



# An Ecologist's Perspective on Northwestern Forests in 2010

by Jerry F. Franklin

**W**hat do I, as an ecologist, see as essential to the Pacific Northwest's forests in 2010? "A KINDER AND GENTLER FORESTRY!"

This would be a forestry which is probably less efficient (on a per-unit basis) in producing wood fiber, but which accommodates a full range of ecological values while yielding economic benefits.

We have tended, conceptually and literally, to separate our forests into the commodity lands and the preserved lands; to divide the "baby" into parts. Commodity lands were, presumably, to be managed "intensively" based upon short-term economics and a narrow view of ecological values. Preserved lands were totally withdrawn from timber harvest, perhaps partially because total preservation has seemed to many interested parties the only response to foresters' inability to convincingly address long-term and ecological values.

As an ecologist, I view this division of lands as an undesirable solution. Society wants and needs commodities from forestlands, but it also wants and needs amenities and other values maintained. This is exemplified by concerns about biological diversity and threatened and endangered species. Society

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wants managers to take a longer view, as exemplified by increasing concerns about sustainable productivity. And it wants options maintained in the face of numerous uncertainties, of which global climatic change is an outstanding example.

Given these societal objectives I see as a key to a desirable solution a new forestry that effectively addresses both commodity and ecological values and is applied, in one form or another, to the majority of our forestlands. What are some components of this new forestry?

One element of the new forestry is the development and application of alternative silvicultural systems. Alternative silvicultural systems use ecological principles to create managed forest stands and landscapes superior to those created under current silvicultural systems in simultaneously providing for commodity (e.g., wood fiber) and noncommodity (e.g., fish and wildlife) values. They also maintain societal options associated with sustained ecosystem

## C onservationists must loosen their fixation with preservation.

resilience, productivity, and diversity.

Conceptually, silviculture is the manipulation of forests for the production of any set of goods and services, but standard silvicultural systems for forest harvest actually focus upon removal of wood products while providing for reforestation. The perspectives of these traditional systems (clearcut, shelterwood and selection), are, therefore, very limited since they are concerned primarily with reestablishment of trees and not a complex forest ecosystem. Traditional silviculture has attempted to incorporate new objectives, such as provision of standing dead trees and down wood for wildlife, but this has been done piecemeal since the philosophical and technical bases for systematic incorporation of such findings are lacking.

Forestry has not kept up with our developing understanding of forest ecosystems and how they work. New information on ecosystem structure, function and composition and concepts, such as biological legacies, provide a conceptual basis for alternative silvicultural systems.

Maintenance or rapid redevelopment of complex forest ecosystems, i.e., systems with compositional, functional and structural diversity, is the objective of alternative silvicultural systems, not just the reestablishment of trees. Management prescriptions are designed to either retain elements of this diversity or to provide for their rapid reintroduction, primarily by natural processes. Hence, biological legacies—what is being left on the site—are the prescriptive focus rather than the material that is being removed. The object becomes one of insuring that many forest ecosystem elements are perpetuated and not just crop trees. Based upon these concepts perhaps the most critical issue is not the size of area that is logged

Bill Jackson



*To maintain diversity, this sale was not burned before planting.*



*The Blue River Ranger District of the Willamette National Forest has been testing concepts such as leaving a "biological legacy" after clearcutting.*

or how often it is logged (i.e., rotation age). It may, in fact, be what is left behind following logging—the biological legacies.

Elements of alternative silviculture at the stand level include retention of more organisms and structures in stands at the time of forest harvest. One example is retention of large green trees for various functions, including provision of habitat for organisms from critical microbes and invertebrates to higher animals. Another common example is provision for a sustained yield of coarse woody debris, in-

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cluding large standing dead trees (snags) and large down boles. Creation of stands of mixed composition and structure can be a valuable stand-level objective as can programs to slow the rate of canopy closure in young stands. Keeping structurally and functionally complex riparian stands can insure structural and energy (food) inputs to stream ecosystems.

Considerations of alternative silviculture at the landscape level include patch (logging unit) size and arrangement, cumulative impacts of treatments, and the role of natural or semi-natural patches and corridors. Patch sizes are selected which fulfill manage-

ment objectives including provision of habitat for interior forest plant and animal species. Amounts, types, and multiple effects of stand edges are a major consideration. The relationships (e.g., connectivity) among natural and semi-natural patches (e.g., spotted owl management areas, streamside corridors, areas of unstable soil, Research Natural Areas) are a concern as are the mutual effects of the natural and managed patches. The mutualistic relationship between intensively managed and natural areas has been viewed largely as negative or has been ignored, yet the exchanges or flows of materials and organisms are potentially of great importance to both; management which reduces the contrast between the managed and natural patches will facilitate such flows.

These alternative approaches recognize that biological diversity cannot be dealt with exclusively (or even primarily) through the use of set-asides; maintenance of biological diversity must be integrated into management of commodity lands since they dominate our landscapes. The limited acreage and increased isolation of reserved areas and their vulnerability to global climatic change are further reasons why silvicultural systems which incorporate diversity are essential.

Is anyone developing and testing these concepts? Yes, national forest managers are actively exploring these concepts in collaboration with forest scientists.



In some cases, such as provision for woody debris in streams and for snags for wildlife, changes have been aggressively pursued. The concept of aggregating cutting activities is being studied as an alternative to dispersed patch cutting; dispersed cutting as practiced in the past results in rapid fragmentation of the forest landscape. There are even pilot tests of cuttings in which large green trees are retained on cutover areas. The Blue River Ranger District as well as other units of the Willamette National Forest have been leaders in developing and testing these concepts.

A brief word about global climatic change since it may drastically alter forestry in the Pacific Northwest in 2010.

Global change is a significant issue we tend to ignore, reflecting our tendency to view forests and forest environments as immutable. They are not! Global warming is occurring and the only real argument among scientists is how much and how fast.

The scenarios from three models of global climate are unanimous in predicting temperatures for the Pacific Northwest which will be two to five degrees Celsius higher than present with no added precipitation. If these scenarios are correct our forest environmental will be hotter and drier. To illustrate the magnitude of such a change: the climate at 500 feet elevation would migrate 1,500 to 3,500 feet up the mountain slopes. The zone of major snow accumulation could almost disappear. Climates would move

200 to 500 kilometers north of their current location. The climate of southwestern Oregon would be in northern Oregon and that of northern California in southern Oregon.

Increased catastrophic disturbances are almost a certainty if global changes of the proposed magnitude occur—greater frequency and intensity of wildfires and storms, and more extensive outbreaks of pests and pathogens as trees are subject to greater moisture stress.

Under the model scenario there would be significant loss of commercial forestland, especially in southwestern and eastern Oregon where many sites are already subject to serious moisture deficiencies. Shifts to shrub communities or savannas could be expected on many of these sites. There would also be a net loss of the most productive forest lands. For example, as the productive western hemlock zone is forced up in elevation it would cover fewer and fewer acres.

These losses in total forestland and productive capacity of the remainder probably cannot be offset by intensive management. In fact, intensive management practices may create as many or more problems than they solve under the global warming scenarios.

In conclusion, our forestlands are not just agricultural lands with a slow maturing crop. Society perceives them differently and expects more of them. Foresters and the forest industry need to better recognize this.

Conversely, conservationists must loosen their fixation with preservation as the primary solution for many societal objectives, including biological diversity. This is not to say that reserved lands of all types are not important. They are an important part of any overall forest strategy. But we cannot preserve enough land, and even if we could, changes, such as those threatened under global change, could make our preservation efforts a meaningless exercise.

We need a new forestry that reflects these realities and incorporates our ecological knowledge. And we need to apply it in producing commodities and amenities from the majority of our forest land-base. **[FW]**



Loggers left snags and wildlife trees ranging in size from 16" to 48" on the Englemann Box timber sale, Blue River Ranger District.