

Thank you for inviting me to be here as you discuss the Forest Emergency Recovery and Research Act. As you know, our nation's forests provide vital natural and cultural benefits for all Americans. What you may not know, however, is that certain forms of disturbance play a vital role in sustaining our forests. Although people see wildland fires, wind and ice storms, and insect outbreaks as "catastrophes" affecting federal and nonfederal lands, over time, such events have in fact both created and helped sustain the character of many regional ecosystems. These ecosystems include forests, watersheds, rivers, and even wetlands and coastal areas far downstream. Natural disturbances have been of major ecological importance across the North American continent, from the Southeast to the Pacific Northwest.

Unfortunately, H.R. 4200 does not acknowledge that these disturbances play a constructive role; rather, the act is founded on the premise that "recovery treatments" are needed "in response to catastrophic events affecting Federal lands" (H.R. 4200, official title as introduced). I am especially dismayed that H.R. 4200 takes this view, given that half a century of publicly funded research by government and nongovernment scientists from a wide range of disciplines has demonstrated the contrary.

My remarks today are based on my ecological research over four decades, particularly on research over the past 12 years with a dozen scientists and others, examining what happens when areas affected by natural disturbances are left to regenerate on their own or when humans intervene.

In summary, we have learned that:

1. Postdisturbance logging is not an ecosystem restoration tool. Rather, postdisturbance logging damages forests and associated streams and slows or prevents natural ecological recovery.
2. To avoid the additional ecosystem stress and damage imposed by logging and other treatments after disturbances, a number of actions can be taken.

The first point I wish to make is that logging after natural disturbances is not an ecosystem restoration tool. Such logging damages forest landscapes by limiting populations of species crucial to the maintenance of these landscapes and by impeding the natural processes that have long sustained these ecosystems. A substantial body of evidence (some dating from the early twentieth century) demonstrates that postdisturbance logging impairs the ability of forest ecosystems to recover from natural disturbances (Frothingham 1924; Isaac and Meagher 1938; Beschta et al. 1995, 2004; McIver and Starr 2001; Karr et al. 2004; Lindenmayer et al. 2004; DellaSala et al. 2006; Donato et al. 2006; Foster and Orwig 2006; Hutto 2006; Lindenmayer and Noss 2006; Lindemayeer and Ough 2006; Reeves et al. 2006; Schmiegelow et al. 2006).

Specifically, postdisturbance logging prevents or slows natural recovery by slowing the establishment of plant and animal populations and degrading streams. Logging after natural disturbances damages terrestrial and aquatic systems, plant and animal communities, sensitive areas, and crucial regional resources such as soils. For example, the dramatic physical changes in forest structure resulting from hurricanes and insect infestations in New England do not disrupt biogeochemical cycles or degrade water quality, but postdisturbance logging increases

nitrogen loss and does degrade water quality (Foster and Orwig 2006). Postdisturbance logging also threatens species listed under the Endangered Species Act and places more species at risk, making future listings a near certainty.

Damage from postdisturbance logging may consist of direct effects from logging, such as increased mortality of tree and other seedlings, damage to soils, or destruction of key biological legacies (that is, intact understory vegetation, snags and logs, patches of undisturbed or partially disturbed forest; Lindenmayer and Noss 2006). Equally important are the indirect effects of activities associated with logging, such as more traffic on existing roads, development of new roads, spread of invasive species, further loss of biological legacies, and damaged soils as a result of burning of slash (the leaves, twigs, branches, and other organic material left after logging).

These observations are not mere points in an abstract scientific debate; they constitute an accumulation of on-the-ground evidence that logging after disturbances harms rather than helps the regeneration of forests. As one prominent forest ecologist has put it, "Timber salvage is most appropriately viewed as a 'tax' on ecological recovery."

The second point I wish to make is that recommendations exist for how to avoid damage from postdisturbance treatments and how to speed recovery of both terrestrial and aquatic systems (Karr et al. 2004; Foster and Orwig 2006; Lindenmayer and Noss 2006; Reeves et al. 2006):

? Protect and restore watersheds before disturbance occurs, because healthy ecosystems sustained by natural processes are more resilient to natural disturbances. Such protection is far less expensive than postdisturbance rehabilitation, which often brings new rounds of damage.

? Allow natural recovery to occur on its own, or intervene only in ways that promote natural recovery. For example, ensure that unburned and partially burned patches within the perimeter of a disturbed area are exempt from logging or subject only to low-intensity harvesting that leaves high levels of biological material behind.

? Retain old or large trees and other biological material because they provide habitat for many species, reduce soil erosion, aid soil formation, maintain desirable microclimates, and nourish streams.

? Protect soils because soils and soil productivity are irreplaceable on human time scales.

? Protect ecologically sensitive areas such as streamside, or riparian, corridors; roadless areas; and steep slopes because of their importance in maintaining local and regional biodiversity and protection of water quality and because physical and biological instability in these places often has repercussions that spread across landscapes. For example, after a disturbance, riparian areas should receive the same protection they received before the disturbance.

? Avoid creating new roads and landing zones (for logging by helicopter) in the disturbed landscape because they damage soils, help spread noxious weeds or pests, and alter ground and surface water relationships across the affected landscape; indeed, postdisturbance logging may affect a larger area or have a greater impact on forests than the disturbance itself (Frothingham 1924 and others cited by Foster and Orwig 2006).

? Limit reseeded and replanting, especially with nonnative species, which can impede native plant regeneration, or even with varieties of native species that may not be appropriate for local ecosystems.

? Do not place structures such as weirs, riprap, or artificially placed large wood in streams because their ecological benefits rarely outweigh the physical damage or expense of installing and maintaining them.

? Continue research, monitoring, and assessment that will improve our knowledge of postdisturbance ecosystems, but do this in ways that do not ignore or distort established principles of forest and river ecology.

? Educate the public so that they recognize that fires, storms, or insects on landscapes are not always catastrophes but crucial components in the evolution and maintenance of ecosystems.

More than 500 scientists--from diverse disciplines, institutions, and geographic areas--have to date acknowledged the ecological merits of the recommendations I have outlined here, including the recommendations' broader applicability in ecosystems other than national forests and affected by disturbances other than fire. Yet I suggest that a careful reading of H.R. 4200 reveals assumptions and language in the act that run counter to most of these recommendations. I offer the following quotes from a letter signed by these scientists, which express their concerns:

? "We are concerned that H.R. 4200 will bind us to land management practices that, perhaps logical in the past, are no longer tenable in the light of recent scientific understanding."

? "[N]either ecological benefits nor economic efficiency result from postdisturbance logging. . . . We urge you to work with your fellow lawmakers to craft legislation that will rely on the most up-to-date scientific knowledge to protect the natural resources of the nation's public lands."

In closing, may I also suggest that, like all legislation involving science, H.R. 4200 should be debated on its scientific merits, not politics (Karr 2006). Rather than rush to implement emergency treatments, rather than set aside a half century of ecological research and risk undermining the public's interest in healthy federal lands--as H.R. 4200 appears to do--I respectfully urge this committee to examine with great care the act's potentially irreversible consequences.

Thank you for giving me the opportunity to testify today. I shall be happy to take any questions you may have at this time.

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