The Forestry Source

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Commentary ***By Daniel B. Botkin***

What Forestry Needs in the Anthropocene

On September 17, 2013, I will be giving a presentation at a Pinchot Institute Conference in Washington, DC. The focus of this conference is Forest Conservation in the Anthropocene. The idea behind the conference is that people are having such large effects on the environment, globally, that we can consider that, from a geological point of view, we have entered a new era. I have been asked to talk about Adapting Forest Science, Practice, and Policy to Shifting Ground: From Steady-state Assumptions to Dynamic Change.

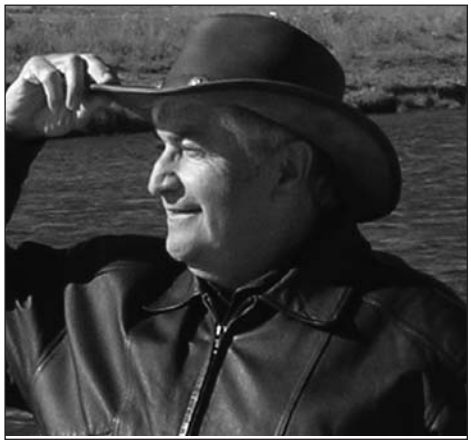
My work in ecology began in forests and forests continue to be a major emphasis. I have spent almost half a century trying to understand how forests work, and to use that understanding to solve forest-related environmental problems, and to come to know what our place within forests should be, both in terms of what is best for us and for forest ecosystems. To understand forests as environment and how we are and should manage and conserve them, we have to deal with three questions: Who owns and controls our forests, how do management and concepts have to change, and what has happened to public attitudes, interests, and appreciation of forests?

The simplest of the questions to answer is the second: How does management have to change? What forestry needs in the Anthropogenic Era is what has been needed for the past 30 years. The proper methods, theory, and goals have been clear and are available; the failure has been, and continues to be, that our laws, policies, and actions are mis-directed because we confuse a truly scientific base with nonscientific beliefs. That is, we call it science while its fundamental assumption is a folktale. Specifically, the folktale is the belief that there always has been and must be a balance of nature —nature in its single equilibrium state, unchanging forever, except for our actions, which are always considered negative. In reality, modern science makes clear that the environment and all ecosystems are dynamic, nonsteady-state systems; that species have evolved with and adapted to the changing conditions of these ecosystems; and that many, perhaps most, species require changes in the state of the environment.

The result is a confusion of folklore and science that is counterproductive, both for forests and for human needs and desires. Our love of forests gets confused with our attempts to understand them. Perhaps the most familiar example is policies and actions about forest fires. Although forest scientists, foresters, and forest ecologist have long known that frequent and therefore light forest fires are necessary to sustain many, perhaps most, kinds of forests, and that prescribed burning is an important tool, public policy continues to put forward Smokey Bear, "Only you can prevent forest fires," and there is continual opposition to prescribed burning. But the problems run deeper.

For 10 years I directed studies in the states of Oregon and Washington concerning the relative effects of forest practices on salmon. During the Clinton administration, laws and policies were established that required no-touch zones near to salmon streams, expressed as no closer that the distance twice the height of the tallest old-growth tree characteristic of the forest. The underlying assumption appears to be that old-growth, and only old-growth, is necessary for the persistence of salmon.

It is well-known among salmon ecologists, however, that the food chain on which young salmon depend in fresh water streams begins with the nitrogen fixing capability of alders and their bacterial symbionts. The nitrogen necessary for the



salmon food-chain gets into the streams through the fall of alder leaves, and twigs, and possibly through groundwater and subsurface seepage. But alders are characteristic of early successional stages. Therefore, some disturbances at some recurrent rates are necessary for the persistence of salmon. Thus the policy that requires no-touch is based either on a belief that supply of alder nitrogen is not necessary, or that somehow, in the great balance of nature, natural disturbances will always provide sufficient early successional stages for the growth of alder. Instead, we can propose a careful ecological management of salmon streams in which the equivalent of a river keeper watches over the stream and determines when some clearing is necessary. That would be forest conservation and management in an ever-changing environment.

If this is obvious and the methods have been available, why aren't management and conservation acknowledging the dynamic character of forests in practice? Especially since the understanding of nature's dynamism has been clear for at least more than two decades, as discussed in my 1990 book *Discordant Harmonies,* and updated in my latest book, *No Man's Garden: Discordant Harmonies Reconsidered.*

Of course, we who study and manage forests have to admit that a lot of the opposition to timber harvest is a reaction to long-standing misuse of many forests, of poor practices, of mining rather than attempting to sustain the forest, especially in the 19th century and early 20th century. In addition, there is the continued dominance of the balance of nature belief, and two other reasons that forest conservation and management are stuck. One is the great change in forest ownership. Until the 1980s, most private forests were owned by 15 major timber corporations, and forest research was expanding. Today, not a one of the major timber corporations owns any significant forestland. They sold their forests. The major, large private owners are real estate investment trusts (REITs) and timber investment management organizations (TIMOs). From the environmental side, The Nature Conservancy has grown to become one of the largest owners of private forestland in our nation. One cannot overestimate the importance of this change. Oddly, almost nobody knows about it. Almost nobody talks about it.

According to Peter Stein, writing in *Forest History Today,* "By 2004 only six of these fifteen were traditional forest product companies; of the remaining nine, seven were TIMOs and two were REITs. In 2010, only one of the top fifteen US forestland owners was a traditional owner, while ten were TIMOs and four were REITs. In addition, since 1995, more than half of the nation's 68 million acres of private industrial timberland has changed hands, most within the period from 2000 to 2005" (Stein 2011).

Before this change in ownership, forest corporations and environmentalists held many different opinions about how forests should be managed, but both were in it for the long-term. Timber companies saw their profit from the sustained yield of their lands. The primary goal of REITs and TIMOs, however, is to make a profit by buying and selling land. There is less inherent interest in how these lands are used and to what degree the forests achieve sustainability. Some REITs seem to be attempting to do a decent job of forest management, even so. But those of us who hope for best management have to add a new level of watchfulness and actions.

Forest research and its funding appear to have declined since the 1980s, when forestry was one of the central environmental issues. The traditional timber companies supported their own research, some of it substantial, like that of Weyerhaeuser Corporation. Research conducted by the former major traditional timber companies is over. In addition, a 2002 National Academy of Sciences report noted, "The USDA Forest Service has experienced a 46 percent decrease in number of scientists in the last 15 years, from 985 in 1985 to 537 in 1999." Since then, the number of Forest Service scientists has dropped even more, to 498 in 2008, the most recent estimate I have found (Committee on National Capacity in Forestry Research, 2002).

This NAS report warns "The waning Forest Service research base may be challenged as demands on forest resources increase. Enhancing the nation's forestry-research capacity must deal with the tangible matters of substance—funding, facilities, and equipment, and personnel—and with intangible matters of perception and values—priorities, organizations, structures, and leadership" (Committee on National Capacity in Forestry Research, 2002).

How could this have happened? Part of the answer is the decline in media attention to forests and public interest in forests. Almost nobody I talk with, including professional forest scientists, know about the great change in forest ownership. Consider this: through the 1980s, forests were among the most talked about environmental problems. Then, most aspects of forest use were the subject of lively discussions, including the importance of old-growth, the role of forests in affecting salmon habitat, the certification of forest practices as sustainable, whether timber corporations and the Forest Service were managing forests properly, and what were the roles of stages in forests succession other than old growth.

Today we hear about forests as possible carbon sinks and players in climate change, and we get alarmed about forests when there are major wildfires. Much of public and media attention about forests is reduced to very simple statements, such as "Stop tropical rainforest deforestation." Therefore, one of our tasks is to renew public interest and concern about forests, which in turn may help promote more governmental and private monitoring and research.

So the challenge that lies before those who wish to see ecologically sound management and conservation of forests is to reawaken public, and therefore, policymakers' interest in forests. This includes helping society move away from the deep-seated belief in the balance of nature. Can this be done?

Here is one encouraging case. Bob Williams, a certified forester practicing in the Pine Barrens of New Jersey, received New Jersey Audubon's Conservationist of the Year Award. He has successfully planned timber harvests for commercial and government forests for more than 20 years, converting what had become little-remembered and poorly cared–for forests into stands that provide valuable timber products, make profits for the landowners, and improve the conservation of biodiversity in the unusual oak-pine forests of the southern New Jersey coastal plain. His management includes prescribed burns, done very carefully, as well as timber harvest of carefully selected trees.

There is hope for forests and forestry in the United States, if we have the will and commitment to make this happen, and if we open our minds to new ideas and to the connections between people and nature that can be constructive for both the forest ecosystems and ourselves.

Daniel Botkin, an SAF member, is a scientist who studies life from a planetary perspective. His latest book, The Moon in the Nautilus Shell: Discordant Harmonies Reconsidered*, was published last year (www.danielbbotkin.com).*

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