September 9, 2002

President George W. Bush
The White House
1600 Pennsylvania Avenue
Washington DC, 20500

Dear President Bush:

As fire researchers and ecologists, we are writing to you concerning the scientific basis for efforts to reduce risks from the kinds of forest fires that have attracted so much media and political attention in the western United States this year. As we elaborate below, responding effectively to this fire situation requires thoughtfulness and care. The fires are traceable to differing factors in different regions and forest types. Some have burned in forests where fire exclusion and land use have created unnatural accumulations of fuels while others have burned in a relatively natural manner. The most debated response to alleviating destructive fires in the future – mechanically thinning trees – has had limited study, and that has been conducted primarily in dry forest types. Thinning of overstory trees, like building new roads, can often exacerbate the situation and damage forest health. Whatever restoration measures are undertaken, preventing the re-emergence of fire problems will require a commitment to manage with fire rather than simply trying to exclude it in the future.

No single cause can explain the variety and number of fires occurring this year in western forests. In some drier forest types, such as the semi-arid ponderosa pine ecosystems, fire exclusion aided by grazing and logging has produced accumulations of highly flammable fuel well outside historical norms. However, in many western forests, including parts of the Siskiyou (mountains of the Biscuit fire), Sierra Nevada, Cascades, and Central Rockies, much of the undergrowth is primarily the product of succession from past logging and other disturbance, rather than fire exclusion alone. In other settings, like southwestern chaparral and the lodgepole pine forests of the Rockies, succession naturally produces highly flammable communities, and periodic crown killing fires are inevitable and ecologically desirable. Drought conditions such as those seen across much of the West this year can produce extensive fires even in areas where fuel loads are "normal." In all of these areas, increased human activity and habitation on fire-prone landscapes have greatly increased the chances of ignitions and the threats to people and their property when wildfires do occur.

We have no simple, proven prescription for meeting this challenge throughout the West. In semi-arid ponderosa pine forests effective restoration may result from cutting small-diameter trees in overly dense stands. However the benefits can only be realized and maintained in the long term through an aggressive post-restoration prescribed fire program that removes surface fuels. The value of thinning to address fire risks in other forest ecosystems is still poorly understood. Although a few empirically based studies have shown a systematic reduction in fire intensity subsequent to some actual thinning, others have documented increases in fire intensity and severity. Models and theories have been advanced to explain these results, but reliable data remain scarce.

In some areas the use of prescribed fire without any "thinning" would be the best restoration method. Indeed, many forests in the West do not require any treatment. These are forests that

for thousa nds of years have burned at long interva ls and only under dro ught con ditions, and have been altered only minima lly by 20th century fire suppression. These forests are st ill "hea lthy" and thinning would only disturb the m, not "restore" them. In sh ort, the var iation amo ng our forested landscapes is much to o great for one treatment to be appr opriate eve rywhere.

Where thinning is used for restorat ion purp oses in dry forest types, rem oval of sma ll diameter materia l is most l ikely to have a net remedia l effect. Brush and s mall trees, along w ith fine dead fuels lying atop the forest floor, constitute the most rapidly i gnited compo nent of dry forests (youn g forest stands regenerating a fter t imber harve st often burn with the gr eatest intensity in western wi ldfires). They most surely post -date management-induced alterat ion of dry forest fir e regimes. And their removal is not so l ikely to increase future fi re intensity, for example f rom increased insolat ion and/or the drying effects of w ind.

In contrast, removal of more mature trees can increase f ire intensity and severity, e ither immediately post-logging or afte r some years. These trees provide “insurance” because they often survive surface f ires and c an speed p ost-fire recovery. Even if they are diseased, dying or dead, lar ge and old trees and snags are important to ma ny wildl ife species and ecosy stem functions. Bui lding or re-opening roads to faci litate th inning w ill also heighten f ire risks, s ince roads correlate with increased numbers of human-started fires. Remov ing more than small t rees and co nstructing roads wi ll also make col lateral damage to forest ecosystems m ore l ikely (e.g., through effects on water quality, fish populations, and the spread of invasi ve spec ies). There fore, where done, this k ind of thinning needs particu larly careful planning and implementation. The results require faithful monitoring and analysis before any effort to extrapolate the practice to other segments of the fores t landscape.

Forests are dyna mic bio logical systems an d their management requires integrat ion of approaches over t ime and space. Thus, whatever remediat ion or restoration is undertaken in dry forests, close attention must be paid to the fut ure management of the treated forests. Because of the inevitab ility of fire in these systems, the goal of restoration has to be landscapes in which we can better control the fi res we do not want and prom ote the o nes we do. However, w ithout a thoughtful post -treatment prescribed fire management program, the forest w ill likely return to its current highly flammable state with in a decade or two, losing – among other things – the pu blic investment made in treating it

The locat ion of management treatmen ts is simi larly impo rtant. Strateg ic p lacement of management activ ities such as thinning and burning within landscapes is cr itical to accomplishing the most benefit with m inima l ecolog ical impact. As an important example, protecting bui ldings, power lines, and water supplies will be most effect ively accompl ished by reducing fue ls near them.

In sum mary, fire threats in western forests ar ise from many causes, an d solutions wil l require a suite of treatments adjuste d on a site -by-site basis. Enough experience exists to suggest areas such as the se mi-arid pondero sa pine forests where we can, now, undertake correct ive act ion. However, ne ither the magnitude of the problem nor our u nderstanding of treatment impacts would justify proceeding in panic or without thorough environmental reviews. Moreove r, whatever treatments we undertake must include provis ions for long -term ma intenance, integrat ion of f ire, and robust monitoring.

Very truly yours,

Norman L. Christensen, Jr.
Dean Emeritus and Professor of Ecology, Nicholas School of the Environment and Earth Sciences, Duke University.

Thomas W. Swetnam
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BIOGRAPHICAL INFORMATION

Dr. Christensen has written widely on fire ecology and management. He chaired reviews of the fire management programs in the Sierra Nevada National Parks and the Interagency Review of the Ecological Consequences of the 1988 Yellowstone Fires. He directed the recently released National Academy of Sciences study of the ecological consequences of forest management in

the Pacific Northwest and is currently the chair of the National Commission on Science for Sustainable Forestry.

Dr. Swetnam has published numerous papers and book chapters on fire, climate and human land-use history of the western United States, Mexico, and Siberia, Russia. He has served on a variety of editorial boards (including the International Journal of Wildland Fire, Canadian Journal of Forest Research, and Ecological Applications), and he is co-editor of a forthcoming book titled "Fire and Climatic Change in Temperate Ecosystems of the Western Americas" (Springer-Verlag publishers). He was appointed by the President in 2000 to the Board of Trustees of the Valles Caldera National Preserve, a congressionally-chartered experiment in federal land management.

Dr. Erman was the Science Team Leader for the Sierra Nevada Ecosystem Project and Director of the University of California Centers for Water and Wildland Resources. He currently serves on a CALFED Bay-Delta Science Committee and California Tahoe Conservancy restoration science advisory team.

Dr. Perry researches forest structure in ponderosa pine forests and its implications for fire risk. He has been a member of the National Academy of Sciences Committee on the Ecologic al Consequences of Forest Management in the Pacific Northwest, the Scientific Societies Panel on Interim Management of East Side Forests, the Scientific Advisory Panel for the Oregon Biodiversity Project, the Scientific Advisory Panel for Weyerhaeuser Canada 20 Year Forest Management Plan, and the Marbeled Murrelet Recovery Team.

Dr. Morgan has taught, published, and done research on fire ecology and management for more than 15 years. She testified on fire management issues before the Forests and Forest Health Subcommittee of the US House Resources Committee in July, 2002. She is also a member of the Technical Advisory Committee for the Collaborative Forest Restoration Program, a United States Forest Service program in New Mexico.

Dr. Stephens' expertise is in wildland fire sciences and management. He was a founder of the National Fire and Fire Surrogate Treatments for Ecological Restoration research project, currently the largest fire science project in the nation with 13 experimental sites in 11 states. He has given testimony on fire management to the Forests and Forest Health and the National Parks, Recreation, and Public Lands subcommittees of the Committee on Resources of the United States House of Representatives.

Dr. Romme has studied fire ecology and fire effects in a variety of western ecosystems over the past 25 years. He has published over 50 scientific articles and book chapters on fire ecology, and won an award from the Ecological Society of America for an outstanding paper in ecology. He is conducting on-going, long-term studies of the fire effects and ecological responses to the 1988 Yellowstone fires, and is the lead scientist in a successful ponderosa pine restoration project in southwestern Colorado. He also is heading a team of scientists evaluating the ecological effects of the Hayman fire that burned in 2002 near Denver, Colorado.

Dr. Omi. Is Director of the Western Forest Fire Research Center, an interdisciplinary research facility based at Colorado State University. He teaches Wildland Fire Measurements, Forest Fire Management, Forest Fire Behavior, Technical Fire Management, Forest Fire Meteorology and Behavior, and Fire Science. His professional interests include forest fire management, fire behavior prediction, and fuel modeling, and his recent research focuses on the systematic assessment of the effectiveness of fire mitigation treatments, such as mechanical removal and prescribed fire.

Dr. Grauml ich is the director of the Mountain Research Center Director at Montana State University. She is past Director of the University of Arizona's Institute for the Study of Planet Earth and Deput y Director of Columbia University's Biosphere 2 Center. She uses tree-ring records to investigate how climate variation affects forests. Her research focuses on the interaction of climatic variation at multiple scales, ecological processes, land-use and social factors in governing change in mountain regions.

Dr. Zedler has researched and published for over 35 years on fire ecology, the ecology of shrublands, forests and temporary wetlands, and the restoration and creation of habitat for endangered plant species.

Dr. Kauffman researches fire ecology, ecosystem structure, and riparian zone processes and restoration.

cc: Secretary of Interior Norton; Secretary of Agriculture Veneman