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The following individuals significantly contributed to development of the "Proposed Land Management Plan for the Apache-Sitgreaves National Forests" as members of the interdisciplinary plan revision team from 2006 to 2012.

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In addition, numerous individuals and groups provided meaningful input into the development of this plan. Some of these include:

- Members of the public; tribes; State, Federal, and local agencies; and nongovernmental organizations provided review and input.
- The forests' leadership team under three forest supervisors—James Zornes, Chris Knopp, and Elaine Zieroth—provided direction and oversight.
- The employees of the Apache-Sitgreaves NFs provided review and input, especially the staffs of Alpine, Black Mesa, Clifton, Lakeside, and Springerville Ranger Districts.
- The Southwestern Region Plan Revision Team provided oversight and guidance.

Glossary

Adequate access – A route and method of access to non-Federal land that provides for reasonable use and enjoyment of the non-Federal land consistent with similarly situated non-Federal land and that minimizes damage or disturbance to NFS lands and resources (36 CFR 251.111).

Adjudication – The legal process by which an arbiter or judge reviews evidence and argumentation, including legal reasoning, set forth by opposing parties or litigants to come to a decision which determines water rights and obligations between the parties involved.

Administrative use – Use by the Forest Service.

Air quality related value – A scenic, cultural, physical, biological, ecological, or recreational resource which may be affected by a change in air quality as defined by the Federal land manager for Federal lands.

Age class – Trees or plants that originated within a relatively distinct range of years. Typically the range of years is considered to fall within 20 percent of the average natural maturity of a particular species (e.g., if 100 years is required to reach maturity, then there would be five 20-year age classes).

Aspen clone – A genetically identical set of aspen trees all connected by the same root system, such that they can be vegetatively propagated. A clone may be a distinct aspen stand, or it may be a smaller inclusion within a conifer stand, or it may cover an entire mountainside as a large stand or patch.

Available forage – That amount of growth of a vigorous and healthy plant that can be utilized as feed (regardless of what animal is using it) without impairing the plant's long-term health and productivity or other uses such as riparian filtering. The amount of available forage may be less where there is a need to restore health and vigor of forage plants. That amount may also depend on time of year and plant physiological stage or other conditions such as drought.

Basal area – The cross-sectional area of the stem or the stems of the plant or all plants in a stand. Herbaceous and small woody plants are measured at diameter at root collar (d.r.c.) or near ground level; larger woody plants are measured at diameter at breast height (d.b.h.) or other appropriate height. Basal area is a way to measure how much of a site is occupied by plants.

Beneficial use – Beneficial use of water from rivers and streams is allocated by prior appropriation, meaning the first user to divert water and put it to a "beneficial use" obtains a priority right, and that right is to be satisfied before any other user has access to the water. The definition of what constitutes a "beneficial use" has evolved. Although the Arizona Legislature added habitat for wildlife and fish as one of the beneficial uses in 1941, it wasn't until 1976 that the court ruled this included a right for instream flow, and the first instream flow permit was not issued until 1990. Obtaining a permit for instream flow allows users to leave their allocation of water in the river rather than diverting, consuming, or losing it for nonuse.

Best management practices (BMPs) – Methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR 130.2(m)).

Browser – Animals that eat twigs and leaves of woody plants. An example of a browser is deer.

Class I airshed – An airshed classification where areas require the highest level of protection under the Clean Air Act of 1963.

Class II airshed – An airshed classification representing National Forest System land that is not classified as a Class I airshed. These areas may receive a greater amount of human-caused pollution than Class I areas.

Clear-cutting regeneration method – The cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class.

Clump – A tight cluster of two to five trees of similar age and size originating from a common rooting zone that typically lean away from each other when mature. A clump is relatively isolated from other clumps or trees within a group of trees, but a stand-alone clump of trees can function as a tree group.

Coarse woody debris – Woody material, including logs, on the ground greater than 3 inches in diameter—a component of litter. Large coarse woody debris is often considered to be downed logs at least 12 inches in diameter and 8 feet in length.

Common variety minerals – Common variety minerals/salable mineral materials are synonymous terms for the same class of minerals that can be sold under a mineral material contract and are common. These minerals are relatively low value per volume such as sand, gravel, cinders, common building stone, and flagstone. Many of the materials are used for road surfacing, boulders, and engineering construction or may be specialty resources such as soil amendments or decorative stone, including flagstone. These minerals are typically sold unless used internally, by another government agency, or for ceremonial uses. In these cases they may be provided free of charge.

Communications site – An area of National Forest System land used for telecommunications services. A communications site may be limited to a single communications facility, but most often encompasses more than one facility. Existing Apache-Sitgreaves NFs communications sites are listed in appendix C.

Communities-at-risk – As identified in the Federal Register, high risk urban communities within the wildland-urban interface.

Community wildfire protection plans (CWPPs) – Plans for at-risk communities that identify and prioritize areas for hazardous fuels treatments. The CWPPs that cover the Apache-Sitgreaves NFs include: CWPP for the At-Risk-Communities in Apache County, CWPP for the At-Risk-Communities in Greenlee County, and the Sitgreaves CWPP (includes Apache, Coconino, and Navajo Counties).

Condition class – The Forest Service Manual (FSM 2521.1) uses three classes to describe watershed condition:

- **Class 1** watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition and are functioning properly.

- **Class 2** watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition and are functioning at risk.
- **Class 3** watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition and their function is impaired.

Connectivity – The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation; the opposite of fragmentation.

Coppice regeneration method – An even-aged method of regenerating a stand in which the trees in the previous stand are cut and the majority of regeneration is from sprouts or root suckers, such as used in regenerating aspen stands.

Critical area – A critical area for grazing management is an area which should be treated with special consideration because of inherent site factors, size, location, condition, values, or significant potential conflicts among uses. Critical areas are evaluated separately from the remainder of a management unit because they contain special or unique values such as riparian areas (Bureau of Land Management, 1999).

Critical habitat – When a species is listed as endangered or threatened under the Endangered Species Act (ESA), it is protected which includes protection of the habitat it occupies. In addition, specific areas may be designated as particularly necessary for the species' recovery whether the species is present or not; these areas are called "critical habitat." Besides requiring Federal agencies to ensure that their actions will not jeopardize the survival of an endangered or threatened species itself, the ESA also requires that their actions not destroy or adversely modify designated critical habitat. ESA requirements have no implications on non-Federal lands unless activities thereon are undertaken with Federal funding or require a Federal permit.

Culmination of mean annual increment – The age in the growth cycle of an even-aged stand at which the average annual rate of wood volume growth has peaked and is beginning to steadily decline.

Cultural affiliation – A relationship of shared group identity which can be reasonably traced historically or prehistorically between a present day American Indian tribe or Native Hawaiian organization and an identifiable earlier group (25 USC 3001 (2)).

Declining – The senescent (aging) period in the lifespan of plants that includes the presence of dead and/or dying limbs, snag tops, and other characteristics that indicate the later life stages of vegetation.

Defensible space – An area either natural or manmade where material capable of allowing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and property or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Developed recreation site – A distinctly defined area where facilities are provided by the Forest Service for concentrated public use (e.g., campgrounds, picnic areas, swimming areas).

Diameter – The diameter of a tree species, usually measured by two primary methods:

- **Diameter at breast height (d.b.h.)** – The diameter of a forest tree species at the bole (or trunk), typically measured at 4.5 feet above ground level.
- **Diameter at root collar (d.r.c.)** – The diameter of a woodland tree species, typically measured at the root collar (the part of a tree where the main roots join the trunk, usually at or near ground level) or at the natural ground line, whichever is higher.

Dispersed recreation – Outdoor recreation in which visitors are spread over relatively large areas. Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the visitors.

Ecological restoration – The process of assisting a degraded, damaged, or destroyed ecosystem in the recovery of its resilience and adaptive capacity. 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.

Ecotones – Communities that include the species of two or more adjacent communities. Few plant communities have distinct boundaries. Ecotones expand and contract over time; they are a source of ecological and species diversity.

Ecosystem – A spatially explicit, relatively homogeneous unit of the earth that includes all interacting organisms and components of the abiotic (nonliving) environment within its boundaries. An ecosystem is commonly described in terms of its: (1) composition: major vegetation types, rare communities, aquatic systems, and riparian systems; (2) structure: successional stages, water quality, wetlands, and floodplains; and (3) function: ecological processes such as streamflows and natural disturbance regimes.

Ecosystem services – Benefits people obtain from ecosystems, including: (1) provisioning services such as food, fresh water, fuel, and fiber; (2) regulating services such as climate, water, pollination, and disease regulation; (3) supporting services such as soil formation and nutrient cycling; and (4) cultural services such as educational, aesthetic, and cultural heritage values as well as recreation and tourism opportunities.

Emergent vegetation – Erect plants rooted under water that grow above (emerge from) the surface of the water (e.g., cattail, bulrush, Eurasian watermilfoil).

Encumbrance – Any right or interest in land, held by someone other than the owner, that may or may not be consistent with the owner's use. Among other things, encumbrances may consist of mortgages, deeds of trust, agreements for support, life estates, leases, tax liens, outstanding mineral rights, reservations, restrictions, and rights of reverter.

Endemic – (1) A population that has unique genetic characteristics and likely exists in a very limited geographic area. (2) A population of native insects, diseases, plants, or animals which perform a functional role in the ecosystem when they are present at low levels, or constantly attack just a few hosts throughout an area, but it can become potentially injurious when they increase or spread to reach outbreak (epidemic) levels.

Energy corridor – A linear strip of land identified for the present or future location of utility right-of-way (e.g., above or below-ground electric transmission line, gas pipeline).

Ephemeral wetlands – Wetlands that exist for a short period following precipitation or snowmelt; they are temporary and not the same as intermittent or seasonal wetlands, which exist for longer periods but not yearlong.

Even-aged stands – Stands that are composed of one or two distinct age classes of trees.

Even-aged management – The application of a combination of actions that result in the creation of stands in which trees are essentially the same age. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree size) throughout the forest area. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

Federally listed species – Threatened or endangered species listed under the Endangered Species Act of 1973, as amended.

Federal reserved water rights (reserved rights) – When Congress designates Federal lands for a specific purpose, it also reserves sufficient water to serve the purposes of that designation. These water rights are known as "Federal reserved water rights" or simply, reserved rights. Reserved rights are implied rights, meaning that Congress need not expressly state in a bill that it intends to reserve Federal water right. The right exists whether or not Congress explicitly mentions it.

Fire hazard – A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.

Fire regime – The patterns, frequency, and severity of fire that occur over a long period of time across a landscape and its immediate effects on the ecosystem in which it occurs. There are five fire regimes which are classified based on frequency (average number of years between fires) and severity (amount of replacement of the dominant overstory vegetation) of the fire. These five regimes are:

- **Fire regime I** – 0 to 35-year frequency and low (surface fires most common, isolated torching can occur) to mixed severity (less than 75 percent of dominant overstory vegetation replaced)
- **Fire regime II** – 0 to 35-year frequency and high severity (greater than 75 percent of dominant overstory vegetation replaced)
- **Fire regime III** – 35 to 100+ year frequency and mixed severity
- **Fire regime IV** – 35 to 100+ year frequency and high severity
- **Fire regime V** – 200+ year frequency and high severity.

Fire risk – The chance of fire starting, as determined by the presence and activity of causative agents.

Fire severity – Degree to which a site has been altered or disrupted by fire; also used to describe the product of fire intensity and residence time; usually defined by the degree of soil heating or mortality of vegetation.

Fireline – The part of a containment or control line that is scraped or dug to mineral soil.

Forage reserve – An area that is normally not allocated for livestock grazing, although it may be used when an authorized pasture or allotment is unavailable.

Free-flowing – Existing or flowing in natural conditions without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.

Fugitive dust – Fine particulate matter from windblown soil and dust which becomes airborne.

Firewood – Wood grown or used for fuel.

Functioning ecosystem – An ecosystem that contains all components and processes necessary to maintain resilience over time.

Genetic exchange – The exchange of genetic material between individuals and/or populations through sexual reproduction.

Geomorphic – Refers to the process of erosion and sediment transport and deposition.

Goshawk foraging areas – Areas that surround goshawk PFAs (post-fledgling family areas) that northern goshawks use to hunt for prey. They are approximately 5,400 acres in size (not including the PFA or nesting area acres).

Goshawk nest areas – Areas immediately around a nest that are used by northern goshawks in relation to courtship and breeding activities. They are approximately 30 acres in size and contain multiple groups or patches of large, old trees with interlocking crowns.

Goshawk post-fledgling family areas (PFAs) – Areas that surround nest areas. They represent an area of concentrated use by the northern goshawk family until the time the young are no longer dependent on adults for food. PFAs are approximately 420 acres in size (not including the nest area acres).

Group – A cluster of two or more trees with interlocking or nearly interlocking crowns at maturity surrounded by an opening. Size of tree groups is typically variable depending on forest type and site conditions and can range from fractions of an acre (a two-tree group) (i.e., ponderosa pine, dry mixed conifer) to many acres (i.e., wet mixed conifer, spruce-fir). Trees within groups are typically nonuniformly spaced, some of which may be tightly clumped.

Group selection – An uneven-aged management method in which trees are removed and new age classes are established in groups, adjacent to other groups of different age classes. Group cut size is determined by the reproduction requirements of the species desired and by the number or total acreage of different age classes desired across the stand.

Half-shrub – Half-shrubs have a woody base and lower stems but the top growth remains herbaceous during the growing season.

Herbaceous – Grass and/or forb vegetation.

Herbivory – Loss of vegetation due to consumption by another organism.

Highly interactive species – A species that has a disproportionate effect on its ecosystem. The virtual or effective absence of a highly interactive species leads to significant changes in some feature of its ecosystem. Such changes include structural or compositional modifications, alterations in the import or export of nutrients, loss of resilience to disturbance, and decreases in native species diversity.

Hydraulic – Refers to the mechanical properties of water.

Hydrologic – Refers to the movement, distribution, and quality of water.

Hydrologic function – The behavioral characteristics of a watershed described in terms of ability to sustain favorable conditions of waterflow. Favorable conditions of waterflow are defined in terms of water quality, quantity, and timing.

Hydrologic Unit Code (HUC) – The United States is divided and subdivided into successively smaller hydrologic units which are identified by unique hydrologic unit codes (HUCs). The Apache-Sitgreaves NFs is contained within three 3rd level HUC watersheds: Little Colorado, Gila, and Salt Rivers. The Apache-Sitgreaves NFs intersect thirteen 4th level HUC watersheds, thirty-two 5th level HUC watersheds, and two hundred and fifteen 6th level HUC watersheds. The average size of a 4th level HUC watershed is 1 million acres, 5th level HUC watersheds are around 165,000 acres, and 6th level HUC watersheds are about 21,000 acres.

Individual tree selection – An uneven-aged management method where individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

Instream flow – Seasonal streamflows needed for maintaining aquatic and riparian ecosystems, wildlife, fisheries, and recreational opportunities at an acceptable level.

Intrinsic qualities – For scenic byways, intrinsic qualities are the features considered representative, unique, irreplaceable, or distinctly characteristic of an area. They include archaeological, cultural, historic, natural, recreational, and scenic.

Invasive species – Species that are not native to the ecosystem being described and that cause, or have the potential to cause, ecological or economic harm.

Leasable minerals – Leasable minerals include coal, oil, gas, oil shale, sodium, phosphate, potassium, and geothermal. Leasable minerals also include the hardrock minerals, if they are found on lands that have “acquired” status. Leases are obtained through the Bureau of Land Management to extract these mineral resources.

Leave No Trace – Guidelines that help protect the land and lessen the sights and sounds of forest visitors. http://www.lnt.org/

Lentic – A nonflowing or standing body of water (e.g., pond, lake).

Litter – Litter consists of dead, unattached organic material on the soil surface that is effective in protecting the soil surface from raindrop splash, sheet, and rill erosion and is at least ½ inch thick. Litter is composed of leaves, needles, cones, and woody vegetative debris including twigs, branches, and trunks.

Livestock grazing – Foraging by permitted livestock (domestic foraging animals of any kind).

Locatable minerals – In general, the hardrock minerals mined and processed for metals (e.g., gold, silver, copper, uranium, and some types of nonmetallic minerals such as sandstone). They are called “locatable,” meaning subject to mining claim location under the United States mining laws. Locatable minerals are limited to lands with “reserved public domain” status.

Lotic – A flowing body of water (e.g., stream, river).

Management review – One of the primary components of the overall Forest Service management/internal control system (FSM 1400). Management reviews are used to evaluate internal and administrative controls and to identify successful management, management/internal control weaknesses, and needed corrective actions.

Mechanized travel – Movement using any contrivance over land, water, or air, having moving parts, that provides a mechanical advantage to the user and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts.

Metapopulation – A set of partially isolated populations belonging to the same species that can interbreed and recolonize areas where the species has recently become locally extinct.

Mexican spotted owl protected activity center (PAC) – An area established around an occupied Mexican spotted owl site to help ensure successful reproduction and species viability. A PAC is no less than about 600 acres in size and includes the best owl nesting and roosting habitat. Management in PACs is focused on forest health and includes retention of key habitat elements such as higher levels of basal area and canopy cover to provide the cool understory conditions owls need and the down woody debris and forage conditions (e.g., cover, fungi, seeds) needed by their prey. Management may involve thinning and/or burning to reduce the risk of high intensity wildfire, often with timing restrictions to prevent disturbance to owls during the breeding season (March 1 through August 31).

Mosaic – Mix of recurring patterns of forested and nonforested areas at the identified scale (e.g., landscape, watershed, mid-scale). Patterns are variable and may change over time.

Motorized travel – Movement using machines that use a motor, engine, or other nonliving power sources other than a vehicle operated on rails or a wheelchair or mobility device (including one that is battery powered) that is designed solely for the use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area.

Motor vehicle use map (MVUM) – The MVUM displays designated roads, trails, and areas on an administrative unit or a ranger district of the National Forest System.

National Forest System (NFS) – As defined in the Forest and Rangeland Renewable Resources Planning Act of 1974 (Public Law 93-378), the “National Forest System” includes all national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means; the national grasslands and land use projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therein administered by the Forest Service or are designated for administration through the Forest Service as part of the system.

National Forest System road – A road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its

resources. A forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 CFR 212.1).

National Forest System trail – A trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 CFR 212.1).

Natural disturbance regime – The historic patterns (frequency and extent) of fire, insects, wind, landslides, floods, and other natural processes in an area.

Natural fire regime – The fire regime that existed prior to human facilitated interruption of frequency, extent, or severity.

Nonmotorized travel – Movement not relying on machines that use a motor, engine, or other nonliving power source (e.g., walking, canoeing, horseback riding).

Nonpoint source pollution (NPS) – NPS refers to water pollution affecting water quality from diffuse sources, such as polluted runoff from agricultural areas draining into lakes, wetlands, rivers, and streams. NPS can be contrasted with point source pollution, where discharges occur to a body of water at a single location, such as discharges from a chemical factory or urban runoff from a roadway or storm drain. NPS may derive from many different sources with no specific solution to rectify the problem, making it difficult to regulate.

Noxious weed – Those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official (FSM 2080). Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.

Old growth – In southwestern forested ecosystems, old growth is different than the traditional definition based on northwestern infrequent fire forests. Due to large differences among Southwest forest types and natural disturbances in the Southwest, old growth forests vary extensively in tree size, age classes, presence, and abundance of structural elements, stability, and presence of understory (Helms, ed., 1998). Old growth refers to specific habitat components that occur in forests and woodlands—old trees, dead trees (snags), downed wood (coarse woody debris), and structure diversity (Franklin and Spies, 1991; Helms, ed., 1998; Kaufmann et al., 2007). These important habitat features may occur in small areas, with only a few components, or over larger areas as stands or forests where old growth is concentrated (Kaufmann et al., 2007). In the Southwest, old growth is considered “transitional” (Oliver and Larson 1996), given that that the location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Some species, notably certain plants, require “old forest” communities that may or may not have old growth components but have escaped significant disturbance for lengths of time necessary to provide the suitable stability and environment. See appendix B for a more detailed description.

Old growth components – Include old trees, dead trees (snags), downed wood (coarse woody debris), and structural diversity.

Old tree – Any native tree established before natural disturbance patterns were notably altered by European settlement (generally between 1850 and 1890 on the Apache-Sitgreaves NFs). Such a tree exhibits all or most characteristics of overmaturity for its species, and/or has tree rings revealing its advanced age. For example, old ponderosa pine trees display the following: yellow/orange plates widened between bark furrows, horizontal to drooping limbs, rounded crown tops, and gradual bole taper (see Keen's tree class number 4 in appendix B).

Openings – Spatial breaks between groups or patches of trees, as large as or larger than groups, which contain grass, forb, shrub, and/or tree seedlings but are largely devoid of big trees, with a total tree cover of less than 10 percent in openings.

Other energy development – Infrastructure associated with the provision or transport of energy (e.g., biomass power generation, wind turbines, solar panels).

Patches – Areas larger than tree groups in which the vegetation composition and structure are relatively homogeneous. Patches comprise the mid-scale, thus they range in size from 100 to 1,000 acres.

Plan set of documents – The complete set of documentation supporting the land management plan. It may include, but is not limited to, evaluation reports, documentation of public involvement, the plan including applicable maps, applicable plan improvement documents, applicable NEPA documents, and the monitoring program for the plan area.

Planned ignition – A fire ignited by management actions under certain predetermined conditions to meet plan desired conditions. Prescribed fire is a synonymous term.

Planning period – The life of the plan, generally 10 to 15 years from plan approval.

Primitive recreation – The reliance on personal, nonmotorized, or nonmechanized skills to travel and camp in an area, rather than reliance on facilities or outside help.

Priority 6th level HUC watershed – The designated watersheds where restoration activities will concentrate on the explicit goal of improving watershed condition.

Proper functioning condition (PFC) – Proper functioning condition (PFC) is a qualitative method for assessing the condition of riparian-wetland areas. The term PFC is used to describe both (1) the assessment process or tool and (2) a defined, on-the-ground condition of a riparian-wetland area:

- The PFC tool is designed to assess if the physical elements (abiotic and biotic) are in working order relative to an area's capability and potential. When these physical elements are in working order, then channel characteristics develop that provide habitat for wildlife and other uses. Functionality comes first, then desired conditions are achieved.
- A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to:
    - dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality;
    - filter sediment, capture bedload, and aid floodplain development;

- improve floodwater retention and groundwater recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and
- support greater biodiversity (Bureau of Land Management, 1998).

Recreation opportunity spectrum (ROS) – A framework for defining the types of outdoor recreation opportunities the public might desire, and identifies that portion of the spectrum a given national forest area might be able to provide. The ROS map can be found in the plan set of documents. The broad classes are:

- **Primitive (P)** – Characterized by essentially unmodified natural environment. Interaction between users is very low and evidence of other users is minimal. Essentially free from evidence of human induced restrictions and controls. Motorized use within the area is generally not permitted. Very high probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.
- **Semiprimitive Nonmotorized (SPNM)** – Characterized by a predominantly natural or natural appearing environment. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present but are subtle. Motorized use is generally not permitted. High probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.
- **Semiprimitive Motorized (SPM)** – Characterized by a predominantly natural or natural appearing environment. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present but are subtle. Motorized use is generally permitted. Moderate probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.
- **Roaded Natural (RN)** – Characterized by a predominantly natural appearing environment with moderate evidence of the sights and sounds of other humans. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate but with evidence of other users prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities. Opportunity to affiliate with other users in developed sites but with some chance for privacy.
- **Roaded Modified (RM)** – Characterized by substantially modified natural environment except for campsites. Roads and management activities may be strongly dominant. There is moderate evidence of other users on roads. Conventional motorized use is provided for in construction standards and design of facilities. Opportunity to get away from others but with easy access.
- **Rural (R)** – Characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed sites.

Facilities for intensified motorized use and parking are available. Opportunity to observe and affiliate with other users is important, as is convenience of facilities.

- **Urban (U)** – Characterized by a substantially urbanized environment, although the background may have natural appearing elements. Resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans onsite are predominant. Large numbers of users can be expected, both onsite and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site. Opportunity to observe and affiliate with other users is very important, as is convenience of facilities.

Redundancy – Multiple occurrences of the representative conditions across the landscape.

Reference conditions – Environmental conditions that infer ecological sustainability. Reference conditions are often represented by the historic range of variation (i.e., the characteristic range of variation, not the total range of variation) for a particular attribute, prior to European settlement and under the current climatic period. For some ecosystems, the historic range of variation reflects native burning prior to settlement.

Reforestation – The natural or artificial restocking of an area with forest trees.

Regulated – The technical (rather than legal or administrative) aspect of controlling forest stocking, periodic harvests, growth, and yields to meet management objectives including sustained yield. This control can be done either by area, volume of growing stock, or basal area or stand density index measures. An uneven-aged, regulated forest is one which has a balanced progression of three or more age/size classes, such that each younger/smaller class is advancing to replace the class above it on approximately the same acreage, until it is mature for harvest or other resource objectives. A regulated forest reaches sustained yield when the volume cut periodically equals the amount of net volume growth for that same period.

Repatriation – In the Native American Graves Protection and Repatriation Act (25 USC 3005), the term “repatriate” means to transfer physical custody of and legal interest in Native American cultural items to lineal descendants, culturally affiliated American Indian tribes, and Native Hawaiian organizations.

Research natural area – A physical or biological unit in which current natural conditions are maintained insofar as possible. These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. Research natural areas are principally for nonmanipulative research, observation, and study. They are designated to maintain a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and natural situations that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.

Resiliency – The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Riparian area – Terrestrial ecosystems characterized by wet soils and plant species that are water loving and dependent on the water table or its capillary fringe zone (a zone in the soil just above the water table that remains saturated or almost saturated).

Road decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1). It includes a range of activities from ripping and seeding to full reclamation by restoring the original topography. Road decommissioning results in the removal of a National Forest System road from the forest transportation atlas.

Road removal – The elimination of unauthorized routes. It includes a range of activities from ripping and seeding to full reclamation by restoring the original topography.

Scale – The aerial extent of certain plan decisions are described at various scales:

- **Fine scale** is an area of about 10 acres or less at which the distribution of individual tree species (single, grouped, or aggregates of groups) is described.
- **Mid-scale** is an area of 100 to 1,000 acres composed of assemblages of fine-scale units that have similar biophysical conditions.
- **Landscape scale** is an assemblage of mid-scale units typically composed of variable elevations, slopes, aspects, soils, plant associations, and natural ecological processes. An area at this scale is comprised of multiple mid-scale units, most often 10 or more.
- **6th level HUC** watershed scale is a unit of the forest approximately comparable to a 6th level HUC (hydrologic unit code) watershed (approximately 5,000 to 80,000 acres).
- **4th to 5th level HUC** watershed scale is a unit of the forest approximately comparable to a 4th level HUC (hydrologic unit code) watershed (approximately 400,000 to 2,000,000 acres). A 4th level HUC watershed is an aggregation of multiple 5th level HUC watersheds. A 5th level HUC watershed scale is a unit of the forest approximately comparable to a 5th level HUC watershed (approximately 80,000 to 300,000 acres).

Scenic integrity – The state of naturalness or a measure of the degree to which a landscape is visually perceived to be “complete.” The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the landscape character valued by constituents for its aesthetic quality. Scenic integrity is the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. Scenic integrity is measured in five levels:

- **Very high** (unaltered) – A scenic integrity level that generally provides for ecological change only.
- **High** (appears unaltered) – Human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.
- **Moderate** (slightly altered) – Landscapes where the valued landscape character “appears slightly altered.” Noticeable deviations must remain visually subordinate to the landscape character being viewed.
- **Low** (moderately altered) – Human activities must remain visually subordinate to the attributes of the existing landscape character. Activities may repeat form, line, color, or texture common to these landscape characters, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to these landscape characters.

- **Very low** (heavily altered) – Human activities of vegetative and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Seed cut – One step of an even-aged regeneration cutting method in which the healthiest, most desirable trees are left, and stand conditions are created for them to become good cone producers. The intention is to promote natural tree regeneration where needed.

Selection regeneration method – An uneven-aged method where individual trees or groups of trees of all size classes are removed, more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration. Includes individual tree selection and group selection methods.

Sense of place – The aesthetic, nostalgic, or spiritual effects of physical locations on humans based on personal, use oriented, or attachment oriented relationships between individuals and those locations. The meaning, values, and feelings that people associate with physical locations because of their experiences there.

Seral state – A particular plant and animal community developmental stage which is transitional between other stages along the continuum of succession or change. Changes in seral states can take place over time or very quickly and movement between states can be in either direction. Aspen is an example of a seral state that, without disturbance over time, will eventually be replaced by a subsequent seral state dominated by conifers.

Silvics – Knowledge of forest tree species differing needs for light, water, soil nutrients, growing space, and temperature ranges; it includes species adaptations and responses to various environmental factors such as fire, flood, extreme temperatures, wind, drought, insects, diseases, wildlife, and other tree species. The basis for silviculture.

Silviculture – The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands using species silvics to meet the diverse needs and values of landowners and society on a sustainable basis.

Sinkholes – Large depressions in limestone geology.

Slash – The residue (e.g., branches, bark) left on the ground after a management activity such as logging, or natural ecological process such as a storm or fire.

Snags – Standing dead or partially dead trees (snag topped), often missing many or all limbs and/or bark. Snags (generally12 inches or larger) provide essential wildlife habitat for many species and are important for forest ecosystem function.

Soil condition rating – A qualitative rating developed within the Southwestern Region of the Forest Service that provides an overall picture of soil condition vital in sustaining ecosystems. It is based on three soil functions: the ability of soil to resist erosion, infiltrate water, and recycle nutrients. There are four soil condition ratings:

- **Satisfactory** – soil function is being sustained and soil is functioning properly and normally.

- **Impaired** – the ability of the soil to function properly and normally has been reduced or there exists an increased vulnerability to degradation.
- **Unsatisfactory** – degradation of vital soil functions result in the inability of the soil to maintain resource values, sustain outputs, or recover from impacts.
- **Inherently unstable** – these soils are eroding faster than they are renewing themselves.

Soil productivity – The inherent capacity of the soil to support appropriate site specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses.

Special use authorization – A permit, term permit, temporary permit, lease, easement, or other written instrument that grants rights or privileges of occupancy and use subject to specified terms and conditions on National Forest System land.

Stand – A contiguous group of trees generally uniform in age class distribution, composition, condition, and structure, and growing on a site of generally uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the fundamental unit of silviculture reporting and record keeping.

Streamside management zones – An area of vegetation or forest litter located adjacent to stream courses and/or riparian areas for the purpose of filtering sediment, providing bank stability, and providing shade for fisheries habitat in tree/shrub ecosystems.

Structure – Structure includes both the vertical and horizontal dimensions of a vegetation type or plant community. The horizontal structure refers to spatial patterns of individual and groups of plants and openings, as well as plant size and species composition. The vertical component refers to the layers of vegetation between the forest floor and the top of the canopy. Each vegetation type has its own structure. For example, forests have greater vertical structure than a grassland or woodland based on the height of the dominant species.

Suitable timberlands – Land to be managed for timber production on a regulated basis. Such lands are those which have been determined to meet the following criteria: (a) are available for timber production (i.e., not withdrawn for wilderness or other official designation by Congress, the Secretary of Agriculture, or Chief of the Forest Service); (b) are physically capable of producing crops of industrial wood without irreversible resource damage to soils productivity or watershed conditions; (c) adequate tree restocking within 5 years of final harvest is reasonably assured; (d) adequate information exists about responses to timber management activities; (e) timber management is cost efficient over the planning horizon in meeting forest objectives that include timber production; (f) timber production is consistent with meeting the management requirements and multiple-use objectives specified in the forest plan or plan alternative; and (g) other management objectives do not limit timber production activities to the point where it is impossible to meet management requirements set forth in 36 CFR 129.27 (per FSH 2409.13, WO Amendment 2409.13-92-1, O Code and Chapter 20).

Sustainability – Meeting the needs of the present generation without compromising the ability of future generations to meet their needs. Sustainability is composed of desirable social, economic, and ecological conditions or trends interacting at varying spatial and temporal scales embodying the principles of multiple use and sustained yield.

Temporary road or trail – A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas (36 CFR 212.1).

Terrestrial ecosystem survey (TES) – Also called the terrestrial ecological unit inventory, the TES identifies ecological units for the Apache-Sitgreaves NFs that are distinct from each other in terms of their soil, vegetation, and climate components.

Thinning – An intermediate treatment made to reduce the stand density of trees primarily to improve growth, enhance forest health, to recover potential mortality, or to emphasize desired tree species. Includes crown thinning (thinning from above, high thinning), free thinning, low thinning (thinning from below), mechanical thinning (geometric thinning), and selection thinning (dominant thinning). Thinning can be used with both even- and uneven-aged management systems.

Timber production – Purposefully growing, tending, harvesting, and regenerating regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. In addition, managing land to provide commercial timber products on a regulated basis with planned, scheduled entries.

Traditional cultural property (TCP) – Defined in the National Register Bulletin 38 as a location, building, structure, community, and individual objects that are considered eligible for inclusion in the National Register as a historic property because of its association with cultural practices or beliefs of a living community that are (a) rooted in that community's history and (b) important in maintaining the continuing cultural identity of the community.

Tree cutting – The cutting or removal of trees for wood fiber use and other multiple-use purposes. Sometimes referred to as "timber harvest."

Tread Lightly! – Outdoor ethics with a special focus on motorized and mechanized recreation. http://www.treadlightly.org

Unauthorized road or trail – A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas (36 CFR 212.1). Sometimes referred to as a "user-created" road or trail.

Uneven-aged forests – Forests that are comprised of three or more distinct age classes of trees, either inter-mixed or in small groups.

Uneven-aged management – The application of combined actions needed to simultaneously maintain continuous forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Outstanding Arizona Waters – Surface water designated by Arizona Department of Environmental Quality as an outstanding State water resource. These are waters with exceptional quality where water quality should not be degraded.

Unplanned ignition – A wildfire, not including planned ignitions.

Wild and scenic rivers – These rivers are free flowing and have at least one outstandingly remarkable value. Eligible and suitable rivers are given a tentative classification of wild, scenic, or recreational. These rivers may be included in the National Wild and Scenic Rivers System.

- **Wild** – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive, and waters unpolluted. These represent vestiges of primitive America.
- **Scenic** – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive, and shorelines largely undeveloped but accessible in places by roads.
- **Recreational** – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Wild horse (wild free-roaming horse) – All unbranded and unclaimed horses and their progeny using National Forest System lands on or after December 15, 1971. This definition does not include any horse introduced onto National Forest System lands on or after December 15, 1971, by accident, negligence, or willful disregard of private ownership. Animals that stray from other lands onto National Forest System lands are not considered wild free-roaming horses and are not under Forest Service protection. No known records or documentation exists that the Apache NF had any unbranded and unclaimed horses prior to December 15, 1971. See CFR 220 and FSM 2260 for more information.

Wilding – A native plant growing uncultivated in the wild: specifically, the collection or transplant of such whole live plants.

Wildland-urban interface (WUI) – Wildland-urban interface includes those areas of resident populations and human developments having special significance at imminent risk from wildfire. These areas may include critical communications sites, municipal watersheds, high voltage transmission lines, church camps, scout camps, research facilities, and other structures that, if destroyed by fire, would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites, regardless of the distance involved.

Windthrow – Trees susceptible to wind damage (i.e., breakage, toppling).

Woody biomass – The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or grassland environment, that are the byproducts of forest management used to produce bio-energy and the full range of biobased products.

References

Arizona Department of Environmental Quality. (2003). Arizona State Implementation Plan to Maintain and Improve Air Quality. Phoenix, AZ.

Arizona Department of Environmental Quality. (2009). 2006/2008 Status of Ambient Surface Water Quality in Arizona: Arizona's Integrated 305 (b) Assessment and 303(d) Listing Report.

Bureau of Land Management, U.S. Department of the Interior. (1998). Riparian area management: A user guide to assessing proper functioning condition and the supporting science for lotic areas, Prichard, D.; Anderson, J.; Correll, C.; Fogg, J.; Gebhardt, K.; Krapf, R.; Leonard, S.; Mitchell, B.; and Staats, J. (wkgroup.). Tech. Ref. 1737–15, USDI Bureau of Land Management, Service Center. Denver, CO. BLM/RS/ST-98/001+1737. 134 pp.

Bureau of Land Management, U.S. Department of the Interior, and Cooperative Extension Service, Forest Service, and Natural Resources Conservation Service, U.S. Department of Agriculture. (1999). Interagency Technical Reference 1734-3: Utilization Studies and Residual Measurements.

Environmental Protection Agency (EPA). (1999). EPA Regional Haze Rule 40 CFR Part 51. EPA Office of Air and Radiation, Technology Transfer Network, OAR Policy and Guidance Record.

Franklin, J.F. and T.A. Spies. (1991). Ecological definitions of old-growth Douglas-fir Forests. Pp. 61–69 in *Wildlife and Vegetation of Unmanaged Douglas-fir Forests*. L.F. Ruggiero, K.B. Aubry, A.B. Carey, and M. Huff, tech. coords. USDA Forest Service Gen. Tech. Rep. PNW-GTR-285. Pacific Northwest Research Station, Portland, OR. 533 pp.

Forest Service. U.S. Department of Agriculture. (2008a). Comprehensive Evaluation Report. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2008b). Ecological Sustainability Report. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2008c). Forest Plan Revision Resource Evaluations. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2009a). Economic and Social Sustainability Assessment. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2009b) Eligibility Report for the National Wild and Scenic River System. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2010a). Comprehensive Evaluation Report Supplement to Meet Analysis of the Management Situation Requirements. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2010b). Final Environmental Assessment for Blue River and KP Creek Wild and Scenic Suitability. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2012a). Programmatic Draft Environmental Impact Statement for the Proposed Land Management Plan. Springerville, AZ: Apache-Sitgreaves National Forests.

Forest Service. U.S. Department of Agriculture. (2012b). Wallow Fire Changed Condition Assessment. Springerville, AZ: Apache-Sitgreaves National Forests.

Helms, John A., editor (1998). The Dictionary of Forestry. The Society of American Foresters. pp. 1–224.

Kaufmann, M.R., D. Binkley, P.Z. Fulé, M. Johnson, S.L. Stephens, and T.W. Swetnam. (2007). Defining old growth for fire-adapted forests of the western United States. Ecology and Society 12(2): 15. [online] URL: http://www.ecologyandsociety.org/vol12/iss2/art15/.

Laing, L., N. Ambos, T. Subirge, C. McDonald, C. Nelson, and W. Robbie. (1987). Terrestrial Ecosystem Survey for the Apache-Sitgreaves National Forests. Southwestern Region, Albuquerque, NM. 453 pp.

Oliver, C.D. and B.C. Larson. (1996). Forest Stand Dynamics, Update Edition. New York: John Wiley & Sons.

Stynes, D.J. and E.M. White. (2005). Spending Profiles of National Forest Visitors, NVUM Four Year Report. Michigan State University. East Lansing, MI. [online] URL: http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf