of the cause of the health problem of a tree. If this is not possible, there are a number of people who can be contacted for help. These experts include the local County Agriculture Commissioner's office, the University of California Cooperative Extension, the California Department of Forestry and Fire Protection, and the USDA Forest Service's Forest Pest Management office.

Be prepared to list your observations, and try to provide photographs and samples for observation and analysis.