

# Ecological Restoration Calls for a New Kind of Language<sup>1</sup>

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**Abstract.** In recent years, national forest managers have increasingly practiced ecological restoration in collaboration with local communities. However, in communicating with the public about proposed projects, U.S. Forest Service employees tend to use the technical language of silviculture. Such language is difficult for lay audiences to understand; moreover, because it originated in a timber culture, it can cause confusion about a restoration project's true purpose. For collaboration to work and restoration to succeed in managing public lands, a new kind of language is needed, one that more clearly communicates the intended restoration purpose. In this article, we explore the kind of language typically used in national forest management and the need for something new.

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A new collaborative culture is emerging in national forest management, a welcome break from 30 to 40 years of bitter conflict over timber and roads (Bosworth and Brown 2007a; Brown 2006; Friedman 2006; Vaughan 2006). Although differences persist, former antagonists are now coalescing around opportunities to restore ecosystems on national forest land. The U.S. Forest Service has embraced ecological restoration (Bosworth and Brown 2007b; Restoration Framework Team 2006), and ranger districts nationwide are facilitating restoration projects of all kinds. In fact, 75 to 80 percent of the timber production generated on national forests is the byproduct of thinning for restoration and other nontimber purposes (Timko 2006).

Forest managers can help build public confidence in this new restoration approach by using a new kind of language to describe it. The evolving language of wildland fire management provides a useful example. The need to control fire control and the associated language of fire control are as necessary as ever. However, the same managers who suppress fires are now also using fire to help restore ecosystems, either through prescribed fire or by monitoring natural fires to make sure they stay where they belong. These new uses of fire require a whole different language. As Pyne (2004) has pointed out, the full story of fire is complex and needs to be told in different languages, including "a more biological language" to "get the kinds of fires we need" through "ecological engineering, not simply fuels management."

As two long-time employees of the Forest Service, we have observed a fundamental shift in agency priorities (Bosworth and Brown 2007a; Collins and Larry 2007). More collaborative strategies have emerged in national forest management, along with a new focus on restoring ecosystems for all the services they provide to people, such as clean water, carbon sequestration, soil protection, wildlife habitat, and opportunities for outdoor recreation. In this paper, we argue that we need a new language to reflect these new goals and opportunities.

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<sup>1</sup> This article appeared in *Ecological Restoration* 26(3) [September 2008]: 213-218.

## Technical Forestry Language as a Barrier

The terminology that land managers are comfortable with using can inadvertently distort the story they want to tell. Consider the beginning sentence from a national forest management project announcement:

The proposed action will include commercial and precommercial conifer thinning to increase crown spacing, reduce fuel ladders, and improve forest health by reducing conifer competition.

The project described was designed to remove vegetation from a forest that historically had fewer and bigger trees, a purpose commensurate with ecological restoration. But terms such as “commercial” and “precommercial thinning” suggest management oriented more toward commodity production than ecological restoration. Moreover, the announcement was intended to elicit public comment and to engage the public in the process of deciding forest health goals and the measures needed to reach them. The language of the announcement, however, is obscure. A reader would need to know what “commercial” and “precommercial thinning” are, as well as “crown spacing,” “fuel ladders,” and “conifer competition.” Whereas Forest Service professionals and many interested groups are familiar with terms like these, others are not. Sustainable restoration efforts require broad public involvement and support, yet relatively few people are likely to engage in a project when they do not understand the terms used to describe it.

Technical forest management terms were developed by the silvicultural profession over the last century. Silvicultural terms have been compiled in a dictionary of forestry published by the Society of American Foresters (Helms 1998). When in doubt, foresters use the dictionary to find out exactly what other foresters mean. Through precise communication and consistent usage, the language of silviculture enhances professional credibility and facilitates the transfer of forestry techniques and technologies. Similarly, it promotes new research and enables the application of sound science.

However, a technical language can be highly exclusive. It demarcates a professional group, reinforcing its cohesion and differentiating it from other, “nonexpert” groups. Lay audiences are often confused—sometimes intimidated—by specialist terms, whether used by lawyers, doctors, engineers, or foresters. A technical language tends to validate expert judgment and to discourage challenges from outside.

In the early 20th century, the public put much more trust in technical experts to make the right decisions in national forest management. Today, the public is far more skeptical of technical expertise across the board. Public faith in science now depends on transparent research and even on the degree to which the public can participate (Gibbons 1999). Growing skepticism toward scientific and technical expertise has translated into widespread demands for greater public involvement in natural resource management (Cortner 2003; Kennedy and Dombeck 1999; Nelson 2000). The National Environmental Policy Act (NEPA), for example, requires public involvement in federal decisions affecting “the human environment.”

In complying with NEPA and other environmental legislation, the Forest Service went beyond just revising its procedures. Recognizing the underlying shift in public values and expectations, the agency underwent a profound cultural change in the 1980s and 1990s (Brunson and Kennedy

1995; Cramer and others 1993; Kennedy and Quigley 1998; Kennedy and Dombek 1999). Benign professional technocracy gave way to management through interdisciplinary teams and partnerships with other agencies and outside groups. The Forest Service began promoting leaders with strong communication skills who built consensus before acting. Today, the agency strives to reach decisions in collaboration with community groups and anyone else interested; the Forest Service aims to be a catalyst and facilitator in arriving at a consensus.

### A Case in Point

The language of professional forestry, however, is poorly suited to the open, respectful dialogue needed for collaborative decisionmaking, where all comers participate on an equal footing. One example comes from ponderosa pine (*Pinus ponderosa*) restoration efforts on the Cibola National Forest in New Mexico. The purpose of the effort was to restore the overgrown forest to the open, parklike woodland native to the area (figure 1). This was to be done by initially removing some of the trees, then by returning fire to its historical role. Land managers used residual evidence on the ground—old logs, stumps, and depressions—to decide where to cut trees and where to leave them. Timber was offered for sale, but project purpose and design were driven entirely by ecological goals.

The Forest Service record of decision associated with the project, however, described the efforts in traditional silvicultural terms (see the sidebar). A Forest Service record of decision describes what a forest supervisor has decided to do on a project after a process of consultation and deliberation involving the public. The purpose, the record stated, was tied to “reducing stand density” and “fuel loads.” It spoke of “stands [that] will be pre-commercially and commercially thinned” and “prescribed burn activities [that] will include broadcast burns as well as pile burns.” It called for applying “an uneven-aged silvicultural system ... to create a multi-aged stand structure with the majority of trees retained in the larger diameter classes.”

As the forest supervisor later told us, the underlying purpose was well understood by the professionals involved in designing and implementing the project. Interested groups apparently



**Figure 1**—Dry ponderosa pine (*Pinus ponderosa*) restoration in Fort Valley, Coconino National Forest, AZ. Overgrown stands (left) are thinned to restore the structure, functions, and processes characteristic of native pine woodlands (right). Photos: Ecological Restoration Institute, Flagstaff, AZ.

### **Silvicultural vs. Restoration Language: An Example**

The U.S. Forest Service has undertaken many projects to restore dry ponderosa pine (*Pinus ponderosa*) ecosystems. For example, the Bluewater Ecosystem Management Project on the Mt. Taylor Ranger District, Cibola National Forest, New Mexico, was approved in 2003 and initiated in 2004 (U.S. Forest Service 2003). Language from the record of decision is shown below, followed by alternative language that we suggest is better suited to the project's restoration spirit, methods, and goals.

#### *Actual silvicultural language:*

“This alternative [project] will ... improve stand health by thinning overstocked stands of junipers, piñon pine, and ponderosa pine, and create conditions where fire can resume a more manageable and less destructive role in the ecosystem. ... Activities included in the decision are [among others]: ... Restore ponderosa pine ecosystems on 25,365 acres by reducing stand density and utilize prescribed fire to reduce fuel loads. Stands will be pre-commercially and commercially thinned and prescribed burn activities will include broadcast burns as well as pile burns. An uneven-aged silvicultural system will be applied to create a multi-aged stand structure with the majority of trees retained in the larger diameter classes. Utilize existing roads as burn control lines and reduce the amount of handline construction to approximately 18 miles.”

#### *Alternative restoration language:*

“Where thick grasses once waved under big orange-barked pines, thickets of spindly trees now threaten natural and human communities alike through outbreaks of insects and disease, followed by devastating fires. The Forest Service wants to change all that by restoring ponderosa pine ecosystems on 25,365 acres to a healthier, more natural condition. Our reference point is the open ponderosa pine woodland native to the area, in all its beauty and ecological richness. Trained specialists will use old stumps, logs, and other evidence to help decide what trees to leave; other trees will be removed and sold or cut down and left. The entire area will then be lightly burned to begin returning the natural role of fire to the ecosystem. The intent is to restore landscapes that future generations will describe with the same awe inspired in the area's first European visitors.”

understood the intent and felt comfortable with the purpose, and the project has proven remarkably successful: The Ecological Restoration Institute in Flagstaff, AZ, has strongly endorsed the project, even using it to model ecological restoration for trainees. We suggest, however, that the language used in the record of decision did not capture the project's spirit and purpose. Consider:

- Project managers technically did no “precommercial” or “commercial thinning.” Such thinning presumes a focus on “crop trees” for a future harvest payoff, which was not a management objective. Managers focused entirely on residual evidence on the ground in restoring a semblance of the original fire-adapted pine woodland. In deciding what vegetation to leave, they paid little attention to future crop tree potential or other commercial considerations.
- Reduced stand density and fuel loads were incidental to the project purpose. Ecological restoration in dry ponderosa pine has both as a result, but they were not the goal of the

project. The same goes for “an uneven-aged silvicultural system,” “a multi-aged stand structure,” and “the majority of trees retained in the larger diameter classes.” Though expected, these were incidental effects associated with the long-term goal of restoring ecosystem processes and functions.

- Like other treatments under the project, prescribed burns were designed to help restore the historical fire regime, an outcome consistent with “broadcast burns” and “pile burns.” However, such management techniques are also used for other purposes, including fuels control and silvicultural site preparation. What was their purpose here? The language used—“to reduce fuel loads”—does not seem to reflect the true restoration purpose. The language did not convey key information commonly associated with restoration projects, such as a reference ecosystem. Nor did it reflect the consensus reached in the collaborative decisionmaking process that prepared the project. Language expressing why people value restored ponderosa pine woodlands might better have captured the spirit of the project while more clearly and accurately articulating its restoration goals and methods (see the sidebar).

### **The Need for Clarity**

And yet, what difference does language really make? The project went well. If the purpose of a project is ecological restoration, why does it matter what language is used to describe it?

One reason, we suggest, is proper terminology. In theory, silvicultural language can be used to achieve any land management goal, yet ecological restoration has become a discipline of its own, with its own science, practices, and terminology (Clewell and Aronson 2007; SER 2004). Effective restoration projects call for thinking, speaking, and acting in terms of the latest restoration science and techniques. Silvicultural language has a place in traditional timber harvesting, but in restoration projects it seems out of place.

Another reason is clarity of purpose. National forest managers owe it to the people they serve to be clear and open about their purpose. If conditions call for removing and selling timber to supply jobs and help meet the national demand for wood, then a traditional timber sale and its attendant silvicultural language—including the language of mitigation to protect waterways, scenery, wildlife habitat, and other nontimber values—might be perfectly appropriate. But if conditions call for restoring an ecosystem, then a language that clearly expresses the restoration purpose and goals would seem to be more suitable, even if timber is removed and sold as a byproduct.

The following excerpt from a Forest Service restoration project proposal indicates that some forest managers already see the need for a language that reflects the purpose of restoration:

Trees removed would provide growing space for shrubs and remaining trees. Live and dead trees would be retained in an irregular spacing to provide wildlife habitat, meet visual quality objectives, and [furnish] woody debris for long-term site productivity. Generally, less than 30 percent of the trees would remain on these areas. The result would be an open stand with scattered standing trees and patches of trees.

Facilitating communication provides a third reason to develop a new language for ecological restoration. We are not issuing a call to replace the technical language of silviculture with a new restoration terminology. However, sustainable land management is predicated on public

trust and understanding, and ecological restoration has broad appeal, with a high potential for finding common ground as a basis for collaborative decisionmaking. To realize the full potential of restoration projects, the Forest Service needs to engage the broadest possible public, using a language that can inspire confidence and enthusiasm in everyone involved. For that, restoration practitioners need a language that is clear and understandable—and that expresses their deepest convictions and highest hopes. For example, a project description might envision a beautiful landscape as a long-term outcome, including things about it that people cherish, both material and immaterial (see the sidebar). Ecological restoration needs a way of communicating that builds mutual trust and understanding while promoting collaborative decisionmaking in pursuit of common restoration goals.

### **Cultivating a Restoration Language**

A report by the Forest Service’s Restoration Framework Team (2006) offers a helpful overview of restoration issues and terminology, including two basic principles of ecological restoration:

First, because restoration needs reflect diverse public values and transcend property lines, ecosystem restoration is based upon *collaboration* with the public and with partners....  
Second, *scientific knowledge* is essential to effective ecosystem restoration and necessarily serves as its basis. [Italics added.]

Successful restoration depends on both collaboration and science—and each has its own language needs. In science and management, shared terms such as “ecological trajectory” or “community structure” are useful for communicating restoration goals, experiences, and accomplishments. The Society for Ecological Restoration International has formulated a science-based vocabulary for use in designing restoration projects (SER 2004).

In communicating with the general public, however, there is danger in replacing one kind of jargon with another. There is a useful distinction between the project *description* in documents such as the initial public notification and the final record of decision and the project *prescription* attached to environmental studies required under NEPA. Description can employ clear and accessible language and help engage a broad variety of groups in making decisions about proposed restoration projects. By contrast, prescriptions rely on the emerging technical language of ecological restoration to help guide managers in implementing the decisions made and researchers in evaluating the results.

No technical language can capture the land management values and beliefs underpinning restoration. The language of restoration needs vision and poetry. We want our words to convey our love for the land and the resources we care for on behalf of the people we serve. If we are truly committed to practicing the restoration we preach, then restoration practitioners on public land should consider using a clear yet inspirational language that speaks both to restoration purposes and to the collaborative spirit needed to achieve them. Clarity of thought, purpose, and communication demands nothing less.

## Acknowledgments

We would like to thank Mrill Ingram, editor of *Restoration Ecology*, for helping us finalize this article. We could not have done it without Mrill's consummate skill. We also gratefully acknowledge all the thoughtful comments and criticisms we received in preparing this article, including from Liz Agpaoa, Deputy Regional Forester for the Pacific Northwest Region, U.S. Forest Service, Portland, OR; Dale Bosworth, Chief Emeritus of the U.S. Forest Service, Washington, DC; Jessica Call, Policy Analyst for the U.S. Forest Service, Washington, DC; Richard Fitzgerald, Assistant Director of Forest Management (retired) for the U.S. Forest Service, Washington, DC; Dave Dillard, Director of Ecosystem Management Coordination, U.S. Forest Service, Washington, DC; Jerry F. Franklin, Professor of Ecosystem Analysis, College of Forest Resources, University of Washington, Seattle, WA; Michael Goergen, Executive Vice President and CEO of the Society of American Foresters, Bethesda, MD; Chuck Hagerdon, District Ranger for the Mt. Taylor Ranger District, Cibola National Forest, Grants, NM; Joel Holtrop, Deputy Chief for the National Forest System, U.S. Forest Service, Washington, DC; William Lange, Director of Policy Analysis, U.S. Forest Service, Washington, DC; Corbin Newman, Director of Forest Management, U.S. Forest Service, Washington, DC; Fred Norbury, Associate Deputy Chief for the National Forest System, U.S. Forest Service, Washington, DC; and Fred Swanson, Ecosystem Processes Researcher, Pacific Northwest Research Station, U.S. Forest Service, Corvallis, OR. We would also like to thank H.B. "Doc" Smith, Associate Director (retired) of the Ecological Restoration Institute in Flagstaff, AZ, for providing the photos used to illustrate the article.

## References

- Bosworth, D.; Brown, H. 2007a. After the timber wars: Community-based stewardship. *Journal of Forestry* 105(5): 271-273.
- Bosworth, D.; Brown, H. 2007b. Investing in the future: Ecological restoration and the USDA Forest Service. *Journal of Forestry* 105(4): 208-211.
- Brunson, M.W.; Kennedy, J.J. 1995. Redefining multiple use: Agency responses to changing social values. In: Knight, R.L.; Bates, S.F. (eds.). *A New Century for Natural Resources Management*. Washington, DC: Island Press: 130-138.
- Clewell, A.F.; Aronson, J. 2007. *Ecological restoration: Principles, values, and structure of an emerging profession*. Washington, DC: Island Press.
- Collins, S.; Larry, E. 2007. Caring for our natural assets: An ecosystem services perspective. In Deal, R.L., tech. ed. *Integrated restoration of forested ecosystems to achieve multiresource benefits: Proceedings of the 2007 National Silviculture Workshop*. Gen. Tech. Rep. PNW-GTR-733: 1-12.
- Cortner, H.J. 2003. The governance environment: Linking science, citizens, and politics. In: Friederici, Peter, ed. *Ecological restoration in southwestern ponderosa pine forests*. Washington, DC: Island Press: 70-80.
- Cramer, L.A.; Kennedy, J. J.; Krannich, R.S.; Quigley, T.M. 1993. Changing Forest Service values and their implications for land management decisions affecting resource-dependent communities. *Rural Sociology* 58(3): 475-491.
- Friedman, M. 2006. The Forest Service is dead: Long live the Forest Service! *Grist Magazine*. 28 February. [<http://www.grist.org>]
- Gibbons, M. Science's new social contract with society. *Nature* 402(6761): C81-C84.

- Helms, J.A., ed. 1998. The dictionary of forestry. Bethesda, MD: Society of American Foresters.
- Kennedy, J.J.; Dombeck, M.P. 1999. The evolution of public agency beliefs and behavior toward ecosystem-based stewardship. In: Sexton, W.T.; Malk, A.J.; Szaro, R.C.; Johnson, N.C., eds. Ecological stewardship: A common reference for ecosystem management. Oxford, UK: Elsevier Science, Ltd.: 85-96.
- Kennedy, J.J.; Quigley, T.M. 1998. Evolution of USDA-Forest Service organizational culture and adaptation issues in embracing an ecosystem management paradigm. *Landscape and Urban Planning* 40: 113-122.
- Nelson, R. 2000. Rethinking scientific management: Brand-new alternatives for a century-old agency. In: Sedjo, Roger A., ed. A vision for the U.S. Forest Service: Goals for its next century. Washington, DC: Resources for the Future.
- Pyne, S.J. 2004. Tending fire: Coping with America's wildland fires. Washington, DC: Island Press.
- Restoration Framework Team. 2006. Ecosystem restoration: A framework for restoring and maintaining the national forests and grasslands. Unpublished report on file at the Forest Service, Washington, DC.
- SER (Society for Ecological Restoration International Science and Policy Working Group). 2004. The SER International primer on ecological restoration. Tucson, AZ: SER International. [<http://www.ser.org>]
- Timko, B. 2006. Personal comment. January 25. Deputy Director, Forest Management, USDA Forest Service, Washington Office, Washington, DC.
- U.S. Forest Service. 2003. Final environmental impact statement and record of decision for Bluewater Ecosystem Management Project, Cibola National Forest. September. McKinley County and Cibola County, NM.
- Vaughan, R. 2006. Kicking dirt and drinking beer: The dynamics of moving conservation from conflict to cooperation. Presentation at conference: 6<sup>th</sup> Annual Meeting, Southeastern Working Group of Partners in Amphibian and Reptile Conservation; 24 February 2006; Andalusia, AL.