

Technology Transfer for Ecosystem Management¹

Tim O'Keefe²

In many parts of our country today, forest health and sustainability are important management questions. Some individuals and groups have observed that during the past century the emphasis in American forest management on commodity production has, in many cases, contributed to a unhealthy forest landscape. For example, the forestland in eastern Oregon has considerably declined because of the overharvest of commercially valuable ponderosa pine because of over-intensive fire control.

In addition to this forest decline problem, public concern has grown about lack of sustainability in traditional (clearcut and replant) timber management. It is increasingly evident that even successful timber management is essentially a systematic conversion of both public and private forest land to a "tree-farm," fiber-production system. This commodity approach to forestry has also decreased natural biodiversity, and replaced the diverse forest ecosystem with a monoculture, highly susceptible to insects/disease, and fire.

The Thomas report (1992) on the conservation of the spotted owl habitat, and the Endangered Species Act (ESA) introduced wildlife as a significant forest management element. In addition to the biological aspects of that report, the socio-economic implications were also highly significant. Throughout the northwest, that report resulted in prolonged controversy, reduced timber harvest, and most recently Option 9, the Presidential Preferred Alternative (PPA).

In response to the Thomas report, and growing public pressures for a diverse, sustainable management system, the USDA Forest Service developed a program originally called "New Perspectives" that has now evolved into the "ecosystem management" program. This new program is a belated effort to redirect public forest management away from commodity timber harvest towards a more diverse, sustainable forestry system. Ecosystem management is composed of both biological (ecosystem sustainability and diversity) and sociological (public participation and collaboration) elements. For years, most traditional forest managers have concentrated on timber production, at the expense of both biological and sociological elements. Thus, ecosystem management is an attempt to integrate the biological with the human dimension to build a sustainable forestry system on a long-term basis. Ecosystem management represents a significant departure

from traditional forestry, primarily because most professional forestry training has been and continues to be, directed at timber production alone. As a new forest management philosophy, the Forest Service ecosystem management program will force managers to be more responsive to a wide array of both biological, and social forestry issues.

The process of redirecting traditional forest management to an ecosystem forestry approach requires both short-term, immediate, and long-term, sustainable action. Long-term ecosystem management will require a major change in professional forestry training. The addition of some new hardware, or some minor curriculum changes, are insufficient to redirect the training focus from the traditional timber emphasis. Thus, an effective ecosystem forestry education will require removal of the old standard timber courses like mensuration, regulation and economics, and replacement with new conservation forestry courses like habitat restoration, and social forestry.

Short-term ecosystem implementation requires a significant shift in management emphasis from commodity to non-commodity forest resources. In addition, successful and meaningful public participation is a critical element in effective ecosystem management. Thus, from an area, regional or forest basis successful short-term ecosystem management requires application of sound technology transfer (TT) programs. As a focal point for this TT effort, the Forest Service ecosystem management program has supported the development of a network of specialized Learning Centers. In the Pacific Northwest Region, the Learning Center concept has been very effective as a productive technology transfer effort for external and internal ecosystem management.

Forest Service Technology Transfer

Since the early 1980's the Forest Service has pioneered effective TT programs aimed at shifting the focus of research information from the laboratory to field application on the National Forest Ranger District level. In those early years, Hal Marx, of the Agency's Washington office staff, emphasized the importance of TT as a coordinated outreach effort to encourage public participation. Since that time, the Ecosystem Learning Center concept has been developed as an effective vehicle to inform forest managers about Ecosystem Management and to focus public participation. In addition, adaptive management as a basis for ecosystem collaboration, has also been directed from some Learning Centers. Adaptive management is an integrated system of applied research that attempts to combine management and

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²Professor, Natural Resource Management, California State Polytechnic University at San Luis Obispo, CA.

research skills, in a forest area that will also have long-term demonstration (TT) value.

Although the Learning Center concept is still relatively new (since 1991), two Centers in the Pacific Northwest Region have made good progress. The Blue Mountains Learning Center, directed by Jim McIver, Blue Mountain Natural Resources Institute, and the Olympic Learning Center, directed by Kathy Snow, Olympic National Forest have both been effective in developing a wide variety of ecosystem, technology transfer projects. Some of the most successful TT projects have included public information and participation, and the development of demonstration areas to show-case ecosystem management.

Last year, at the Olympic Learning Center, a special technology transfer project was developed to provide information about ecosystem management for the general public. The basic idea of this Olympic East Demonstration Project was to develop a series of ecosystem demonstration sites, accessible from a main road, on the east side of the Olympic Peninsula. Most of the specific demonstration sites were located on two districts, the Quilcene and the Hood Canal, as well as on State forest lands, and some private lands. Thus, initial Project planning, and later implementation, required close collaboration between both public and private forestland owners. The planning phase of this Project was completed in a series of three steps:

1. Preliminary site location/evaluation
2. Network discussionst view and evaluated each site on-the-ground.
3. Draft plan/report preparation, and implementation scheduling.

Each demonstration site was selected to illustrate some aspect of ecosystem management, such as "green-tree retention," or habitat improvement for wildlife. Main road accessibility was a key aspect in site selection, and eventually all sites will be tied into a single visitor network. The purpose of this network of ecosystem demonstration sites is to provide the general public with a good visual demonstration of selected aspects of the ecosystem management concept. Each demonstration site will be marked along the main road, and interpreted on-site with appropriate signs, brochures, and audio. This demonstration site network can be used as part of an individual auto tour, or as a guided group tour, where staff is available. In addition, these demonstration sites may be used off-site, in the form of video and/or slide-tape products for groups in urban locations.

Many of the demonstration sites selected will illustrate not only biological aspect of ecosystem management, but frequently they will also illustrate some social element, such as participation and/or collaboration. In terms of collaboration, local sections of larger organizations, such as the USDA Cooperative Extension Service (CES), the Society of American Foresters (SAF), and local Resource Conservation Districts (RCD) have all been directly and indirectly involved in site selection and planning. Other State and Federal

agencies, such as Washington State Forestry (DNR) National Park Service (NPS), and State Fish and Game were also very helpful with many aspects of this project.

In general, this initial site selection and planning seemed to be successful. During the planning process, the wide array of contacts with local forest land owners, industrial foresters, and community organizations provided a very substantial degree of public exposure, and involvement with this initial planning process. Thus, this technology transfer effort was a valuable way for the Learning Center to focus community attention on the ecosystem management process. In addition, the Forest Service staff, both National Forest and Ranger District level, also developed some additional awareness about ecosystem management and the technology transfer process. At this point, pending further resource allocation, this ecosystem management, technology transfer project is now ready for implementation.

But although the Olympic Peninsula landscape has a rich diversity of natural beauty, unfortunately during the past century, a large part of this forest landscape has been heavily cut for timber, and replanted. In addition, significant wildfires and wind throw have also shaped the visual appearance of forest stands in this area. During the past few decades increased use of clearcutting to harvest timber, and subsequent replanting, has decreased diversity, reduced wildlife habitat values, and most recently threatened valuable shellfish beds by siltation from logging. Clearcutting on ridges separating narrow east side Olympic valleys may also promote genetic isolation of elk herds that have recently migrated from the west side of the Peninsula. These problems have been more common on both public and private forest lands.

More recently, in the last 5 or 6 years, there has been a very rapid rate of residential development, particularly on the east side of the Peninsula. This has resulted in all the management problems associated with parcelization, including the fact that many private forest land owners are now most interested in land speculation. Almost any management activity that could result in more attractive wildlife habitat is frequently considered to be a professional invitation for expensive litigation, and lost profits under the ESA or similar environmental regulations. In many cases, this intense rapid residential development has also resulted in local water pollution because of septic system failure.

The most significant obstacle for effective ecosystem management technology transfer included:

- A division between forest landowners/timber managers and the environmental community
- A rapidly growing public interest, accompanied by a lack of knowledge, about forest resources
- Growing public pressures on traditional (clearcutting) timber management systems
- A lack of understanding (distrust) of ecosystem management by professional foresters
- Some private forestland owners lack of stewardship, replaced by greed for high short-term profits

- Some small community feelings of “right to Federal timber,” for jobs; limited understanding of biodiversity and sustainability
- Limited forest landscape that was suitable for ecosystem demonstration.

Clearly, most of these technology transfer problems were socio-economic in nature. However, from a practical viewpoint, the limited number of forest sites suitable for visually clear ecosystem demonstration areas was undoubtedly the greatest obstacle. Most of the road accessible forest sites on the east side were managed on a traditional clearcut/replant even-age timber system. A few medium-age stands were treated by selective thinning, and other natural stands were harvested by a type of seed-tree system, that was locally called “green-tree retention.” Some of this cutting called green-tree retention was the result of a professional misunderstanding, or an outright attempt to misrepresent the ecosystem management process.

In terms of the socio-economic technology transfer problems, the deep division between the commodity (timber production/utilization) management programs, and non-commodity (environmental) groups is still significant. Of course, the relatively rapid reduction in timber/mill related jobs in small single-industry towns was also a significant factor. Families that had enjoyed generations of forest/mill employment and rural, small town lifestyle, were forced out of this traditional system. The resulting unemployment caused an increase in social/community problems and family discord throughout this area. Thus, locally, the ecosystem management concept is frequently viewed as another government/environmental plan to further curtail timber harvest--and community jobs.

During most of the planning stage of this technology transfer project, formal public participation was a relatively weak element. Only a few years ago, on the Quilcene District, the Spenser Project was a good example of active, public participation. Unfortunately, this participation has not continued. On a short-term planning process, public participation was not given any high priority, so only a limited amount of informal participation occurred, mainly through the local RCD councils. On a long-term basis, any successful ecosystem technology transfer effort had to be developed on a strong program of formal public participation.

Another significant socio-political problem has been the lack of understanding about ecosystem management by professional foresters. Many timber managers, by training and inclination, favor only a traditional clearcut/replant harvest system. Professional reluctance to consider ecosystem management results in a TT effort that is much more difficult, time consuming, and expensive. On many forest districts, ecosystem management seems to be considered as a public relations means to reduce public pressure about management issues such as clearcutting. Of course, under such circumstances, it is difficult to develop any meaningful ecosystem TT plan. For example, on one district, the ranger

wanted to cut 20 mm feet from a sales area to keep the local mill in operation, and to maintain local jobs. However, on the same site, when the SO staff forester suggested reducing this Annual Sales Quantity (ASQ) for ecosystem considerations, the ranger implemented the full cut. On the other hand, in 1990 on Pine District, Wallow-Whitman National Forest, the ranger initiated a very productive Consensus Project for ecosystem public participation.

The Ecosystem Learning Centers have also developed successful demonstration projects to illustrate ecosystem techniques like improved wildlife habitat, riparian cattle exclusion and rehabilitation, use of large woody debris (LWD) in streams and forest, and green tree retention. Demonstration projects can be established on very specific, physical sites, or as an ecosystem process, such as public participation. Thus, some TT demonstration projects will be easier to view, while other projects will require more video to illustrate the process.

Both industrial forest landowners and woodlot owners have also been important positive and negative elements in ecosystem technology transfer. Many industrial forest companies, such as Paper Resources, were very supportive and offered forest areas as potential demonstration sites. However, some companies preferred to avoid any association with ecosystem management, based on the concern that this was another type of environmental plot to completely close timber harvesting on private as well as public lands. Similarly, woodlot owners often supported ecosystem management, especially if land stewardship was a major management goal. However, where the woodlot was held for land speculation, most landowners were hostile to the ecosystem concept. In eastern Oregon, the Consensus Program and other similar public participation programs have been used to develop a productive ecosystem management technology transfer process. Some local organizations, like the Extension Service, and RCD can be very effective community links to facilitate public participation and closer cooperation with woodlot owners.

Ecosystem technology transfer has also been hindered by a “fortress attitude.” Some environmental groups see ecosystem management as a cynical effort at public relations, while traditional timber harvest (clearcutting) continues unchanged. At the other end of the spectrum, some local landowners maintain a “frontier mentality,” where “unlimited” resources were exploited by pioneers without any concern about sustainability. Any attempt to change this traditional pattern of cheap, unrestricted resources—“welfare resources” according to some—is considered an “unAmerican environmental plot.” Ecosystem technology transfer must be developed on a basis of mutual understanding and trust.

Discussion

Successful ecosystem management requires a continuing commitment to a strong technology transfer effort. At present, ecosystem management is a poorly understood program that

has also produced some heated reactions in both the public and the professional communities. Urban and rural populations are divided concerning ecosystem management. As a result of these conditions, a detailed technology transfer program is essential for more productive ecosystem management.

Because of this continuing controversy, ecosystem technology transfer will continue to be difficult, time-consuming, and expensive. Successful ecosystem technology transfer will require some significant changes, such as:

- Increased public participation, both short and long-term.
- Clearly defined ecosystem demonstration projects.
- Sound field examples of correct ecosystem management techniques, such as green tree retention.
- Focus timber management on a more diverse non-commodity, ecosystem program.

In addition, successful ecosystem management should also require a major change in professional forestry education. At present, most forestry programs continue to focus on commodity, timber management training. The present traditional timber related courses like mensuration, regulation, and economics must be replaced with training in habitat restoration, conservation forestry, and social forestry.

Technology transfer is a production tool that can stimulate public participation and understanding about ecosystem management. Long-term successful ecosystem management will require a new system of forest regulations or an incentive system such as the new Stewardship Incentives Program (SIP). Ecosystem management also requires a shift from the

traditional stand-level management system. Another important aspect of ecosystem management is development of a sound forest health program, including an active system of forest restoration. A complete ecosystem program will also require a major shift silviculturally from the traditional even-age, clearcutting system to an uneven-age selection system.

Conclusions

Technology transfer for ecosystem management will continue to be a major forestry challenge, both biologically and socially. Full implementation of ecosystem management will force a complete reconstruction of traditional American, commodity-focused, forestry. The era of free, welfare resources is over, and the pioneer, frontier mentality is a relic.

In addition to technology transfer, a new system of ecosystem forestry education and research will be required to implement effective ecosystem management. A complete ecosystem management program will require a balanced approach, for sustainable and ethical forest land use. As Aldo Leopold once observed: "The first rule of sound tinkering is to save all the parts." Thus, technology transfer, as one important part of ecosystem management, provides another tool that helps us "save all the parts."

References

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