
Part 3—Design Criteria

Design criteria include legal and regulatory compliance, treatment and clear need criteria, the decision tree, standards and guidelines, and monitoring and evaluation procedures. Design criteria are sideboards for subsequent projects and activities to help achieve the desired conditions.

Legal and regulatory direction, treatment and clear need criteria, the decision tree, standards and guidelines, and monitoring and evaluation procedures are included in this part.

Legal and Regulatory Compliance

The National Environmental Policy Act of 1969 (NEPA) at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with... other environmental review laws and executive orders.” The Monument will be guided by applicable laws, regulations, policies, and guidelines. This Monument Plan supplements, but does not replace, the direction from those sources.

The Monument is guided by direction from numerous sources. The governing source of legal direction is the Proclamation (Clinton 2000); this section discusses other laws and executive orders. Laws passed by Congress such as NEPA, the Organic Act of 1897, the National Forest Management Act of 1976 (NFMA), the Multiple Use Sustained Yield Act of 1964 (MUSYA), and the Endangered Species Act of 1973 (ESA), provide direction for certain aspects of management. At the national level, the Resources Planning Act of 1974 (RPA) gives broad direction and the Administrative Procedure Act of 1966 (APA) (P.L. 79-404) governs the way in which administrative agencies of the federal government may propose and establish regulations.

Applicable laws, regulations, policies, and executive orders, as well as Forest Service manual and handbook guidance, memoranda of understanding, conservation strategies, and programmatic agreements, are listed here by resource. The relevant documents are available on the Forest Service website (<http://www.fs.fed.us/publications/>) and from Forest Service offices. The list included here is not all inclusive.

Scientific Study and Adaptive Management

- Forest Service Handbook (FSH) 1909.12-2006-5, Chapter 40—Science and Sustainability: direction

regarding scientific review guidelines and procedures

Vegetation, including Giant Sequoia Groves

- National Forest Management Act of 1976
- National Forest Resource Management: Forest Service Manual (FSM) 2000—Chapter 2020—Ecological Restoration and Resilience
- Silvicultural Practices Handbook (FSH 2409.17), Silvicultural Examination and Prescription Handbook (FSH 2409.26d)
- Timber Management: FSM 2400—Silvicultural Practices Chapter

Fire and Fuels

- Guidance for Implementation of Federal Wildland Fire Management Policy, February 2009
- Fire Management: FSM 5100

Air Quality

- Federal Clean Air Act: The Federal Clean Air Act (CAA) is the federal law passed in 1963, and last amended in 1990, (42 U.S.C. §7401 et seq.) which is the basis for national control of air pollution.
- National Ambient Air Quality Standards (NAAQS): These are standards for pollutants considered harmful to public health and the environment. The EPA has set the NAAQS for six principal pollutants, which are called “criteria pollutants” (see Table III-2: National ambient air quality standards). Smoke contributes to PM₁₀ and to a lesser degree NO₂, CO, and O₃.

- Class I areas: These include national parks, wildernesses, and some U.S. Fish and Wildlife refuges that were in existence at the passage of the 1977 Clean Air Act amendments. These areas are provided special protection from new and modified major stationary sources. Federal land managers are mandated an affirmative responsibility to protect values that might be affected by air pollution, including visibility and other air quality-related values.
 - Regional Haze Rule: These regulations require states to review how pollution emissions within the state affect visibility at class I areas across a broad region. These rules also require states to make “reasonable progress” in reducing any effect this pollution has on visibility conditions in class I areas and to prevent future impairment of visibility. The states are required by the rule to analyze a pathway that takes the class I areas from current conditions to “natural conditions” in 60 years. “Natural conditions” is a term used in the Clean Air Act that means that no human-caused pollution can impair visibility. This program, while aimed at class I areas, will improve regional visibility and air quality throughout the country.
 - Conformity Rule: This rule implements the Clean Air Act conformity provision, which mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve, any activity not conforming to an approved state implementation plan.
 - EPA Interim Policy on Wildland and Prescribed Fire, announced in 1998: This EPA interim policy integrates two public policy goals: (1) to allow fire to function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems, and (2) to protect public health and welfare by mitigating the effects of air pollutants on air quality and visibility.
 - California Clean Air Act (H&S §§ 39660 et seq.): California adopted the California Clean Air Act (CCAA) in 1988. The Act provides the basis for air quality planning and regulation in California independent of federal regulations, and establishes ambient air quality standards for the same criteria pollutants as the federal clean air legislation.
- San Joaquin Valley Air Pollution Control District. The district is comprised of eight counties that share a common air district: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties. Local air pollution control districts in California develop plans and implement control measures in their areas of jurisdiction. These collectively make up California’s state implementation plan. These controls primarily affect stationary sources but do include sources of dust and smoke. The following district regulations may directly or indirectly affect planning in the Monument:
- Public Nuisance (Rule 4102): Prohibits air discharge of material that causes nuisance or annoyance to any considerable number of people.
 - Prescribed Burning and Hazard Reduction (Rule 4106): This rule was adopted June 21, 2001, in response to California’s Title 17, and is designed to permit, regulate, and coordinate the use of prescribed burning and hazard reduction burning while minimizing smoke effects on the public.
 - Fugitive Dust (Regulation 8): The existing Regulation 8 rules were developed to implement control strategies for major sources of dust. These include construction, demolition, excavation, extraction, handling/storage, landfills, paved/unpaved roads, and open areas. EPA has recently cited deficiencies in these existing rules and the district is evaluating a series of new rules aimed at further reductions in particulates. The San Joaquin Valley Air Pollution Control District (Valley Air District) is responsible for implementing and regulating air quality programs for Fresno County, Tulare County, and a portion of Kern County in the Sequoia National Forest. The Valley Air District regulations can be found at: <http://www.valleyair.org/index.htm>. The Valley Air District has set rules to limit fugitive dust emissions. However, activities conducted at an elevation of 3,000 feet or higher above sea level are exempt. Kern County Air Pollution Control District, which serves eastern Kern County, has set rules for fugitive dust but currently excludes national forests and recreation areas.
 - Memorandum of understanding between the California Air Resources Board (CARB) and the Forest Service, signed on July 13, 1999: CARB has set more stringent standards, oversees state and

local actions, and implements programs for toxic air pollutants, heavy-duty trucks, locomotives, ships, aircraft, off-road diesel equipment, and some types of industrial equipment.

- The Smoke Management Guidelines for Agricultural and Prescribed Burning (Title 17) are the regulatory basis for California’s smoke management program. Amendments to California’s Title 17 may directly or indirectly affect planning in the Monument. The smoke management guidelines became effective on March 14, 2001. Local air pollution control districts use these guidelines in local rule development. These guidelines are currently being revised by the CARB.
- General Conformity State Implementation Plan Handbook (1995)

Climate Change

- Environmental Protection Agency (EPA) “State of Knowledge” paper (2007) development
- Climate Change Consideration in Project Level NEPA Analysis, January 13, 2009

Wildlife and Plant Habitat

Wildlife

- Endangered Species Act (ESA): The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered (TE) species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service concerning TE species under their jurisdiction. It is Forest Service policy to analyze effects to TE species to ensure management activities are not likely to jeopardize the continued existence of a TE species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a biological assessment (BA).

- FSM and FSH, Chapter 2670. Forest Service Sensitive (FSS) species are species identified by the regional forester for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and to ensure their continued viability on national forests. It is Forest Service policy to analyze effects to FSS species to ensure management activities do not create a significant trend toward federal listing or loss of viability. This assessment is documented in a biological evaluation (BE).
- The California Condor Recovery Plan (USDI 1996) provides guidelines for management of nest and roost sites. The 1988 Forest Plan designated the Starvation Grove nest area and Lion Ridge roost area, which are within the Monument (USDA Forest Service 1988a pp. 3-29, 4-27 to 4-28).
- Bald and Golden Eagle Protection Act of 1940
- Migratory Bird Treaty Act of 1918
- Valley Elderberry Longhorn Beetle (VELB) Recovery Plan provides habitat management objectives from the U.S. Fish and Wildlife Service (USDI 1993b)

Threatened, Endangered, and Sensitive Species

- Endangered Species Act (ESA): The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the USFWS and the National Marine Fisheries Service concerning threatened or endangered species under their jurisdiction.
- Executive Order 13112, Invasive Species 64 FR 6183 (February 8, 1999), to prevent and control the introduction and spread of invasive species
- FSM and FSH, Chapter 2670. Forest Service Sensitive (FSS) species are species identified by the regional forester for which population viability

is a concern. The Forest Service develops and implements management practices to ensure that plants and animals do not become threatened or endangered and to ensure their continued viability on national forests. It is Forest Service policy to analyze effects to sensitive species to ensure management activities do not create a significant trend toward federal listing or loss of viability.

Botanical Resources

- FSM Chapter 2070, Regional Native Plant Policies.

Invasive Nonnative Species

- FSM, Chapter 2081.03 requires that a weed risk assessment be conducted when any ground disturbing activity is proposed. Determines the risk of introducing or spreading noxious weeds associated with the proposed action. Projects having moderate to high risk of introducing or spreading noxious weeds must identify noxious weed control measures that must be undertaken during project implementation.
- Executive Order 13112 of Feb. 3, 1999 directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to and control such species; not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and take all feasible and prudent measures to minimize risk of harm in conjunction with the actions.
- Pacific Southwest Region Noxious Weed Management Strategy
- Sequoia National Forest Weed Management Guidelines
- Continue to participate in and work toward the goals of the California Interagency Coordinating Committee Memorandum of Understanding signed in 1995. Coordinated weed management will take place in the context of regional and local cooperative weed management areas, which allow effective strategy development and cost-sharing in specific areas to solve common weed problems.

Range

- Secretary of Agriculture regulations relating to grazing and livestock on the National Forest System in 36 CFR 222
- Legislative authorities for administration of the National Forest System range program are described in FSM 2201. Objectives, policies, and responsibilities for the range management program are in FSM 2202 through 2204, and FSM 2230.01 through 2230.06. National direction and guidance for grazing permit administration is contained in FSM 2230 through FSM 2238.
- 1997 Rangeland Analysis and Planning Guide

Hydrological Resources

- Organic Act of 1897, Object of Forest Reservations, states that “Public forest reservations are established to protect and improve the forests for the purpose of...insuring conditions favorable to continuous water flow.”
- Clean Water Act of 1948 (as amended in 1972 and 1987) establishes as federal policy the control of point and non-point source pollution and assigns the states the primary responsibility for control of water pollution. Compliance with the Clean Water Act by national forests in California is achieved under state law.
- Non-point source pollution on national forests is managed through the Regional Water Quality Management Plan (USDA 2000), which relies on implementation of prescribed best management practices (BMPs).
- The California Water Code consists of a comprehensive body of law that incorporates all state laws related to water, including water rights, water developments, and water quality. The laws related to water quality (Sections 13000 to 13485) apply to waters in national forests and are directed at protecting the beneficial uses of water.
- The Porter-Cologne Water Quality Act, as amended in 2006, is included in the California Water Code. This act provides for the protection of water quality by the State Water Resources Control Board and the Regional Water Quality Control Boards, which are authorized by the U.S.

Environmental Protection Agency to enforce the Clean Water Act in California.

- Executive Orders 11988 and 11990 (Floodplains and Wetlands) require federal agencies to avoid, to the extent possible, short- and long-term effects resulting from the occupancy and modification of floodplains and the modification or destruction of wetlands. Standards and guidelines are provided for soil, water, wetlands, and riparian areas to minimize effects to floodplains and wetlands. They incorporate the BMPs of the Soil and Water Conservation Handbook. The standards and guidelines apply to all floodplains and wetlands where less restrictive management might otherwise occur.
- Region 5, FSH 2509.22, Chapter 20
- *Sequoia National Forest Cumulative Watershed Effects Field Guide* (Kaplan-Henry and Machado 1991)

Groundwater

- Judicial doctrine and water-rights case law provide the legal interpretations of federal and state statutes about usage and management of groundwater (see FSM 2541.01 and FSH 2509.16 for procedures to be followed for complying with federal policy and state water rights laws).
- The Forest Service national groundwater policy is intended to set out the framework in which groundwater resources are to be managed on NFS lands. As of the publication date of this document, the national policy has not yet been finalized. However, the Technical Guide for Ground Water Resource Management provides a framework for the management of groundwater resources while the national policy is completed.
- Safe Drinking Water Act of 1974, as amended (42 U.S.C. §300f et seq.): The intent of the SDWA is to ensure the safety of drinking water supplies. Its authority is used to establish drinking water standards and to protect surface and groundwater supplies from contamination.
- Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. §6901 et seq.): The Resource Conservation and Recovery Act (RCRA) regulates the generation, transportation, treatment, storage and disposal of waste materials. It has very specific requirements for the protection and monitoring of groundwater and surface water at operating facilities that may generate solid wastes or hazardous wastes.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. §9601 et seq.): Also known as “Superfund,” the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulates cleanup of existing environmental contamination at non-operating and abandoned sites (see also FSM 2160).
- National Environmental Policy Act of January 1, 1970 (NEPA) (83 Stat. 852 as Amended; 42 U.S.C. 4321, 4331-4335, 4341-4347) (FSM 1950.2): This act directs all agencies of the Federal Government to utilize a systematic interdisciplinary approach which will ensure the integrated use of the natural and social sciences in planning and in decision making which may have an effect on man’s environment. Hydrogeology is one of the applicable sciences.
- Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (RPA) (88 Stat. 476; 16 U.S.C. 1600-1614) as amended by National Forest Management Act of October 22, 1976 (90 Stat. 2949; 16 U.S.C. 1609) (FSM 1920 and FSM 2550): This act requires consideration of the geologic environment through the identification of hazardous conditions and the prevention of irreversible damages. The Secretary of Agriculture is required, in the development and maintenance of land management plans, to use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.
- Federal Water Pollution Control Act of July 9, 1956, as Amended (33 U.S.C. 1151) (FSM 2501.1); Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816) (FSM 2501.1), and Clean Water Act of 1977 (91 Stat. 1566; 33 U.S.C. 1251) (FSM 2501.1, 7440.1): These acts are intended to enhance the quality and value of the water resource and to establish a national policy for the prevention, control, and abatement of water pollution. Groundwater

information, including that concerning recharge and discharge areas, and information on geologic conditions that affect ground water quality are needed to carry out purposes of these acts.

Geological Resources

- Mining and Minerals Policy Act of December 31, 1970 (84 Stat. 1876; 30 U.S.C. 21a): This act provides for the study and development of methods for the reclamation of mineral waste products and the reclamation of mined lands. This requires an evaluation of geology as it relates to groundwater protection and geologic stability.
- Surface Mining Control and Reclamation Act of August 3, 1977 (SMCRA) (30 U.S.C. 1201, 1202, 1211, 1221–43, 1251–79, 1281, 1291, 1309, 1311–16, 1321–28): This act enables agencies to take action to prevent water pollution from current mining activities and also promote reclamation of mined areas left without adequate reclamation prior to this act.
- Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. 4301 et seq.): This act provides that Federal lands be managed to protect and maintain, to the extent practical, significant caves.
- Wild and Scenic Rivers Act of October 2, 1968 (82 Stat. 906 as Amended; 16 U.S.C. 1271-1287): This act states that it is the policy of the United States that certain selected rivers of the nation which, with their immediate environments, possess outstanding scenic, recreation, geologic, fish and wildlife, cultural, or other similar values shall be preserved in free-flowing condition.

Paleontological Resources

- FSM 2360 pertaining to special interest areas
- Omnibus Public Land Management Act of 2009 (PL 111-011, Title VI, Subtitle D, Section 6300-6312 [16 USC 470aaa-11]) “Paleontological Resources Preservation”: This subtitle provides for the management and protection of paleontological resources on Federal land, including the development of plans for inventory, monitoring, and the scientific and educational use of such resources. It also identifies collection and curation

requirements, prohibited acts and penalties, rewards and forfeitures, and confidentiality.

Soils

- National Soil Management Handbook: The Soil Management Handbook (USDA 1991) is a national soils handbook that defines soil productivity and components of soil productivity, establishes guidance for measuring soil productivity, and establishes thresholds to assist in forest planning.
- Region 5 Soil Management Handbook Supplement (USDA 1991): The Forest Service Region 5 Soil Management Handbook Supplement (R5 FSH Supplement 2509.18-95-1) establishes regional soil quality analysis standards. The analysis standards address three basic elements for the soil resource: (1) soil productivity (including soil loss, porosity; and organic matter); (2) soil hydrologic function; and (3) soil buffering capacity. The analysis standards are to be used for areas dedicated to growing vegetation. They are not applied to lands with other dedicated uses such as developed campgrounds or administrative facilities.
- Regional Forester’s Letter (dated Feb 5, 2007): This letter provided clarification to forest supervisors on the appropriate use of the R5 Soil Management Handbook Supplement (R5 FSH Supplement 2509.18-95-1).

Human Use (Including Recreation, Scenery, and Civil Rights and Environmental Justice)

Recreation

Several authorities guide the provision of recreation opportunities. The FSM provides policy direction, primarily in FSM 2300 for recreation and FSM 2700 for special uses, for both recreation special uses and non-recreation special uses.

The primary management authorities for recreation and related resources are:

- The Term Permit Act of 1915 (38 Stat. 1101, as amended; 16 U.S.C. 497)

- The Multiple Use Sustained-Yield Act of 1960 (74 Stat. 215, as amended; 16 U.S.C. 528-531)
- The Wilderness Act of 1964 (16 U.S.C. 1131-1136)
- The National Historic Preservation Act of 1966 (Pub. L. 89-665; 80 Stat. 915; 16 U.S.C. 470 et seq.)
- The Federal Lands Recreation Enhancement Act, Title VIII, Div. J., of the Consolidated Appropriations Act for 2005, Pub. L. 108-447
- The Architectural Barriers Act of 1968, as amended (42 U.S.C. 4151 et seq.)
- The Rehabilitation Act of 1973, as amended, Sections 504 and 508 (29 U.S.C. 794 and 794d)
- Title V, Section 507c of the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. 12101 et seq.)
- In addition, the Organic Act of 1897, as amended (FSM 1021.11a), instructs the Secretary of Agriculture to preserve and to regulate occupancy and use of the national forests (16 U.S.C. 473-478, 479-482, 551); prohibitions on the use of National Forest System lands are contained in 36 CFR 261 (FSM 1023.4).

Numerous statutory authorities govern the issuance and administration of special use authorizations on National Forest System lands. Some of those laws are:

- The Organic Administration Act of 1897 (16 U.S.C. 477-482, 551)
- The Act of March 4, 1915, as amended in 1956 (16 U.S.C. 497), which authorizes term permits
- Section 7 of the Granger-Thye Act of 1950 (16 U.S.C. 490, 504, 504a, 555, 557, 571c, 572, 579a, 580c-5801, 581i-1)
- The Independent Offices Appropriation Act of 1952, as amended (31 U.S.C. 9701) (Office of Management and Budget Circular No. A-25 further defines this authority)
- The Wilderness Act of 1964 (16 U.S.C. 1131-1136)
- The Land and Water Conservation Fund Act of 1964, as amended (16 U.S.C. 4601-6a(c))
- The National Forest Roads and Trails Act of 1964 (16 U.S.C. 532-38)
- Title V of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761-1771)
- The Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3210)
- The National Forest Ski Area Permit Act of 1986 (16 U.S.C. 497b)
- The Omnibus Parks and Public Lands Management Act of 1996 (16 U.S.C. 497c)
- The Act of May 26, 2000 (16 U.S.C. 4061-6d), which supplements the authority to regulate commercial filming and still photography
- The Cabin User Fee Fairness Act of 2000 (16 U.S.C. 6201-6213)
- The National Forest Organizational Camp Fee Improvement Act of 2003 (16 U.S.C. 6231 et seq.).
- Special use regulations are in 36 CFR 251.

Scenery

- Agriculture Handbook 434:1973, National Forest Landscape Management, Volume 1
- Agriculture Handbook 701:1995, Landscape Aesthetics, A Handbook for Scenery Management
- *Built Environment Image Guide* (BEIG): The built environment, as used in this guide, refers to the administrative and recreation buildings, landscape structures, site furnishings, structures on roads and trails, and signs installed or operated by the U.S. Department of Agriculture (USDA) Forest Service, its cooperators, and permittees.

The elements of the built environment constructed on national forest lands and grasslands, or those used for administrative purposes in rural areas, towns, and cities, shall—to the extent practicable—incorporate the principles of sustainability, reflect their place within the natural and cultural landscape, and provide optimal service to our customers and cooperators. These elements will:

- Be located, planned, and designed with respect for the natural systems in which they reside.

- Aesthetically integrate their natural, cultural, and experiential context.
- Contain design elements, including appropriate signs, that reinforce a national agency identity.
- Emphasize efficiency of energy and materials consumption in construction and operation.
- Serve as premier examples to interpret conservation of natural resources and sustainable development.
- Create environments for people to enjoy and gain increased appreciation for the natural environment, and in which employees work productively, experiencing the connection to the resources they manage.

Civil Rights and Environmental Justice

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d-2000d-7; Sec. 2000d): Prohibition against exclusion from participation in, denial of benefits of, and discrimination under federally assisted programs on grounds of race, color, or national origin.
- Civil Rights Impact Analysis (CRIA) (FSM 1730.3)
- The Civil Rights Policy for USDA, Departmental Regulation 4300-4 dated May 30, 2003 (7 CFR 15d)
- Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations: Requires each federal agency to make achieving environmental justice part of its mission.
- Departmental Regulation (DR) 5600-2: Provides direction to agencies for integrating environmental justice considerations into USDA programs and activities, in compliance with EO 12898.

Socioeconomics

- Social Impact Analysis (1900-03)
- Healthy Forest Restoration Act (HFRA), (Section 303 of Public Law 108-148, December 3, 2003).
- Energy Act of 2008 (Public Law 110-234).

- Department of Agriculture Departmental Regulation 1350-001, September 11, 2008.
- Departmental Regulation 1340-007, March 14, 2008.

Cultural Resources/Tribal and Native American Interests

- Organic Act of 1897 (Title 16, United States Code (U.S.C.), section 473-478, 479-482, 551)
- Antiquities Act of 1906 (16 U.S.C. 431) In so doing, the USDA Forest Service built environment will strengthen and reinforce the image of the agency as an international conservation leader.
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990
- Historic Sites Act of 1935 (16 U.S.C. 461)
- National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470), and its implementing regulation 36 CFR 800
- Archaeological and Historic Preservation Act of 1974 (AHPA) (16 U.S.C. 469)
- Archaeological Resources Protection Act of 1979 (ARPA), as amended (16 U.S.C. 470aa et seq.), as implemented by 36 CFR part 296
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), as amended (25 U.S.C. 3001), as implemented by 43 CFR Part 10, Subpart B – Human Remains, Funerary Objects, Sacred Objects, or Objects of Cultural Patrimony From Federal or Tribal Lands
- Curation of Federally-owned and Administered Archaeological Collections, 36 CFR part 79
- National Indian Forest Resources Management Act (NIFRMA), Public Law 101-630, November 28, 1990
- American Indian Religious Freedom Act (AIRFA) (Public Law 103-344, October 6, 1994)
- Tribal Forest Protection Act of 2004 (Public Law 108-278, July 22, 2004)

- Executive Order 11593, Protection and Enhancement of the Cultural Environment, issued May 13, 1971
- Executive Order 13007, Indian Sacred Sites, issued May 24, 1996
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, issued November 6, 2000
- Executive Order 13287, Preserve America, issued March 3, 2003
- *The First Amended Regional Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings on the National Forests of the Pacific Southwest Region* (2001)
- *The Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Identification, Evaluation and Treatment of Historic Properties managed by the National Forests of the Sierra Nevada, California* (1996)
- Other regional programmatic agreements for individual historic property types, including lookouts, administrative buildings, and recreation residences, and specific undertaking types of fuel reduction and range; and subsequently issued programmatic agreements
- FSM 2300, Chapter 2360, Heritage Program Management
- FSM 1500, External Relations, Chapter 1560—State Tribal, County, and Local Agencies, Public and Private Organizations (2007)
- FSH 1509.13, American Indian and Alaska Native Relations Handbook
- Executive Memo, April 29, 1994, “Government-to-Government Relationship.”
- Executive Memo, September 23, 2004, “Government-to-Government Relationship.”

Transportation

- Highway Safety Act of 1966: The Department of Transportation is authorized and directed to assist and cooperate with other federal departments and agencies, state and local governments, private industry, and other interested parties to increase highway safety. Each state is responsible for implementing a highway safety program to reduce traffic accidents and deaths, injuries, and property damage.
- Title 36, Code of Federal Regulations, Part 212 (36 CFR 212): The implementing regulation for the National Forest Roads and Trails Act (FRTA) includes portions of the Travel Management Rule published in the Federal Register on November 9, 2005. Part 212, Subpart B, provides criteria for designation of roads and trails. Providing safe transportation facilities and considering the affordability of maintaining the transportation facilities are two of the criteria.
- The California Vehicle Code (CVC): The CVC contains regulations related to the use of motor vehicles in California, including motor vehicles used on the national forests. The CVC sets safety standards for motor vehicles and vehicle operators. It defines the safety equipment needed for highway legal and non-highway legal vehicles. The code also defines the roads and trails where non-highway legal motor vehicles may be operated.
- FSM sections 2350 and 7700 contain agency policy for management of the National Forest Transportation System (NFTS). FSH 7709.59 describes the maintenance management system the Forest Service uses and the maintenance standards needed to meet road management objectives (RMOs). FSH 2309.18 describes the maintenance management system the Forest Service uses and the maintenance standards needed to meet trail management objectives (TMOs).

Special Forest Products

- USDA Forest Service, 36 CFR Parts 223 and 261, Sale and Disposal of National Forest Products and Forest Botanical Products
- Federal Register/Vol. 73, No. 249/December 29, 2008/Rules and Regulations (FR 2008)

Clear Need Criteria/Standards and Guidelines

Ecological Restoration

These giant sequoia groves and the surrounding forest provide an excellent opportunity to understand the consequences of different approaches to forest restoration. These forests need restoration to counteract the effects of a century of fire suppression and logging. Fire suppression has caused forests to become denser in many areas, with increased dominance of shade-tolerant species. Woody debris has accumulated, causing an unprecedented buildup of surface fuels. One of the most immediate consequences of these changes is an increased hazard of wildfires of a severity that was rarely encountered in pre-Euroamerican times. Outstanding opportunities exist for studying the consequences of different approaches to mitigating these conditions and restoring natural forest resilience (Clinton 2000, pp. 24095-24096).

The Proclamation recommended managing the Monument for ecological restoration and maintenance of those restored conditions, but did not define the term. The Forest Service definition for ecological restoration can be found in the Forest Service Manual, Chapter 2020, Ecological Restoration and Resilience (FSM 2000, Sept. 22, 2008), which defines it as:

The process of assisting the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed. Restoration focuses on establishing the composition, structure, pattern, and ecological processes necessary to make terrestrial and aquatic ecosystems sustainable, resilient, and healthy under current and future conditions.

In addition, the Pacific Southwest Region of the Forest Service has published a Region 5 Ecological Restoration Leadership Intent that states:

Our goal for the Pacific Southwest Region is to retain and restore ecological resilience of the National Forest lands to achieve sustainable ecosystems that provide a broad range of services to humans and other organisms. Ecologically healthy and resilient landscapes, rich in biodiversity, will have greater capacity to adapt and thrive in the face of natural disturbances and large scale threats

to sustainability, especially under changing and uncertain future environmental conditions such as those driven by climate change and increasing human use (USDA 2011).

The Proclamation provides the context in which to use ecological restoration and maintenance for protecting and caring for the objects of interest. The Monument is located in a Mediterranean climate where species are adapted to frequent disturbances, usually due to wildfire. Ecological restoration in the Monument is likely to be strongly correlated to fuel treatments in the wildland urban intermix (WUI). However, focusing solely on burning to achieve ecological restoration would not address state air quality requirements or the need to achieve and maintain resiliency and heterogeneity. Advisory IV, Restoration of the Natural Fire Regime, from the Scientific Advisory Board, questions whether fire alone can be used to reach the desired conditions for giant sequoia groves and their ecosystems:

Fire often is a useful tool for restoring giant sequoia groves and other fire-adapted ecosystems (Hardy and Arno 1996; Stephenson 1996, 1999). However, issues such as human safety, air quality, water quality, endangered species, cumulative impacts with other management actions, current and desired forest structure, and current fuel loads mean that fire alone cannot always be used to achieve desired forest conditions (Weatherspoon 1996; Fulé et al. 1997; Piirto and Rogers 1999). In areas where fire alone cannot be used to achieve desired conditions, mechanical thinning often proves to be a useful alternative (Weatherspoon 1996) (The Scientific Advisory Board 2003).

And Advisory IX, Undesirable Fire Effects, from the Scientific Advisory Board states:

Fuels reduction strategies in the Sierra Nevada Forest Plan Amendment [2001 SNFPA] may not adequately protect the giant sequoias and mixed conifer ecosystem from catastrophic fire... One of the goals stated in the Monument Proclamation is to restore “natural forest resilience” (Clinton 2000). Some foresters, forest ecologists, and others believe that in some areas of the Monument, the standards

set forth in the Forest Plan Amendment may be too restrictive to meet this goal with regard to catastrophic wildfire, and to protect other objects of interest in the Monument (The Scientific Advisory Board 2003).

As a result, restoration and maintenance activities will likely involve the use of both fire and mechanical treatments to reduce fuels and manage vegetation to protect the objects of interest, to accomplish critical restoration objectives, and to improve resilience in this fire-adapted ecosystem. Ecological integrity will

Table 46 Management Direction for Ecological Restoration

Land Allocation/Species	Focus	Diameter Limit (inches)
General Monument ⁽¹⁾	Protection ⁽²⁾ Resiliency ⁽³⁾ Heterogeneity ⁽⁴⁾	20 (conifers) 12 (hardwoods)
Old forest emphasis	Protection Resiliency Heterogeneity	20
Northern goshawk and California spotted owl PACs: inside defense zones	Protection Resiliency	6 (within 1-2 acres of nest tree) 20 (elsewhere) ⁽⁵⁾
Northern goshawk and California spotted owl PACs: outside defense zones, inside threat zones or TFETA	Protection Resiliency	6 (within 1-2 acres of nest tree) ⁽⁶⁾
Carnivore den sites: inside defense zones	Protection	20 ⁽⁷⁾
Carnivore den sites: outside defense zones	Protection	Avoid ⁽⁸⁾
Wildland urban intermix (WUI): defense zone	Protection Public safety Resiliency	20
Giant sequoias outside WUI	Protection Resiliency	12
Giant sequoias inside WUI defense zone	Protection Resiliency Giant sequoia regeneration	12
Giant sequoias inside WUI threat zone	Protection Resiliency Giant sequoia regeneration	12
Tribal Fuels Emphasis Treatment Area (TFETA)	Protection Public safety Resiliency	20

1. Outside of other allocations.
2. Protection of objects of interest.
3. Promotion of resiliency.
4. Promotion of heterogeneity.
5. For northern goshawk and California spotted owl PACs within defense zones, mechanical treatments would be prohibited within 500 feet of nest trees. Prescribed burning would be allowed within the 500-foot buffer. Prior to burning, hand treatments could be conducted, including the felling of small trees, within the 1-2 acre area surrounding nest trees. The rest of the PAC could be mechanically treated, with a 20-inch diameter limit, to achieve fuels reduction goals.
6. In northern goshawk and California spotted owl PACs outside of defense zones, fuel treatments would be limited to prescribed fire. Prior to burning, hand thinning of trees less than 6 inches in diameter would be permitted within the 1-2 acre area surrounding nest trees. These restrictions would also apply where a goshawk or spotted owl PAC overlaps with WUI threat zone or the TFETA.
7. Inside defense zones, if necessary to achieve fuels objectives, mechanical treatments of ladder and surface fuels over 85 percent of the treatment area would be permitted, with a 20-inch diameter limit. Prescribed fire could be used if there is no other reasonable treatment method.
8. Fuel treatments within carnivore dens site buffers that are outside of defense zones would be avoided.

be maintained, making use of the same management tools, to keep landscapes ecologically healthy and resilient.

Types of Treatments

Two types of treatment are considered for ecological restoration in the Monument: fire (prescribed fire, managed wildfire, and the hand treatments that accompany them, including chainsaws) and mechanical (self-propelled ground-based machines). Site-specific project analysis will determine the scope and percentage of fire and mechanical treatments necessary to restore and maintain ecosystems, provide for public safety, and meet the desired conditions for the Monument.

There are two types of wildland fires: wildfires and prescribed fires. Prescribed fires are planned and used for ecological restoration following site-specific project analysis. Wildfires are caused by natural ignitions, such as lightning, or some type of human interaction. The term “managed wildfire” refers to the use of wildfires started by natural ignitions to protect, maintain, and enhance resources, and, whenever possible, allow fire to function in its natural ecological role. This is one tool used to restore and maintain the natural fire regime. Human-caused wildfires will continue to be suppressed, and not managed for resource benefits.

Unplanned natural ignitions will be evaluated on a case-by-case basis at the project level to determine if the fire should be allowed to burn. Managed wildfires would use strategies and tactics which provide for the protection of human health, safety, and natural and cultural resource values. Risks and complexities for all ignitions would be analyzed in order to determine those ignitions which could be successfully managed for ecological benefit. Managed wildfire can be used as a tool to reintroduce fire to the ecosystem, reduce unnatural fuel accumulations, and promote resilient forest structures under appropriate conditions (Fites-Kaufman 2005).

Throughout the Monument, even in WUI zones and the Tribal Fuels Emphasis Treatment Area (TFETA), mechanical treatments will be limited or prohibited:

- in wilderness (existing and proposed)
- in wild and scenic river corridors

- in inventoried roadless areas
- in research natural areas
- in riparian conservation areas
- on slopes exceeding 35 percent
- in areas greater than 9,000 feet in elevation
- in areas more than ¼ mile from a road

Based on these constraints, approximately 23 percent of the 328,315 acres of National Forest System land in the Monument could be considered for mechanical treatments (alone or in conjunction with fire treatments), compared to about 77 percent that could be considered for fire treatments.

Removal of Trees from Within the Monument

Any treatments that involve the removal of trees from within the Monument area, including both standing trees and downed logs, will only be permitted following a determination that removal of the trees is “clearly needed for ecological restoration and maintenance or public safety” (Clinton 2000, p. 24097).

Removal of trees, except for personal use fuel wood, from within the monument area may take place only if clearly needed for ecological restoration and maintenance or public safety (Clinton 2000, p. 24097).

In July 2008, the Forest Service provided a public comment period for reviewing the advisories from the Scientific Advisory Board and key terms used in the Proclamation. These comments were summarized in a report and then used to prepare an interpretation by the Forest Supervisor of the key principles of the Proclamation (Terrell 2009). The Forest Service interpretation includes this discussion on tree removal:

Tree Removal: Trees may only be removed if clearly needed for ecological restoration and maintenance or public safety. I have reviewed the comments received on the term “removal,” in the particular context of “tree removal” as stated in the Proclamation, to determine which definition to use for resource management in the Monument. I agree that “tree removal” is defined as “to take away or off of the Monument.”

As the Monument plan is developed, the environmental impact statement will be prepared to evaluate tree removal within the context of biomass removal during restoration activities. A number of restoration activities are likely to remove some form of biomass. The biomass removal may be in the form of burning on site, or production of secondary products such as wood chips, lumber, or other wood products (Terrell 2009).

An evaluation of clear need is required and will be completed before any site-specific projects that propose tree removal take place in the Monument. When evaluating if tree removal is clearly needed for ecological restoration and maintenance or public safety, the following removal criteria (numbered R1 through R3) will be applied. If the proposed treatment will also involve the felling of standing trees, the Forest Service will first apply the tree felling criteria (F1 through F5) outlined below, and will then apply the tree removal criteria.

The criteria to be applied in determining a clear need for the removal of trees are as follows:

R1. Protection of Objects of Interest: If keeping one or more trees on site would cause unacceptable fuels accumulation and fire severity effects (high tree mortality when fire is reintroduced); if removing trees would reduce the risk of wildfire to the giant sequoia groves, sensitive wildlife habitat, and adjacent communities at risk.

Woody debris has accumulated, causing an unprecedented buildup of surface fuels. One of the most immediate consequences of these changes is an increased hazard of wildfires of a severity that was rarely encountered in pre-Euroamerican times. Outstanding opportunities exist for studying the consequences of different approaches to mitigating these conditions and restoring natural forest resilience (Clinton 2000, pp. 24095-24096).

R2. Resiliency: If keeping one or more trees on site would provide a vector for insect or disease infestations at levels higher than currently known endemic levels.

These forests need restoration to counteract the effects of a century of fire suppression and logging. Fire suppression has caused forests to become denser in many areas, with increased

dominance of shade-tolerant species. Woody debris has accumulated, causing an unprecedented buildup of surface fuels. One of the most immediate consequences of these changes is an increased hazard of wildfires of a severity that was rarely encountered in pre-Euroamerican times (Clinton 2000, p. 24095).

R3. Public Safety: If keeping one or more trees on site would create a public safety hazard or attractive nuisance. Forest Service policy is to eliminate safety hazards from developed recreation sites, including trees or tree limbs identified as hazardous (FSM 2332). Depending on the situation, down trees in a developed recreation site may present a hazard if people are likely to climb on them and potentially fall and get hurt (becomes more likely if the logs are large and/or they are piled on top of one another).

Tree Felling

Any projects which propose the felling of trees inside the Monument will be subject to the following five criteria (numbered F1 through F5) for tree felling. These five criteria shall apply to any treatments which involve the felling of trees, whether or not removal of those trees from the Monument is also proposed. Where removal of the felled trees from the Monument is proposed, the proposal will also be subject to the “clearly needed” evaluation for tree and down log removal (criteria numbered R1 through R3) outlined above.

The Forest Service shall apply the following five criteria when proposing the felling of trees inside the Monument.

F1. Resiliency: If maintaining one or more standing trees on a site would deplete moisture, light, or nutritional resources critical to the health and survival of the plant community or forest.

These forests need restoration to counteract the effects of a century of fire suppression and logging. Fire suppression has caused forests to become denser in many areas, with increased dominance of shade-tolerant species. Woody debris has accumulated, causing an unprecedented buildup of surface fuels. One of the most immediate consequences of these changes is an increased hazard of wildfires of a severity that

was rarely encountered in pre-Euroamerican times (Clinton 2000, p. 24095).

F2. Regeneration: If maintaining one or more standing trees on a site would adversely affect the regeneration, longevity, or growth of giant sequoias and other desired species.

...a century of fire suppression has led to an unprecedented failure in sequoia reproduction in otherwise undisturbed groves (Clinton 2000, p. 24095).

F3. Heterogeneity: If maintaining one or more standing trees on a site would adversely affect the desired diversity or structure of a stand or forest.

Sequoias and their surrounding ecosystems provide a context for understanding ongoing environmental changes (Clinton 2000, p. 24095).

F4. Public Safety: If maintaining one or more standing trees on site would create a public safety hazard. Forest Service policy is to eliminate safety hazards from recreation sites, administrative sites, and the public transportation system of roads and trails, including trees or tree limbs identified as hazardous (FSM 2332).

F5. Recreation and Administrative Sites: Other projects that may be proposed in the Monument that could require tree felling include recreation or administrative site development and maintenance, scenic vistas, and road access and parking for these sites. These activities would meet the intent of the Proclamation, which provides the following:

The plan will provide for and encourage continued public and recreational access and use consistent with the purposes of the monument (Clinton 2000, p. 24097).

The management plan shall contain a transportation plan for the monument that provides for visitor enjoyment and understanding about the scientific and historic objects in the monument, consistent with their protection. For the purposes of protecting the objects included in the monument, motorized vehicle use will be permitted only on designated roads, and non-motorized mechanized vehicle use will be permitted only on designated roads and trails, except for emergency or authorized administrative

purposes or to provide access for persons with disabilities. No new roads or trails will be authorized within the monument except to further the purposes of the monument (Clinton 2000, p. 24098).

Decision Tree

Advisory IV, Restoration of the Natural Fire Regime, and Advisory XXVIII, Decision Tree, from the Scientific Advisory Board, advise that a decision tree be developed to help determine which methods of forest restoration and maintenance should apply at different locations (The Scientific Advisory Board 2003).

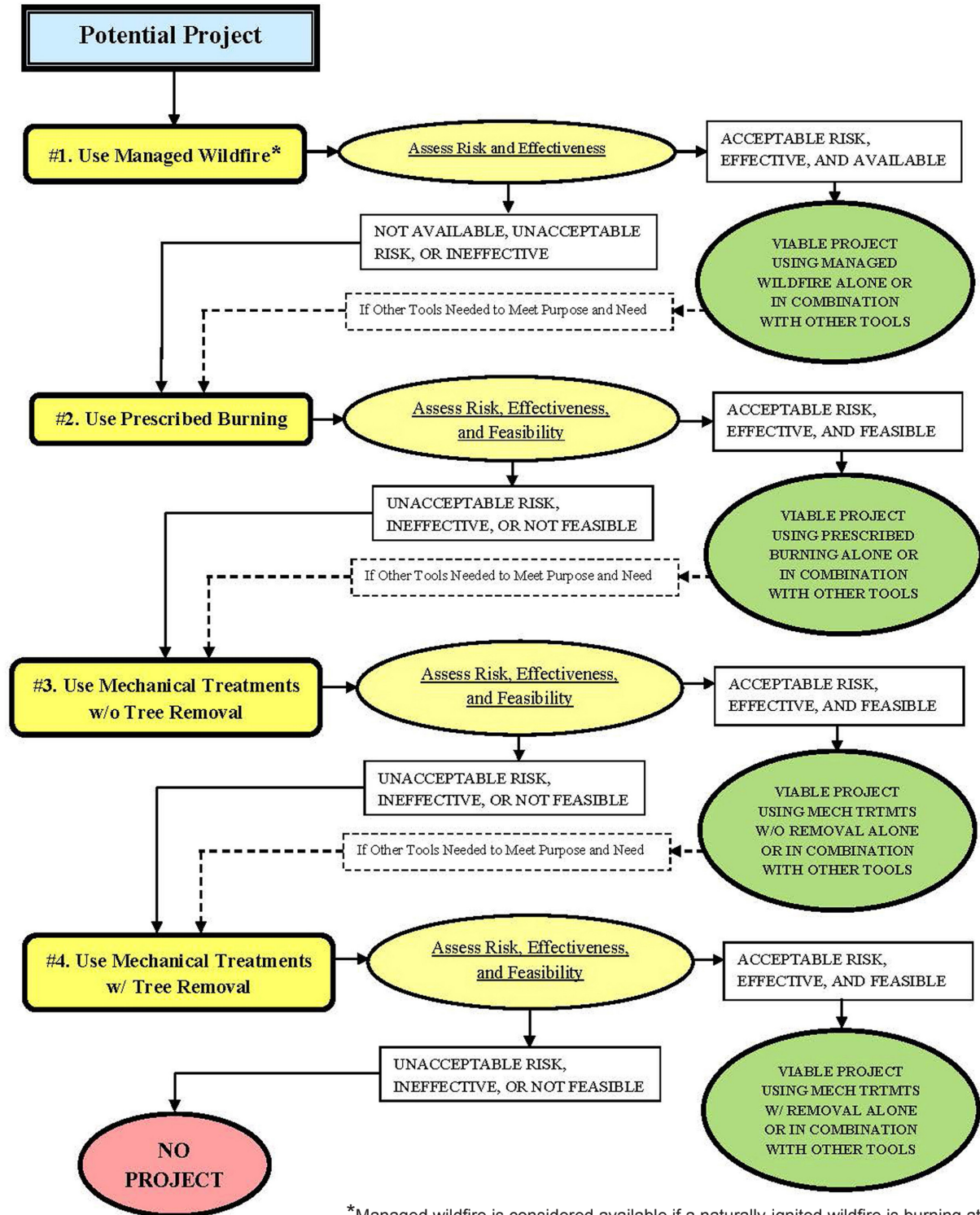
This decision tree (shown on the following page) will be used for each site-specific project proposed in the Monument. The desire to return the Monument to natural cycles and processes, including a natural fire interval, makes managed wildfire the preferred tool to accomplish ecological restoration and maintenance (as shown in Box #1). As the decision tree shows, the risks, feasibility, and effectiveness of using managed wildfire will be assessed to determine if it would meet ecological objectives and help protect the objects of interest. The evaluation will consider combining managed wildfire (when available) with other management tools to meet the purpose and need for the project. The availability of managed wildfire is difficult to anticipate. Managed wildfire is considered available if a naturally-ignited wildfire is burning at the desired time to initiate a project, or during project planning or implementation. If managed wildfire is available, the risks and effectiveness of using it will be weighed using the Wildland Fire Decision Support System (WFDSS), or subsequent systems developed for this purpose. If managed wildfire is not available, or needs to be used in combination with other treatments, the use of prescribed fire will be evaluated (as shown in Box #2).

A risk assessment will be conducted of local conditions such as slope, fuel loadings, and proximity to communities, giant sequoia groves, fisher den sites, and nest trees. The effectiveness of using prescribed fire will be evaluated to determine if the prescribed fire treatment will meet ecological objectives and help protect the objects of interest. Factors such as the availability of personnel and favorable burn days will help determine the feasibility of the treatment.

The evaluation will consider combining prescribed burning with other management tools to meet the purpose and need for the project. If the use of prescribed fire would create unacceptable risk to the

objects of interest, to forest users, or to communities; or would not meet ecological restoration objectives; or would not be feasible; or needs to be used in combination with other treatments, the use of

Figure 4 Decision Tree for Site-Specific Projects in the Monument



*Managed wildfire is considered available if a naturally-ignited wildfire is burning at the desired time to initiate a project, or during project planning or implementation.

mechanical treatment without tree removal will be assessed (as shown in Box #3). The use of mechanical treatment without tree removal will be assessed in a manner similar to the use of managed wildfire and prescribed fire, to determine if it would reduce risk and improve effectiveness and/or feasibility. The evaluation will consider combining mechanical treatments with other management tools to meet the purpose and need for the project.

Mechanical treatment with tree removal (Box #4) will only be considered if other methods do not meet ecological objectives in the project purpose and need. Additional analyses of the risks and hazards of leaving the trees in the Monument, the effectiveness of the treatment, and feasibility must show that mechanical treatment with tree removal is clearly needed to reduce the risk to acceptable levels, make the project effective in meeting restoration and protection objectives, and make it feasible. Only by meeting these criteria, would tree removal be used as part of a viable project.

It is possible that projects will plan to use a combination of management tools. For example, managed wildfire may be acceptable under certain conditions, but not others. Where it is acceptable,

it may be appropriate to plan for either managed wildfire or prescribed burning as the method to meet project objectives. Some projects may include a combination of fire and mechanical treatments. For example, in areas with heavy fuel accumulations, mechanical treatments could be used before fire is introduced to reduce risks and increase the effectiveness of prescribed burning or managed wildfire.

Standards and Guidelines

Standards and guidelines are requirements that preclude or impose limitations on resource management activities and are designed to be consistent with the objectives and desired conditions; they come into play as site-specific activities are planned to implement the Monument Plan. The standards and guidelines act as thresholds or constraints for management activities or practices to ensure the protection of resources. They may apply to the entire Monument or they may only apply to certain land allocations. The following standards and guidelines for the Monument are organized by resource area.

Standard/Guideline
Vegetation, including Giant Sequoias
<i>Monument-wide⁽¹⁾</i>
1. For all projects that include a proposal for tree removal from within the Monument, except for personal use fuelwood, conduct an evaluation to document the clear need for removing trees for ecological restoration and maintenance or public safety.
2. When implementing vegetation and fuels treatments, retain all conifer trees with a dbh of 20 inches or greater in westside forest types. Retain montane hardwoods with a dbh of 12 inches or larger in westside forest types. Occasional mortality of larger trees is expected to occur; however, design prescribed fire prescriptions and techniques to minimize the loss of large trees and large down material.
3. Incidental removal of trees that present safety hazards may deviate from vegetation management standards and guidelines.
4. Fall and remove hazard trees along Maintenance Level 3, 4, and 5 roads and within or immediately adjacent (tree falling distance) to administrative sites. Review by an appropriate resource specialist is required prior to falling hazard trees along Maintenance Level 1 and 2 roads. Retain felled trees, where needed, to meet down woody material standards.
5. Plant all regeneration areas requiring reforestation except where natural seeding is prescribed. Regeneration by natural seeding will be applied primarily in the true fir type.
6. Both natural and artificial regeneration shall be used as appropriate.

1. These standards and guidelines apply across all land allocations/management areas in the Monument (other than Wilderness and Wild and Scenic Rivers).

Standard/Guideline
7. Save viable existing reproduction where feasible and incorporate into silvicultural prescriptions for new stands.
8. Utilize current state-of-the-art regeneration techniques including controlling pests, such as gophers, and controlling competing vegetation.
9. Make dead and down woody material available for firewood gathering.
10. In order to maintain forest diversity, particularly within the mixed conifer forest type, reforestation and timber stand improvement prescriptions shall generally emulate desired species composition. Variation from this guideline will be the exception and will be discussed in an environmental document.
11. Design vegetation treatments to provide for edge corridors of cover and enhancement of special habitat features such as meadows for wildlife.
<i>Giant Sequoia Groves⁽²⁾</i>
12. Protect and manage giant sequoias to perpetuate the species and preserve old growth specimen trees.
13. Any naturally-occurring giant sequoia (1 foot or larger dbh) which is located within 500 feet of at least 3 other giant sequoias (each 1 foot or larger dbh), shall always be included within the hypothetical perimeter line (of the grove).
14. Refine the lower boundary of the zone of influence (ZOI) as necessary for groves adjacent to, included in, or in any way affected by proposed site-specific projects, to protect the giant sequoia groves and their associated ecosystems. Survey stream channels where downstream riparian ecotype is unknown, assign the downstream ecotype(s), identify the nearest stable stream channel below the grove, and refine the ZOI based on this new information (North et al 2002).
15. Several adjacent groves are to be managed as if they were one large grove, the hypothetical perimeter line, as defined, shall be a single line around the outermost giant sequoia trees in the complex of groves, taken as a whole.
16. Restrict mechanical entry and vegetation management within grove administrative boundaries. The following mechanical/motorized uses will be permitted within the grove boundary line: <ul style="list-style-type: none"> a. Use of existing roads, b. Management in accordance with approved fuel load reduction plans, where clearly needed for ecological restoration and maintenance or public safety, c. Use of light equipment to build and/or maintain trails, d. Expansion of parking areas for trailheads, e. Use of equipment to fight wildfires (use of heavy equipment off of existing roads will require Forest Supervisor approval), and f. Use of battery-operated wheelchairs. In Indian Basin Grove, there will be no felling of trees except for safety reasons in and near the Princess Campground area south and east of Highway 180.
17. Protect the named sequoias (such as the Boole Tree) from wildfires and fuels reduction activities. Protect these trees by pulling fuels away from the base of the tree or removing ladder fuels that can promote a crown fire in the named sequoia.
18. Manage the Freeman Creek Grove Management Area as a Botanical Area.
<i>Sugar Pine</i>
19. Silvicultural prescriptions are to consider means of maintaining the widest possible base of sugar pine genes. Generally, this means protecting as many sugar pine trees as possible while meeting land management plan objectives.

2. Using the ZOI grove allocation boundary.

Standard/Guideline
20. Continue to plant a modest mix (5-10 percent) of sugar pine along with other mixed conifer species. This may mean collecting seed from non-tested trees in order to maintain a sugar pine seedbank. With resistant stock this percentage could be increased.
21. Intensify the effort to collect sample cones from candidate resistant trees. This is a high priority.
22. Continue to protect trees that are known to carry resistance. Collect seed from these trees for our seedbank.
<i>Young Stands, Including Plantations</i>
23. In young stands of trees, apply the necessary silvicultural and fuels reduction treatments to: (a) accelerate the development of old forest characteristics, (b) increase stand heterogeneity, (c) promote hardwoods, and (d) reduce risk of loss to wildland fire. Use mechanical fuels treatments to remove the material necessary to achieve the following outcomes if the treated plantation was to burn under 90th percentile fire weather conditions: (a) wildland fire would burn with average flame lengths of 2 to 4 feet, (b) the rate of fire spread would be less than 50 percent of the pre-treatment rate of spread, and (c) fireline production rates would be doubled. Achieve these outcomes by reducing surface and ladder fuels and adjacent crown fuels. Treatments should be effective for more than 5 years.
<i>Hardwood Ecosystems</i>
24. During or prior to landscape analysis, spatially determine distributions of existing and potential natural hardwood ecosystems (Forest Service Handbook 2090.11). Identify hardwood restoration and enhancement projects.
25. Manage hardwood ecosystems for a diversity of hardwood tree size classes such that seedlings, saplings, and pole-sized trees are sufficiently abundant to replace large trees that die and maintain mast production.
26. Where possible, create openings around existing California black oaks and canyon live oaks to stimulate natural regeneration.
27. Retain the mix of mast-producing species where they exist within a stand.
28. Retain all blue oak and valley oak trees except where: (a) stand restoration strategies call for tree removal; (b) trees are lost to fire; or (c) tree removal is needed for public health and safety.
29. When planning prescribed fire or mechanical treatments in hardwood ecosystems: (a) consider the risk of noxious weed spread and (b) minimize effects to hardwood ecosystem structure and biodiversity.
<i>Fire and Fuels</i>
<i>Monument-wide</i>
1. Use the most recent inventories of fuel load to develop a fuel load reduction plan for each giant sequoia grove (within its administrative boundaries).
2. Incorporate fuel treatment and protection planning into reforestation plans. Ensure that tree stocking levels and silvicultural goals are consistent with fuel reduction objectives in plantations located in high and moderate fire hazard and risk areas.
3. Limit the structural change to treatment acres by mechanical methods to one per decade. Treatments should be designed to be effective for at least 10 years. When subsequent entries within 10 years are needed to reduce surface fuels, prescribed fire is the preferred method. When burning opportunities are limited, mechanical treatments, such as mastication and piling, are allowed.
4. Use lightning-caused fires to reduce fuel loads or to provide other resource benefits, such as conserving populations of fire-dependent species.
5. For prescribed fire treatments, use multiple entries, as needed, to achieve fuels management objectives, up to two burns per decade and four burns over 20 years.
6. When planning prescribed fire or mechanical treatments in hardwood ecosystems: (a) consider the risk of noxious weed spread and (b) minimize effects to hardwood ecosystem structure and biodiversity.
7. Design treatments in brush and shrub patches to remove the material necessary to achieve the following outcomes from wildland fire under 90th percentile fire weather conditions: (a) wildland fires would burn with an

Standard/Guideline
average flame length of 8 feet or less; (b) the fire’s rate of spread would be less than 50 percent of the pre-treatment rate of spread; and (c) fireline production rates would be doubled. Treatments should be effective for more than 5 years.
<i>Old Forest Emphasis Area</i>
8. Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes: <ul style="list-style-type: none"> ● On over 75 percent of the stand area achieve an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions. ● Stands with less than 40 percent canopy cover, achieve an average live crown base height of 15 feet. ● Stands with 40 to 70 percent canopy cover, achieve an average live crown base height of 20 feet. ● Stands with greater than 70 percent canopy cover, achieve an average live crown base height of 25 feet. <p>To enhance stand heterogeneity and to maintain intact biological processes, particularly soil biota that may be affected by mechanical treatments, do not mechanically treat the remaining 25 percent of the stand area.</p>
9. Where mechanical treatments are necessary, design treatments to achieve or approach the fuels outcomes described above by reducing surface and ladder fuels. Apply treatments to enhance stand heterogeneity. Allow incidental felling of trees between 12 and 20 inches dbh where required for operability. Retain felled trees on the ground, where needed, to achieve down woody material standards of 10 to 20 tons per acre in logs greater than 12 inches diameter at midpoint.
10. Do not reduce canopy cover in dominant and co-dominant trees by more than 10 percent across a stand following mechanical treatments. (For example, if canopy cover in a stand’s dominant and co-dominant trees is 80 percent, retain at least 70 percent canopy cover in dominant and co-dominant trees following mechanical treatment.)
11. In westside forest types, where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. Do not reduce canopy cover in stands that currently have between 40 and 50 percent canopy cover, except where canopy cover reductions result from removing shade-tolerant trees less than 6 inches dbh.
12. Give priority to restoring historic fire return intervals where possible. Emphasize fire restoration in pine and mixed-conifer forests. In mixed-conifer forests, fire return intervals vary by aspect and topographic position, with most frequent burning on south- and west-facing aspects.
13. Emphasize fuel treatments in stands at lower elevations with high fire hazard in the pine and mixed conifer forest types. Emphasize fuel treatments on the upper two-thirds of south- and west-facing aspects near roads. Use mechanical treatments where fire managers determine a high potential for: (a) prescribed fire escape due to excessive fuel accumulations; (b) unacceptable smoke effects; or (c) canopy cover and old forest structure loss due to excessive surface and ladder fuels.
<i>Wilderness</i>
14. In wilderness, use naturally ignited wildfires to meet management strategies when fuel loading and natural barriers will limit the final fire perimeter to a planned boundary under the most severe weather conditions.
<i>WUI Defense Zone</i>
15. Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes: (a) On more than 90 percent of the stand area, achieve an average flame length of 4 feet or less if the stand was to burn under 90th percentile fire weather conditions; (b) On stands with less than 40 percent canopy cover, achieve an average live crown base height of 15 feet; 40 to 70 percent canopy cover, achieve an average live crown base height of 20 feet; and greater than 70 percent canopy cover, achieve an average live crown base height of 25 feet.
16. To enhance stand heterogeneity, do not mechanically treat the remaining 10 percent of the stand area.

Standard/Guideline
17. Achieve the fuels outcomes described above through thinning from below to remove surface and ladder fuels.
WUI Threat Zone
18. Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes: (a) On more than 85 percent of the stand area, achieve an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions; (b) On stands with less than 40 percent canopy cover, achieve an average live crown base height of 15 feet; 40 to 70 percent canopy cover, achieve an average live crown base height of 20 feet; and greater than 70 percent canopy cover, achieve an average live crown base height of 25 feet.
19. To enhance stand heterogeneity, do not mechanically treat the remaining 15 percent of the stand area.
20. Design mechanical treatments to achieve the fuels outcomes described above through understory thinning to remove surface and ladder fuels up to 20 inches dbh. Focus treatments on removing suppressed and intermediate trees. Apply treatments to enhance stand heterogeneity. When conducting treatments in dense stands with uniform tree size and spacing, introduce heterogeneity into such stands by creating small (typically less than 1 acre), irregularly spaced openings. Canopy cover reductions may be needed to meet fuels objectives, but do not exceed a 20 percent reduction in the dominant and co-dominant trees. For example, a stand's canopy cover may be reduced from a pre-treatment level of 70 percent down to 50 percent to meet fuels objectives.
21. In westside forest types, where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. In stands that currently have between 40 and 50 percent canopy cover, do not reduce canopy cover except where canopy cover reductions result from removing primarily shade-tolerant trees less than 6 inches dbh.
22. For prescribed fire treatments, use multiple entries, as needed, to achieve fuels management objectives, up to two burns per decade and four burns over 20 years.
General Monument⁽³⁾
23. Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes: (a) On more than 75 percent of the stand area, achieve an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions; (b) On stands with less than 40 percent canopy cover, achieve an average live crown base height of 15 feet; 40 to 70 percent canopy cover, achieve an average live crown base height of 20 feet; and greater than 70 percent canopy cover, achieve an average live crown base height of 25 feet.
24. To enhance stand heterogeneity, do not mechanically treat the remaining 25 percent of the stand area.
25. Design mechanical treatments to achieve the fuels outcomes described above through understory thinning to remove surface and ladder fuels up to 20 inches in diameter. Focus treatments on removing suppressed and intermediate conifer trees.
Air Quality
Monument-wide
1. Continue the visibility monitoring program and determine sensitive indicators for each air quality-related value in national forest class I areas. Protect air quality-related values by reviewing all projects and management activities that may affect those values. Review external prevention of significant deterioration (PSD) source applications and make recommendations to permitting authorities.
2. Minimize resource and air quality effects from air pollutants generated by management activities through use of the following control measures: <ul style="list-style-type: none"> a. Follow dust abatement procedures. b. Conduct an air quality analysis for all projects that may impair air quality to determine effects, mitigations, and/or controls.

3. The 2001 SNFPA called this land allocation General Forest. For the Monument, it is called General Monument and includes any area in the Monument that is outside of other allocations.

Standard/Guideline
<p>c. Respond to local planning and regulatory authorities when development outside forest jurisdiction may affect forest resources.</p> <p>d. Conduct prescribed burning activities in accordance with air pollution control district regulations and with proper prescriptions to assure good smoke management.</p> <p>e. Notify the public before burning.</p>
<p>3. Minimize smoke emissions by following best available control measures (BACMs). Avoid burning on high visitor days. Notify the public before burning.</p>
<p>4. Coordinate and cooperate with other agencies and the public to manage air quality. Conduct prescribed burns when conditions for smoke dispersal are favorable, especially away from sensitive or class I areas. Use smoke modeling tools to predict smoke dispersion.</p>
<p>Wildlife and Plant Habitat⁽⁴⁾</p>
<p>Wildlife Habitat</p>
<p><i>Monument-wide</i></p>
<p>1. Fell and/or remove snags as needed to address imminent safety hazards.</p> <p>2. Manage snag levels for ecological restoration. Within green forests, design projects to provide a sustainable population of medium- and large-diameter snags. Existing medium- and large-diameter snags, as well as medium- and large-diameter living trees that exhibit form and/or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.), will form the backbone snag network over large landscapes.</p> <p>In areas burned by wildfire, including high- and mid-severity patches, manage snag levels to meet ecological restoration objectives, with consideration for the spatial arrangement and density of snags for wildlife needs. Include site-specific considerations such as a wider range of snag sizes and densities, and focal placement of snags and snag patches.</p>
<p>3. Retain felled trees on the ground where needed to achieve down woody material standards of 10 to 20 tons per acre in logs greater than 12 inches in diameter.</p>
<p>4. Upon detection (photograph, track plate, or sighting verified by a wildlife biologist) of a wolverine or Sierra Nevada red fox, conduct an analysis to determine if activities within 5 miles of the detection have a potential to affect the species. For a 2-year period following the detection, restrict activities that are determined in the analysis to have an adverse effect from January 1 to June 30.</p>
<p>5. Prior to undertaking vegetation treatments in suitable California spotted owl habitat with unknown occupancy, conduct surveys in accordance with Pacific Southwest Region survey protocol. Designate California spotted owl protected activity centers (PACs) where appropriate based on survey results.</p>
<p>6. Prior to undertaking vegetation treatments in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC, conduct surveys using Pacific Southwest Region survey protocols. Suitable northern goshawk nesting habitat is defined as follows: stands with an average tree size of 11 inches dbh or greater and at least 40 percent canopy cover.</p>
<p>7. Conduct additional surveys to established protocols to follow up reliable sightings of great gray owls.</p>
<p><i>Old Forest Emphasis Area</i></p>
<p>8. Minimize old forest habitat fragmentation. Assess potential effects of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.</p>
<p>9. Assess the potential effects of projects on the connectivity of habitat for old forest associated species.</p>
<p>10. Consider forested linkages (with canopy cover greater than 40 percent) that are interconnected via riparian areas and ridgetop saddles during landscape-level and project-level analysis.</p>

4. Including Threatened, Endangered, and Sensitive Species; Management Indicator Species; Botanical Resources; and Invasive Nonnative Species.

Standard/Guideline
11. During landscape analysis, identify areas for acquisition, exchange, or conservation easements to enhance connectivity of habitat for old forest associated species. Assign a priority order for these areas.
<i>California Spotted Owl PACs and HRCAs</i>
12. Delineate California spotted owl protected activity centers (PACs) surrounding each territorial owl activity center detected on National Forest System lands since 1986. Owl PACs are designated for all territorial owls based on: (1) the most recent documented nest site, (2) the most recent known roost site when a nest location remains unknown, and (3) a central point based on repeated daytime detections when neither nest or roost locations are known.
13. Delineate PACs to: (1) include known and suspected nest stands and (2) encompass the best available 300 acres of habitat in as compact a unit as possible. Select the best available habitat for PACs to incorporate: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; (3) at least 70 percent tree canopy cover (including hardwoods); and (4) in descending order of priority, CWHR classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent canopy cover (including hardwoods). Use aerial photography interpretation and field verification, as needed, to delineate PACs.
14. As additional nest location and habitat data become available, review boundaries of PACs and make adjustments as necessary to better include known and suspected nest stands and to encompass the best available 300 acres of habitat.
15. When activities are planned adjacent to non-national forest lands, check available databases for the presence of nearby California spotted owl activity centers on non-national forest lands. Delineate a 300-acre circular area centered on the activity center. Designate and manage any part of the circular 300-acre area that lies on national forest lands as a California spotted owl PAC.
16. When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.
17. Maintain PACs regardless of California spotted owl occupancy status, unless habitat is rendered unsuitable by a catastrophic stand-replacing event and surveys conducted to protocol confirm non-occupancy.
18. Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (March 1 through August 15) unless surveys confirm that California spotted owls are not nesting. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance.
19. The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.
20. The LOP may be waived, where necessary, to allow for early season prescribed burning in up to 5 percent of the California spotted owl PACs on a national forest per year.
21. The LOP may be modified or waived to assess the effects of prescribed fire and mechanical treatments on breeding owls as a formal adaptive management study developed in cooperation with the Pacific Southwest Research Station.
22. In PACs located outside the defense zone of the wildland urban intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of 4 feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees, as needed, to protect nest trees and trees in their immediate vicinity.

Standard/Guideline
<p>23. In PACs located inside the defense zone of the wildland urban intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around the California spotted owl activity center. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees, as needed, to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the General Monument land allocation.</p>
<p>24. Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. Mitigate effects where there is documented evidence of disturbance to the nest site from existing recreation, off-highway vehicle route, trail, and road uses (including road maintenance).</p>
<p>25. Establish a home range core area surrounding each territorial spotted owl activity center detected after 1986. Home range core area size is 600 acres on the Sequoia National Forest.</p>
<p>26. Use aerial photography to delineate California spotted owl home range core areas. Identify acreage for the entire core area on national forest lands. Delineate core areas to encompass the best available California spotted owl habitat in the closest proximity to the owl activity center. Select the best available contiguous habitat to incorporate: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; and (3) in descending order of priority, CWHR classes 6, 5D, 5M, 4D and 4M and other stands with at least 50 percent tree canopy cover (including hardwoods). The acreage in the 300-acre PAC counts toward the total home range core area. Delineate core areas within 1.5 miles of the activity center.</p>
<p>27. When activities are planned adjacent to non-national forest lands, delineate circular core areas around California spotted owl activity centers on non-national forest lands. Using the best available habitat as described above, designate and manage any part of the circular core area that lies on national forest lands as a California spotted owl home range core area.</p>
<p>28. Fuel treatment standards and guidelines for California spotted owl home range core areas are identical to those presented for old forest emphasis areas above, except for the wildland urban intermix.</p>
<p><i>Northern Goshawk PACs</i></p>
<p>29. Delineate northern goshawk protected activity centers (PACs) surrounding all known and newly discovered breeding territories detected on National Forest System lands. Designate northern goshawk PACs based upon the latest documented nest site and location(s) of alternate nests. If the actual nest site is not located, designate the PAC based on the location of territorial adult birds or recently fledged juvenile goshawks during the fledgling dependency period.</p>
<p>30. Delineate PACs to: (1) include known and suspected nest stands and (2) encompass the best available 200 acres of forested habitat in the largest contiguous patches possible, based on aerial photography. Where suitable nesting habitat occurs in small patches, define PACs as multiple blocks in the largest best available patches within 0.5 miles of one another. Best available forested stands for PACs have the following characteristics: (1) trees in the dominant and co-dominant crown classes average 24 inches dbh or greater; (2) in westside conifer and eastside mixed-conifer forest types, stands have at least 70 percent tree canopy cover. Non-forest vegetation (such as brush and meadows) should not be counted as part of the 200 acres.</p>
<p>31. As additional nest location and habitat data become available, review boundaries of PACs and make adjustments, as necessary, to better include known and suspected nest stands and to encompass the best available 200 acres of forested habitat.</p>
<p>32. When activities are planned adjacent to non-national forest lands, check available databases for the presence of nearby northern goshawk activity centers on non-national forest lands. Delineate a 200-acre circular area centered on the activity center. Designate and manage any part of the circular 200-acre area that lies on national forest lands as a northern goshawk PAC.</p>

Standard/Guideline
33. When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.
34. Maintain PACs regardless of northern goshawk occupancy status, unless habitat is rendered unsuitable by a catastrophic stand-replacing event and surveys conducted to protocol confirm non-occupancy.
35. Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand is unknown, either apply the LOP to a ¼-mile area surrounding the PAC or survey to determine the nest stand location. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance.
36. The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.
37. The LOP may be waived, where necessary, to allow for early season prescribed burning in up to 5 percent of the northern goshawk PACs on a national forest per year.
38. Evaluate proposals for new roads, trails, and recreational and other developments for their potential to disturb nest sites. Mitigate effects where there is documented evidence of disturbance to the nest site from existing recreation, trail, and road uses (including road maintenance).
39. In PACs located outside the defense zone of the wildland urban intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of 4 feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees, as needed, to protect nest trees and trees in their immediate vicinity.
40. In PACs located inside the defense zone of the wildland urban intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around nest trees. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees, as needed, to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the General Monument land allocation.
<i>Great Gray Owl PACs</i>
41. Establish and maintain a protected activity center (PAC) that includes the forested area and adjacent meadow around all known great gray owl nest stands. Delineate at least 50 acres of the highest quality nesting habitat (CWHR types 6, 5D, and 5M) available in the forested area surrounding the nest. Also include the meadow or meadow complex that supports the prey base for nesting owls.
42. Apply a limited operating period (LOP), prohibiting vegetation management activities and road construction within ¼ mile of active great gray owl nest stands during the nesting period (typically March 1 to August 15). The LOP does not apply to: (1) existing road traffic and road maintenance, (2) trail uses, and (3) other recreational uses and activities, unless a biological evaluation documents that these activities will result in nest disturbance. The LOP may also be waived for projects of limited scope and duration.
43. Evaluate proposals for new roads, trails, and recreational and other developments for their potential to disturb nest sites. Mitigate effects where there is documented evidence of disturbance to the nest site from existing recreation, trail, and road uses (including road maintenance).

Standard/Guideline
44. In meadow areas of great gray owl PACs, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. Where available, follow regional guidance to determine potential prey species and associated habitat requirements at the project level.
<i>Southern Sierra Fisher Conservation Area (SSFCA)/Furbearer Den Sites</i>
45. Assess the effect of vegetation management on Pacific fisher habitat using models appropriate for the scale of the project.
46. Because the effects of prescribed fire on key components of fisher habitat are uncertain, give preference to mechanical treatments over prescribed fire. However, prescribed fire may be applied to achieve restoration and regeneration objectives for fire-adapted giant sequoia.
47. In areas outside the wildland urban intermix zone, manage each planning watershed to support fisher habitat requirements. Retain 60 percent of each 5,000- to 10,000-acre watershed in CWHR size class 4 (average dbh of overstory trees between 11 and 24 inches) or greater and canopy cover greater than or equal to 60 percent.
48. Prior to vegetation treatments, identify important wildlife structures, such as large diameter snags and coarse woody material within the treatment unit. For prescribed fire treatments, use firing patterns, fire lines around snags and large logs, and other techniques to minimize effects on snags and large logs. Evaluate the effectiveness of these mitigation measures after treatment.
49. Fisher den sites are 700-acre buffers consisting of the highest quality habitat (CWHR size class 4 or greater and canopy cover greater than 60 percent) in a compact arrangement surrounding verified fisher birthing and kit rearing dens in the largest, most contiguous blocks available.
50. Protect fisher den site buffers from disturbance with a limited operating period (LOP) from March 1 through June 30 for all new projects as long as habitat remains suitable or until another regionally approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.
51. Evaluate the appropriateness of LOPs for existing uses in fisher den site buffers during environmental analysis.
52. Avoid fuel treatments in den site buffers to the extent possible. If areas within den site buffers must be treated to achieve fuels objectives for the wildland urban intermix zone, limit treatments to mechanical clearing of fuels. Treat ladder and surface fuels over 85 percent of the treatment unit to achieve fuels objectives. Use piling or mastication to treat surface fuels during initial treatment. Burning of piled debris is allowed. Prescribed fire may be used to treat fuels if no other reasonable alternative exists.
53. Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb den sites. Mitigate effects where there is documented evidence of disturbance to the den site from existing recreation, off-highway vehicle route, trail, and road uses (including road maintenance).
<i>Marten Den Sites</i>
54. Marten den sites are 100-acre buffers consisting of the highest quality habitat in a compact arrangement surrounding the den site. CWHR Types 6, 5D, 5M, 4D, and 4M in descending order of priority, based on availability, provide highest quality habitat for the marten.
55. Protect marten den site buffers from disturbance with a limited operating period (LOP) from May 1 through July 31 for all new projects as long as habitat remains suitable or until another regionally approved management strategy is implemented.
56. Evaluate the appropriateness of LOPs for existing uses in marten den site buffers during environmental analysis.

Standard/Guideline
57. Avoid fuel treatments in marten den site buffers to the extent possible. If areas within den site buffers must be treated to achieve fuels objectives for the wildland urban intermix zone, limit treatments to mechanical clearing of fuels. Treat ladder and surface fuels over 85 percent of the treatment unit to achieve fuels objectives. Use piling or mastication to treat surface fuels during initial treatment. Burning of piled debris is allowed. Prescribed fire may be used to treat fuels if no other reasonable alternative exists.
58. Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb den sites. Mitigate effects where there is documented evidence of disturbance to the den site from existing recreation, off-highway vehicle route, trail, and road uses (including road maintenance).
<i>Willow Flycatcher Sites</i>
59. Evaluate proposals for new concentrated stock areas (for example, livestock handling and management facilities, pack stations, equestrian stations, and corrals) located within five miles of occupied willow flycatcher sites.
60. As part of landscape analysis, give priority to meadow restoration opportunities near or adjacent to known willow flycatcher sites.
61. To the extent possible, construct no new roads in potential willow flycatcher habitat. Potential willow flycatcher habitat includes: (1) occupied willow flycatcher habitat, (2) known willow flycatcher sites, (3) emphasis habitat [meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component], and (4) small, wet woody meadows (meadows less than 15 acres that have standing water on June 1 and a deciduous shrub component).
62. Continue a 4-year cycle for conducting willow flycatcher surveys in all five known willow flycatcher sites in the Monument.
63. In meadows with occupied willow flycatcher sites, allow only late-season grazing (after August 15) in the entire meadow. This standard and guideline may be waived if an interdisciplinary team has developed a site-specific meadow management strategy. This strategy is to be developed and implemented in partnership with the affected grazing permittee. The strategy objectives must focus on protecting the nest site and associated habitat during the breeding season and the long-term sustainability of suitable habitat at breeding sites. It may use a mix of management tools, including grazing systems, structural improvements, and other exclusion by management techniques to protect willow flycatcher habitat.
64. In willow flycatcher sites receiving late season grazing, monitor utilization annually using regional range analysis and planning guide. Monitor willow flycatcher habitat every 3 years using the following criteria: rooting depth cores for meadow condition, point intercepts for shrub foliar density, and strip transects for shrub recruitment and cover. Meadow condition assessments will be included in a GIS meadow coverage. If habitat conditions are not supporting the willow flycatcher or trend downward, modify or suspend grazing.
65. For historically occupied willow flycatcher sites, assess willow flycatcher habitat suitability within the meadow. If habitat is degraded, develop restoration objectives and take appropriate actions (such as physical restoration of hydrological components, limiting or re-directing grazing activity and so forth) to move the meadow toward desired conditions.
66. Evaluate site condition of historically occupied willow flycatcher sites. Those sites that no longer contain standing water on June 1 and a deciduous shrub component and cannot be reasonably restored may be removed from the willow flycatcher site database. As part of the project planning process, survey emphasis habitat within five miles of occupied willow flycatcher sites to determine willow flycatcher occupancy. Emphasis habitat is defined as meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component. Use established protocols to conduct these surveys. If these surveys determine willow flycatcher occupancy, add these to the database of occupied willow flycatcher sites and include them in the 4-year survey cycle of willow flycatcher sites described above.

Standard/Guideline
Plant Habitat⁽⁵⁾
<i>Monument-wide</i>
1. Minimize or eliminate direct and indirect effects on threatened, endangered, proposed, and sensitive (TEPS) plants unless management activities are designed to maintain or improve plant populations.
2. Prohibit or mitigate ground-disturbing activities that negatively affect hydrologic processes that maintain water flow, water quality, or temperature critical to sustaining fen ecosystems and the plant species dependent on them. During project analysis, survey, map and protect fens from activities such as trampling by livestock, pack stock, humans, and wheeled vehicles. Criteria for defining fens include, but are not limited to, presence of sphagnum moss (<i>Sphagnum spp.</i>), presence of mosses in the genus <i>Meesia</i> , or presence of sundew (<i>Drosera spp.</i>). Complete initial inventories of fens within active grazing allotments prior to re-issuing permits.
3. Conduct field surveys for TEPS plant species early enough in the project planning process so that the project can be designed to conserve or enhance TEPS plants and their habitat. Conduct surveys according to procedures outlined in the Forest Service Handbook (FSH 2609.25.11). If additional field surveys are conducted as part of project implementation, document the survey results in the project file.
Invasive Nonnative Species
<i>Monument-wide</i>
1. Inform forest users, local agencies, special use permittees, groups, and organizations in communities near national forests about noxious weed prevention and management.
2. Work cooperatively with California and Nevada state agencies and individual counties (for example, cooperative weed management areas) to: (1) prevent the introduction and establishment of noxious weed infestations and (2) control existing infestations.
3. As part of project planning, conduct a noxious weed risk assessment to determine risks for weed spread (high, moderate, or low) associated with different types of proposed management activities. Develop mitigation measures for high and moderate risk activities.
4. When prescribed in project-level noxious weed risk assessments, require off-road equipment and vehicles (both Forest Service and contracted) used for project implementation to be weed free.
5. Minimize weed spread by incorporating weed prevention and control measures into ongoing management or maintenance activities that involve ground disturbance or the possibility of spreading weeds.
6. Conduct follow-up inspections of ground-disturbing activities.
7. Encourage use of certified weed free hay and straw. Cooperate with other agencies and the public in developing a certification program for weed free hay and straw. Phase in the program as certified weed free hay and straw becomes available. This standard and guideline applies to pack and saddle stock used by the public, livestock permittees, outfitter guide permittees, and local, state, and federal agencies.
8. Include weed prevention measures, as necessary, when amending or re-issuing permits (including, but not limited to, livestock grazing, special uses, and pack stock operator permits).
9. Include weed prevention measures and weed control treatments in mining reclamation plans. Monitor for weeds, as appropriate, for 2 years after project implementation (assuming no weed introductions have occurred).
10. Conduct a risk analysis for weed spread associated with burned area emergency rehabilitation (BAER) treatments (the BAER team is responsible for conducting this analysis). Monitor and treat weed infestations for three (3) years after the fire.
11. During landscape analysis or project-level planning, consider restoring or revegetating degraded ecosystems to minimize the potential for noxious weed re-infestations (USDA 2008; FSM Chapter 2070).
12. Consult with American Indians to determine priority areas for weed prevention and control where traditional gathering areas are threatened by weed infestations.

5. Includes Botanical Resources; Threatened, Endangered, and Sensitive Plants; and Invasive Nonnative Species.

Standard/Guideline
13. Review and update noxious weed inventories on an annual basis.
14. When new, small weed infestations are detected, emphasize eradication of these infestations while providing for the safety of field personnel.
15. Routinely monitor noxious weed control projects to determine success and to evaluate the need for follow-up treatments or different control methods. Monitor known weed infestations, as appropriate, to determine changes in weed population density and rate of spread.
Range⁽⁶⁾
<i>Monument-wide</i>
1. Under season-long grazing: For meadows in early seral status—limit livestock utilization of grass and grass-like plants to 30 percent (or minimum 6-inch stubble height). For meadows in late seral status—limit livestock utilization of grass and grass-like plants to a maximum of 40 percent (or minimum 4-inch stubble height).
2. In meadow areas of great gray owl PACs, maintain herbaceous meadow vegetation at a height commensurate with site capability and habitat needs of prey species. Where available, follow regional guidance to determine potential prey species and associated habitat requirements at the project level.
3. Grazing utilization in annual grasslands will maintain a minimum of 60 percent cover. Where grasslands are in satisfactory condition and annual precipitation is greater than 10 inches, manage for 700 pounds residual dry matter (RDM) per acre. Where grasslands are in satisfactory condition and annual precipitation is less than 10 inches, manage for 400 pounds RDM per acre. Where grasslands are in unsatisfactory condition and annual precipitation is greater than 10 inches, manage for 1,000 pounds RDM per acre; manage for 700 pounds RDM per acre where grasslands are in unsatisfactory condition and precipitation is less than 10 inches. Adjust these standards, as needed, based on grassland condition.
4. Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs (including willow and aspen) and no more than 20 percent of individual seedlings. Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from grazing herbaceous vegetation to browsing woody riparian vegetation.
5. To protect hardwood regeneration in grazing allotments, allow livestock browse on no more than 20 percent of annual growth of hardwood seedlings and advanced regeneration. Alter grazing plans if hardwood regeneration and recruitment needs are not being met.
6. Where professional judgment and quantifiable measurements find that current practices are maintaining range in good to excellent condition, the grazing utilization standards above may be modified to allow for the Forest Service, in partnership with individual permittees, to rigorously test and evaluate alternative standards.
7. Evaluate proposals for new concentrated stock areas (for example, livestock handling and management facilities, pack stations, equestrian stations, and corrals) located within 5 miles of occupied willow flycatcher sites.
8. Cattle will be distributed in a manner consistent with moderate forage utilization within meadows. Use any acceptable method as described in the most current version of the Rangeland Analysis and Planning Guide to monitor the results.
9. Grazing will cease in time to permit re-growth sufficient to store carbohydrates for initial spring growth (as specified in individual allotment plans).
10. Meadows will be grazed to allowable use standards as determined by use of any applicable method described in the most current version of the Region 5 Rangeland Analysis and Planning Guide.

6. Also see standards and guidelines in the watershed resources and wildlife, willow flycatcher section that pertain to range management.

Standard/Guideline																																																												
Hydrological Resources																																																												
Monument-wide																																																												
<i>Riparian and Wetland</i>																																																												
1. Manage riparian areas under the principles of multiple use and sustained yields, while emphasizing protection and improvement of soil, water, vegetation, and fish and wildlife resources. Give preferential consideration to riparian-dependent resources when conflicts among land use activities occur.																																																												
2. Give special attention to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water. This distance shall correspond to at least the recognizable area dominated by the riparian vegetation.																																																												
3. Provide protection where resource management activities are likely to seriously and adversely affect water conditions or fish habitat.																																																												
4. Facilitate the determination of sound vegetation manipulation practices based on watershed conditions and land capability, rather than decisions based solely on silvicultural characteristics and the public demand for goods.																																																												
5. Delineate and evaluate riparian areas prior to implementing any project activity.																																																												
6. Avoid long- and short-term adverse effects associated with modification of floodplains and wetlands. Minimize, to the extent practicable, destruction, loss, or degradation of wetlands (E.O. 11988 Floodplain Management and E.O. 11990 Protection of Wetlands) (BMP 1.18).																																																												
<i>Cumulative Watershed Effects Analysis</i>																																																												
7. Utilize the Sequoia National Forest’s cumulative watershed effects (CWE) methodology for application within the forest to assess each project for potential to incur cumulative effects. The Forest shall determine the proper size of the watershed unit to be subject to CWE analysis based on the identified beneficial use(s). The unit size will generally range from 250 to 2,000 acres.																																																												
8. Identification and Evaluation of Processes Within the Watershed (CWE Analysis). The Sequoia National Forest staff will determine the controlling processes of concern (as required by FSM 2509.22, 7/88, Amendment 1) in order to assess disturbance coefficients and mitigation opportunities.																																																												
<i>Streamside Management Zones</i>																																																												
9. Streamside Management Zones will be established and maintained for all stream courses and wetlands affected by management activities. Project plans will be designed to include site-specific prescriptions for the prevention of sedimentation, stream damage, and the protection of riparian dependent species (Clean Water Act, P.L. 92-500, Section 208).																																																												
<table border="1"> <thead> <tr> <th rowspan="2">Stream Class</th> <th colspan="5">SMZ Width by % Slope</th> <th rowspan="2">Stream Order</th> </tr> <tr> <th><30%</th> <th>>30%</th> <th>>40%</th> <th>>50%</th> <th>>70%</th> </tr> </thead> <tbody> <tr> <td>Meadows, Seeps, Springs, Bogs</td> <td>100</td> <td>150</td> <td>200</td> <td>250</td> <td>1.5 times distance to slope break</td> <td>-</td> </tr> <tr> <td>I</td> <td>100</td> <td>150</td> <td>200</td> <td>250</td> <td>1.5 times distance to slope break</td> <td>4+</td> </tr> <tr> <td>II</td> <td>100</td> <td>100</td> <td>150</td> <td>200</td> <td></td> <td>3-4</td> </tr> <tr> <td>III</td> <td>50</td> <td>100</td> <td>100</td> <td>150</td> <td></td> <td>2-3</td> </tr> <tr> <td>IV</td> <td><50</td> <td><50</td> <td>75</td> <td>100</td> <td></td> <td>1-2</td> </tr> <tr> <td>IV</td> <td><50</td> <td><50</td> <td><50</td> <td><50</td> <td></td> <td>1-0</td> </tr> </tbody> </table>							Stream Class	SMZ Width by % Slope					Stream Order	<30%	>30%	>40%	>50%	>70%	Meadows, Seeps, Springs, Bogs	100	150	200	250	1.5 times distance to slope break	-	I	100	150	200	250	1.5 times distance to slope break	4+	II	100	100	150	200		3-4	III	50	100	100	150		2-3	IV	<50	<50	75	100		1-2	IV	<50	<50	<50	<50		1-0
Stream Class	SMZ Width by % Slope					Stream Order																																																						
	<30%	>30%	>40%	>50%	>70%																																																							
Meadows, Seeps, Springs, Bogs	100	150	200	250	1.5 times distance to slope break	-																																																						
I	100	150	200	250	1.5 times distance to slope break	4+																																																						
II	100	100	150	200		3-4																																																						
III	50	100	100	150		2-3																																																						
IV	<50	<50	75	100		1-2																																																						
IV	<50	<50	<50	<50		1-0																																																						

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10. The following table displays the appropriate management requirements and constraints with respect to stream type and class. Manage for specific components of the Pfankuch channel and stream stability indices that might be affected by management activities. Evaluate special conditions at the project level:

<u>Riparian Ecotype</u>	<u>Environmental Indicator</u>			
	<u>Vegetative Bank Protection</u>	<u>Bank Cutting</u>	<u>Bottom Deposition and Scour & Deposition</u>	<u>Bottom Size Distribution and % Stable Material</u>
<u>Naturally Stable</u> Riparian Channel Type: A1, A2, B1, B2, B3, C1, C2, F1, F2, G1, G2 <i>Restoration Not Required</i>	NA	NA	Low frequency of mid-channel bars and good pool to riffle ratio	NA
<u>Stable Sensitive</u> Riparian Channel Type: B4, B5, B6, C3, C4, C5, C6, E3, E4, E5, E6 <i>Recover with Passive Restoration</i>	80 to 90 % ground cover with stable continuous root mass	Less than or equal to 1 foot of exposed bank cuts affecting less than or equal to 20% of the channel	Little or no sand bar development with 0 to 5% of the bottom affected by bar deposition	NA
<u>Unstable-Sensitive</u> Riparian Channel Type: G2, G3, G4, G5, G6, F3, F4, F5, F6, and those D3, D4, D5, D6 in unexpected geomorphic settings. <i>Recover with Active Restoration</i>	Greater than or equal to 70 % ground cover with stable continuous root mass	Less than or equal to 1 foot of exposed bank cuts affecting less than or equal to 30% of the channel	Low frequency of mid channel bar development, Improved pool to riffle ratio, with 5 to 30% deposition behind obstructions	Slight size distribution shift between 50-80% stable material
<u>Naturally Unstable</u> Riparian Channel Type: A3, A4, A5, A6 (Landslide and Debris slide Terrain) <i>Inoperational to Restore</i>	NA	NA	NA	NA

11. Conduct monitoring of individual management practices to determine how well objectives have been met and how closely management standards and guidelines have been applied (NFMA, NEPA, FSM 1922.7, 36 CFR 219.12k).

Interception of Sediment and Ground Cover Requirements

12. Correct existing and prevent potential water quality problems through the implementation of best management practices (BMPs) as contained in Water Quality Management for the National Forest System Lands in California: a State of California Water Resources Control Board (SWRCB)/USDA Forest Service Cooperative Agreement (Clean Water Act, P.L. 92-500, Section 208). This agreement contains the following provisions from NFMA P.L. 94.588:

- Protection of stream courses from detrimental changes in temperature (BMP 1.8).
- Protection of stream courses from blockage (BMP 1.19).
- Protection of stream courses from detrimental deposits of sediment (BMP 1.19).

Riparian Conservation Areas (RCAs) and Critical Aquatic Refuges (CARs)

13. Designate riparian conservation area (RCA) widths as described in the 2004 SNFPA ROD, Appendix A, Part B, pages 42 and 62:

- Perennial Streams:** 300 feet on each side of the stream, measured from the bank full edge of the stream.
- Seasonally Flowing Streams (includes intermittent and ephemeral streams):** 150 feet on each side of the stream, measured from the bank full edge of the stream.
- Streams in Inner Gorge:** top of inner gorge.
- Special Aquatic Features (lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs) or Perennial Streams with Riparian Conditions extending more than 150 feet from edge of streambank**

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<p>or Seasonally Flowing streams with riparian conditions extending more than 50 feet from edge of streambank: 300 feet from edge of feature or riparian vegetation, whichever width is greater.</p> <p>Other hydrological or topographic depressions without a defined channel: RCA width and protection measures determined through project level analysis.</p> <p>RCA widths may be adjusted at the project level if a landscape analysis has been completed and a site-specific riparian conservation objective (RCO) analysis demonstrates a need for different widths.</p>
<p>14. Evaluate new proposed management activities within the critical aquatic refuges (CARs) and RCAs during environmental analysis to determine consistency with the riparian conservation objectives at the project level and the aquatic management strategy goals for the landscape. Ensure that appropriate mitigation measures are enacted to (1) minimize the risk of activity-related sediment entering aquatic systems, and (2) minimize effects to habitat for aquatic- or riparian-dependent plant and animal species.</p>
<p>15. Identify existing uses and activities in the CARs and RCAs during landscape analysis. At the time of permit re-issuance, evaluate and consider actions needed for consistency with RCOs.</p>
<p>16. As part of project-level analysis, conduct peer reviews for projects that propose ground-disturbing activities in more than 25 percent of the RCAs or more than 15 percent of the CARs.</p>
<p><i>Riparian Conservation Objective 1: Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses.</i></p>
<p>17. For waters designated as “water quality limited” (Clean Water Act Section 303(d)), implement appropriate state mandates for the waterbodies, such as total maximum daily load (TMDL) protocols.</p>
<p>18. Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.</p> <p>Maintain temperature at no more than a daily average of 20° C on streams affected by management activities. Evaluate stream courses with special circumstances, such as those affected by hot springs or other geologic and geochemical features, on a site-by-site basis at the project level.</p> <p>Maintain average stream surface shade at >60 percent on streams affected by management activities. Assess meadow environments and streams with limited overhead vegetation on a site-by-site basis at the project level.</p> <p>Ensure that management activities do not adversely affect pH values necessary for local aquatic and riparian-dependent species as defined by the Central Valley Water Quality Board Basin Plan. Maintain pH values between 6.5 and 8.5 on streams affected by management activities. Evaluate water bodies that exhibit special conditions at the project level, including waters affected by hot springs in the presence of CO₂ springs or other geologic and geochemical features (such areas would be expected to yield pH values outside the range of state standards).</p> <p>Ensure that management activities do not adversely affect alkalinity values, which can affect pH values, necessary for local aquatic- and riparian-dependent species as defined by the Central Valley Water Quality Board Basin Plan. Maintain alkalinity values of no less than 10 mg/L. Site-specific differences could occur based on local geology and water chemistry. Evaluate values outside this range at the project level.</p>
<p>19. Limit pesticide applications to cases where project-level analysis indicates that pesticide applications are consistent with RCOs. Use local channel geometry curves to determine the location of flood prone areas. Do not apply pesticides, including gopher baiting, within the floodprone area of perennial or intermittent stream courses. If a project’s objectives include treatment of riparian areas, evaluate conditions on a site-by-site basis at the project level.</p>
<p>20. Within 500 feet of known occupied sites for the California red-legged frog, foothill yellow-legged frog, or mountain yellow-legged frog, design pesticide applications to avoid adverse effects to individuals and their habitats.</p>

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<p>21. Prohibit storage of fuels and other toxic materials within RCAs and CARs except at designated administrative sites and sites covered by a special use authorization. Prohibit refueling within RCAs and CARs unless there is no other alternative. Ensure that spill plans are reviewed and up-to-date.</p>
<p><i>Riparian Conservation Objective 2: Maintain or restore: (1) The geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species.</i></p>
<p>22. Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions, where necessary, to restore connectivity.</p> <p>Maintain and restore the hydrologic connectivity of meadows by identifying those at risk. Implement corrective actions, where necessary, to restore connectivity of meadows to their floodplain.</p> <p>A stream condition inventory (SCI) may be used instead of proper functioning condition (PFC) to validate an existing PFC determination or existing meadow condition.</p> <p>Perform a full hydrologic survey prior to restoration. Include a longitudinal profile and adequate cross-section surveys to determine design parameters. At a minimum, determine meadow pattern, profile, and dimensions for the impaired site and the design.</p> <p>Design projects by a qualified specialist prior to implementation. A qualified specialist is one that has received training in river restoration and natural channel design. Have the design reviewed by a forest hydrologist prior to implementation.</p> <p>Make sure all restoration is sustainable. Designs that require continued maintenance are not considered sustainable.</p>
<p>23. Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species. Locate water drafting sites to avoid adverse effects on stream flows and depletion of pool habitat. Where possible, maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features.</p>
<p>24. Prior to activities that could adversely affect streams, determine if relevant stream characteristics are within the range of natural variability. If characteristics are outside the range of natural variability, implement mitigation measures and short-term restoration actions needed to prevent further declines or cause an upward trend in conditions. Evaluate required long-term restoration actions and implement them according to their status among other restoration needs.</p> <p>Maintain width to depth ratios for A and E channels of values less than 14 on streams affected by management activities. Maintain width to depth ratios for B, C, and F channels of values greater than 10 on stream channels affected by management activities. Encourage G and F channels to trend towards width to depth ratios greater than 12.</p> <p>Evaluate streams affected by management activities to detect shifts in mean particle size toward fine material in stable channel types (A, B, C, or E) to the extent that a change in channel type occurs. Mean particle size would be expected to change in impaired systems or following restoration activities. Evaluate stream courses with special circumstances on a site-by-site basis at the project level.</p> <p>Manage for specific components of the Pfankuch channel and stream stability indices that might be affected by management activities. Evaluate special conditions at the project level:</p>

Standard/Guideline				
Riparian Ecotype	Environmental Indicator			
	Vegetative Bank Protection	Bank Cutting	Bottom Deposition and Scour & Deposition	Bottom Size Distribution and % Stable Material
Naturally Stable Regen Channel Type: A1, A2, B1, B2, B3, C1, C2, F1, F2, G1, G2 <i>Restoration Not Required</i>	NA	NA	Low frequency of mid-channel bars and good pool to riffle ratio	NA
Stable Sensitive Regen Channel Type: B4, B5, B6, C3, C4, C5, C6, E3, E4, E5, E6 <i>Recover with Passive Restoration</i>	80 to 90 % ground cover with stable continuous root mass	Less than or equal to 1 foot of exposed bank cuts affecting less than or equal to 20% of the channel	Little or no sand bar development with 0 to 5% of the bottom affected by bar deposition	NA
Unstable-Sensitive Regen Channel Type: G2, G3, G4, G5, G6, F3, F4, F5, F6, and those D3, D4, D5, D6 in unexpected geomorphic settings. <i>Recover with Active Restoration</i>	Greater than or equal to 70 % ground cover with stable continuous root mass	Less than or equal to 1 foot of exposed bank cuts affecting less than or equal to 30% of the channel	Low frequency of mid channel bar development, improved pool to riffle ratio, with 5 to 30% deposition behind obstructions	Slight size distribution shift between 50-80% stable material
Naturally Unstable Regen Channel Type: A3, A4, A5, A6 (Landslide and Debris slide Terrain) <i>Inoperational to Restore</i>	NA	NA	NA	NA

For stable streams (A, B, C, or E), maintain or improve the channel, as necessary, based on the Pfankuch channel and stream stability indices. Take action to maintain or improve stream sites based on successional stage shifts away from stable conditions. For impaired stream reaches (G, F, or D), successional stage shifts from the impaired stream reach would show a trend toward an unimpaired condition.

25. Prevent disturbance to streambanks and natural lake and pond shorelines caused by management activities and resource use (such as livestock and dispersed recreation) from exceeding 20 percent of a stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. This standard does not apply to developed recreation sites, sites authorized under special use permits, or roads.

26. In stream reaches occupied by, or identified as “essential habitat” in the conservation assessment for the Little Kern golden trout, limit streambank disturbance from livestock to 10 percent of the occupied or “essential habitat” stream reach (conservation assessments are described in the 2004 SNFPA ROD, page 10; see <http://www.tucalifornia.org/cgtic/GTCAssessmnt&Strategy9-04.pdf>). Cooperate with state and federal agencies to develop streambank disturbance standards for threatened, endangered, and sensitive species. Use the regional streambank assessment protocol. Implement corrective action where disturbance limits have been exceeded.

Maintain width to depth ratios for A and E channels of values less than 14 on streams affected by management activities. Maintain width to depth ratios for B, C, and F channels of values greater than 10 on streams affected by management activities. Encourage G channels to trend towards width to depth ratios greater than 12.

27. At either the landscape or project level, determine if the age class, structural diversity, composition, and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.

28. Cooperate with federal, tribal, state, and local governments to secure in-stream flows needed to maintain, recover, and restore riparian resources, channel conditions, and aquatic habitat. Maintain in-stream flows to protect aquatic systems to which species are uniquely adapted. Minimize the effects of stream diversions or other flow modifications from hydroelectric projects on threatened, endangered, and sensitive species.

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<p>29. For exempt hydroelectric facilities on national forest lands, ensure that special use permit language provides adequate in-stream flow requirements to maintain, restore, or recover favorable ecological conditions for local riparian- and aquatic-dependent species.</p>
<p>Riparian Conservation Objective 3: <i>Ensure a renewable supply of large down logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the RCA.</i></p>
<p>30. Determine if the level of coarse large woody debris is within the range of natural variability in terms of frequency and distribution and is sufficient to sustain stream channel physical complexity and stability. Ensure that proposed management activities move conditions toward the range of natural variability for coarse large woody debris.</p> <p>Maintain woody material in and adjacent to stream courses. Where fire is responsible for removal of woody material, replace at levels associated with pre-fire conditions if possible. Evaluate the amount of wood necessary for maintenance of stream stability, sediment reduction, and aquatic species habitat.</p>
<p>Riparian Conservation Objective 4: <i>Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species.</i></p>
<p>31. Within CARs, in occupied habitat or “essential habitat” as identified in conservation assessments for threatened, endangered, or sensitive species, evaluate the appropriate role, timing, and extent of prescribed fire. Avoid direct lighting within riparian vegetation; prescribed fires may back into riparian vegetation areas. Develop mitigation measures to avoid effects to these species whenever ground-disturbing equipment is used.</p>
<p>32. Use screening devices for water drafting pumps (fire suppression activities are exempt during initial attack). Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses, and tadpoles.</p>
<p>33. Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in RCAs. In burn plans for project areas that include or are adjacent to RCAs, identify mitigation measures to minimize the spread of fire into riparian vegetation. In determining mitigation measures, weigh the potential harm of mitigation measures (e.g., firelines) against the risks and benefits of prescribed fire entering riparian vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances when fire suppression or fuel management actions could be damaging to habitat or the long-term function of a riparian community.</p>
<p>34. Post-wildfire management activities in RCAs and CARs should emphasize enhancing native vegetation cover, stabilizing channels by non-structural means, minimizing adverse effects from the existing road network, and carrying out activities identified in landscape analyses. Post-wildfire operations shall minimize the exposure of bare soil.</p>
<p>35. Allow hazard tree removal within RCAs or CARs if it is clearly needed for public safety. Allow mechanical ground-disturbing fuels treatments or fuelwood cutting within RCAs or CARs when the activity is consistent with RCOs and is clearly needed for ecological restoration and maintenance or public safety. Utilize low-ground-pressure equipment, helicopters, or other non-ground-disturbing actions off of existing roads when needed to achieve RCOs. Ensure that existing roads meet best management practices (BMPs). Minimize the construction of new roads into RCAs for access for fuel treatments, fuelwood cutting, or hazard tree removal.</p>
<p>36. As appropriate, assess and document aquatic conditions following the regional stream condition inventory protocol prior to implementing ground-disturbing activities within suitable habitat for California red-legged frogs, foothill yellow-legged frogs, and mountain yellow-legged frogs.</p> <p>Maintain average stream surface shade at or above 60 percent on streams affected by management activities. Assess meadow environments and other streams with limited overhead vegetation for site-specific projects.</p> <p>Maintain width to depth ratios for A and E channels of values less than 14 on streams affected by management activities. Maintain width to depth ratios for B, C, and F channels of values greater than 10 on streams affected by management activities. Encourage G channels to trend towards width to depth ratios greater than 12.</p>

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<p>Evaluate streams affected by management activities to detect shifts in mean particle size toward fine material in stable channel types (A, B, C, or E) to the extent that a change in channel type occurs. Mean particle size would be expected to change in impaired systems or following restoration activities. Evaluate stream courses with special circumstances on a site-by-site basis at the project level.</p>
<p>Maintain 85 percent of any waterbodies affected by management activities at no less than very good water quality based on the Hilsenhoff biotic index or similar indices. Evaluate waterbodies outside of this range for site-specific effects. Indices would be less than 4.50 on Hilsenhoff biotic index or indicate very good water quality with similar indices. A biotic index or other index of this value should indicate no apparent to possible slight organic pollution. Evaluate waterbodies outside of this range for site-specific projects.</p>
<p>Manage for specific components of the Pfankuch channel and stream stability indices that might be affected by management activities. Evaluate special conditions at the project level (see previous table).</p>
<p>37. During fire suppression activities, consider effects to aquatic- and riparian-dependent resources. Where possible, locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of RCAs or CARs. During pre-suppression planning, include guidelines for suppression activities that avoid potential adverse effects to aquatic- and riparian-dependent species.</p>
<p>38. Identify roads, trails, staging areas, developed recreation sites, dispersed campgrounds, areas under special use permits or grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic- and riparian-dependent species. At the project level, evaluate and consider actions to ensure consistency with standards and guidelines.</p>
<p><i>Riparian Conservation Objective 5: Preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas.</i></p>
<p>39. Assess the hydrologic function of meadow habitats and other special aquatic features during site-specific range management analysis. Ensure that characteristics of special features are, at a minimum, at proper functioning condition (PFC), as defined in the following technical reports (or their successor publications): (1) Process for Assessing PFC, TR 1737-9 (1993); (2) PFC for Lotic Areas, USDI TR 1737-15 (1998); (3) PFC for Lentic Riparian-Wetland Areas, USDI TR 1737-11 (1994); and (4) Assessing Proper Functioning Condition for Fen Areas in the Sierra Nevada and Southern Cascade Ranges in California: A User Guide, USDA Forest Service, R5-TP-028 (April 2009).</p>
<p>Assess the hydrologic function of at-risk meadow habitats. Ensure that characteristics are, at a minimum, at PFC as defined in the Process for Assessing PFC, TR 1737-9 (1993); PFC for Lotic Areas, USDI TR 1737-15 (1998); or PFC for Lentic Riparian-Wetland Areas, USDI TR 1737-16 (Rev. 2003).</p>
<p>40. Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality, or water temperature critical to sustaining bog and fen ecosystems and plant species that depend on these ecosystems. During project analysis, survey, map, and develop measures to protect bogs and fens from such activities as trampling by livestock, pack stock, humans, and wheeled vehicles. Criteria for defining bogs and fens include, but are not limited to, the presence of sphagnum moss (<i>Sphagnum</i> spp.), mosses belonging to the genus <i>Meessia</i>, or sundew (<i>Drosera</i> spp.). Complete initial plant inventories of bogs and fens within active grazing allotments prior to re-issuing permits.</p>
<p>Maintain temperature at a daily average of no more than 20° C on streams affected by management activities. Evaluate stream courses with special circumstances or conditions, such as those affected by hot springs, for site-specific projects.</p>
<p>41. Locate new facilities for gathering livestock and pack stock outside of meadows and RCAs. During project-level planning, evaluate and consider relocating existing livestock facilities outside of meadows and riparian areas. Prior to re-issuing grazing permits, assess the compatibility of livestock management facilities located in RCAs with RCOs.</p>
<p>42. Determine ecological status on all key areas monitored for grazing utilization prior to establishing utilization levels. Use regional ecological score cards and range plant list in regional range handbooks to determine</p>

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ecological status. Analyze meadow ecological status every 3 to 5 years. If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing. Include ecological status data in a spatially explicit geographic information system (GIS) database.
43. Under intensive grazing systems (such as rest-rotation and deferred rotation) where meadows are receiving a period of rest, utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being affected. Degraded meadows (such as those in early seral status with greater than 10 percent of the meadow area in bare soil and active erosion) require total rest from grazing until they have recovered and have moved to mid- or late seral status.
44. Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs and no more than 20 percent of individual seedlings. Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from herbaceous vegetation to woody riparian vegetation.
<i>Riparian Conservation Objective 6: Identify and implement restoration actions to maintain, restore, or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species.</i>
45. Recommend restoration practices in: (1) areas with compaction higher than that allowed in soil quality standards, (2) areas with lowered water tables, or (3) areas with either active downcutting or historic gullies. Identify other management activities (e.g., road building, recreational use, grazing, and fuels reduction) that may be contributing to the observed degradation. Use water-dependent vegetation as a surrogate to evaluate riparian soil moisture condition. Maintain width to depth ratios for A and E channels of values less than 14 on streams affected by management activities. Maintain width to depth ratios for B, C, and F channels of values greater than 10 on streams affected by management activities. Encourage G channels to trend towards width to depths greater than 12. For stable streams (A, B, C, or E), maintain or improve the channel as necessary based on stability indices. Take action to maintain or improve stream sites based on successional stage shifts away from stable conditions. For impaired stream reaches (G, F, or D), successional stage shifts from the impaired stream reach would show a trend toward an unimpaired condition.
Groundwater
<i>Monument-wide</i>
1. Establish a minimum distance from a connected river, stream, wetland, or other groundwater-dependent ecosystem from which a well may be sited.
2. Establish minimum limits to which water levels can be drawn down at a specified distance from a groundwater-dependent ecosystem.
3. Conduct appropriate analyses when evaluating proposals and applications for water wells or other activities that propose to test, study, monitor, modify, remediate, withdraw, or inject ground water on NFS lands (see Technical Guide to Managing Ground Water Resources, FS-881, May 2007).
Geological Resources
<i>Monument-wide</i>
1. Protect cave entrances from all activities, including prescribed fire, mechanical treatments, and recreation.
2. Evaluate proposed septic systems to determine their potential to contaminate groundwater that moves through cave systems.
Soil Resources
<i>Monument-wide</i>
1. During management activities maintain an average of 50 percent effective soil cover in treatment areas that is well distributed and generally in the form of fine organic matter. Effective soil cover is that whose thickness and continuity provides adequate protection to prevent rill network formation. Fine organic matter includes plant litter, duff, and woody material less than 3 inches in diameter.

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Management activities in areas with ecological types that cannot normally support 50 percent soil cover will need to be considered individually for soil cover needs. In special areas such as fuelbreaks and defense zones, immediate post-treatment soil cover levels less than 50 percent will be allowed as long as the site conditions and actual cover level will prevent erosion. Field review and monitoring should be used to determine the minimal level of soil cover necessary in special areas.
2. Maintain 100 percent soil cover in a 100-foot-wide buffer below rock outcrops that have the potential to generate runoff into management activity areas and cause erosion.
3. In areas where sustained slopes exceed 35 percent, limit mechanical operations such as skidding, tractor piling, grapple piling, and mastication, except where supported by on-the-ground evaluation by an interdisciplinary team that includes a watershed specialist.
4. Limit total soil compaction (displacement and total soil porosity reduction) to less than 15 percent of the management activity area. No more than 10 percent of the activity area can be displaced. Temporary roads, temporary landings, and skid trails will be considered part of the activity area to evaluate. Areas excluded from this standard include National Forest System roads, trails, and facilities, and other dedicated sites. Soil will be considered displaced if more than one-half of the thickness of the topsoil or A horizon has been removed from a contiguous area larger than 100 sq. ft. Soil will be considered compacted if there is less than 90 percent total soil porosity in a contiguous area greater than 100 sq. ft compared to undisturbed soils nearby. Conduct operations when soil porosity, especially macroporosity, will be maintained at a level sufficient for soil hydrologic function and long-term soil productivity for plant growth. Use the latest findings of studies such as that for Long Term Soil Productivity by Powers to evaluate the effects to soil productivity from porosity changes.
5. Maintain aquatic soil moisture conditions (defined in Soil Taxonomy) in wet meadows and fens. Areas with aquatic soil moisture conditions include wet meadows and fens where soil moisture levels remain high throughout most of the year. Maintain soil structure and porosity. Use the presence and density of water-dependent vegetation as indicators of soil moisture condition.
6. Maintain downed logs for soil organisms, based upon the ecological type and in consultation with wildlife and fuels.
7. For projects involving the application of chemicals, such as herbicides, pesticides, or other amendments, evaluate the effects to soil micro-organisms, post-project erosion risk, leaching potential, and risk of off-site movement of the chemicals. Provide recommendations to prevent adverse effects.
Human Uses⁽⁷⁾
Recreation
<i>Monument-wide</i>
1. Cross-country travel (non-motorized [e.g., horses, hikers—non-mechanized]) may be restricted to prevent resource damage.
2. Manage dispersed recreation activities by location and period of use based on wildlife needs (e.g., excluding incompatible use from key areas during fawning and nesting).
Energy
<i>Monument-wide</i>
1. Encourage energy development, when sources are available, as long as the development is consistent with other standards and guidelines.
Scenery
<i>Monument-wide</i>
1. Design management activities to meet and exceed when practical the specified Scenic Integrity Objective (SIO).

7. Including Recreation, Scenery, and Socioeconomics.

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2. Meet scenic integrity objectives with the following exceptions: (1) accept occasional short-term departure from adopted minimum scenic integrity that will lead to long-term desired scenic character if disclosed in a site-specific NEPA decision, and (2) temporary drops of one minimum scenic integrity level may be made during and immediately following project implementation providing they do not exceed 3 years in duration.
3. Include mitigation measures for activities that alter the landscape beyond the adopted minimum scenic stability.
Cultural Resources
<i>Monument-wide</i>
1. Fully integrate opportunities for preservation, protection, and utilization of cultural resources into land use planning and decisions through: <ul style="list-style-type: none"> (1) Assessing potential effects on heritage resources on a project-specific basis. (2) Avoiding or mitigating effects on sites eligible for the National Register or other significant sites. (3) Follow-up monitoring to assess the effectiveness of management procedures. (4) Post and sign (e.g., tractors prohibited, Antiquities Act) selected cultural resource sites where such signing will not endanger the sites. (5) Monitor number of sites for protection visits on revolving basis, and prioritize according to resource significance and vulnerability as developed in the forest overview. (6) Develop and provide interpretive brochures for selected sites.
2. Conduct inventories as necessary, occasionally doing non-project-specific surveys. Complete archaeological reconnaissance reports and site records to allow evaluation of site significance. Release those site locations declared not significant for other management activities. Approach systematically the reduction of the existing forest backlog of sites to be evaluated. Those types of sites deemed more potentially critical in the forest overview will receive priority.
3. Conduct on-the-ground interpretation at a number of sites that exist at or near developed sites, where high level of use or exposure is possible (i.e., properties adjacent to campgrounds, historic logging activities in the vicinity of campgrounds).
4. Regularly consult with Native Americans as interested parties on proposed undertakings.
Transportation System
<i>Monument-wide except Wilderness</i>
1. To protect watershed resources, meet the following standards for road construction, road reconstruction, and road relocation: (1) design new stream crossings and replacement stream crossings for at least the 100-year flood, including bedload and debris; (2) design stream crossings to minimize the diversion of streamflow out of the channel and down the road in the event of a crossing failure; (3) design stream crossings to minimize disruption of natural hydrologic flow paths, including minimizing diversion of streamflow and interception of surface and subsurface water; (4) avoid wetlands or minimize effects to natural flow patterns in wetlands; and (5) avoid road construction in meadows.
2. Maintain developed trailhead access roads and primary access routes to developed facilities at a minimum of maintenance level 3.
3. Use seasonal closure as a tool to protect key wildlife values, environmental resources, and road investment.
4. Limit motorized vehicles to designated roads.
5. Limit non-motorized mechanized vehicles (such as bicycles) to designated roads and trails.
6. Limit over-snow vehicles to designated roads.
Wilderness
7. Construct and maintain trail bridges consistent with wilderness uses.

Standard/Guideline
Special Areas, including Special Interest Areas
<i>Kings River Special Management Area (KRSMA)</i>
1. Archaeological sites: Sites are maintained in a condition that will permit an evaluation of significance and, if appropriate, listing in the National Register of Historic Places. Significant sites are protected to permit future data recovery (KRSMA MP p. 53).
2. Suitable fish habitat: R-5 minimum management requirements, FLMP guidelines, riparian standards and guidelines, and best management practices are being applied in a way that supports the objectives established in the SMA and WSR EIS and Plan; and project-specific NEPA documents (KRSMA MP p. 53).
3. Management of SMA and WSR: Periodic reviews to evaluate the effectiveness of management directions and monitoring plan indicate that the documents reflect the current environmental social and administrative needs in the area (KRSMA MP p. 53).
4. Transportation system: The transportation system’s effectiveness meets the opportunity class and zone objectives. Project-specific NEPA documents and the forest trails plan reflect the objective in the SMA and WSR EIS and Plan (KRSMA MP p. 54).
5. Water quality: Implementation of BMPs and project design do not permit a decrease in water quality (KRSMA MP p. 54).
6. TES species: Project plans and prescriptions are implemented as designed, consistent with the biological evaluations (KRSMA MP p. 54).
<i>Standards for South Fork Zone (Kings South Fork Wild and Scenic River)⁽⁸⁾</i>
7. Public use areas consistency with opportunity class III: Dispersed recreation effects are temporary, and are commonly only fire rings in the turnouts along Highway 180. Effects from recreation activities may be evident to the visitor. Use areas are generally >50 feet apart and are fewer than two per 320 acres (KRSMA MP p. 57).
8. Management of Highway 180, Boyden Cavern, and Grizzly Falls: Adequate parking is provided, sanitation facilities meet current needs, and all facilities complement the area’s natural scenic resources (KRSMA MP p. 57).
9. Zone aside from Highway 180, Boyden Cavern, and Grizzly Falls: A low probability of meeting other parties or forest users during low-use periods (<50 percent chance), a possible encounter with other recreationists during the spring (25 to 50 percent chance) (KRSMA MP p. 57).
10. Management focus on river-based and unique opportunities: all resource conditions, social conditions, and management activities reflect the characteristics described for opportunity class II and the objectives for this zone (KRSMA MP p. 57).
<i>Standards for Verplank Zone</i>
11. Campsite consistency with opportunity class II: Campsites are small and temporary. Some facilities are provided. Effects from recreation activities may be evident to the visitor. Campsites are greater than 50 feet apart and are fewer than five per 320 acres (KRSMA MP p. 58).
12. Few encounters between travelers: A low probability of meeting other parties or forest users during low-use periods (less than 50 percent chance), a possible encounter with other recreationists during the spring (25 to 50 percent chance) (KRSMA MP p. 58).
13. Scope of OHV, grazing, and vegetation management: Use of forest resources and OHV use of designated routes is consistent with the long-term protection of the area’s natural, archaeological, and scenic resources (KRSMA MP p. 58).
14. Management focus to balance recreation with maintaining natural environment: All resource conditions, social conditions, and management activities reflect the characteristics described for opportunity class II and the objectives for this zone (KRSMA MP p. 58).

8. The South Fork Zone is actually within the Kings South Fork Wild and Scenic River corridor, but lies within the boundaries of KRSMA.

Standard/Guideline
<i>Standards for Converse Zone</i>
15. Campsite consistency with opportunity class I: Campsites are small and temporary. No facilities are provided. Effects are not evident to the visitor. Campsites are >100 feet apart and are fewer than two per 320 acres (KRSMA MP p. 59).
16. Human developments: No large developments are permitted, and small developments are temporary or subordinate to the environmental setting (KRSMA MP p. 59).
17. Few encounters between travelers: Extremely low probability of meeting other parties or forest users during low-use periods (<25 percent chance), a possible encounter with other recreationists on the National Recreation Trail and the Yucca Point Trail (25 to 50 percent chance) (KRSMA MP p. 59).
18. Management emphasizes maintaining natural environment: All resource conditions, social conditions and management activities reflect the characteristics described for opportunity class I and the objectives for this zone (KRSMA MP p. 59).
<i>Standards for Boole Zone</i>
19. Campsite consistency with opportunity class II: Campsites are small and temporary. Some facilities may be provided. Effects from recreation activities may be evident to the visitor. Campsites are greater than 50 feet apart and are fewer than five per 320 acres (KRSMA MP p. 60).
20. Few encounters between travelers: A low probability of meeting other parties or forest users during low-use periods (less than 50 percent chance), a possible encounter with other recreationists along the Boole Tree Trail (25 to 50 percent chance) (KRSMA MP p. 60).
21. Scope of OHV, grazing, and vegetation management: Use of forest resources and OHV use of designated routes is consistent with the long-term protection of the area's natural, archaeological, and scenic resources (KRSMA MP p. 60).
<i>Standards for Kings River Corridor Zone (Portion Within the Monument)</i>
22. Dead and down material: Ten tons per acre of dead and down material should be available for wildlife and recreational campfire building (KRSMA MP p. 61).
23. Human developments: Not more than five developments per a 320-acre area. Developments include structures and facilities for recreation and non-recreation activities (KRSMA MP p. 61).
24. Vandalism effects to visuals: No more than three new occurrences of graffiti vandalism or defacing of natural features located anywhere within the zone per year (KRSMA MP p. 61).
25. Dispersed campsites: No more than five sites within a quarter-mile length of the river corridor. Dispersed site locations should not affect the experience of other campers (KRSMA MP p. 61).
26. Group camping (encourage use outside SMA/WSR corridor): No more than five declined requests for group camping. The existing accommodations for group camping should meet user needs (KRSMA MP p. 62).
27. Few encounters between travelers: Fifty percent probability of no more than five encounters with other parties (KRSMA MP p. 62).
28. Conflicts between users: No more than five reported or otherwise documented conflicts between different types of users (e.g. anglers and rafters) (KRSMA MP p. 62).
29. Public safety: No more than four accidents per year within the zone, with attention to rafting incidents. Accidents are incidents where there is either an incident report filed by a forest officer or a forest visitor requires medical attention (KRSMA MP p. 62).
30. Public parking that protects resource and provides public safety: Public parking space should be provided at a level that protects the resource and provides for public safety and comfort. Visitors should find adequate parking at trailheads, raft put-ins, and raft take-outs.
31. Congestion at launch site: Rafting groups do not wait longer than 60 minutes to launch (KRSMA MP p. 63).
32. Groups encountered on river per day: Maximum of 17 parties per day (KRSMA MP p. 63).

Standard/Guideline
Research Natural Areas
33. Protect and manage South Mountaineer Creek, a potential research natural area, as if it was already established, pending its final establishment or release by the Chief of the Forest Service.
Botanical Areas
34. Manage the Freeman Creek Grove as a botanical area.
35. There shall be no logging and no motorized vehicle use by the public anywhere in the Freeman Creek Botanical Area.

Monitoring and Evaluation

Monitoring and evaluation are integral parts of the adaptive management cycle that will provide a framework to guide future management decisions and actions. Monitoring and evaluation activities in the Monument are closely linked to the adaptive management strategy in the 2001 SNFPA. Adaptive management is the process of continually adjusting management in response to new information, knowledge, or technologies. The Monument Plan monitoring process responds to specific requirements of the 1976 National Forest Management Act that must be met on a forest-wide basis, and the need to monitor forest management on a forest-wide basis. This monitoring plan also responds to Advisory XVIII from the Scientific Advisory Board which recommends that the Forest Service “strive for an on-site research and monitoring presence” (The Scientific Advisory Board 2003, Advisory XVIII).

Adaptive management is the foundation for planning and management. Forest plans need to be dynamic to account for changing resource conditions, resulting from large-scale wildfires, climate change, or listing of additional species under the Endangered Species Act, and new information and science, such as results from scientific study and monitoring.

Monitoring requirements are found in all three parts of the Monument Monitoring Plan. Part 1 monitoring is focused on measuring movement toward desired conditions over the long term. Part 2 monitoring documents individual program accomplishments and is reported annually. Finally, Part 3 monitoring measures a randomly selected sample of projects and ongoing activities and evaluates how well project implementation follows Monument Plan direction. All three parts use an adaptive management approach

designed to lead to continuous improvement in management of the Monument.

Types of Monitoring

The tables in this section include monitoring or inventory program areas or projects, monitoring questions, associated performance measures, and the frequency of reporting (annual or other time period). They also document the source, or who is expected to conduct the monitoring. Most of the monitoring will be conducted by the Sequoia National Forest (SQF), sometimes engaging the Pacific Southwest Region (RO), or another regional entity or program (such as the Pacific Southwest Research Station (PSW)), for consultation and assistance as needed and as resources are available.

The types of monitoring are:

- Implementation monitoring:** Determines if the management strategy (strategies, objectives, and standards and guidelines) is implemented as designed and in compliance with the Monument Plan. Implementation monitoring answers the question: “Were the management activities to protect the objects of interest and their ecosystems accomplished as specified in the Monument Plan?”
- Effectiveness monitoring:** Determines if the management strategy (strategies, objectives, and standards and guidelines) is effective in moving the Monument toward desired conditions. This type of monitoring provides a better understanding of how ecosystem components, structures, and processes have responded to the management strategy and answers the question: “Did the management strategy actually work to move

Monument resources closer to their desired conditions?”

- **Validation monitoring:** Determines whether the initial data and assumptions used in development of the Monument Plan and its management strategy are correct, or if there is a better way to meet forest planning regulations, policies, goals, strategies, and objectives. Validation monitoring is generally done only when implementation or effectiveness monitoring results suggest that a given practice may not have been implemented properly or was not effective in achieving expected outcomes. Validation monitoring is usually conducted by researchers in scientific studies or analyses.
- **Status and trend monitoring of ecosystem conditions and management activities:** Assesses important biological, physical, and sociocultural conditions, to gauge whether desired conditions are being achieved and provide early warning of unanticipated effects from management activities evaluated at a large scale. Baseline data are required before status and trend monitoring can occur. Baseline can be considered a component of implementation monitoring, while status and trend can be considered a component of effectiveness monitoring.

Part 1 Monitoring

Monitoring and evaluation provide knowledge and information to keep the Monument Plan viable. Appropriate selection of indicators, and monitoring and evaluation of key results, helps the Forest Service determine if the desired conditions identified in the Monument Plan are being met. Monitoring and evaluation also help the Forest Service determine if there should be changes to strategies, objectives, standards and guidelines, or monitoring methods.

Monitoring and evaluation processes begin by identifying key questions Forest Service managers need to answer about Monument Plan implementation. Understanding the questions help to identify information needs, data collection designs, and the tools needed to turn data into information and knowledge. Managers must also have a clear understanding of baseline conditions (current resource condition at the time of signing the ROD) versus desired conditions and the type of evaluation that

will help determine if movement towards desired conditions is occurring.

Monitoring and evaluation will answer the following key questions:

- Has the Sequoia National Forest taken actions to protect the objects of interest and restore their ecosystems?
- Has on-the-ground management in the Monument maintained or made progress toward the desired conditions?
- How are baseline conditions changing in response to changing climate and climate-related processes (e.g., wildfire)?
- What changes are needed to account for unanticipated changes in conditions?

The Part 1 Monitoring Summary presented in the following table focuses on evaluating the broad aspects of plan implementation. Most importantly, this monitoring includes elements for protecting the objects of interest identified in the Proclamation, including:

- The naturally-occurring giant sequoia groves and their associated ecosystems, individual giant trees, rare and endemic plant species such as the Springville clarkia, and other species listed as threatened or endangered by the Endangered Species Act (ESA), or sensitive by the Forest Service.
- The ecosystems and outstanding landscapes that surround the giant sequoia groves.
- The diverse array of rare animal species, including the Pacific fisher, the great gray owl, the American marten, the northern goshawk, the peregrine falcon, the California spotted owl, the California condor, several rare amphibians, the western pond turtle, and other species listed as threatened or endangered by the ESA, or sensitive by the Forest Service.
- The paleontological resources in meadow sediments and other sources that have recorded ecological changes in such markers as fire regimes, volcanism, vegetation, and climate.
- The limestone caverns and other geologic features, including granite domes, spires, geothermally-

produced hot springs and soda springs, and glacial and river-carved gorges.

- Cultural resources, both historic and prehistoric, which provide a record of human adaptation to the landscape, and land use patterns that have shaped ecosystems.

Cultural resources are monitored based on law, regulation, and policy. Most monitoring takes place based on site-specific project needs and are developed through the process codified in the National Historic Preservation Act (NHPA) in consultation with the State Historic Preservation Officer and Advisor Council on Historic Preservation. Monitoring is based on the potential to affect historic properties listed and/or potentially eligible for listing on the National Register of Historic Places. Standard

protection and mitigation measures, and monitoring of those measures, can be found in the *First Amended Regional Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings on the National Forests of the Pacific Southwest Region (2001)* (Regional PA), the *Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Identification, Evaluation, and Treatment of Historic Properties managed by the National forests of the Sierra Nevada, California (1996)*.

Table 47 Part 1 Monitoring Summary

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Air Quality				
Air quality conditions	What is the trend of air quality conditions associated with prescribed fire and wildfire?	Chemical constituents of atmospheric aerosols.	Status and Trend	Ongoing Committee for Interagency Monitoring for Protected Visual Environments (IMPROVE), SQF
Climate Change				
Climate change trend assessments	What are the trends in temperature in the Monument and neighboring southern Sierra Nevada?	Mean, mean maximum, and mean minimum annual temperature based on Western Regional Climate Center database.	Status and Trend	1-2 years Regional Ecology Program
	What are the trends in precipitation in the Monument and neighboring southern Sierra Nevada?	Mean and variance annual precipitation based on Western Regional Climate Center database.	Status and Trend	1-2 years Regional Ecology Program
	What are the emerging trends in climate-driven processes (wildfire, hydrology, vegetation) in the Monument and surrounding Sierra Nevada?	Associated trends in climate-driven processes based on science literature review.	Status and Trend	1-2 years Regional Ecology Program

Part 3—Design Criteria

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Ecosystem Analysis				
Assessment of watershed condition	Have Monument landscapes been analyzed to identify opportunities for site specific environmental analysis including reduction of risks and hazards associated with wildfire; opportunities for ecological restoration; program and budget development; and priorities for cultural, social and economic ecological needs?	# of landscape analyses (hydrologic unit code [HUC] 6th-field) completed.	Status and Trend	Within 5 years of ROD, as new science/ information available. SQF
	Was current distribution of geologically unstable lands identified in landscape analysis?	# of landscape analyses (HUC 6th-field) completed that identified this.	Status and Trend	Within 5 years of ROD, as new science/ information available. SQF
Assessment of watershed condition: stream channel discharge and geometry relationships	What are the current distribution, status and location of flooding and discharge relationships of channels?	Channel geometry, discharge relationships.	Status and Trend	Ongoing, in response to flood events. SQF
Assessment of watershed condition: stream bank erosion rates	What are the background stream bank erosion rates?	Stream bank erosion.	Status and Trend	Ongoing SQF
Assessment of watershed condition: stream channel discharge and geometry relationships	Are discharge and channel geometry relationships established?	Channel geometry, discharge relationships at the new HUC scale.	Status and Trend	Ongoing SQF
	Were the areas with a history of flooding identified in landscape analysis?	Review the watershed condition assessment data.	Status and Trend	In response to flood events. SQF
Assessment of watershed condition: areas of special concern	Did the landscape analysis identify areas of special concern, raise awareness of conditions, and result in mitigation/ design modification/ protection/action?	# of completed landscape analyses at the 6th-field HUC level.	Status and Trend	Before site-specific project analysis SQF

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Stream bank erosion rates	Have background stream channel erosion rates changed as a result of natural processes (including fire) or management actions?	Stream bank erosion.	Status and Trend	After site-specific project or disturbance SQF
Stream channel discharge and geometry relationships	Are discharge and channel geometry relationships for the 5th-field HUC accurate at the 6th-field HUC?	Compare 5th-field HUC stream channel discharge and geometry data with 6th-field HUC data.	Validation	After disturbance SQF
Stream bank erosion rates	Are discharge and channel geometry relationships for the 5th-field HUC accurate at the 6th-field HUC?	Compare 5th-field HUC erosion rates with 6th-field HUC rates.	Validation	After disturbance SQF
Meadow ecosystems	What is the ecological condition of meadow ecosystems?	Change in wetland rating, vegetation rating, and ecological status per R5 monitoring protocol.	Status and Trend	5-10 years RO
	Is there a change in the total area occupied by montane meadows?	Total area of montane meadows by class (dry/wet meadow with/without woody vegetation).	Status and Trend	5-10 years RO
Aquatic Resources				
Aquatic resource and habitat condition	What is the current state of aquatic resources and habitat conditions?	Stream condition, aquatic macro invertebrates.	Status and Trend	Every 5 years after plots established SQF
	Did stream condition inventory data show changes in aquatic resource and habitat conditions following large-scale disturbances (such as fires and floods)?	Analysis of stream condition inventories for change.	Status and Trend	After disturbances SQF

Part 3—Design Criteria

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
	Are stream systems capable of moving sediment without causing channel alterations and damage to riparian and aquatic habitat?	Changes in stability and indicators of disequilibrium.	Effectiveness	After disturbances SQF
Aquatic resource and habitat condition	What is the current state of aquatic resources and habitat conditions within the watershed?	Inventories and/or analysis of aquatic resources.	Status and Trend	After disturbances SQF
Protection from flooding	Did the assumptions used to formulate flooding potential on life, property, and natural resources help reduce or avoid damage from flooding?	Evaluate assumptions for flooding events.	Effectiveness	After disturbances SQF
Geological Resources				
Cave condition	Were cave resources considered in landscape analyses?	# of caves inventoried.	Status and Trend	Ongoing SQF
Cultural Resources				
Cultural resource condition	Have changes occurred in the condition of, integrity of, and disturbance risk to cultural resources?	Site condition.	Status and Trend	Every 3-5 years SQF
Fire And Fuels				
Fire susceptibility	Have we identified areas of fire susceptibility that need to be treated to move toward desired conditions?	Ground fuels, ladder fuels, crown bulk density, and tree density. Acres in need of treatment as determined in landscape analysis.	Effectiveness	Within 5 years of ROD, as new science/information available SQF
	Have we treated areas of high fire susceptibility to move toward desired conditions?	Acres of fire susceptibility meeting desired conditions.	Status and Trend	Every 5 years SQF

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Fire behavior and fire regime	Are the fire and fuel strategies and treatments effective in achieving the desired fire behavior and fire regimes within vegetation types or series?	Severity, rate of spread, fire type, intensity, frequency, spotting, crown bulk density, tree density	Effectiveness	Every 5 years or following major wildfire events SQF
Fuel loading	How effective are fuel treatments (prescribed burning, hand and mechanical treatments) and managed wildfire in achieving desired fuel loading at treatment sites?	Surface fuels, ladder fuels, crown loading.	Effectiveness	Every 5 years or following major wildfire events SQF
Groundwater				
Groundwater	What is the relationship between groundwater, giant sequoia grove ecology, and meadow ecosystems?	Groundwater fluctuation and soil moisture levels as measured by lysimeters and piezometers in groves and meadows.	Status and Trend	Ongoing SQF
Invasive Plants/Noxious Weeds				
Noxious weed inventory	What is the distribution of noxious weeds?	Miles of roads and trails inventoried, distribution of noxious weeds.	Status and Trend	Within 3 years of ROD, as new science/information available SQF
Socioeconomics				
Socioeconomics	How are communities changing in response to social and economic conditions?	Change in demographics.	Status and Trend	Every 10 years RO
	What is the capacity for economic development in gateway communities?	Housing, employment by industry, index of industrial specialization, place of work, source of income.	Status and Trend	Every 10 years RO

Part 3—Design Criteria

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Vegetation				
Giant sequoia groves	What is the size and age of giant sequoias? What is the number of larger or monarch giant sequoias?	Dbh, age, height, crown ratio, and crown height (common stand exams).	Status and Trend	1-10 years SQF
	What are the age and species composition of vegetation?	Age, # by species (common stand exams).	Status and Trend	10 years SQF
	What is the status of ladder fuels and fuel loading?	Height by seral stage and species, amount of down woody material (common stand exams).	Status and Trend	5-10 years SQF
	What is the status of giant sequoia regeneration?	# of seedlings and saplings (common stand exams).	Status and Trend	5-10 years SQF
	What is the change in structure in giant sequoia groves and is it trending toward desired conditions?	Dbh, age, height, crown ratio, and crown height (common stand exams).	Effectiveness/ Status and Trend	2-5 years SQF
	What is the change in age and species composition and is it trending toward desired conditions?	Age, # by species (common stand exams).	Effectiveness/ Status and Trend	2-5 years SQF
	What is the change in ladder fuels and fuel loading and is it trending toward desired conditions?	Height by seral stage and species, amount of down woody material (common stand exams).	Effectiveness/ Status and Trend	2-5 years SQF
	What is the change in status of giant sequoia regeneration and is it trending toward desired conditions?	# of seedlings and saplings (common stand exams).	Effectiveness/ Status and Trend	2-5 years SQF
General Monument outside groves	What are the age and species composition of vegetation?	Age, # by species (common stand exams).	Status and Trend	10 years SQF

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
	What is the status of ladder fuels and fuel loading?	Height by seral stage and species, amount of down woody material (common stand exams).	Status and Trend	10 years SQF
	What is the status of regeneration?	# of seedlings and saplings (common stand exams).	Status and Trend	10 years SQF
	What is the change in age and species composition and is it trending toward desired conditions?	Age, # by species (common stand exams), R5 CALVEG, CWHR.	Effectiveness/ Status and Trend	5-10 years SQF, RSL
	What is the change in ladder fuels and fuel loading and is it trending toward desired conditions?	Height by seral stage and species, amount of down woody material (common stand exams, FIA plots).	Effectiveness/ Status and Trend	10 years SQF
	What is the change in status of regeneration and is it trending toward desired conditions?	# of seedlings and saplings (common stand exams, FIA plots).	Effectiveness/ Status and Trend	10 years SQF
Deforestation by wildfire	How many acres of forest and woodlands have been deforested as a result of wildfire?	Acres of forest and woodland vegetation (by type, including giant sequoia groves) in deforested condition following wildfire.	Status and Trend	Annually for fires exceeding 1,000 acres on National Forest System lands RO
Carbon stocks	What are the baseline carbon stocks?	Total aboveground carbon measured at FIA plots.	Status and Trend	Within 5 years of ROD, as new science/information available FIA Program
Forest health	What is the extent of tree mortality and injury?	Total number of dead trees and total number of acres with recent tree mortality or injury, by forest type and injury agent, based on aerial surveys.	Status and Trend	Annually Forest Health Protection, State and Private Forestry

Part 3—Design Criteria

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Canopy gap analysis	Are gaps in the canopy large or frequent enough to meet desired conditions for regeneration of giant sequoias and pines?	Canopy cover, acres of canopy gaps (common stand exams).	Effectiveness/ Status and Trend	10-20 years SQF
Wildlife				
Wildlife protection	Do management strategies provide for the protection of wildlife habitat?	Occupancy, habitat conditions.	Effectiveness	Ongoing SQF
Terrestrial wildlife	Are wildlife species adequately protected?	Occupancy, habitat conditions.	Effectiveness	Within 5 years of ROD, as new science/ information available SQF
	What is the status of the Pacific fisher population?	Detection rates.	Status and Trend	Ongoing RO
	What is the status of the willow flycatcher population and its suitable habitat?	Occupancy, habitat conditions at the five historically occupied sites.	Status and Trend	Every 4 years SQF
Threatened, Endangered, and Sensitive (TES) Plants				
TES Plants	What is the status of known populations of and suitable habitat for TES species (specifically Springville Clarkia)?	Plant survey	Status and Trend	Annually SQF
	Is there any change in the status, location, and suitable habitat for TES species (specifically Springville Clarkia)?	Analysis of population demographics.	Status and Trend	Annually SQF

Part 2 Monitoring

Monitoring in Part 2 of the Monument Monitoring Plan is focused on program implementation including inventory. The Sequoia National Forest currently uses performance measures for tracking program accomplishments (see the following table). The current system is expected to be replaced by a performance accountability system integrating

annual budgets with programs of work (WorkPlan) and linking these to tracking of activities designed to implement the National Strategic Plan through the Forest Activities Tracking System (FACTS) or subsequent reporting system.

Actual performance is tracked over time through annual documentation of accomplishments. The Forest Supervisor and other managers will display

Table 48 Part 2 Monitoring Summary

Accomplishment	Units	Measuring Frequency (years)	Report Period (years)
Wildlife habitat improvement	Acres	1	1
Fish habitat improvement	Miles of stream, acres of lake	1	1
Watershed improvement	Acres	1	1
Meadow restoration	Acres	1	1
Fuel treatment	Acres (WUI & non-WUI)	1	1
Vegetation management for ecological restoration and maintenance	Acres	1	1
Cultural resources managed to standard	Number of sites	1	1
Recreation use	PAOT days ⁽¹⁾	1	1
Trail maintenance	Miles	1	1
Rangeland improvement	Acres	1	1
Grazing allotments administered to standard	Acres	1	1
Road maintenance	Miles	1	1

1. PAOT Days=persons at one time days

monitoring results in evaluation reports after a management review and determine if any changes are needed in plan guidance. These data will no longer be reported in the annual report agreed to in the 1990 Mediated Settlement Agreement (1990 MSA), but rather will be reported in an annual monitoring and evaluation report (Forest Plan Monitoring Report). This report will include both site-specific project monitoring and forest-wide (programmatic level) monitoring.

Inventory is a continuous effort. As funding is available, priority inventories are implemented and reported through various resource information systems, such as the Natural Resources Information System (NRIS) and the Infrastructure database (INFRA). Periodic evaluation of inventory data is used to explore trends in resource conditions over time. Annual forest plan monitoring reports will document when there is a need to change the Monument Plan in response to changing trends in resource conditions.

General Budget History

The Sequoia National Forest’s budget allocations increased from 1995 to 2009. Analysis of budget history indicates that practically all of the increase was for hazardous fuels reduction and fire pre-

suppression (preparedness) to implement the National Fire Plan. Some other program budgets increased at roughly the rate of inflation.

For the Sequoia National Forest, the budget allocations for the last three fiscal years (2009-2011) were:

Program	FY2009	FY2010	FY2011
	(in million \$)		
Fire/fuels management	16.15	15.75	15.19
Recreation/facilities/trails	2.18	1.81	1.59
Natural resources	2.32	1.93	2.28
Total	20.65	19.49	19.06

Based on the current trend, budgets for the Sequoia National Forest are predicted to decline in the first years of plan implementation.

Part 3 Monitoring

Monitoring for Part 3 of the Monument Monitoring Plan is conducted at the project level. Monitoring and evaluation will be conducted to determine how well the management direction for the Monument (strategies, objectives, and standards and guidelines) has been followed, and how closely standards and guidelines have been applied.

The monitoring plan presented in the following table consists of those special activities that focus on evaluating the broad aspects of plan implementation associated with projects and ongoing activities.

Other monitoring consists of reports, reviews, and records that occur as a routine part of forest management. Actions not duplicated in this plan include such things as: individual and annual fire reports; management attainment reports; annual vegetation management action plans, reviews, and reports; budget and financial management documents; recreation information management reports and databases; visitor use monitoring; special uses administration; environmental analysis reports; activity reviews; audits; and general management reviews.

Table 49 Part 3 Monitoring Summary

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Air Quality				
Air quality	Did smoke from prescribed fire contribute to public nuisance or health standard violations?	Micrograms/cubic meter of PM ₁₀ ; visual observations.	Status and Trend	Bi-annually SQF
Aquatic Resources				
Water quality	Were best management practices (BMPs) identified for all activities in the Monument?	% implementation monitoring of BMPs.	Implementation	Ongoing SQF
	Were BMPs monitored on all projects?	% effectiveness monitoring of BMPs.	Implementation	After site-specific projects SQF
	Were BMP prescriptions effective in protecting soil and water resources of the watersheds?	SCI surveys.	Effectiveness	After site-specific projects SQF
Cultural Resources				
Cultural resource condition	Have cultural resources been identified and located in project areas and managed wildfire locations?	# of sites inventoried.	Status and Trend	Ongoing SQF
	Were cultural resources affected by forest use and management activities?	# of sites affected.	Status and Trend	Every 3-5 years SQF

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
Fire And Fuels				
Fire threat and severity	Have we identified areas in the WUI and general Monument that need treatment to reduce the threat and severity of wildfire?	Ground fuels, ladder fuels, crown bulk density, and tree density. Acres in need of treatment as determined in landscape analysis.	Status and Trend	Within 5 years of ROD, as new science/information available SQF
	Do fire and fuel treatments in the WUI and general Monument reduce the threat and severity of wildfire?	Treatment characteristics (location and type), ground fuels, ladder fuels, crown bulk density, and tree density.	Status and Trend	Every 5 years SQF
Prescribed burns and managed wildfire	Are prescribed burns and managed wildfire being used to meet or move toward desired conditions?	Acres of prescribed burns, acres of managed wildfire.	Status and Trend	Annually SQF
Geological Resources				
Cave condition	Are caves affected by management activities?	# of caves affected by management activities.	Status and Trend	Every 3 years SQF
	Are gates secured and cave features protected in Church and Boyden Caves?	Condition of Church and Boyden Caves.	Status and Trend	Annually SQF
Invasive Plants/Noxious Weeds				
Noxious weed inventory	Are noxious weed populations responding to the management strategies?	Noxious weed populations and distribution.	Status and Trend	Ongoing SQF
Range				
Utilization standards: lower westside hardwoods	Did grazing utilization follow standards and guidelines for residual dry matter (RDM)?	Indices of RDM.	Status and Trend	Annually, at end of grazing season SQF
	Are utilization standards for oaks being met?	% livestock browse on annual growth of hardwood seedlings and advanced regeneration.	Status and Trend	Annually, at end of grazing season SQF

Part 3—Design Criteria

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
	Did grazing utilization maintain at least 60% cover in annual grasslands?	% ground cover.	Status and Trend	Annually, at end of grazing season SQF
	Are grazing utilization standards for oak regeneration meeting desired conditions?	Grazing utilization of oak regeneration.	Status and Trend	Every 5 years SQF
Utilization standards: aquatic, meadow, and riparian ecosystems	Are grazing utilization standards being met for meadow vegetation?	Ecological status of meadows per R5 monitoring protocol.	Status and Trend	Annually, at end of grazing season SQF
Ecological status: range of natural variability	Has the range of natural variability been determined in the Monument?	Riparian conditions.	Status and Trend	Annually SQF
Ecological status: stream banks	Are stream banks maintained at desired conditions?	% stream bank alteration.	Status and Trend	Annually SQF
Ecological status: aquatic, meadow, and riparian ecosystems	What is the ecological status and trend of key aquatic, meadow, and riparian ecosystems within allotments?	Change in wetland rating, vegetation rating, riparian condition, stream condition, and ecological status per R5 monitoring protocol.	Status and Trend	Every 5 years SQF
Ecological status: special aquatic features	Are special aquatic features protected from grazing/	Riparian vegetation within allotments.	Status and Trend	Annually SQF
Ecological status: woody riparian shrubs	Are grazing utilization standards being met for woody riparian shrubs?	% browsed mature riparian shrubs and individual seedlings.	Status and Trend	Annually SQF
Soils				
Assessment of soil quality	Were soil quality standards identified for management activities?	Soil quality standards documented in project record.	Status and Trend	Ongoing SQF
	Was soil condition assessed? Were soil erosion risk and ground cover needs evaluated?	Soil condition assessment. ⁽¹⁾	Status and Trend	Ongoing SQF

Monitoring or Inventory Program or Project	Monitoring Question	Performance Measures	Type of Monitoring	Frequency of Reporting and Source
	Was the risk of soil displacement evaluated?			
	Are aquic soil moisture conditions appropriate for local conditions?			
	Was soil compaction risk assessed considering both existing and potential conditions?			
	After management activity, was ground cover maintained, soil displacement minimized, aquic soil moisture maintained (where appropriate), and compaction minimized?	Soil condition assessment. ⁽¹⁾	Status and Trend	Ongoing SQF
	Have chemical applications been applied in a manner consistent with soil quality standards?	Chemical application rates.	Status and Trend	Ongoing SQF

1. See the following Soil Indicator Condition Exhibit.

Table 50 Soil Indicator Condition Exhibit

Soil Function	Indicator	Soil Indicator Condition		
		Functioning Properly Meets Desired Condition	Functioning at Risk	Impaired Function
Productivity for plant growth	Organic matter on mineral soil	The size, amount, and distribution of organic matter present are within the range for the ecological type and normal fire return interval. Soil cover level is 50% or greater, composed mostly of fine organic matter, and well distributed.	Fine organic matter covers 30-49% of the soil surface in the area.	Fine organic matter covers less than 30% of the soil surface in the area.
	Soil organic matter (humus) in mineral soil	The thickness and typical color of the topsoil present is within the range of characteristics for the soil type and is distributed normally. Minor areas of displacement may have occurred but will not affect the productivity for the desired plant species.	Topsoil has been lost, displaced, or removed to a depth and in an area large enough to affect productivity for the desired plant species, but is restricted to localized areas.	Topsoil has been lost, displaced, or removed to a depth and in an area large enough to affect productivity for the desired plant species over a major portion of the area.

Soil Function	Indicator	Soil Indicator Condition		
		Functioning Properly Meets Desired Condition	Functioning at Risk	Impaired Function
	Erosion prevention	An adequate level of soil cover is present and signs of erosion are not visible or extremely minor in degree and extent. No gully erosion is present. Erosion control measures are effective.	In localized portions of the area signs of erosion such as pedestals, sheet, rill, and/or gully erosion is visible. Erosion control measures are ineffective and actions may be needed to prevent further soil loss.	Soil cover is inadequate throughout the area and pedestals, sheet, rill, and/or gully erosion is widespread. Erosion control measures are needed immediately to prevent further soil loss.
	Aquic soil moisture regime	Water-dependent species composition comprises the majority (70-90%) of plant species present. A variety of species and age classes are represented. Growth is vigorous and ground continuous. Deep dense root mat is inferred (Pfankuch 1978).	Water-dependent plant species cover from 50-70%, and lack of vigor is evident in some individuals or species. Seedling reproduction is nil (Pfankuch 1978).	Less than 50% of the ground is covered and root mass is discontinuous and shallow. Water-dependent species are diminished in present (Pfankuch 1978).
Hydrologic function	Soil cover	Soil cover is present in amount and distribution to protect the soil surface from raindrop impact and runoff energy. Soil Cover includes mostly smaller diameter organic material (< 3 inches), rock fragments (> ¾ inch) and low growing vegetation (grass, forbs, shrub canopy within 3 feet of the soil surface). Any sign of overland flow and erosion is minor in degree and extent.	Soil cover is lacking and there is evidence of overland flow and erosion in localized portions of the area.	Soil cover is lacking and there is widespread evidence of overland flow and erosion in the area.
	Infiltration and permeability capacity	Visually, soil structure and macro-porosity in the top 10 inches are relatively unchanged from natural condition for the soil type, and no signs of erosion or overland flow are present or extremely minor in degree and extent. Infiltration and permeability capacity of the soil is sufficient for the local climate.	In portions of the area being assessed, overland flow and signs of erosion are visible, indicating the infiltration and permeability capacity of the soil has been exceeded for the local climate.	Overland flow and signs of erosion are widespread throughout the area, indicating the infiltration and permeability capacity of the soil has been exceeded for the local climate.