

Chapter 4. Consultation and Coordination

List of Preparers

Following is a list of the key interdisciplinary team of specialists who substantially contributed to preparation of the “Perk-Grindstone Fuel Reduction Project Environmental Impact Statement.” There were many other specialists who provided valuable assistance in preparation of this document, as reviewers, consultants and administrative support staff.

Name	Position/Organization	Contribution to EIS	Education	Years of Relevant Experience
Amell, Larry	Forester-Silviculturist; F.S.- TEAMS Enterprise Unit	Silviculture, Fire Behavior	B.S. Forest Resources; M.S. Forest Resources	15
Atencio, Lawrence	Range Specialist; Smokey Bear Ranger District	Invasive Plant Species	B.S. in Agriculture and Range Science	2
Baker, Blaze	Botanist; F.S.- TEAMS Enterprise Unit	Invasive Plant Species	B.S. in Botany and in Environmental Biology	17
Bruin, Susan	Environmental Coordinator; F.S.- TEAMS Enterprise Unit	Project/Team Leader, EIS Writing-Editing	B.S. Natural Res. Mgt.; M.S. Natural Res. Policy and Administration	20
Carlson, Richard	Recreation/Lands Staff; Smokey Bear Ranger District	Recreation, Scenery	M.A. Landscape Architecture; B.A. Pre-landscape Architecture	29
Cordova, Larry	District Wildlife Biologist; Smokey Bear Ranger District	Wildlife	B.S. Wildlife Management/Zoology, Minor Range Management	26
Doyle, Ruth	Regional Landscape Architect; FS, Southwestern Region	Recreation, Scenery	M.A. Landscape Architecture; B.A. French	22
Eubank, Vickey	Geographic Information Systems; F.S.- TEAMS Enterprise Unit	Spatial Analysis, Maps	A.A.S. Science and Business	30

Chapter 4: Consultation and Coordination

Hoadley, Jeanne	Air and Water Quality Specialist; NM Zone, Southwestern Region	Air Quality, Smoke	B.S. Geography; M.A. Geography; NOAA Graduate Scientist Program - Meteorology	25
Klug, Paul	Forester-Team Leader; F.S.- TEAMS Enterprise Unit	Project/Team Leader (06/2006-06/2007)	B.S. Forestry (Zoology); FS Northern Region Forest Ecology and Silviculture	33
Kuhar, Kim	District Fire Management Officer; Smokey Bear Ranger District	Fuels and Fire	B.A. Recreation/Outdoor Education; Graduate Technical Fire Management	20
Maloney, Cavan	Hydrologist; F.S.- TEAMS Enterprise Unit	Water, Soil	B.S. Natural Resource Management-Hydrology	18
Mendonca, Adam	NEPA Planner/Asst. Fire Mgt. Smokey Bear Ranger District	Fuels and Fire, Silviculture	B.S. Forestry	4
Messnik, Virginia	Cartographic Technician; Smokey Bear Ranger District	Maps	B.A. Biology; B.S. Chemistry	11
Oechsner, Marynell	Wildlife Biologist; F.S.- TEAMS Enterprise Unit	Wildlife	B.S. Biology	30
Rheinberger, Steve	Forester/Logging Engineer; FS – Forest Resource Enterprises, Enterprise Unit	Economics	B.S. Forest Management; M.S. Forest Engineering	37
Salas, Danny	Forest Wildlife Biologist; Lincoln National Forest	Wildlife, Sensitive Plants	B.S. Wildlife Management	27
White, Diane	Heritage Staff Officer; Lincoln National Forest	Heritage Resources	M.A. Anthropology; B.A. Anthropology	20

Yori, Karen	Blue Earth Ecological, Inc.	Social Effects, EIS Writing-Editing	B.S. Forestry; B.A. Social Work	26
York, Judith	Writer-Editor; F.S.-TEAMS Enterprise Unit	EIS Writing-Editing	B.S. Wildlife Resources; M.S. Natural Resources Communications	18
Yurczyk, Frank	Forester-Logging Systems; F.S.- TEAMS Enterprise Unit	Roads, Logging Systems, Costs	B.S. Forest Management	30

List of Agencies, Organizations and Persons to Whom Copies of the Draft Environmental Impact Statement Are Sent

Federal Agencies and Tribes

Army Corps of Engineers
 Bureau of Indian Affairs—Mescalero
 Bureau of Land Management—Roswell
 Mescalero-Apache Tribe
 Natural Resources Conservation Service—Alamogordo and Carrizozo
 U.S. Fish and Wildlife Service—Albuquerque
 U.S. Senator Jeff Bingaman
 U.S. Senator Pete Dominici
 U.S. Representative Steve Pearce

State Agencies

New Mexico Department of Game and Fish—Santa Fe and Roswell
 New Mexico Environment Department Surface Water and Air Quality Bureaus
 New Mexico Forestry Resource Conservation—Santa Fe
 New Mexico State Forestry—Santa Fe and Capitan
 New Mexico State Police—Alamogordo
 New Mexico State Resource Conservation and Development
 State Representative Daniel Foley
 State Senator Pete Campos
 State Representative WC “Dub” Williams
 State Representative Nora Espinoza

Local Agencies

Lincoln County Commissioner's Office
Lincoln County Manager's Office
Ruidoso Public Schools
Ruidoso Valley Chamber of Commerce
Village of Ruidoso—Emergency Services
Village of Ruidoso—Forestry Division
Village of Ruidoso—Manager's Office
Village of Ruidoso—Mayor's Office

Organizations

Center for Biological Diversity—Tucson
Ecological Restoration Institute—Flagstaff
Forest Guardians—Santa Fe
Ecoservants—Ruidoso
Sierra Club—El Paso

Individuals

Numerous individuals on the project mailing list will receive notification of the availability of the EIS or a complete EIS. Most expressed an interest in accessing the EIS electronically from the Lincoln National Forest Web site. Many requested the EIS Summary only.

Glossary and Acronyms Used

A

Aspect: the direction to which a slope faces.

B

Basal area (BA): the area of a cross-section of a tree, including bark, at breast height. Basal area of a forest stand is the sum of the basal areas of all individual trees in the stand, usually reported as square feet per acre or square meters per hectare.

Biodiversity: the variety, distribution and abundance of living organisms in an ecosystem. Maintaining biodiversity is believed to promote stability, sustainability and resilience of ecosystems.

Best management practices (BMPs): guidelines or minimum standards for proper application of forestry operations, designed primarily to prevent soil erosion and water pollution, and to protect certain wildlife habitat values in riparian and wetland areas.

Board foot: a unit of unfinished wood 1 inch thick, 12 inches long, and 12 inches wide. A traditional unit for measuring and selling solid wood products (e.g., lumber). One board foot contains 144 cubic inches of wood.

Bole: the main stem of a tree.

Broadcast burn: a type of prescribed burn where the burn is intentionally lit so that the fire will spread across the surface of the landscape, sometimes under residual trees, to meet resource objectives.

Browse: woody vegetation that animals use for food.

Browsing: the consumption of leaves and shoots from woody plants. Contrast with **grazing**, or consumption of non-woody plants.

Brush: usually refers to shrubs and similar low growing vegetation.

Buffer: an area of specified width where certain activities may not occur. Buffers are usually defined around special sensitive resources like rare plants or archeological sites, or along each side of streams or near other features to be protected from human disturbance.

C

Canopy: the more or less continuous cover of leaves and branches in a forest, usually formed by the crowns of the dominant and codominant trees.

Canopy cover or closure (percent): the percentage of a given ground area that is covered by the vertical projection of the crowns of trees. Also, the amount that tree canopies interlock and cover the ground surface with shade.

Chain: a unit of linear measure that is equal to 66 feet in length.

Codominant tree: a tree with its crown in the upper level of the canopy of surrounding trees, and receiving direct sunlight from above and comparatively little sunlight from the sides. See also “dominant” and “suppressed.”

Commercial treatments: forestry operations, such as thinning or other timber harvest, that generate income from the sale of removed trees or other products.

Community: an assemblage of plant or animal species, dependent on each other, and constituting an organized system or population.

Competition: the process in which organisms with similar requirements contend for resources—light, water, nutrients, and space—that are in limited supply.

Conifer: any tree that produces seeds in cones, with no fruit structure around the seed. Leaves are usually needles, scales, or narrow and linear in shape, and evergreen.

Contained fire: once a fuel break is completed around a fire to keep it in a specific perimeter area. Fuel breaks may include natural barriers like water or rocks, or manually or mechanically constructed lines where vegetation is cleared away.

Cooperating agency: A Federal, state or local agency that has jurisdiction that may be affected by the proposed Federal project and provides support and assistance in completing the environmental analysis for a project in accordance with National Environmental Policy Act regulations.

Cord: a pile of wood 4 feet high, 4 feet wide, and 8 feet long, with a volume of 128 cubic feet. Actual volume of solid wood in a cord will vary from 60 to 100 cubic feet, depending on size of individual pieces, bark thickness, and orderliness of stacking.

Cordwood: small diameter or low quality wood suitable for firewood, pulp or chips; not sawlogs.

Cover (wildlife): the protective element within an animal’s habitat, which provides concealment from predators (hiding cover) and shelter from the weather (thermal cover). Cover takes many forms, including patches of dense brush, tall grasses, the forest canopy, or other landscape features.

Creeping fire: Fire burning with a low flame and spreading slowly.

Crown: the portion of an individual tree above the main stem, consisting of live branches and foliage.

Crown fire (crowning): a fire that burns and moves through the uppermost branches (crowns) of trees, and spreads from crown to crown. Fire burning in the crowns of trees is an indicator of a high-intensity wildfire.

Crown spacing: the distance between the uppermost branches of individual mature trees within a stand. Crown spacing distance, along with the pattern in which trees are spaced (even vs. uneven), are indicators of how easily a crown fire can spread within a stand.

Cubic foot (cf): a unit of measure for the volume of wood products, equivalent to the volume of a cube that measures one foot on each side. **Ccf** refers to 100 cubic feet of volume.

D

Den tree: a tree with cavities that provide shelter and nesting sites for various wildlife species.

Defensible space: An area where the flammable vegetation has been treated (reduced or cleared away) so the area acts as a barrier to the advancing wildfire and loss to life, property or resources.

Dominant tree: a tree with its crown extending above the general level of the canopy of surrounding trees, and receiving full sunlight from above and partly from the sides.

Diameter at breast height (dbh): diameter of the tree bole at 4.5 feet above ground level.

Diameter at root collar (drc): diameter of the tree bole at the base of the tree.

Drip torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm and igniter. Fuel is usually a mixture of diesel and gasoline.

Duff: The layer of decomposing organic materials lying below the litter layer of the freshly fallen twigs, needles and leaves, and above the mineral soil.

E

Ecosystem: a complex of interacting organisms (plants, animals, fungi, bacteria, etc.) together with its environment, considered as a unit.

Ecosystem sustainability: the capacity of an ecosystem for long-term maintenance of ecological processes and functions, biological diversity, and productivity.

Edge effect: the increased richness of plants and animals that occurs in areas where two or more habitat types come together.

Environmental assessment (EA): A concise environmental analysis document prepared by a Federal agency proposing an action, prepared in compliance with National Environmental Policy Act associated regulations. The EA is also used to determine whether an EIS is needed.

Environmental impact statement (EIS): A more detailed environmental analysis document prepared by a Federal agency proposing a major action that may significantly affect the human environment, prepared in compliance with National Environmental Policy Act associated regulations. Prepared with public participation, the EIS assists decisionmaking by providing analytic information about the predicted consequences of a range of alternatives.

Escaped fire: A fire that has exceeded or is expected to exceed the prescribed burn prescription.

Extreme fire behavior: A level of fire behavior that ordinarily precludes direct control action. It usually involves a high rate of spread, prolific crowning or spotting, and possibly some fire shirls or a strong convection column. Predictability and control are very difficult.

F

Felling: the cutting of standing trees.

Fine fuels: Fast-drying fuels usually less than ¼ inch in diameter and having a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fire break or fire line: A natural constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work in managing a fire.

Fire intensity: A term related to the heat energy released during a fire.

Fire line: A linear fire barrier that is scraped or dug to mineral soil.

Fire regime: long-term pattern of fire behavior on a given landscape in terms of frequency, intensity, severity, seasonality and other fire behavior factors.

Fire severity: A term related to the environmental impacts caused by a fire.

Flame length: the height of flames from a wildfire or prescribed burn, above the ground surface.

Forest Stewardship Program: a program funded by the U.S. Forest Service to encourage private forest landowners to practice sustainable, multiple-use land management. Cost-share assistance is available for approved conservation practices.

Forage: woody or non-woody vegetation such as grasses, forbs and shrubs that are eaten by wildlife and/or livestock.

Forb: a plant with a soft rather than woody stem that is not a grass.

Forest cover type: a classification of forest land named after the most dominant tree species.

Forest fragmentation: the splitting of forest lands into smaller, detached areas as a result of road building, farming, suburban development, and other activities.

Fuel: combustible living and dead material including vegetation such as trees, shrubs, grasses, snags, down logs, tree needles and other leaf litter that feeds a fire.

Fuelbreak: a strip or patch of land maintained clear of trees and tall brush.

Fuel model: a description of fuels within an area that helps managers describe or simulate how a fire might behave, given other factors that can influence fire behavior (weather and topography). Fuel Models 1 and 2 describe areas where grasses are the dominant ground fuels. Fuel Model 6 describes an area dominated by understory and mid-story shrubs and immature trees. Fuel Model 9 describes a stand where ground fuels are dominated by forest litter (pine needles and leaves).

G

GIS (Geographic Information Systems): computer system used to store, organize and display geographic information spatially, such as roads, streams, soil types, or any other feature that can be mapped on the ground.

Ground cover: all herbaceous plants and low growing shrubs in a forest or open area.

H

Habitat diversity: the variety of wildlife habitat features and types in a specific area.

Hardwood: tree species in the angiosperm group (the flowering plants that produce seeds enclosed in a fruit). Hardwood trees are characterized by broad leaves as opposed to needles.

Harvest: cutting and gathering a tree crop. In a forest harvest, trees are felled and moved to a central location (landing) for final transport by trucks.

Herbaceous vegetation: non-woody plants, for example, grasses, forbs, wildflowers and ferns.

Herbicide: a chemical for killing unwanted plants.

Home range: the area an animal uses to satisfy its normal requirements for food, water, and cover.

I

Integrated pest management (IPM): the use of different techniques in combination to control pests, with an emphasis on methods that are least injurious to the environment and most specific to the particular pest.

Invasive plants or noxious weeds: plants that possess one or more of the following attributes—aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier of serious insect or disease, and may or may not have been part of a native plant community.

L

Ladder fuels: vegetation fuels that provide vertical continuity, thereby allowing fire to carry from surface fuels into the crowns of trees with relative ease. They help initiate and assure crowning.

Landing: a central location where logs are gathered for transport to the mill.

Litter: the uppermost layer of organic debris on a forest floor, composed mainly of fresh or slightly decomposed leaves, bark, twigs, flowers, fruits, and other vegetable matter.

Live fuels: Living plants that are combustible such as trees, grasses and shrubs.

Log: section of the main stem of a harvested tree.

M

Mast: the flowers, fruits or seeds of plants, especially of trees and shrubs that are eaten by animals. Hard mast includes hard-shelled seeds such as acorns or nuts. Soft mast includes flowers and seeds with a fleshy cover, for example berries and seeds.

MBF: abbreviation signifying 1,000 board feet of wood volume.

N

NEPA: National Environmental Protection Act.

Non-point source (NPS) pollution: effluent sediments or chemicals that enter a water body in a diffuse manner (e.g., runoff or leaching from farms, forestry operations, or urban areas), rather than from a specific point such as a pipe. Use of BMPs or filter strips helps prevent NPS pollution.

O

Old growth: a late stage of forest succession beyond the age of biological maturity, or stands that contain old growth characteristics including numerous large trees, large snags, and logs on the ground (attributes defined in the forest plan, pages 38a-38b).

Overstocked: a stand in which trees are so closely spaced that they are competing for required resources, resulting in less than full growth potential for individual trees.

Overstory: the trees in a forest of more than one story that form the upper canopy layer.

P

Particulate matter: the microscopic particles that are part of smoke.

Prescribed burn: a fire ignited by management actions under specified environmental conditions and following appropriate precautionary measures to achieve specific objectives. Prescribed burns are typically conducted in the spring or fall when temperatures are cool, humidity is high, and fire behavior is moderate. Prescribed burns are monitored by firefighters to ensure they remain within the area designated for burning.

Prescription: a schedule of activities for a stand or forest property which, when carried out, should produce the outcome desired by the landowner.

R

Regeneration: the replacement or renewal of a forest stand by natural or artificial means. Also, the term “regeneration” may refer to the young tree crop itself.

Release: freeing a tree or group of trees from competition by removing trees or shrubs that overtop or crowd them.

Residual stand: trees remaining uncut following any cutting operation.

Riparian zone or ecosystem: the land and vegetation bordering flowing or standing water, identified by distinctive saturated soil characteristics and vegetation that require water (streams, lakes, ponds).

Running or active fire: A rapidly spreading fire with a well-defined head.

S

Sanitation cut: the harvest of dead, damaged, and susceptible trees to prevent the spread of pests and disease within a stand.

Sapling: a tree that is no longer a seedling but not yet a pole, usually at least 4.5 feet tall and 1 to 4.9 inches in diameter.

Sawtimber: trees, or logs cut from trees, with a minimum dbh of 8 inches, and with stem quality suitable for conversion to lumber. Small sawlog trees (dbh 8 to 14 inches) and large sawlog trees (dbh over 14 inches) sometimes are distinguished.

Sedimentation: the filling-in of stream channels or water bodies with soil particles, usually as a result of erosion on adjacent land.

Seedling: a young tree, usually less than 3 feet high and less than 1 inch in diameter.

Sensitive species: plant and animal species identified by a regional forester for which population viability is a concern as evidenced by significant current or predicted downward trends in population or habitat capability that would reduce a species' distribution.

Shade tolerance: the ability of a tree species to survive in relatively low light conditions, although it may not thrive.

Silviculture: the art, science, and practice of establishing, tending, and reproducing forest stands.

Site: the combination of biotic, climatic, topographic and soil conditions of an area.

Skidder: specialized logging equipment used to slide logs from stump to landing. Skidders are typically rubber tired or track mounted. Some are modified tractors equipped with either cable and winch, or a hydraulic grapple.

Skidding: moving trees from the felling site to a landing, using tractors or other logging equipment.

Slash: branches, treetops, bark, and other woody material left on the ground as a byproduct of thinning (activity produced slash).

Snag: a standing dead or dying tree that has lost most of its branches.

Soil productivity: the capacity of a soil to produce a specific plant or sequence of plants under a specific system of management.

Spotting (fires): New fires that start from sparks or embers carried by the main fire.

Stand: a group of trees sufficiently uniform in species composition, structure and spatial arrangement to be distinguished from surrounding groups of trees.

Stand density: a quantitative measure of the amount of tree cover on a given area.

Stand density index (SDI): a relative measure of competition in a forest stand based on number of trees per unit area and average tree size.

Structure: the presence, size, and physical arrangement of vegetation in a stand. Vertical structure refers to the variety of plant heights from the canopy to the forest floor. Horizontal structure refers to distribution of trees and other plants across the land surface.

Stump height: the distance between ground level and the top of a stump.

Succession: the ecological process of sequential replacement by plant communities on a given site as a result of reproduction and competition.

Suppressed trees: trees with crowns below the general level of the canopy, and receiving no direct sunlight. Suppressed trees are characterized by low growth rate and low vigor due to competition with overtopping trees.

Sustainability: a characteristic of a process or state that can be maintained indefinitely. Sustainable land management has often been defined as that which meets the needs of the present without compromising the ability of future generations to meet their own needs.

T

Thinning: removing some trees in a forest stand to provide growing space for other trees, and/or to remove dead or dying trees to reduce pest problems.

Thinning from below: a method of thinning that involves cutting the smallest trees in the stand up to a specified diameter limit.

Torching: Fires igniting and flaring up from the bottom to the top of a tree or group of trees.

Treatment: any silvicultural practice or procedure.

U

Underburn: A prescribed fire that burns mostly surface fuels although it may cause some torching in trees or groups of trees.

Understory: trees and other vegetation that grows beneath the overstory of a forest stand. Understory vegetation usually consists of grasses, forbs, and herbs; shrubs, bushes and brush; and small immature trees (saplings).

Uneven-aged stand: a group of trees of a variety of ages and sizes, and often of different species.

W

Wildlife habitat: the arrangement of food, water, cover and space required to meet the biological needs of an animal. Different wildlife species have different habitat requirements.

Water bar: a ditch or hump constructed diagonally across trails or roads to reduce soil erosion by diverting surface water runoff into adjacent ditches or vegetation.

Watershed: the total land area from which water drains into a particular stream or river.

Well stocked: the stand density at which trees are spaced widely enough to prevent competition, yet closely enough to fully use site resources.

Wetlands: lowlands covered with shallow, and sometimes temporary, water. The frequency and duration of inundation is sufficient to support plant communities that typically are adapted for life in saturated soils.

Wildlife corridors: strips of trees, shrubs and understory vegetation that provide cover and habitat for wildlife, and serve as travel lanes for movement across open areas and between isolated patches of habitat.

Woodland: a forest with low tree densities, often defined as less than 20 to 30 percent crown cover when trees are mature.

References Cited

- Agee, J. K. 1993. Fire Ecology of Pacific Northwest forests. Island Press, Covelo, CA. 493 pp.
- Agee, J. K. 1996. The influence of forest structure on fire behavior. Pages 52-68 *in*: Proceedings of 17th forest vegetation management conference, January 6-18, 1996. Redding, CA.
- Agee, J. K., B. Bahro, M. A. Finney, P. N. Omi, D. B. Sapsis, C. N. Skinner, J. W. van Wagtenonk, and C. P. Weatherspoon. 2000. The use of fuelbreaks in landscape fire management. *Forest Ecology and Management* 127(1-3):55-66.
- Alexander, M. E. 1988. Help with making crown fire hazard assessments. Pages 147-156 *in*: Protecting people and homes from wildfire in the interior West: proceedings of the symposium and workshop. U.S. Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-251.
- Anderson, H. E. 1982. Aids to determining fuel models for estimating fire behavior. U.S. Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-122.
- Arno, S. F. 1985. Ecological Effects and Management Implications of Indian Fires. Pages 81-86 *in* James E. Lotan, et al., ed. Proceedings, Symposium and Workshop on Wilderness Fire: Missoula, MT, November 15-18, 1983. U.S. Forest Service, Intermountain Forest and Range Experiment Station.
- Arno, S. F. and M. G. Harrington. 1999. Concluding remarks. Pages 47-49 *in* Eighty-eight years of change in a managed ponderosa pine forest. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-23.
- Arno, S. F., H. Y. Smith, and M. A. Krebs. 1997. Old growth ponderosa pine and western larch stand structures: influences of pre-1900 fires and fire exclusion. U.S. Forest Service, Intermountain Research Station, Research Paper INT-RP-495.
- Arno, S. F., J. H. Scott, and M. G. Hartwell. 1995. Age-class structure of old growth ponderosa pine/Douglas-fir stands and its relationship to fire history. U.S. Forest Service, Intermountain Research Station, Research Paper INT-RP-481.
- Barrett, S. W. 1988. Fire suppressions effects on forest succession within a central Idaho wilderness. *Western Journal of Applied Forestry* 3(3): 76-80.
- Beier, P. and J. E. Drennan. 1997. Forest structure and prey abundance in foraging areas of northern goshawks. *Ecological Applications* 7: 564-371.
- Bevis, K. R., J. E. Richards, G. M. King, and E. E. Hanson. 1997. Food habits of the northern spotted owl (*Strix occidentalis caurina*) at six nest sites in Washington's eastern Cascades. Pages 68-73 *in* Duncan, J. R., D. H. Johnson, and T. H. Nicholls. Biology and conservation of owls of the northern hemisphere: second international symposium, February 5-9, 1997, Winnipeg, Manitoba, Canada. U.S. Forest Service, North Central Forest Experiment Station, General Technical Report NC-190.
- Biswell, H. H. 1960. Danger of wildfire reduced by prescribed burning in ponderosa pine. *California Agriculture* 14(10):5-6.
- Biswell, H. H. 1989. Prescribed burning in California wildlands vegetation management. University of California Press, Berkeley, CA. 255 pp.

References Cited

- Biswell, H. H., H. R. Kallander, R. Komarek, R. J. Vogel, H. Weaver. 1973. Ponderosa fire management. Tall Timbers Research Station, miscellaneous publication 2. Tallahassee, FL.
- Board of Lemhi County Commissioners. 2006. Lemhi County wildland fire hazard, risk, and mitigation plan. Board of Lemhi County Commissioners, Salmon, ID. Online: www.idl.idaho.gov/nat_fire_plan/county_wui_plans/lemhi
- Brown, A. A. and K. P. Davis. 1973. Forest fire: control and use. 2nd edition. McGraw Hill, New York, NY. 686 pp.
- Buckley, A. J. 1992. Fire behavior and fuel reduction burning: Bemm River wildfire, October 1988. *Australian Forestry* 55:135-147.
- Buenger, B. 2003. The impact of wildland and prescribed fire on archaeological resources. Dissertation submitted to the Department of Anthropology, University of Kansas. www.blm.gov/heritage/docum/fire
- California Department of Forestry and Fire. 2007. Angora fire incident information, final report. <http://cdfdata.fire.ca.gov/incidents>
- Canton-Thompson, J. and D. Silvieus. 1999. Understory burning gets the job done *in* Ecoreport, Fall 1999. U.S. Forest Service, Rocky Mountain Research Station.
- Clark, R. N. and Stankey, G. H. 1979. The recreation opportunity spectrum: A framework for planning, management, and research. Pacific Northwest Forest and Range Experiment Station. General Technical Report. PNW-98.
- Clevette, R. E., L. C. Cragg, G. Morgan, J. H. Rubini, F. L. Shelley, J. R. Shelly, and S. Caudle. 2007. Toward a collaborative cost management strategy. 2006. U.S. Forest Service large wildfire cost review recommendations. A report on 2006 wildland fires by the independent large wildfire cost panel chartered by the U.S. Secretary of Agriculture, Washington, D.C. <http://www.fs.fed.us/fire/BR6988~1.PDF>
- Cochran, P. H. 1992. Stocking levels and underlying assumptions for uneven-aged ponderosa pine stands. U.S. Forest Service. Pacific Northwest Research Station. PNW-RN-509.
- Cochran, P. H., J. M. Geist, D. L. Clemens, R. R. Clausnitzer, D. C. Powell. 1994. Suggested stocking levels for forest stands in northeastern Oregon and southeastern Washington. U.S. Forest Service. Pacific Northwest Research Station. PNW-RN-513.
- Conkin, D. A. and W. A. Armstrong. 2002. Effects of three prescribed fires on dwarf mistletoe infection in southwestern ponderosa pine. U.S. Forest Service. Southwestern Region Forestry and Forest Health. R3-01-02.
- Cooper, C. F. 1960. Changes in vegetation, structure, and growth of southwestern pine forests since white settlement. *Ecological Monographs*. 30(2): 129-164.
- Costello, C. M., D. E. Jones, K. A. Green Hammond, R. M. Inman, K. H. Inman, B. C. Thompson, R. A. Deitner, and H. B. Quigley. 2001. A study of black bear ecology in New Mexico with models for population dynamics and habitat suitability. Final Report. Federal Aid in Wildlife Restoration Project W-131-R.

- Covington, W. W. and M. M. Moore. 1992. Post-settlement changes in natural fire regimes: implications for restoration of old-growth ponderosa pine forests. Pages 81-99 *in* Kaufmann, W. H., W. H. Moir, and R. L. Bassett (technical coordinators). Old-growth forests in the Southwest and Rocky Mountain regions: proceedings of a workshop, March 9-13, 1992, Portal, AZ. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-213.
- Covington, W. W. and M. M. Moore. 1994. Southwestern ponderosa forest structure: changes since Euro-American settlement. *Journal of Forestry* 92 (1): 39-47.
- Cram, Douglas S., T. T. Baker, J. C. Boren. 2006. Wildland fire effects in silviculturally treated vs. untreated stands of New Mexico and Arizona. U.S. Forest Service. Rocky Mountain Research Station Research Paper RMRS-RP-55.
- Cram, D. S., T. T. Baker, A. G. Fernald, A. Madrid, B. Rummer. 2007. Mechanical thinning impacts on runoff, infiltration, and sediment yield following fuel reduction treatments in a southwestern dry mixed conifer forest. Final report. *Journal of Soil and Water Conservation*.
- Dahms, C. W. and B. W. Geils, technical editors. 1997. An assessment of forest ecosystem health in the Southwest. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Southwestern Region, General Technical Report RM-GTR-295.
- Dancker, R. 2001. Burned Area Report for the Scott Abel Fire. Informal Report FS-2500-8. U.S. Forest Service, Lincoln National Forest, Alamogordo, NM. August 9, 2001.
- Dancker, R. 2001. Burned Area Report for the Cree Fire. Informal Report FS-2500-11. U.S. Forest Service, Lincoln National Forest, Alamogordo, NM. November 28, 2001.
- Deal, K. 2002. Fire effects to lithic artifacts. Paper presented at the cultural resources and fire planning training, January 14-18, 2002, Shepherdstown, WV.
- DeBano, L. F., D. G. Neary, P. F. Ffolliott. 1998. Fire's effects on ecosystems. John Wiley & Sons, Inc., New York, NY.
- Delaney, D. K. and T. G. Grubb. 2003. Sound recordings of road maintenance equipment on the Lincoln National Forest, New Mexico. Construction Engineering Research Laboratory, Rocky Mountain Research Station. Final Report. 55 pages.
- Delaney, D. K., T. G. Grubb, P. Beier, L. L. Pater, M. H. Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. *Journal of Wildlife Management* 63(1): 60-76.
- Denton, C. 2006. Mexican spotted owl protected activity centers, pre-settlement plots, Smokey Bear Ranger District, Lincoln National Forest. Ecosystem Restoration Institute. Northern Arizona University. Unpublished Report. 21 pages.
- Dieterich, J. H. 1980. Chimney Spring forest fire history. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Research Paper RM-220.
- Dieterich, J. H. 1983. Fire history of southwestern mixed conifer: a case study. *Journal of Forest Ecology and Management*. 6:13-31.

References Cited

- Dixon, G. E. compiler. 2003. Essential FVS: a user's guide to the forest vegetation simulator. Internal Report. U.S. Forest Service, Forest Management Service Center, Fort Collins, CO. 193 pp.
- Dixon, G. E. 2006. Central Rockies variant of the forest vegetation simulator. U.S. Forest Service, Forest Management Service Center, Fort Collins, CO.
- Ducey, M. J. and B. C. Larson. 2003. Is there a correct stand density index? An alternative interpretation. *Western Journal of Applied Forestry* 18: 179-184.
- Edminster, C. B. and W. K. Olsen. 1996. Thinning as a tool in restoring and maintaining diverse structure in stands of southwestern ponderosa pine. Pages 62-68 *in* Conference on adaptive ecosystem restoration: restoration of Cordilleran conifer landscapes in North America, June 6-8, 1996. U.S. Forest Service, Rocky Mountain Range and Experiment Station, General Technical Report RM-GTR-278.
- Elliot, W. J., D. E. Hall, and D. L. Scheele. 1999. WEPP: Disturbed (Draft 12/1999). WEPP interface for predicting road runoff, erosion, and sediment delivery. Technical documentation. U.S. Forest Service, Rocky Mountain Research Station and San Dimas Technology and Development Center.
- Elliot, W. J., D. E. Hall, and D. L. Scheele. 2000. WEPP: Disturbed (Draft 02/2000). WEPP interface for disturbed forest and range runoff, erosion, and sediment delivery. Technical documentation. U.S. Forest Service, Rocky Mountain Research Station and San Dimas Technology and Development Center.
- Elliot, W. J. and P. R. Robichaud. 2006. WEPP FuME fuel management erosion analysis. Online at <http://forest.moscowfsl.wsu.edu/cgi-bin/fswepp/fume/fume.pl>. Accessed September 2007.
- Ferguson S. A., S. J. McKay, D. E. Nagel, T. Piepho, M. L. Rorig, C. Anderson, and L. Kellogg. 2003. Assessing values of air quality and visibility at risk from wildland fires. U.S. Forest Service, Pacific Northwest Research Station, Research Paper PNW-RP-550.
- Fiala Anne C. S., S. L. Garman, A. N. Gray. 2006. Comparison of five canopy cover estimation techniques in the western Oregon Cascades. *Forest Ecology and Management* 232: 188-197.
- Fiedler, C. E. and C. E. Keegan. 2003. Reducting crown fire hazard in fire-adapted forests of New Mexico. Pages 39-48 *in* Fire, fuel treatments, and ecological restoration: conference proceedings, April 16-18, 2002. U.S. Forest Service, Rocky Mountain Research Station, P-29.
- Fiedler, C. E., C. E. Keegan, and S. F. Arno. 1997. Utilization as a component of restoring ecological processes in ponderosa pine forests. U.S. Forest Service, Forest Products Laboratory, General Technical Report FPL-GTR-100.
- Floyd, M. L., D. D. Hanna, and W. H. Romme. 2004. Historical and recent fire regimes in piñon-juniper woodlands on Mesa Verde, CO. *Forest Ecology and Management* 198:269-289.
- Fule, P. Z, A. EM. Waltz, W. W. Covington, T. A. Heinlein. Measuring forest restoration effectiveness in reducing hazardous fuels. *In* *Journal of Forestry*, Vol. 99, No.11, Nov. 2001: 24-29.

- Fulé, P. Z., J. E. Crouse, A. E. Cocke, M. M. Moore, and W. W. Covington. 2003. Changes in canopy fuels and potential fire behavior 1880-2040: Grand Canyon, AZ. *Ecological Modelling*, 175: 231-248.
- Frey, J. K. and C. R. Wampler. 2005. Preliminary analysis of red squirrel densities in mixed coniferous forest in the Lincoln National Forest. Informal thesis project report. New Mexico State University Dept. of Fishery and Wildlife Sciences and Dept. of Biology. Las Cruces, NM. 5 pages.
- Gehring, C. and T. Whitham. 1995. Environmental stress influences aboveground pest attack and mycorrhizal mutualism in pinyon-juniper woodlands: implications for management in the event of global warming. Pages 30-27 *in*: Desired future conditions for pinyon-juniper ecosystems. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RM-258.
- George, T. L. and S. Zack. 2001. Temporal and spatial effects on restoration of habitat for wildlife. *Restoration Ecology* 9: 272-279.
- Ghalambor, C. K. and R. C. Dobbs. 2006. Pygmy nuthatch (*Sitta pygmaea*): a technical conservation assessment. [Online] U.S. Forest Service, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/pygmy_nuthatch.pdf
- Graham, R. T., A. E. Harvey, T. B. Jain, and J. R. Tonn. 1999. The effects of thinning and similar stand treatments on fire behavior in western forests. U.S. Forest Service, Pacific Northwest Research Station and U.S. Bureau of Land Management, General Technical Report PNW-GTR-463.
- Graham, R. T., A. S. McCaffrey, T. B. Jain. 2004. Science basis for changing forest structure to modify wildfire behavior and severity. U.S. Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-120.
- Green, L. R. 1977. Fuelbreaks and other fuel modification for wildland fire control. USDA Agricultural Handbook. 499 pp.
- Grissino-Mayer, H. D. and T. W. Swetnam. 1995. Effects of habitat diversity on fire regimes in El Malpais National Monument, New Mexico. *In*: Brown, J. K., R. W. Mutch, C. W. Spoon, and R. H. Wakimoto (technical coordinators). Proceedings: symposium on fire in wilderness and park management, March 30 - April 1, 1993, Missoula, MT. U.S. Forest Service, Intermountain Research Station, General Technical Report INT-GTR-320.
- Grubb, T. G. and R. M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. *Journal of Wildlife Management* 55: 500-511.
- Gruell, G. E. 1985. Indian fires in the interior West: A widespread influence. *In*: James E. Lotan, editor. Proceedings: Symposium and Workshop on Wilderness Fire, November 15-18, 1983, Missoula, MT, U.S. Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. General Technical Report INT-182.
- Gruell, G. E., W. C. Schmidt, S. F. Arno, and W. J. Reich. 1982. Seventy years of vegetative change in a managed ponderosa pine forest in western Montana – implications for resource management. U.S. Forest Service, Intermountain Research Station, General Technical Report INT-130.

References Cited

- Haecker, Charles 2001 Fire Effects on Materials of the Historic Period. In, *Wildland Fire in Ecosystems: Effects of Fire on Cultural Resources and Archeology*. Kevin C. Ryan and Anne Trinkle Jones, editors. Rainbow Series, Rocky Mountain Research Station, U.S. Forest Service.
- Hall, F. C. 1974. Fire and vegetation in the Blue Mountains - implications for land managers. Pages 155-163 *in*: Komarek, E.V., Sr. (general chairman). Proceedings 15th Tall Timbers Fire Ecology Conference, Pacific Northwest, Portland, Oregon. Tall Timbers Research Station, Tallahassee, FL.
- Hanks, J. P, and W. A. Dick-Peddie. 1974. Vegetation patterns of the White Mountains, New Mexico. *Southwestern Naturalist* 18: 372-382.
- Hann, W. J. and D. L. Bunnell. 2001. Fire and land management planning and implementation across multiple scales. *International Journal of Wildland Fire*. 10:389-403
- Hann, W. J. and D. J. Strohm. 2003. Fire regime condition class and associated data for fire and fuels planning: methods and applications. p 337-443. In: Omi, Philip N.; Joyce, Linda A., technical editors. *Fire, fuel treatments, and ecological restoration: Conference proceedings; 2002 16-18 April; Fort Collins, CO*. Proceedings RMRS-P-29. Fort Collins, CO: U.S. Forest Service, Rocky Mountain Research Station. 475 p.
- Hardy, C. C., R. D. Ottmar, J. L. Peterson, J. E. Core, P. Seamon. 2001. *Smoke management guide for prescribed and wildland fire, 2001 edition*. National Wildfire Coordination Group. PMS 420-2. NFES 1279. 226 pp.
- Harrington, M. G. 1987. Ponderosa pine mortality from spring, summer and fall crown scorching. *Western Journal of Applied Forestry* 31 (1):156-163.
- Harrington, M. G. and S. F. Arno. 1999. *Ameliorating unhealthy forest conditions*. U.S. Forest Service, Rocky Mountain Research Station, EcoReport.
- Harrington, M. G. and F. G. Hawksworth. 1990. Interactions of fire and dwarf mistletoe on mortality of southwestern ponderosa pine. Pages 234-240 *in*: J. S. Krammes (technical coordinator). 1990. *Effects of fire management of southwestern natural resources: proceedings of the symposium, November 15-17, 1988, Tucson, AZ*. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-191.
- Harrington, C. A., S. D. Roberts, L. C. Brodie. 2005. Tree and understory responses to variable density thinning in western Washington. In: *Balancing ecosystem values proceedings, regional experiments: 97-101*. U.S. Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, Olympia, WA.
- Hatchett, B., M. P. Hogan, M. E. Grismer. 2006. Mechanical mastication thins Lake Tahoe forest with few adverse impacts. *California Agriculture*, Volume 60, Number 2: 77-82.
- Hawksworth, F. G. 1995. *Dwarf mistletoes: biology, pathology, and systematics*, U.S. Forest Service., Washington, D.C, Agriculture Handbook 450.
- Hedwall, S. J., C. L. Chambers, S. S. Rosenstock. 2006. Red squirrel use of dwarf mistletoe-induced witches' brooms in Douglas-fir. *Journal of Wildlife Management* 70 (4): 1142-1147.

- Heffelfinger, J. R., C. Brewer, C. H. Alcalá-Galvan, B. Hale, D. L. Weybright, B. F. Wakeling, L. H. Carpenter, and N. L. Dodd. 2006. Habitat guidelines for mule deer: southwest deserts ecoregion. Mule Deer Working Group, Western Association of Fish and Wildlife Agencies. 48 pp.
- Helms, J. A. 1979. Positive effects of prescribed burning on wildfire intensities. *Fire Management Notes* 40(3): 10–13.
- Hill, B. 2000. Fire management lessons learned from the Cerro Grande (Los Alamos) fire and action needed to reduce fire risks. U.S. General Accounting Office testimony before the subcommittee on forests and forest health and committee on resources, House of Representatives. GAO/T-RCED-00-273. Online: www.gao.gov/cgi-bin (accessed October 2007).
- Hoover, R. L. and D. L. Wills, ed. 1984. Managing forested lands for wildlife. Colorado Division of Wildlife in cooperation with U.S. Forest Service, Rocky Mountain Region, Denver, CO. 459 pp.
- Huckaby, L. S., and P. M. Brown. 1996. Fire history in mixed conifer forests of the Sacramento Mountains, southern New Mexico, final report. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station. 33 p.
- Hugh, E. K. and K. G. Cameron. 2001. Pygmy nuthatch. In: *Birds of North America*, No. 567 (A. Poole and F. Gillies). The birds of North America, Inc., Philadelphia, PA. Accessed online Nov. 12, 2007.
- Jackman R. E. and Jenkins J. M. 2004. Protocol for evaluating bald eagle habitat and populations in California. U.S. Fish and Wildlife Service, Endangered Species Division.
- Jenness, J. S. 2000. The effects of fire on Mexican spotted owls in Arizona and New Mexico. Thesis, Northern Arizona University, Flagstaff, AZ.
- Jenness, J. S., P. Beier, J. L. Ganey. 2004. Associations between forest fire and Mexican spotted owls. *Forest Science* 50 (6): 765-772.
- Kalabodkidis, K. D. and P. N. Omi. 1998. Reduction of fire hazard through thinning/residue disposal in the urban interface. *International Journal of Wildland Fire* 8(1): 29-35.
- Kalabodkidis, K. D. and R. H. Wakimoto. 1992. Prescribed burning in uneven-aged management of ponderosa pine/Douglas-fir forests. *Journal of Environmental Management* 34(3): 221-235.
- Kamees, L. 2002. Long-range plan for the management of wild turkey in New Mexico 2001-2005. New Mexico Department of Game and Fish, Santa Fe, NM. 31 pp.
- Kaufmann, M. R., L. S. Huckaby, C. M. Regan, and J. Popp. 1998. Forest reference conditions for ecosystem management in the Sacramento Mountains, New Mexico. U.S. Forest Service. Rocky Mountain Research Station, General Technical Report RMRS-GTR-19: 58-63.
- Klopaatek, C. C., L. F. DeBano, and J. M. Klopaatek. 1990. Impact of fire on the microbial processes in pinyon-juniper woodlands: management implications. Pages 197-205 in: Krammes, J. S. (technical coordinator). *Effects of fire management of Southwestern*

References Cited

- natural resources, November 15-17, 1988, Tucson, AZ. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RM-191.
- Koonce, A. L. and L. F. Roth. 1980. The effects of prescribed burning on dwarf mistletoe in ponderosa pine. Pages 197-203 *in* Proceedings, sixth conference on fire and forest ecology; April 22-24, 1980, Seattle, WA. Society of American Foresters.
- Koprowski, J. L., K. M. Leonard, C. A. Zugmeyer, and J. L. Jolley. 2006 Direct Effects of Fire on Endangered Mount Graham Red Squirrels. *The Southwestern Naturalist*: 51(1):59-63.
- Kozlowski, T. T. and C. E. Ahlgren ed. 1974. *Fire and ecosystems*. Academic Press. Inc., New York, NY. 542 pp.
- Kucera T. 2005. Juniper titmouse. California wildlife habitat relationships system. Database, version 8.1. California Department of Fish and Game.
- LeCount, A. L. and J. C. Yarchin. 1990. Black bear habitat use in east central Arizona. Arizona Game and Fish Department. Final Report. Technical Report 4. September 1990. Accessed online: www.bison-m.org.
- Leopold, A. 1924. Grass, brush, timber and fire in southern Arizona. *Journal of Forestry* 22(6): 1-10.
- Leopold, L. B. 1951. Vegetation of Southwestern watersheds in nineteenth century. *Geographic Review* 41: 295-316.
- Lincoln County 2007. County Assessor's Database, Property Owners. Accessed August 2007.
- Long, James N. 1985. A practical approach to density management. *Forest Chronicle* 61: 23-27.
- McCaw, J., K. Candelaria, A. Johnson, and N. Mower. 2007. Sacramento Salamander *Aneides hardii* annual report. Unpublished report on file at the Lincoln National Forest, Smokey Bear Ranger District, Ruidoso, NM.
- Miller, R. F. and R. J. Tausch. 2001. The role of fire in juniper and pinyon woodlands: a descriptive analysis *in*: Proceedings of the invasive species workshop: the role of fire *in* Galley, K. E. M. and T. P. Wilson, (editors). *The control and spread of invasive species*, held at fire conference 2000, the first national congress on fire ecology, prevention, and management. Tallahassee, FL. Tall Timbers Research Station. 146 pp..
- Minnich, R. A., M. G. Barbour, J. H. Burk, J. Sosa-Ramirez. 2000. California mixed-conifer forests under unmanaged fire regimes in the Sierra San Pedro Martir, Baja California, Mexico. *Journal of Biogeography* 27: 105-129.
- Moeur, M. and A. R. Stage. 1995. Most similar neighbor: an improved sampling inference procedure for natural resource Forest Science planning. *Forest Science* 41(2):337-359.
- Nakamura, G. 1996. Harvesting forest biomass reduces wildfire fuel. *California Agriculture* 50(2): 13-16.
- NatureServe. 2007. NatureServe Explorer: An online encyclopedia of life {web application}. Version 6.2 NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: August thru October 2007).

- New Mexico Department of Game and Fish. 2006. Comprehensive wildlife conservation strategy for New Mexico. Accessed online: http://fws-nmcfwru.nmsu.edu/cwcs/documents/CWCS_NM_Feb142006.pdf
- New Mexico Department of Game and Fish. 2006. Mule deer of New Mexico. NM Department of Game and Fish, Santa Fe, NM. 3 pages. Accessed online: www.wildlife.state.nm.us, November 2007.
- New Mexico Environment Department Air Quality Bureau. 2005. New Mexico Smoke Management Program Guidance Document. New Mexico Environment Department, Santa Fe, NM.
- New Mexico Environment Department. 2006. Total maximum daily load for the Rio Hondo watershed (Lincoln County): Pecos River to headwaters. 303d report. New Mexico Environment Department, Santa Fe, NM.
- New Mexico State University. 2007. New Mexico Climate Center, weather statistics, for Ruidoso, NM. www.weather.nmsu.edu
- Oliver, W. W. 1995. Is self-thinning in ponderosa pine ruled by *Dendroctonus* bark beetles? Pages 213-218 *In*: Eskew, L. G. (compiler). Forest health through silviculture: proceedings of the 1995 national silviculture workshop, May 8-11, 1995, Mescalero, NM. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-GTR-267.
- Omi, P. N. 1996. The role of fuelbreaks. Pages 89-96 *in*: Proceedings of the seventeenth forest vegetation management conference, January 16-18, 1996, Redding, CA.
- Omi, P. N., E. J. Martinson, G. W. Chong. 2007. Effectiveness of pre-fire fuels treatments. Joint Fire Science Program: Final Report JFSP Project 03-2-1-07.
- Ortega, Aaron M., David S. Martinez, and Roy A. Hall. 2005. Evaluating risks associated with forest management scenarios in areas dominated by mixed severity fire regimes in southeastern New Mexico, Phase III of the Lincoln capability assessment. Lincoln National Forest, Alamogordo, NM.
- Paysen, T. E., R. J. Ansley, J. K. Brown, G. J. Gottfried, S. M. Haase, M. G. Harrington, M. G. Narog, S. S. Sackett, R. C. Wilson. 2000. Fire in western shrubland, woodland, and grassland ecosystems. 2000. U.S. Forest Service. General Technical Report. RMRS-GTR-42-vol2. 132 pages.
- Peterson, D. L., M. C. Johnson, J. K. Agee, T. B. Jain, D. McKenzie, and E. D. Reinhardt. 2005. Forest structure and fire hazard in dry forests of the western United States. Pacific Northwest Research Station. General Technical Report. PNW-GTR-628. 29 pages.
- Pilliod, D. S., E. L. Bull, J. L. Hayes, and B. C. Wales. 2006. Wildlife and invertebrate response to fuel reduction treatments in dry coniferous forests of the western United States: a synthesis. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-173.
- Pilliod, D. S., K. Shick, M. E. Velasquez. 2007. The Wildlife Habitat Response Model: a tool for estimating terrestrial wildlife habitat responses to fuel treatments. Model Location: <http://forest.moscowfsl.wsu.edu/fuels/tools.html>.

References Cited

- Pollet, J. and P. Omi. 1999. Effect of thinning and prescribed burning on wildfire severity in ponderosa pine forests, final report. U.S. Forest Service, Intermountain Research Station, Agreement INT-95075-RJVA.
- Pollet, J. and P. N. Omi. 2002. Effect of thinning and prescribed burning on wildfire severity in ponderosa pine forests. *International Journal of Wildland Fire* 11: 1-10.
- Ramotnik, C. A. 2007. Effects of the Scott Able fire on Sacramento Mountain salamander abundance and arthropod prey base. U.S. Geological Survey, Administrative Report. 81 pp.
- Reinhardt, E. D. and N. L. Crookston (eds.). 2003. The fire and fuels extension the forest vegetation simulator. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-116.
- Reynolds, R. T., R. T. Graham, M. H. Reiser, R. L. Bassett, P. L. Kennedy, D. A. Boyce, Jr., G. Goodwin, R. Smith, and E. L. Fisher. 1992. Management recommendations for the northern goshawk in the southwestern United States. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-217.
- Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight Web site. http://www.partnersinflight.org/cont_plan/ (VERSION: March 2005).
- Romme, W., L. Floyd-Hanna, and M. Conner. 1993. Effects of fire on cultural resources at Mesa Verde National Park. *Park Science* 13: 28-30.
- Rothermel, R. C. 1983. How to predict the spread and intensity of forest and range fires. U.S. Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-143.
- Rothermel, R. 1991. Predicting behavior and size of crown fires in the northern Rocky Mountains. U.S. Forest Service, Intermountain Research Station, Research Report INT-438.
- Ruidoso Valley Chamber of Commerce. 2007a. Official Web site of the Ruidoso Valley Chamber of Commerce. <http://www.ruidosonow.com/economic.asp>
- Rummer, B. 2004. Mastication treatments and costs. In: Fuels planning-- science synthesis and integration. U.S. Forest Service. Rocky Mountain Research Station. Research Note. RMRS-RN-20-1-WWW.
- Rustay, C. and S. Norris. 2006. New Mexico bird conservation plan. New Mexico Partners in Flight. Accessed online: www.hawksaloft.org/pif Version 2.1. Accessed Aug-Nov. 2007
- Sackett, S. S. 1979. Natural fuel loadings in ponderosa pine and mixed conifer forest of the Southwest. U.S. Forest Service, Rocky Mountain Research Station, Research Paper RM-213.

- Sackett, S. S. 1980. Reducing natural ponderosa pine fuels using prescribed fire: two case studies. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. RM-392.
- Salas, Danney. 2006. Lincoln National Forest management indicator species assessment. U.S. Forest Service. Unpublished report on file at the Lincoln National Forest, Smokey Bear Ranger District, Ruidoso, NM. 30 pp.
- Sandberg, D. V. and F. N. Dost. 1990. Effects of prescribed fire on air quality and human health. Pages 191-138 *in*: Walstad, J. D., S. R. Radosevich, and D. V. Sandberg (editors). Natural and prescribed fire in Pacific Northwest forests. Oregon State University Press, Corvallis, OR.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2007. The North American breeding bird survey, results and analysis 1966-2006. Version 7.23.2007. USGS Patuxent Wildlife Research Center, Laurel, MD. Available online: <http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>. Accessed 9/14/2007
- Savage, M. and T. W. Swetnam. 1990. Early 19th-century fire decline following sheep pasturing in a Navajo ponderosa pine forest. *Ecology* 71(6): 2374-2378.
- Schmidt, W. C. 1985. Historical considerations. Pages 1-6 *in* Brooks, H. H., J. J. Colbert, R. G. Mitchell and R. W. Stark (coordinators.). *Managing trees and stands susceptible to western spruce budworm*. U.S. Forest Service Technical Bulletin No. 1695. Washington, DC. 111 pp.
- Schmidt, W. C. and R. H. Wakimoto. 1988. Cultural practices that can reduce fire hazards to homes in the interior west. Pages 131-141 *in*: *Protecting people and homes from wildfire in the interior West: proceedings of the symposium and workshop*. U.S. Forest Service, Intermountain Research Station, General Technical Report INT-251.
- Schmidt, K. M., J. P. Menakis, C. C. Hardy, W. J. Hann, and D. L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-87.
- Schroeder, M. and C. Buck. 1970. *Fire weather - a guide for application of meteorological information to forest fire control operations*. USDA, Washington, DC. Agricultural Handbook 360.
- Scott, J. H. 1998. Fuel reduction in residential and scenic forests: a comparison of three treatments in a western Montana ponderosa pine stand. U.S. Forest Service, Rocky Mountain Research Station, Research Paper RMRS-RP-5.
- Scott, J. H. and R. E. Burgan. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-153.
- Scott, J. H. and E. D. Reinhardt. 2001. Assessing crown fire potential by linking models of surface and crown fire behavior. U.S. Forest Service, Rocky Mountain Research Station, Research Paper RMRS-RP-29.
- Scott, J. H., Reinhardt, E. D. 2005. Stereo photo guide for estimating canopy fuel characteristics in conifer stands. Gen. Tech. Rep. RMRS-GTR-145. Fort Collins, CO. U.S. Forest Service. Rocky Mountain Research Station. 49 p.

References Cited

- Seyedbagheri, K. A. 1996. Idaho forestry best management practices, a compilation of research on their effectiveness. U.S. Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-GTR-339.
- Skovlin, J. M. 1982. Habitat requirements and evaluations. In: Thomas, Jack Ward; Toweill, Dale E., eds. *Elk of North America: ecology and management*. Harrisburg, PA: Stackpole Books: 369-414.
- Smith, J. K., ed. 2000. *Wildland fire in ecosystems: effects of fire on fauna*. U.S. Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-42-vol. 1.
- Stelman, T. and G. Kunkel. *Community Responses to Wildland Fire Threats in New Mexico. Ruidoso—A Case Study*. North Carolina Department of Forestry. Online at www.ncsu.edu/project/wildfire/ruidoso.html
- Swetnam, T. W., 1990. Fire history and climate in the Southwest United States. Accessed online: <http://tree.ltrr.arizona.edu/~tswetnam/tws-pdf/firehistandclim.pdf>.
- Swetnam, T. W. 1992. Oldest known conifers in the southwestern United States: temporal and spatial patterns of maximum age. Pages 24-38 *in* Kaufmann, W. H., W. H. Moir, and R. L. Bassett (technical coordinators). *Old-growth forests in the Southwest and Rocky Mountain regions: proceedings of a workshop, March 9-13, 1992, Portal, AZ*. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-213.
- Swetnam, T. W. and Baisan, C. H. 1996. Historical fire regime patterns in the southwestern United States since AD 1700. Pages 11-32 *in*: Allen, C. D. (editor). *Fire effects in Southwestern forests: proceedings, 2nd La Mesa fire symposium, March 29-31, 1994, Los Alamos, NM*. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RMGTR-286.
- The Nature Conservancy. 2006. VanderLee, B., R. Smith, and J. Bate eds. *Ecological and biological diversity of the Lincoln National Forest*; In: *Eco-regional conservation analysis of Arizona and New Mexico mountains: ecological and biological diversity of national system land in Region 3*. Chapter 15: 1-54.
- Touchan, R. and T. W. Swetnam. 1991. *Fire history in northern New Mexico*. Final report to U.S. Forest Service from U.S. National Park Service, Bandelier National Monument. Unpublished report. Available from Santa Fe National Forest supervisors office, Santa Fe, NM.
- Traylor, D., L. Hubell, N. Wood, and B. Fiedler. 1990. *The 1977 La Mesa fire study: an investigation of fire and fire suppression impact on cultural resources in Bandelier National Monument*. Southwest Cultural Resources Center Professional Paper No. 28. Branch of Cultural Resource Management, Division of Anthropology, National Park Service, Santa Fe, NM.
- U.S. Census Bureau. 2007c. American Fact Finder. P8. Hispanic or Latino by race [17] - universe: total population; data set: Census 2000 summary file 1(SF 1) 100 percent data. <http://factfinder/census.gov/>

- U.S. Census Bureau. 2007d. American Fact Finder. P8. Sex by age [79] - universe: total population; data set: Census 2000 summary file 3 (SF 3) - sample data. <http://factfinder.census.gov/>
- U.S. Census Bureau. 2007e. American Fact Finder. P82. Per capita income in 1999 (dollar) [1] - universe: total population; data set: Census 2000 summary file 3 (SF 3) - sample data. <http://factfinder.census.gov/>
- U.S. Census Bureau. 2007f. American Fact Finder. P87. Poverty status in 1999 by age [17] - universe: population for whom poverty status is determined; data set: Census 2000 summary file 3 (SF 3) - sample data. <http://factfinder.census.gov/>
- U.S. Census Bureau. 2007g. American Fact Finder. D-P3. Profile of selected economic characteristics 2000. <http://factfinder.census.gov/>
- U.S. Census Bureau. 2007a. American Fact Finder. P7. Race [8] - universe: total population; data set: Census 2000 summary file 1(SF 1) 100 percent data. <http://factfinder/census.gov/>
- U.S. Census Bureau. 2007b. American Fact Finder. Population Finder. 2006 estimated population for Ruidoso Village, NM. <http://factfinder/census.gov/>
- USDA-ARS. 2007. WEPP Model Documentation - Water Erosion Prediction Project Web site. USDA Agricultural Research Service, National Soil Erosion Research Laboratory, <http://topsoil.nserl.purdue.edu/nserlweb/weppmain/docs/readme.htm> (accessed 8/2/2007).
- U.S. Forest Service. 1974. National forest landscape management, volume 2, chapter 1, the visual management system. U.S. Forest Service, Agriculture Handbook Number 462. Available at Forest Service offices.
- U.S. Forest Service. 1980. National forest landscape management, volume 2, chapter 5, timber. U.S. Forest Service, Agriculture Handbook Number 559. Available at Forest Service offices.
- U.S. Forest Service. 1984. Terrestrial ecosystem unit survey report. Unpublished report on file at the Lincoln National Forest, Smokey Bear Ranger District, Ruidoso, NM.
- U.S. Forest Service. 1986. Land and Resource Management Plan for the Lincoln National Forest, as amended (aka Forest Plan). U.S. Forest Service, Southwestern Region, Albuquerque, NM. Online at: www.fs.fed.us/r3/lincoln
- U.S. Forest Service. 1991. Forest and rangeland birds of the United States natural history and habitat use. Agriculture Handbook 688. 625 pp.
- U.S. Forest Service. 1999. Assessing the effects of fire disturbance on ecosystems: A scientific agenda for research and management. U.S. Forest Service, Pacific Northwest Research Station. PNW-GTR-455
- U.S. Forest Service. 1999. List of Regional Forester's Sensitive Species. Region 3. Lincoln National Forest, Ruidoso, NM.
- U.S. Forest Service. 2000. Protecting people and sustaining resources in fire-adapted ecosystems: a cohesive strategy. U.S. Forest Service publication, online at <http://www.fs.fed.us/publications>

References Cited

- U.S. Forest Service. 2000. Fire in western shrubland, woodland, and grassland ecosystems. In Chapter 6, Gen. Tech. Rep. RMRS-GTR-42-vol.2:121-131
- U.S. Forest Service. 2001. Burned Area Report for the Scott Able Fire. Lincoln National Forest, Southwestern Region. On file at supervisor's office, File Reference FS-2500-8.
- U.S. Forest Service. 2002. Lincoln National Forest: Forest plan monitoring and evaluation report for fiscal year 2001. Lincoln National Forest, Alamogordo, NM. p 8.
- U.S. Forest Service. 2003. Monitoring and Evaluation Report. Lincoln National Forest, Alamogordo, NM.
- U.S. Forest Service. 2003. First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities Among New Mexico Historic Preservation Officer and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer and Oklahoma State Historic Preservation Officer and The Advisory Council on Historic Preservation and United States Department of Agriculture, Forest Service, Region 3. Available from Forest Service offices in Alamogordo or Albuquerque, NM.
- U.S. Forest Service 2004. Mastication treatments and costs. In: Fuels planning—science synthesis and integration, economic uses fact sheet 1. Rocky Mountain Research Station Research Note. RMRS-RN-20-1-WWW
- U.S. Forest Service. 2005. A strategic assessment of forest biomass and fuel reduction treatments in western states. Rocky Mountain Research Station Gen. Tech. Rpt. RMRS-GTR-149. 17p.
- U.S. Forest Service. 2006. Perk-Grindstone roads analysis. Unpublished report on file at the Lincoln National Forest, Smokey Bear Ranger District, Ruidoso, NM.
- U.S. Forest Service. 2007. Revised list of Regional Forester's Sensitive Species. Region 3. Lincoln National Forest, Ruidoso, NM.
- U.S. Forest Service. 2007. An assessment of fuel treatment effects on fire behavior, suppression effectiveness, and structure ignition on the Angora fire. Pacific Southwest Region Report. Online at: www.fs.fed.us/r5/angorafuelsassessment
- U.S. Fish and Wildlife Service. 1995. Recovery plan for the Mexican spotted owl: vol. I. Albuquerque, NM. 172 pages.
- U.S. Fish and Wildlife Service. 2001. Biological opinion on wildland-urban interface fuel treatments. Prepared for the U.S. Forest Service, Southwestern Region by U.S. Fish and Wildlife Service, Albuquerque, NM. Available online at: www.fs.fed.us/r3/wui
- U.S. Fish and Wildlife Service. 2002. Evaluating the net benefit of hazardous fuels treatment projects. Memorandum to Regional Directors and Administrators, Regions 1-7, from the Director of Fish and Wildlife Service. December 10, 2002.
- U.S. Fish and Wildlife Service. 2005. Programmatic Biological and Conference Opinion. The continued implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region. Region 2 U.S. Fish and Wildlife Service. Cons. No. 2-22-03-F-366. 1,010 pages.

- U.S. Fish and Wildlife Service. 2007. New Mexico listed and sensitive species list, Lincoln County. <http://www.fws.gov/southwest/es/newmexico/SBC.cfm>
- U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. Available online at: <http://www.wetlandstudies.com/doc>: 14-15.
- U.S. General Accounting Office. 2003. FEMA Cerro Grande Claims. Report to the Committee on Appropriations, U.S. Senate, and the Committee on Appropriations, House of Representatives, May 2003. GAO-03-623.
- Van Wagner, C. E. 1977. Conditions for the start of crown fire. *Canadian Journal of Forest Research* 3:373-378.
- Van Wagner, C. E. 1993. Prediction of crown fire behavior in two stands of jack pine. *Canadian Journal of Forestry* 23(3): 442-449.
- van Wagtenonk, J. W. 1996. Use of a deterministic fire growth model to test fuel treatments. Pages 1,155-1,165 *in*: Sierra Nevada ecosystem project: final report to Congress, vol. II, assessments and scientific basis for management options. Water Resources Center Report No. 37, Centers for Water and Wildland Resources, University of California, Davis, CA. 1,528 pp.
- Veblen, T. T. and D. C. Lorenz. 1991. *The Colorado Front Range: a century of ecological change*. University of Utah Press, Salt Lake City, UT. 186 pp.
- Village of Ruidoso. 2004. Community wildfire protection plan. Available online at: <http://www.emnrd.state.nm.us/FD/FireMgt/documents/RUIDOSO.pdf>
- Village of Ruidoso. 2004. Village of Ruidoso Comprehensive Plan. Online at: www.voruidoso.com/PlanningZoning/ComprehensivePlan.html
- Wagle, R. F. and T. W. Eakle. 1979. A controlled burn reduces impact of a subsequent wildfire in a ponderosa pine vegetation type. *Forest Science* 25: 123-129.
- Wagner, H. 2007. Bull Hog Masticator thins forest: Santa Fe watershed protected by thinning trees to prevent forest fires. Associated Construction Publications.
- Ward, J. P., Jr. 2001. Ecological responses by Mexican spotted owls to environmental variation in the Sacramento Mountains, NM. PhD. Dissertation, Department of Biology, Colorado State University, Fort Collins, CO.
- Weatherspoon, C. P. and Skinner, C. N. 1996. Landscape-level strategies for forest fuel management. Pages 1,471-1,492 *in*: Sierra Nevada ecosystem project: final report to Congress, vol. II, assessments and scientific basis for management options. Water Resources Center Report No. 37, Centers for Water and Wildland Resources, University of California, Davis, CA. 1,528 pp.
- Weaver, H. 1951. Fire as an ecological factor in Southwestern ponderosa pine forest. *Journal of Forestry* 49(2): 93-98.
- Wildland Fire Leadership Council. 2006. A collaborative approach for reducing wildland fire risks to communities and the environment. 10-year strategy implementation plan. In collaboration with USDI, USDA, Western Governors Association and National Association of State Foresters. Available online:

References Cited

- http://www.forestsandrangelands.gov/plan/documents/10-YearStrategyFinal_Dec2006.pdf
- Wilkinson, M. C. 1997. Reconstruction of historical fire regimes along an elevation and vegetation gradient in the Sacramento Mountains, NM. MS thesis, University of Arizona, Tucson, AZ. 124 pp.
- Williams, S. B., E. D. Twombly, R. J. Perisho, M. W. Riffe, K. S. Shewmaker, and J. D. Marston. 1998. INFORMS Version 1.1 Users Guide. U.S. Forest Service, http://www.fs.fed.us/informs/Usersguide/informs_help.html
- Woodbridge, B. and C. D. Hargis. 2005. Northern goshawk inventory and monitoring guide. U.S. Forest Service Internal Report.
- Young, P. J., V. L. Greer, S. K. 2002. Characteristics of Bolus Nest of Red Squirrels in the Pinaleno and White Mountains of Arizona. *The Southwest Naturalist*, Vol. 47, No. 2. pp 267-275.
- Zouhar, K., J. K. Smith, S. Sutherland. 2007. Effects of fire on nonnative invasive plants and invasibility of wildland ecosystems. Available online at: http://www.fs.fed.us/fmi/products/Zouhar_et_al_2007_pdfs/Chap02.pdf. Accessed on November 15, 2007.