From: Dave Bonta <bontasaurus@yahoo.com>
Subject: PABIODIV: more on clearcuts
Date: Tue, 11 Mar 2003 19:52:43 -0500 (EST)

--- "Hess, Stanley" <sthess@state.pa.us> wrote:
I disagree that clearcuts are detrimental to biodiversity. In the eastern hardwoods, natural clearcutting is nature's way to assure renewal of the forest. It's is time to realize what real problems are because we do have them. But scientific application of forestry is not one of them. Forestry may alter, but it doesn't destroy habitat. I live in a clearcut. Farmland is a clearcut. There is no forest any more. I am not willing to give up my home nor am I willing to return farmland to forest. Nor am I willing to move to a city, shut down rural areas, in the name of biodiversity.

Stan Hess
Service Forester for Potter and McKean Counties.

Clearcuts differ from natural disturbances in a number of ways. Here are a few that come to mind, based on a few widely available and often-cited sources I happen to have at hand. This list could easily be multiplied by someone with real expertise.

1. Clearcuts--by which I mean all even-age silvicultural treatments, in the jargon of the forestry profession--are profoundly unnatural in that every tree is removed. In most of the disturbance events common to our region, a certain percentage of trees are left: hence the apparent paradox that one can find a scattering of 500- and 600-year old individuals in mature forests with an average disturbance rate of 1% per year.

2. Clearcuts form part of rotation cycles that are usually much shorter than the natural replacement rate, sometimes by a factor of ten or higher. Replacement rates for the Allegheny Plateau region, for instance, have been estimated between 500 and 1000 years, depending on forest type and other factors. Yet the USFS is busy timbering first-succession black cherry stands less than eighty years old.

3. Even where disturbance rates are high, the one-size-fits-all practice of clearcutting usually fails to mimic specific disturbance effects, such as bole snap on talus slope forests and (especially) the periodic "plowing" of forest soils by various types of "windthrow" (which may in fact be related to non-wind-related circumstances, such as groundwater saturation, in some cases). I've seen various estimates for how often a given patch of forest soil can expect to be turned up in this fashion--usually on the order of once every 1000 years or more--but evidently often enough to result in a thorough mixing of the O and A horizons. If such mixing is the norm for most forests most of the time, we can expect that its widespread cessation will have negative repercussions for the health and diversity of soil biota that evolved under such conditions.

4. Outside certain areas, such as the high plateau where disturbance regimes seem to favor large-scale events, natural canopy replacement in our region would most often occur at small scales--from one to a few trees at a time. The resulting spacial patchiness is a landscape value not promoted by even-aged timbering. Of course, foresters cite the tendency of only certain tree species to prosper under natural conditions (the now somewhat outmoded concept of shade tolerance) as one of the primary justifications for clearcutting. But that's just the point. From the standpoint of biodiversity, a little bit of arrested development goes a long way. Mr. Hess's accurate depiction of ALL cleared land as functional clearcuts merely strengthens the argument for preserving as much acreage in mature forest conditions as possible.

5. A growing literature documents the devastating effects of clearcuts on some of our most vulnerable classes of organisms, especially salamanders and native wildflowers. Again, the relatively small size of natural disturbances would be less threatening to such slow-dispersing species.

6. While debate is ongoing over just how much space and light are needed for the recruitment of some species, evidence continues to pile up suggesting that nurse logs and root balls provide superior sites for regeneration. (One recent study, I think from Washington state, suggested that the nurse log effect isn't related to superior nutrients but to the need for a refuge from naturally occurring pathogens in the first few years of growth. Assuming these pathogens are concentrated in the humus, could this also help explain why root balls are such favored spots for the regeneration of some tree species?)

7. The ecological value of the structural complexity resulting from natural tree death, and from windthrow and other disturbances, is obviously impossible to replicate with any even-age timbering practice. Such complexity--including understorey diversity--is thought to be one of the prime reasons why old growth forests provide such good habitat for a wide range of species that reach their greatest (and sometimes only) concentration in these habitats. (The continued insistence of many foresters that old growth forests are biological deserts reflects, I am afraid, the unwillingness of their profession as a whole to acknowledge the immense contributions of ecologists to our knowledge of forest ecosystems over the last forty years. This professional balkanization serves no one's interest--least of all the public's.)

8. The proliferation of large clearcuts in a given region does no favors to the early-succession tree species they are intended to promote. Virtual monocultures are intrinsically more vulnerable to pests and diseases, and any mitigating genetic-level diversity is seriously threatened by the substitution of clearcuts for natural disturbance regimes, which would tend to result in widely separated distribution of early succession tree species. Foresters themselves have a vested interest in protecting as many large tracts of natural forests as possible as refuges of biodiversity for commercially desirable trees. The fact that this rather obvious argument is so seldom advanced is troubling.

9. In natural disturbances the soil remains undisturbed by heavy machinery, preserving critical features like macropores and mycorrhizae essential to regeneration and ecosystem health. In the absence of these advantages and others noted earlier (root balls and nurse logs), regeneration after clearcutting necessitates the use of herbicides to kill weedier competitors of commercially desirable species. These herbicides are far from benign in their effects, endangering whole suites of ground-dwelling organisms and soil biota.

One common justification cited for clearcutting is to give seedlings a better chance to get above the deer browse line. In some areas--steep slopes, especially--I've noticed some such limited effect in my area (ridge and valley), though steep slopes are, of course, precisely where clearcuts cause the most damage. And in any case, I rarely see a clearcut on state forest land that is not immediately fenced.

Another, more interesting case has to do with oak regeneration. The majority of authors in the new text, OAK FOREST ECOSYSTEMS (William J. McShea and William M. Healy, Johns Hopkins U.P., 2002) suggest that fire, not clearcutting, is the essential ingredient. The current extent of oak forests in the commonwealth is a direct consequence of the widespread burning that followed the statewide clearcutting between 1880-1920. These fires, often intentionally set, burned unchecked for months at a time, in some areas so severely as to destroy thousands of years' worth of accumulated soil. Obviously, no one is advocating a return to that sort of profligacy. Everyone talks instead of Native American forestry practices, in which fire played a central role.

The idea that the indigenous, long-term inhabitants of this continent might have something to teach the rest of us about how to care for it is indeed a welcome change from the Man-knows-better-than-nature rhetoric that has muddied the scientific credentials of the forestry profession for so long. It's worth remembering, however, that Native forestry is primarily motivated not by considerations of short-term profit but by locally evolved, culturally diverse "memes" that put a high value on long-term thinking (seven generations ahead!) and respect for greater-than-human realities.

Of course, there are less damaging ways to harvest timber than clearcuts. But an honest forester must begin by admitting that the removal of biomass from a system without replacing lost nutrients can never

be completely benign. The question is simply how to do it in the most ecologically sensitive manner. Other, more political questions are of course equally crucial, but probably less appropriate for a listserve devoted to biodiversity. I hope that everyone who cares about biodiversity and the health of the land can begin to take a serious, objective and nuanced view of forestry issues, and not simply take refuge in absolutist or emotional positions.

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Check out our nifty Friends of Rothrock poster:
http://www.mccaughey.net/~sam/rothrock.html

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