

Forest Health - An Elusive Concept²⁵

By Douglas C. Allen

The news media and forestry profession currently are focusing on the subject of forest health. Understanding this issue is crucial if we are to provide forest resources for future generations. Intuitively, this should sound like a legitimate concern to both landowners and foresters alike. The message is not quite so clear, however, when one asks the question "what is a healthy forest?"

The use and abuse of this term has made it difficult to define forest health in a clear and meaningful way. Understanding is made even more difficult by the many and diverse definitions that have been offered. For example, from a commodity or products oriented view, forest health is defined by some as a situation where "biotic and abiotic influences do not threaten the attainment of current or future management objectives." At the other extreme, is the conviction that "an ecological system is healthy if it is active and maintains its organization and autonomy over time and is resilient to stress." This perspective is based solely on ecological principles. Neither emphasis by itself, commodity or ecosystem, is adequate to meet societal needs.

Forest health is both a perception based on personal values or organizational agendas and a condition or circumstance. Condition can only be determined by comparing the present structure and biological functions of a forest to what one would expect from its geographic location, existing site conditions and the landscape of which it is a part. This baseline is difficult to establish because of varying cultural and natural influences that have shaped and will continue to shape a forest's character.

Social, economic and ecological needs are interrelated. Each area of concern should be given consideration in any measure of forest health. The final description or definition of health will be a compromise that reflects a sensible evaluation of these three elements. If our land use philosophy does not reflect this array of needs, forest management decisions will be made by the

uninformed and politically motivated, and not based on good science and common sense.

Many federal and state agencies by necessity focus narrowly on forest "health." For example, the mission of the U.S. Forest Service's new National Center of Forest Health Management is aimed at forest pests. The center emphasizes research needed to develop biorational management tools, biological control strategies, and an under-

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standing of nontarget effects of pest management options. Clearly, this is a narrow agenda relative to the complex nature of the overall forest health issue, but appropriate for the organization's mandate within the Forest Service.

As a forest entomologist, I also tend to emphasize pest problems when it comes to discussions of forest health. This is my role in forestry. If insects were not viewed as pests, I would be out of a job! In our haste to provide resources for human use, however, we tend to forget that many disturbances such as "pest" outbreaks and fire are natural phenomena that play key roles in processes such as nutrient recycling and plant succession. Their occurrence often signifies a healthy condition from an ecological standpoint, even though they may be of concern for social or economic reasons.

To my way of thinking, there are two circumstances where insect or disease outbreaks clearly represent an unhealthy ecological condition; (i) situations where deliberate forest management has set the

stage for a problem by changing stand composition, encouraging tree species not adapted to a specific site, creating excessive damage to residual stems following a silvicultural treatment, etc.; and (ii) outbreaks associated with introduced organisms. The latter have never been a part of the native forest system, did not evolve with the community in which they occur, and obviously comprise an unnatural disturbance.

The point I wish to make is that any evaluation of forest "health" must be based on an informed balance and understanding of human needs and ecological requirements. The former to meet societal demands and landowner objectives, the latter to assure that a particular forest and the landscape within which it is nested will provide goods and services for generations to come (sustainable). Under these conditions, it is more likely also to adjust to or recover from disturbances that are either inherent to the system or imposed by human activities (resilience).

The key to good stewardship from the standpoint of forest health, I think, is to utilize management practices that reflect the economic and ecological limitations for a specific ownership. Whether or not one chooses clearcutting as a regeneration method, applies an insecticide to protect foliage, or excludes fire; for example, depends on landowner objectives, site conditions, the structure and composition of the forest relative to neighboring forests, and the economic and ecological costs associated with each decision.

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