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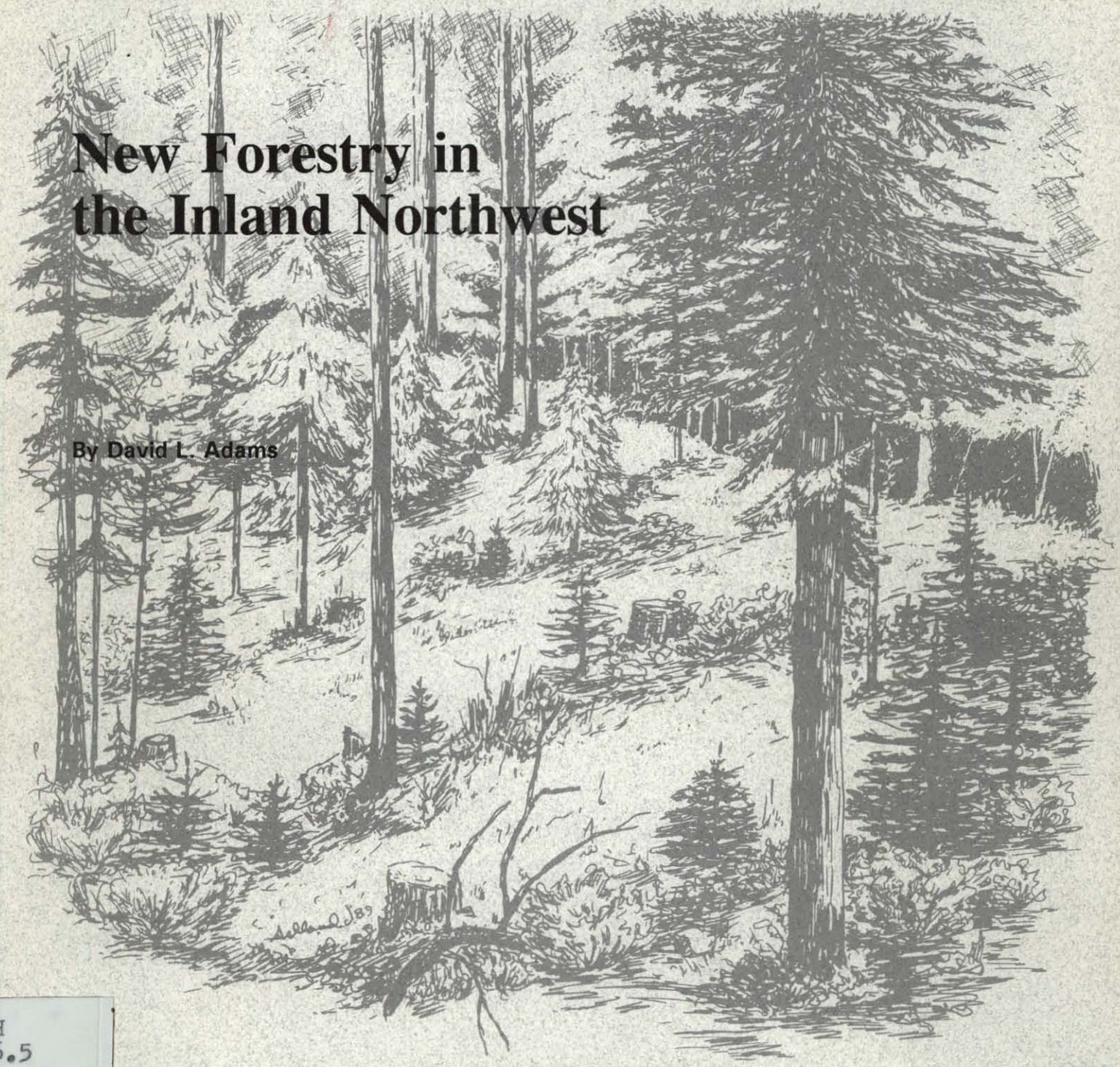
University of Idaho
College of Forestry, Wildlife and Range Sciences

# New Forestry in the Inland Northwest



By David L. Adams



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Experiment Station,

Cover drawing of shelterwood cut by Lorraine Ashland, Idaho Forest, Wildlife and Range Experiment Station graphic artist.

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# Abstract

"New Forestry" refers to the new methods of forest management and timber harvest that are evolving in response to public concerns about clearcutting and the impacts of logging on aesthetics, water quality, wildlife and biodiversity, and the health and sustainability of forests. These concerns apply to public and private lands and New Forestry seeks to provide forest management and timber harvest methods that minimize impacts and maintain fully functioning and healthy forests.

New forestry methods are yet untested and remain to be fully demonstrated, despite the fact that probable implications include reduced harvests and increased costs. Safety factors and the extent of environmental benefits have not yet been measured.[1]

[1]Research in and demonstrations of New Forestry and Adaptive Forestry are currently underway on the University of Idaho Experimental Forest. These efforts are guided by a faculty committee representing forestry, fisheries and wildlife, recreation, and range and water quality disciplines. Related to New Forestry, Adaptive Forestry is a University of Idaho College of Forestry, Wildlife and Range Sciences forest management initiative the principal concept of which is ecosystem sustainability.

# New Forestry in the Inland Northwest

by

David L. Adams

It is difficult to read anything about forest management or to go to any forest-related conference these days without being faced with the terms *New Forestry, New Perspectives, Adaptive Forestry*, *Sustainable Forestry*, or something similar. We are in a period of intense public interest in natural resources and how they are managed, and the public is strongly dissatisfied with some common forest management practices. Coupled with public pressure to change how we manage our forests is new knowledge about how forests function. Because of public pressure and this new knowledge, significant changes are taking place--on public as well as private forest lands. This paper reviews some of the new philosophy of forest land management and terminology commonly used to describe new management directions.

First, a review of some traditional forest terminology.

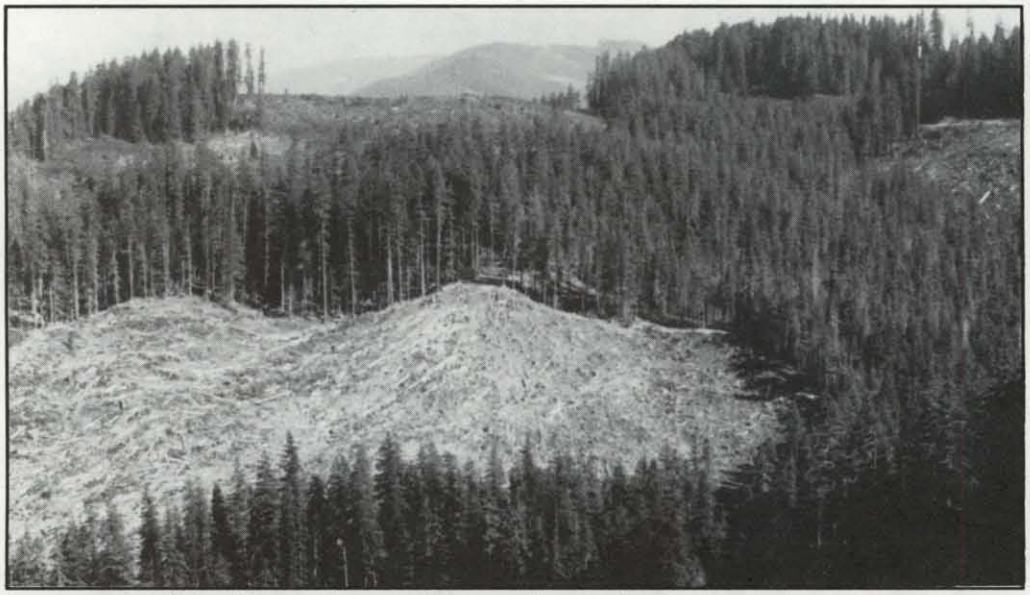
"Silviculture" is somewhat analogous to agriculture. It is commonly defined as *the theory and practice of controlling the establishment, composition, growth, and quality of forest stands in order to achieve the objectives of management*. A shorter definition, which I prefer, is *the management of forest vegetation to meet objectives.* The objectives may include the production of wood fiber, enhancement of wildlife habitat, or the maintenance of visual quality.

Let's also review the commonly used "harvest/regeneration" methods. The method of forest regeneration is so closely tied to how the mature stand is harvested that the harvest and regeneration methods usually carry the same name.

**Methods which result in even-age stands:**

Even-age methods are most applicable to tree species which do not tolerate high degrees of shade and competition from overstory vegetation (such as ponderosa pine and western larch).

***Clear-cut*** -- essentially all trees in a stand are removed in one operation. A new stand is established by preparing the site and by planting seedlings or by relying on natural seeding.



**An example of the clearcut harvest/regeneration method.**

***Seed-tree*** -- retaining a few of the best mature trees (usually 5 - 10 per acre) after removing the rest of the mature stand to provide seed for the new stand. After a sufficient number of seedlings have been established, these large trees are commonly removed.

**A site treated with the seed-tree harvest/regeneration method.**

***Shelterwood*** -- Similar to the seed-tree method except that more mature trees are retained during the harvest entry. Commonly 25 to 30 of the best individuals of the preferred species are retained to provide seed as well as shelter to the new stand. The shelter trees are commonly removed after the new stand is well established.

**This stand has been treated by the shelterwood harvest/regeneration method.**

### Methods which result in uneven-age stands:

Uneven-age methods normally favor the regeneration and growth of tree species which do well under shade (such as western redcedar and grand fir).

***Single-tree selection*** -- removal of individual mature trees at intervals of 10 to 20 years with the objective of obtaining natural regeneration in the openings created. The harvest entries also include additional stand improvement work across the entire range of tree sizes to maintain the desired diameter distribution and species composition.

***Group selection*** -- harvest of small groups instead of individual trees. Harvesting groups (perhaps 3 - 10 trees) facilitates logging and also helps to favor more shade-intolerant species.

## New Terminology

It is often assumed that terms such as *New Forestry, Adaptive Forestry,* and *New Perspectives* are nothing more than attempts to use something new and different to catch the public's attention--or to try to convince the public that foresters in agencies and companies have finally seen the light, that they have

**This is a good example of the group selection harvest/regeneration method.**

discovered the "new" or "correct" way of managing our forests, and that now everything will be okay. The proliferation of terms and programs is somewhat confusing, so let's take a look at the background behind some of these terms, how they are different, how they are the same, and what they may really mean.

**New Forestry**

The concept of "New Forestry" is commonly attributed to Dr. Jerry Franklin, Chief Plant Ecologist for the U. S. Forest Service's Pacific Northwest Research Station, and his research team. The phrase "a kinder, gentler, forestry" is also used to describe this philosophy.

"New Forestry," and the concepts proposed by Franklin, were developed primarily in the west coast Douglas-fir region. Dr. Franklin and his fellow scientists have conducted years of research at the H. J. Andrews Experimental Forest in Oregon. Their work has provided the basis for much of the kind of silviculture that Franklin is proposing.

Franklin views "New Forestry" as a management approach that better accommodates ecological values, while allowing for the extraction of commodities. More attention is given to landscape-level strategies than has often been the case. The effects of management are considered on a large spatial scale and for long time intervals.

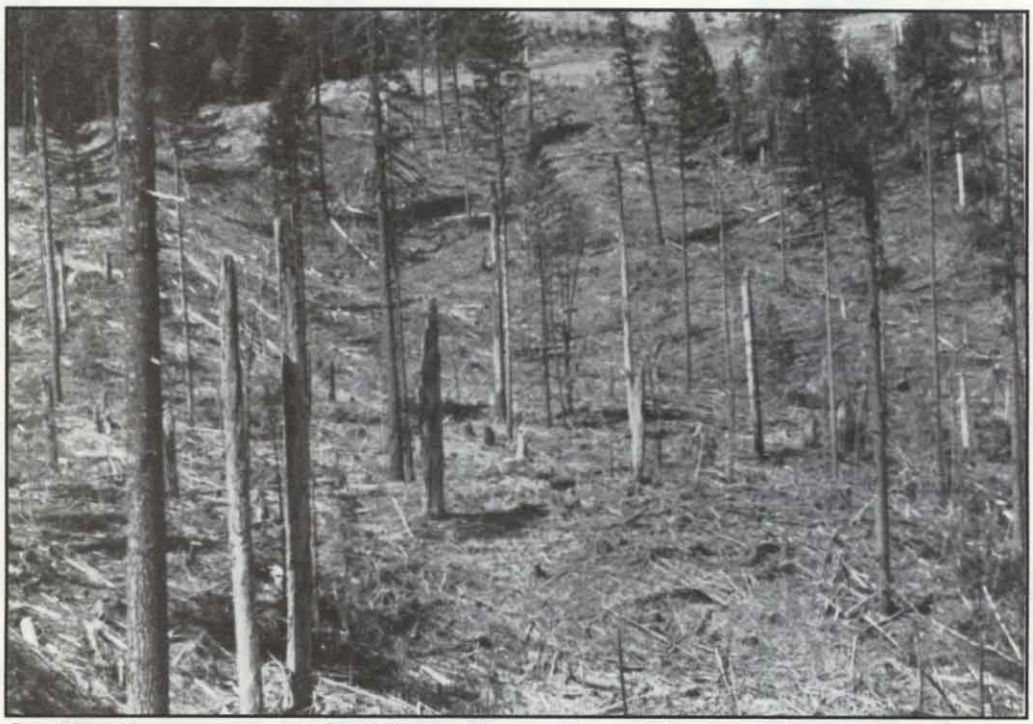
**Under New Forestry, more attention is given to "landscape-level" strategies, recognizing that stand treatments can no longer be considered in isolation.**

Management based on "New Forestry" lies between plantation-based tree farming and total preservation.

Harvest cuts prepared according to Franklin's prescriptions include a lot of large woody debris on the ground, a considerable number of snags, and a dozen or more residual mature trees per acre which are planned for retention through all or a good portion of the next rotation. It quite frankly looks "sloppy." But research is showing the value of the downed woody material to the long-term nutrient budget, the value of snags for wildlife, and that standing green trees will be a future source of high-quality wood and coarse woody debris.

In contrast, the predominant silvicultural system in the Douglas-fir region has been to clearcut, prepare the site (usually by burning), and plant. This rather simple system has been successful for dealing with mature and over-mature coastal Douglas-fir.

However, the landscape is now dotted with artificial-looking patches of very uniform single-species plantations. The forest no longer "looks like a forest" and much of the public doesn't like that. So any system which deviates from strict clearcut, burn, and plant plantation forestry in the Douglas-fir region is likely to be more socially acceptable; and as Franklin's team is discovering, there are long-term sustainability reasons for some of the alternative practices.



**One New Forestry strategy includes partial retention of the mature stand, more snags to serve as wildlife habitat, and large woody debris for long-term nutrient cycling.**

According to Franklin, "New Forestry isn't any one thing. It's an evolutionary way of looking at and managing forests, for both ecological and commodity values. While it incorporates the beginnings of big picture science, it does not eliminate any of the old tools such as clearcutting, herbicides and fire management." The main difference is in how these practices are applied.

**Adaptive Forestry**

"Adaptive Forestry" is the University of Idaho term for forest management, the principal concept of which is ecosystem sustainability.

A dominant characteristic is diversity: landscape diversity from the variety and distribution of management practices across the land and structural diversity of canopy layers and species variety in individual forest units. Such diversity fosters fully functional ecosystems.

The term *adaptive*, means forest management capable of adapting to social changes and demands on the forest; of adapting to characteristics of the ecosystems and sites where it is applied; of adapting to new scientific knowledge and techniques; and of adapting to new conditions yet to be experienced, such as global climate change, drought, fire, etc. By maintaining diverse and fully functional ecosystems, both management and the forest can adapt and respond.

**New Perspectives**

"New Perspectives" is a term being used by the U.S. Forest Service. Forest Service leadership determined that the public, the "landowners" of the National Forests, have a new set of objectives for managing "their" land; so an effort was initiated to use "New Perspectives for Managing the National Forest Systems." This is more a new philosophy of management than a new set of silvicultural practices. Indeed, it is a new approach emanating from the people on the ground, almost like a "movement" to reform. Determining that this new direction or new philosophy was so new that it should not fall under any existing program, the Forest Service established a Director for New Perspectives in the Washington, D.C., Office, and the Regional Foresters' and Supervisors' offices around the country now include staff with "New Perspectives" responsibility.

This management philosophy for the National Forests incorporates more integration of functions--a greater use of integrated or interdisciplinary planning will be in store.

"New Perspectives" is an ecosystem approach that focuses on the middle ground between timber production and preservation by managing forests to provide a greater balance of values. It is aimed at sustaining the ecosystem--instead of sustaining the timber yield. Important aims are to maintain biological diversity and to use a more socially sensitive approach.

There has been a lot of confusion about "New Perspectives"--both within and outside the Forest Service. The College of Forestry, Wildlife and Range Sciences held a workshop in November 1990 involving about 80 federal, state, industrial, and private people for the purpose of gaining a better understanding of this concept and what it means in terms of future management of forest lands. Interestingly, some of the industrial representatives felt that this management philosophy is not something applicable only to the National Forests--that more social and ecological sensitivity will be necessary on all ownerships.

Thus, we have "New Forestry," "New Perspectives," and "Adaptive Forestry." Regardless of the particular emphasis, the thrust is that we cannot continue with "business as usual." On the other hand, there are no really new silvicultural practices which are now available to solve all our problems. As indicated earlier, "New Perspectives" is a management philosophy. Under a changing philosophy we will be forced to be more innovative. We will be looking beyond the specific stand: how does this unit fit into a larger landscape picture? But even this concept is not new--we have long recognized that what we do on one unit will impact the surrounding and downstream country.

The difference, in my view, is that foresters are sensing an opportunity--and a need--to make use of a larger "bag of tools," to make better use of what we

already know, to integrate new information in the decision process, and to think on a broader "landscape" scale, instead of considering each forest "stand" as a discrete unit. Key to the concept are increased innovation and the use of new knowledge about how biological and physical systems work.

These are the philosophical concepts behind New Forestry and similar adaptations. But what do they mean on the ground?

## Implications of New Forestry

We will be seeing *a reduction in the use of clearcutting,* and the clearcuts that we install will be smaller. We are seeing some rather drastic changes in management guidelines; for example, the Washington, D.C., office of the Forest Service has issued a directive reducing by 25 percent the area harvested by clearcutting. And here on the Palouse, the oldest ponderosa pine and western larch will be retained on essentially all Forest Service harvest units. Thus clearcutting, in the strictest sense, is not being practiced (personal comm., Dick Hodge, District Ranger, Palouse Ranger District, Clearwater National Forest, Idaho).

Regardless of how we can justify clear-cutting as a viable silvicultural tool, much of the public doesn't like it. We in forestry have been saying for years that "the public just doesn't understand what we are doing--that if we did a better job of educating the public about forestry they will accept what we do." We are now finding that no matter how knowledgeable the public may be, they still don't like a lot of what they see. Some of the most vocal detractors are very well educated and quite knowledgeable of forest practices.

It's no secret that a very strong environmental movement is underway in this country. The public's vision of what constitutes good land stewardship is shifting. And, as anyone involved in natural resources well knows, public sentiment and pressure greatly influence practices on private as well as public lands. The amount of investment being put into public relations by some of the forest industry is good evidence of this. I believe that foresters will be more and more inclined to prescribe alternative harvest/regeneration methods whenever possible.

*Management under New Forestry will be more expensive.* The alternatives to clearcutting require greater expertise in the planning and preparation process. Marking for cut under the systems proposed under New Forestry will require more forestry expertise in the woods: the person with the paint gun will have to have a lot more knowledge than in the past; the person with the paint gun should be the best silviculturist, not seasonal help. The person doing the marking has a great impact on what the forest looks like and how it will develop for a long time to come.

Greater use of partial cutting systems will mean that *logging will require more care and expertise*--and will probably be more expensive. As we move to the landscape approach, we will be spreading the harvest of a given volume over a larger land area. This alone will mean more up-front expense in planning and preparation, more movement of equipment between settings--and less volume removed per acre per entry. In current seed-tree and shelterwood units, we like to avoid injury to residual trees in the first entry, but we also assume that if a seed tree is barked or otherwise injured, it will be taken out in a few years anyway. We have a different situation if the leave trees are to be retained for all or a good part of the next 80- or 100-year rotation.

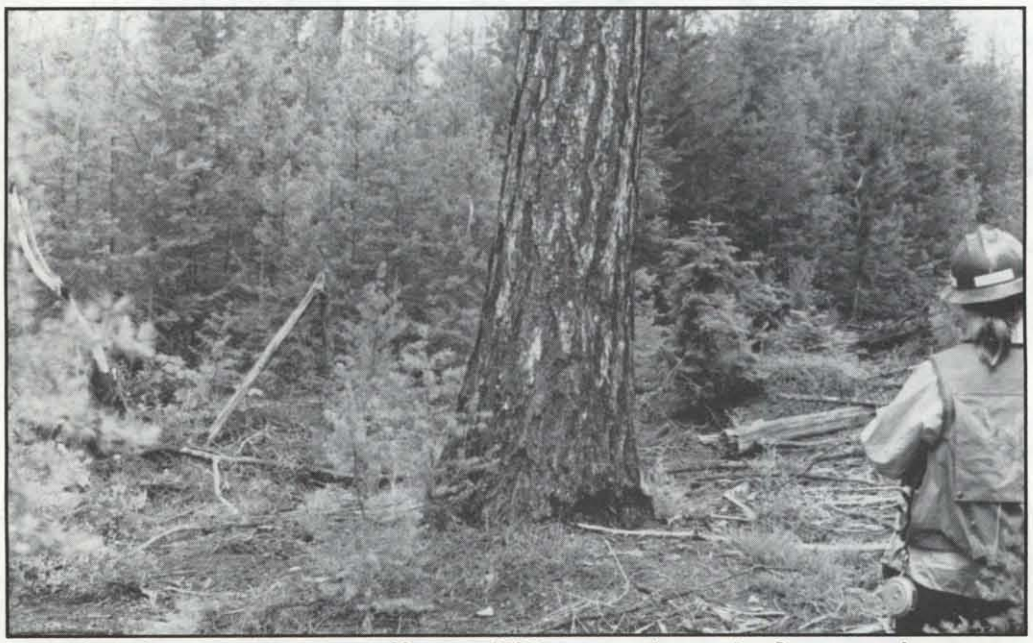
**New Forestry will require more individual tree marking for harvest.**

There are, of course, *safety implications* in leaving more snags and older residuals, as there are for using smaller landings and narrower roads.

There are some *growth and yield implications*--and we don't know all the answers. People on the ground are asking a lot of questions about the consequences of proposed practices.

**With New Forestry, logging in partial cuts will often be more difficult and more expensive.**

For example, pictured below is a seed-tree cut in which the leave trees are scheduled for retention, perhaps through the next rotation. Silviculturists want to know if retention of this overstory will inhibit establishment of regeneration, and they want to know if the overstory will reduce growth of the regeneration that does become established, and if so, by how much.



**Retention of mature trees may affect establishment and growth of regeneration.**

Dr. Jerry Franklin concedes that some of the New Forestry practices in coastal Douglas-fir will probably reduce growth by 20 percent, but that they will enhance long-term sustainability.

There is much we do not know about the long-term effects of repeated crops of single species. Evidence in some parts of the world points to rather drastic reduction in second and third generations of clearcut, single-species silviculture. We do not know if this experience from other forest ecosystems is something we need to worry about in the interior Northwest.

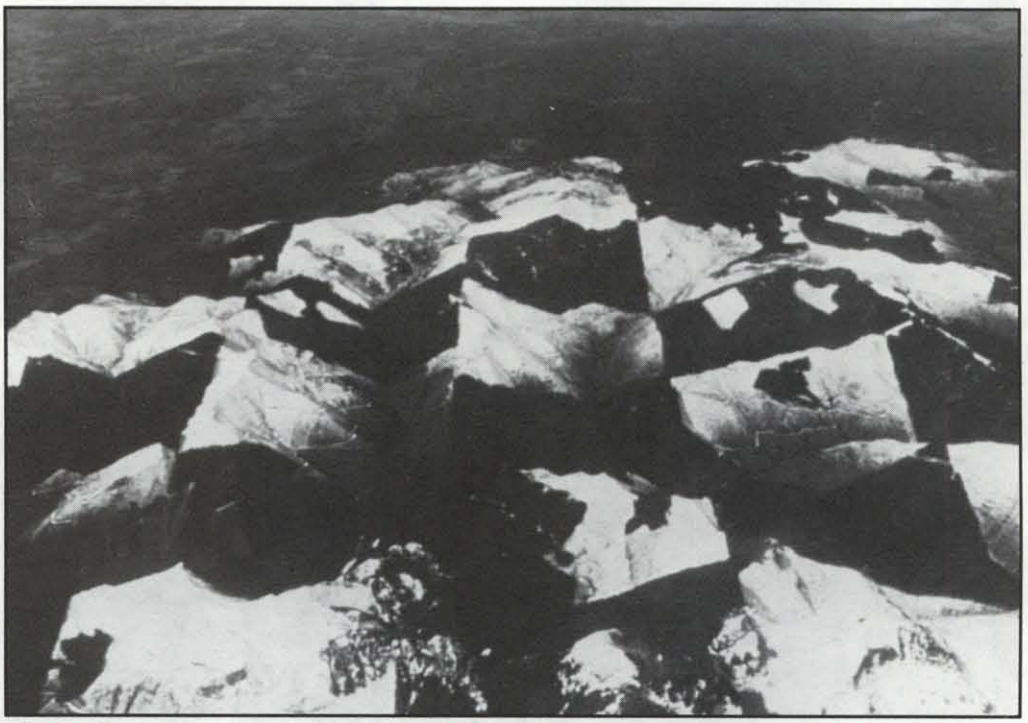
***Woody debris*** -- New knowledge about the long-term importance of woody debris will lead to *changes in the way we treat slash.*

**New Forestry will mean changes in how we handle logging slash.**

We used to think we were doing a good thing if we cleaned up the logging slash so that the unit looked as neat as a potato patch. And it sure made tree planting easy. Now we know that this was a mistake.

Recent research has indicated that coarse woody material on site is very important to long-term sustainability of the system. Downed logs provide eventual habitat for a variety of organisms; they provide erosion protection, and are important for nutrient cycling. Some slash disposal will still be necessary for fire protection, plantability, and movement of wildlife, but just how much should be retained needs more research.

***Fragmentation*** *-- Another change in thinking is the value of dispersing harvest cuts.*



**The haphazard scatter of clearcut units fragments the forest, degrading aesthetic values and animal habitats. New Forestry will mean changing the distribution of harvest units to reduce wildlife habitat impact.**

We usually assumed that staggered settings dispersed the impact of harvest cuts and was therefore desirable. This creates a lot of"edge" which is good for species such as deer and elk, but species which inhabit "interior" parts of the forest avoid these edge areas for long distances. A series of dispersed clearcuts may degrade a very large area. So, placement of cutting units adjacent to existing harvest units may be preferred.

## Maintenance of diversity

"New Forestry" approaches will supplant the simplistic results of plantation forestry with more complex ecosystems.

Diverse forests will be better able to adapt to change, withstand disturbances, are more sustainable, and more socially acceptable. This is not really a new concept; we have known for a long time that diversity in species composition is often desirable. For example, bark beetle hazard rating schemes include species composition as one of the most important variables. We are simply more likely to have insect epidemics in pure stands than in those with mixed

species. The difference now is that we are starting to look beyond the trees--to diversity in other parts of the plant community and diversity in the vertebrate and even invertebrate life in the system. We are discovering that there is a lot of value in the critters that we don't even see.

**New Forestry will mean greater diversity.**

## No more "business as usual"

I have seen lots of programs come and go. Government agencies in particular seem to germinate catchy phrases and new programs. But whether "New Perspectives" or "New Forestry," or "Adaptive Forestry" are remembered very long, I think the philosophy is going to be around for a long time. It will not be business as usual. The public is insisting on something different. And new knowledge about how the forests function is concurrently pushing us in a different direction. We will not be throwing out all the old practices, but we will have to be smarter in how we apply them and will need to add a large dose of social and ecological sensitivity.

And, we are faced with huge gaps in our knowledge base. What are the consequences of applying proposed new management systems? And what are the likely implications of not altering current practices? The College of Forestry, Wildlife and Range Sciences is embarking on a new research and demonstration effort on the University of Idaho Experimental Forest to answer critical questions and to demonstrate the latest concepts in sustainable forest management. This

effort is guided by the Adaptive Forestry Committee, an interdisciplinary faculty group representing of forestry, wildlife, fisheries, recreation, range, and water quality.■

## Additional Readings

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