



USE OF SILVICULTURE TO ACHIEVE AND MAINTAIN FOREST HEALTH ON PUBLIC LANDS

A Position of the Society of American Foresters

Adopted by the SAF Council on March 13, 2005. This position statement will expire March 13, 2010 unless, after subsequent review, the SAF Council decides otherwise.

Position

To achieve forest health and other forest management goals and to maintain public forests in an ecologically sustainable condition capable of providing the many values and benefits that people expect from their forests, the Society of American Foresters (SAF) advocates the use of the proven practices of silviculture.¹

The goals for national forests and other public lands are determined through comprehensive land management planning processes with extensive public participation. Forest managers are then responsible for selecting appropriate, site-specific silvicultural practices, which may include thinning or use of prescribed fire, or both, to accomplish desired forest health, watershed, and wildlife habitat objectives, including maintaining a diversity of tree species and age classes. Skillful use of silvicultural practices can achieve desired resource conditions more rapidly, and with greater assurance of success, than will reliance on natural processes alone. In many cases, silviculture is essential to meeting resource objectives in a timely manner—for example, to rehabilitate damaged watersheds following catastrophic wildfire.

National forest and public land managers in the United States now have a century of experience and research knowledge to support effective use of silvicultural practices on public forest lands. Public forest managers must have the ability to use proven silvicultural practices to reduce the risk of catastrophic wildfires, prevent damage to watersheds and wildlife and fish habitats, and address hazardous fuel conditions that pose unacceptable risks to life, property, and communities. Managers of public forests are both expected and encouraged to use their professional knowledge, experience, and judgment to improve the health, productivity, and condition of our forests for the benefit of the public today, and for future generations.

Issue

¹ The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis. (Helms 1998).

For almost a century, through federal and state forest fire protection efforts, wildfire has been purposely suppressed in many forests that are naturally adapted to periodic low-intensity wildfires. We now know that this policy has had some unintended and undesirable consequences, including altered tree species composition and increased density of trees per acre (USDA-FS 2004). Increased stand density, or overstocking, increases fire hazard in most forest types (NRC 2000). Because of lack of vigor, dense forests are highly susceptible to insects and diseases and, consequently, increased tree mortality. Excess tree mortality causes increased fuel loading, resulting in hazardous forest fire conditions that can put watersheds, wildlife habitat, and other forest values at risk. These conditions also increase fire suppression costs and make wildfire control more difficult. The dominant factor affecting forest vigor is stand density (Helms 2003).

A number of proven silvicultural practices can be employed to manage stand density, reduce vulnerability to insects and diseases, and reduce tree mortality, thereby reducing the buildup of hazardous fuels and the risk of catastrophic wildfires. Such practices include precommercial thinning (the removal of small-diameter trees before they are large enough to provide an immediate financial return), commercial thinning, and use of prescribed fire under controlled conditions. Prudent thinning and prescribed burning can lower the risk of unacceptable loss of property and resource assets (Helms 2003). Appropriate thinnings and other operations also promote sustainable forestry by keeping wildfire and insect and disease outbreaks to noncatastrophic levels (Oliver 2003). Use of such silvicultural practices is often necessary to promote regeneration of desired tree species and achieve desired forest conditions, including maintaining a diversity of tree species and age classes across the landscape.

However, manipulation of forest vegetation is viewed by some people as environmentally harmful, and there are campaigns to inhibit use of silvicultural practices to accomplish forest health and other forest management goals on national forest and other public lands. Those opposed to the use of silviculture to improve forest health believe that the primary intent of such active intervention measures is to increase commercial timber harvest, irrespective of the constraints specified in federal land management plans and by the many laws and regulations that govern management of public lands. These plans, laws, and regulations provide the basis for maintaining sustainable forests for the benefit of future generations, and both research and professional experience have shown that many natural resource values desired by the public are promoted through the use of silviculture.

Background

Because of widespread forest health problems, many of our forests would benefit from thinning or other measures to control stand density, reduce vulnerability to insect-caused mortality, and accomplish regeneration of desired tree species. However, public forest managers often find themselves engaged in debate about the relative benefits and perceived detrimental effects of using active silvicultural intervention to affect the future condition of national forests and other public lands. Much of the debate arises from lack of agreement on appropriate forest land and resource management objectives. By law,

federal forest managers are responsible for developing resource management goals and objectives using a process specified in the National Forest Management Act of 1976 (NFMA) and the Federal Land Policy and Management Act of 1976 (FLPMA). These laws, together with their implementing regulations, provide specific opportunities for public participation in the development of land and resource management plans for each national forest, and for the public lands managed by the USDI Bureau of Land Management (BLM).

Once land and resources objectives are defined through the NFMA or FLPMA planning process, operational practices for attaining them are selected by federal land managers. Debate about forest management practices often focuses on commercial timber harvesting, especially clearcutting (SAF 2002a), but may also challenge the use of chemicals to control insects, diseases, and undesirable vegetation (SAF 2001a), as well as fire control and use of prescribed fire to improve forest stand conditions (SAF 2002b). Yet most resource management objectives can be achieved more rapidly, and with greater assurance of achieving the desired outcome, through use of silvicultural practices designed to manage stand density, improve tree species composition, reduce vulnerability to insect epidemics, reduce tree mortality, and prevent buildup of hazardous fuels. Alternatively, relying on a “do nothing” strategy, or allowing natural processes to take their course will take much more time, measured in decades, to change unsatisfactory current conditions, with no assurance that the desired future conditions will ultimately be achieved. In the interim, overstocked forests with large volumes of dead and downed trees and hazardous fuel accumulations will be vulnerable to catastrophic wildfire, placing watersheds, wildlife habitat, and communities at risk, and significantly increasing the costs of wildfire suppression. The issue for public policy becomes ensuring the ability of public forest managers to select appropriate, site-specific silvicultural practices to reduce the risks to natural resources and communities, accomplish forest management objectives, and achieve the desired future conditions in the most feasible time period, within operational and budget constraints.

Forest Health Problems. Certain circumstances can exert uncommon stress on forests and predispose them to extraordinary insect outbreaks and damage (USDA-FS 2003). In stands that are unmanaged by either silviculture or natural fire, trees often grow too close together and develop small crowns and root systems. These stands have low vigor and, as a result, are susceptible to drought, insects, diseases, and catastrophic wildfire. Under these stressful conditions, tree mortality can be extremely high (Helms 2003). Large areas of aging forests are also susceptible to insects and diseases. During the past decade, several of these forest health problems have arisen simultaneously, causing extensive tree mortality (USDA-FS 2003).

For nearly 100 years, as a result of federal and state fire protection efforts, we have greatly reduced the occurrence of wildfires in forests that are naturally adapted to relatively frequent, low-intensity ground fires. The long-term absence of fire has exacerbated forest health problems in many regions, including the Ozark and Ouachita Mountains (oak decline), interior western forests (dwarf mistletoe), western pine forests (mountain pine beetle), and western Douglas-fir and true fir forests (western spruce

budworm). Many of these forests have altered tree species composition and increased density of trees per acre. These changes have increased fuel loading and other conditions that are conducive to large-scale, high-intensity fires, as reflected in the increased acreage burned in many years since the 1980s (USDA-FS 2004). Increased tree mortality from these problems has contributed to considerable fuel accumulation, which in turn increases the risk of catastrophic wildfires, threatening watersheds and wildlife habitats, including habitats of threatened and endangered species, and resulting in degraded recreational opportunities (USDA-FS 2003).

This forest health situation is unprecedented and extensive. Of a total of 749 million acres of forest land in the United States, approximately 41 million acres, much of which is located on national forest and other federal lands, was identified in 2001 as having been damaged by insects and pathogens, suffering both defoliation and mortality. Over the next 15 years, about 70 million acres is at risk of uncharacteristically high mortality from insects and diseases. Four pests are responsible for two-thirds of the acres at risk: gypsy moth in the East, southern pine beetle in the South, root diseases in the interior West, and bark beetles in the West (USDA-FS 2003).

Management Objectives Vary by Ownership Category. Setting objectives is the key to effective forest management, whether forests are owned by federal, state, or local governments, Native American tribes, industrial corporations, investment institutions, or family forest owners. On private forests, owners determine their management objectives and the means to attain them within the constraints set by state laws or policies regarding silvicultural practices, such as timber harvesting, reforestation, slash disposal, and water quality protection, or through adherence to voluntary best management practices and sustainable forestry initiatives. On state and local government-owned forests, laws and public policies must be met, and management objectives often include generating revenue for public institutions, such as schools. On federal forests, especially the national forests administered by the USDA Forest Service, and the public lands administered by the USDI Bureau of Land Management, the goals defined in federal law include providing a sustained yield of multiple goods and services, determined by comprehensive planning processes that include public involvement, at the forest unit level. Specific objectives and management activities must be consistent with such land and resource management plans. The relevant laws are the Multiple-Use Sustained-Yield Act of 1960, the Wilderness Act of 1964, the National Forest Management Act of 1976, the Federal Land Policy and Management Act of 1976, and the National Environmental Policy Act of 1970.

Timber Harvesting on Federal Lands. SAF (2001b) supports commercial and noncommercial timber harvesting on federal lands allocated for such use through the land and resource management planning processes described above. SAF finds that current harvest levels on federal lands are insufficient to maintain forest health, meet the goals for hazardous fuel reduction to reduce wildfire risk, or provide economic and community benefits. Furthermore, SAF believes that current laws and regulations offer ample protection to sustain the full range of forest values on public lands, and that timber harvesting is a legitimate use of the national forests and BLM public lands, as the multiple-use mandates described in federal law make clear (SAF 2001b).

The Need for Active Forest Management Through Silviculture. The large-scale stand-replacement fires faced by forest managers today are uncharacteristic compared with historical wildfires; this is a result of changes in forest conditions following past timber-harvesting practices, 100 years of firesuppression, and inadequate thinning of regenerated stands (Fitzgerald 2002). We now know that the current overcrowded stands in many of our forests do not sustain the diversity of wildlife and plants that existed a century ago (Covington 2003; SAF 2003). Some people mistakenly assume that the forests they are accustomed to seeing today can be preserved unchanged without undertaking active silvicultural management practices; they advocate no management intervention as preferable to any type of stand improvement cutting, fuel treatment, or prescribed burning (Arno and Allison-Bunnell 2002; Covington 2003). However, such a “no-action” strategy departs radically from natural processes that occur in fire-adapted forests. Today’s uncharacteristically large wildfires can cause severe damage to forests and watersheds by accelerating runoff and erosion, exposing burned landscapes to invasion by exotic weeds, and cause degradation of native plant communities and wildlife habitats. In addition, severe wildfires can harm streams and aquatic food chains and damage habitats for terrestrial and aquatic species threatened with extinction (Arno and Allison-Bunnell 2002; Covington 2003; Fitzgerald 2002).

Recent experience has shown that the damaging and costly consequences of catastrophic wildfire are even more evident in the wildland-urban interface, where residential development is encroaching on forested landscapes, and where forest fire protection efforts, in addition to protecting natural resources, must be directed at preventing loss of human life and property. For example, the devastating 137 thousand acre Hayman fire in Colorado in 2002 resulted in direct suppression costs exceeding \$43 million, loss of 600 structures with an insured value in excess of \$38 million, and the loss of five human lives. Subsequent costs for watershed rehabilitation for this fire are expected to exceed \$39 million, and the long-term damage to the affected watersheds will have serious consequences for many years into the future (Lynch 2004).

A broad-scale resource assessment completed in the interior Columbia River basin provides evidence that the condition of federal forest lands in this region has deteriorated and could be improved (Quigley et al. 1996). A team of Forest Service scientists concluded that compared with the current “process predicament,” which often prevents the Forest Service from taking actions that would improve forest health conditions (USDA-FS 2002), “active management appears to have the greatest chance of producing the mix of goods and services that people want from forest ecosystems, as well as maintaining or enhancing long-term ecological integrity” (Quigley et al. 1996).

In support of silvicultural intervention to accomplish forest health goals on public lands, SAF cites the findings of many scientists and forest managers who have extensively studied forest health issues:

- “The alternative to active management is reduced productivity, many dead trees, and fuel conditions favorable to severe and potentially destructive wildfires. ...

[however,] public policies tend to inhibit active management of national forests” (O’Laughlin and Cook 2003).

- “If we continue the current passive management approach, forest health conditions can be expected to deteriorate, and forests will continue to be subject to high-severity wildfires, with concomitant damage to watersheds, fish and wildlife habitat, homes and communities. Therefore active management within a forest sustainability context is needed” (Fitzgerald 2002).
- “Rather than fighting fire as an implacable enemy, we should actively manage it in order to enjoy a healthy and sustainable wildland forest” (Arno and Allison-Bunnell 2002).
- “Simply installing fuel breaks around our cities and rural developments and forsaking the wildlands would be an abdication of our responsibility to future generations. Attention cannot be narrowly focused on a ring around the developed areas. . . . Restoration-based forest health treatments are proving to be so beneficial in contrast to no action that we must move forward rapidly and at large scales” (Covington 2003).
- “The absence of active forest management caused by overbearing regulatory expenses, coupled with continued absence of fire on the landscape, will and has led to overstocked, unhealthy stands in many forest types in California” (Dicus and Delfino 2003).
- “Today, because society has virtually halted fire from playing its ecological role in the renewal of our eastern forests, forest management practices are the primary means of sustaining important young forest habitats and associated wildlife” (Dessecker 2002).
- “In Appalachian oak forests, active management of younger stands can create old-growth attributes in a significantly shorter period than natural processes would allow” (Jenkins et al. 2004).
- “Active timber management can sometimes promote forest health and reduce damage by enhancing the overall vigor of trees in a forest or by changing the forest composition. . . . Management that precludes natural processes or avoids timber management and favors preservation of forests for other purposes can alter species composition and create more dense or less vigorous forests that are conducive to some damaging agents” (USDA-FS 2004).

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About the Society

The Society of American Foresters, with over 15,000 members, is the national organization that represents all segments of the forestry profession in the United States. It includes public and private practitioners, researchers, administrators, educators, and forestry students. The Society was established in 1900 by Gifford Pinchot and six other pioneer foresters.

The mission of the Society of American Foresters is to advance the science, education, technology, and practice of forestry; to enhance the competency of its members; to establish professional excellence; and to use the knowledge, skills, and conservation ethic of the profession to ensure the continued health and use of forest ecosystems and the present and future availability of forest resources to benefit society.

The Society is the accreditation authority for professional forestry education in the United States. The Society publishes the *Journal of Forestry*; the quarterlies, *Forest Science*, *Southern Journal of Applied Forestry*, *Northern Journal of Applied Forestry*, and *Western Journal of Applied Forestry*; *The Forestry Source*, and the annual *Proceedings* of the Society of American Foresters national convention.