

Selections from: WESTERN LARCH DWARF MISTLETOE AND ECOSYSTEM MANAGEMENT, by Jane E. Taylor

Dwarf mistletoes are parasitic plants that extract water and nutrients from living host trees causing decreased height and diameter growth, reduction in cone and seed crops, and direct mortality or predisposition to other pathogens and insects (Filip and Schmitt 1990).

Larch dwarf mistletoe is a native component of western larch forest systems, having co-evolved with its hosts for millions of years (Hawksworth and Wiens 1972). Because larch dwarf mistletoe only grows and reproduces on living trees, ecological forces that have patterned the development of western larch have also played important roles in influencing the ecology and biology of the dwarf mistletoe. Fire is one of these influential ecological forces. In general, any fire event that kills western larch trees also will reduce the population of larch dwarf mistletoe, at least in the short term. In many fire scenarios, older western larch individuals often escape death due to their high level of fire resistance (Barrett and others 1991). These individuals not only provide a seed source for the regeneration of western larch on the site, but if they are infected with dwarf mistletoe, an ideal situation is created for the perpetuation of the parasite as well. The dwarf mistletoe population is reduced immediately following the burn, but as the new larch regeneration develops, dwarf mistletoe seeds cast down from the overstory infect the new understory and the dwarf mistletoe population continues to increase throughout the stand until the next disturbance event. The greater the fire intensity and the larger the burn patch size, the greater the reduction in the dwarf mistletoe population.....

The USDA Forest Service has committed to implementing an ecosystem approach to land management. This approach involves the incorporation of forest management practices within a sound ecological framework that puts an emphasis on sustainability and places the production of values in an ecosystem context. The ecological approach considers the associations between ecosystems at various scales and focuses on the vital ecosystem elements of composition, structure, and function.

One of the important concepts in ecosystem management is that systems are dynamic and that all components and functions occur within natural ranges of variability at both the temporal and spatial scales. Components such as insects, pathogens, and fire have common or average ranges with occasional outbreak periods which, although are outside of the common range, are still within the natural range of variability. When components of forest ecosystems become imbalanced the health, integrity, and sustainability of the system may be threatened.

Dr. Sue Hagle (1992), Plant Pathologist, USDA Forest Service, defines forest health in an ecosystem management context: "Forest health is a condition typified by disturbance factors occurring within the natural range of amplitudes and periodicities. These functions provide for a natural rate of nutrient and energy flows within forest ecosystems.

A healthy forest is a condition in which insects, pathogens, fire, and other agents function within limits set by the variability of natural ecosystems.”

How do we approach dwarf mistletoe management in a manner consistent with the concepts of ecosystem management? Traditionally we have emphasized dwarf mistletoe impacts on timber growth and yield and viewed the parasitic plant as a pest that must be suppressed. Dwarf mistletoe management should no longer focus only on timber resource objectives and commodity production, but should also recognize the value of dwarf mistletoes as functional components of forest ecosystems in which they occur.....

Commodity production will continue to be a goal within some management units. In these stands, we may choose to emphasize the reduction of dwarf mistletoe populations even to levels below the natural range of variability. In areas where we are attempting to maximize timber production, it may be possible to manage larch dwarf mistletoe within an economic threshold rather than emphasizing complete eradication. In other stands where management is not focused on timber production, mistletoe control may not be warranted or desirable. We may choose to maintain, or even increase, dwarf mistletoe levels to meet specific desired resource objectives. Whatever management choices we make at the stand or site level, we hope to make these decisions with a better understanding of the effects on the function of the entire ecosystem. We should never depart so far as to threaten the future sustainability or integrity of the system.

IN:

Jane E. Taylor. 1995. Western larch dwarf mistletoe and ecosystem management. In: Ecology and management of Larix forests: A look ahead. USDA Forest Service. Intermountain Research Station GTR-INT-319

Proceedings of an international symposium held in Whitefish, Montana October 5-2, 1992.

Jane Taylor is a plant pathologist, Forest Pest Management, USDA, Missoula Montana