Kaibab National Forest
Land Management Plan,
as amended

Record of Decision: April 15, 1988.

Amendment 1: April 6, 1989: Clarify the procedures for 1) involving interested external parties in Integrated Resource Management, and 2) analyzing capacity allocations for the construction and/or expansion of recreation development sites in Management Areas 21 and 22.

Amendment 2: April 5, 1990: Clarification regarding 1) application and relationship of Integrated Resource Management, 2) management of wildlife habitats and populations, 3) forage, cover, and snag and damaged tree retention requirements, 4) conduct of range resource planning and analysis, 5) application of certain even-aged silvicultural treatments, 6) appplication of pesticides, and 7) transportation system management and administration.

Amendment 3: June 5, 1996: Incorporates direction from Alternative G of the *Regional Amendment of Forest Plans, Arizona and New Mexico* (goshawk, spotted owl, old growth). Amendments 1 and 2 were incorporated into the Plan when the Plan was reformatted to include Amendment 3.

Amendment 4: August 28, 2000: Incorporates the use of wildland fire from the *Wildland Fire Use Plan EA.* Also includes a Correction, adding the list of Management Indicator Species for GA 2.

Amendment 5: February 24, 2003: Site-specific amendment from the *Frenchy Ecosystem Management Unit EA* to reallocate 1,355 acres of suitable pine to be managed for antelope habitat in GA 2. This reduces the acres allocated to the suitable timber base by less than one percent.

Amendment 6: October 21, 2004: Adopts new programmatic Recreation Opportunity Spectrum and Scenery Management System classifications and standards on all Federal land within the Tusayan and Williams Ranger Districts (South Zone) from *Environmental Assessment for Amendment of the Kaibab National Forest Management Plan – Recreation and Scenery Management.*

Amendment 7: November 8, 2004: Establishes a goal, a standard, a guideline and two definitions Forest-wide for management of noxious weeds from the *Environmental Impact Statement for Integrated Treatment of Noxious and Invasive Weeds*. Additionally, several corrections were made, removing standards and guidelines for specific Geographic Areas that would be redundant.

Amendment 8: December 18, 2009: Site-specific amendment from the *Community Tank Grassland Restoration Project EA* to reallocate 46 acres of suitable pine to be managed for wildlife habitat in GA 2. This reduces the acres allocated to the suitable timber base by less than one percent.

Amendment 9: July 9, 2010: Non-significant amendment from the *Williams Ranger District Travel Management Project EA* that prohibits motor vehicle use off of the designated system on the Williams Ranger District, except as identified on the Motor Vehicle Use Map. This added a fifth standard to Other Forest-wide Standards on page 34-1.

Amendments made in December 2009 and July 2010 are presented with italicized and underlined text.

The Plan is in **loose-leaf format** to make updates (amendments and corrections) easier to substitute; readers may download the entire Plan or the latest amendment from our website (www.fs.fed.us/r3/kai/management/efoia/documents/planning.shtml). A complete Plan or the latest amendment or correction may be sent upon request.

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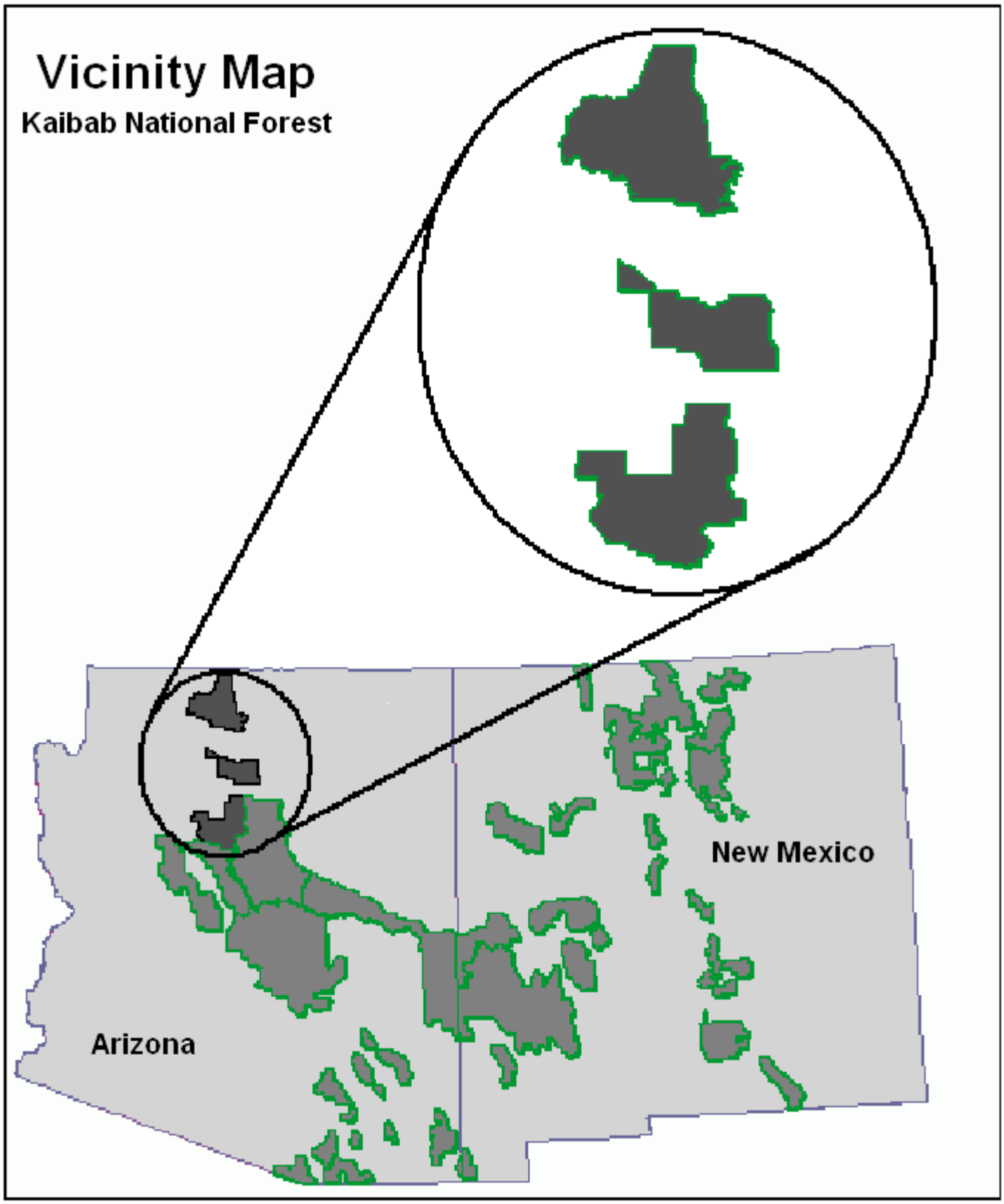

Vicinity Map
Kaibab National Forest
New Mexico
Arizona

Chapter 1 - Introduction

Purpose of this Forest Plan

This Forest Plan establishes the direction for managing the Kaibab National Forest for the next 10 to 15 years, hereafter referred to as Planning Period 1. Preparation of this Plan is required by the Renewable Resources Planning Act (RPA), as amended by the National Forest Management Act (NFMA). It provides for integrated multiple use and sustained yield of goods and services from the Forest in a way that maximizes net public benefits in an environmentally sound manner.

This Forest Plan replaces all previous resource management plans prepared for the Forest. Upon approval of this Forest Plan, all subsequent activities affecting the Kaibab National Forest, including budget proposals, will be based on this Plan [36 CFR 219.10 (e)]. In addition, all permits, contracts, and other instruments for the use and occupancy of these National Forest System Lands must be consistent with the Forest Plan [36 CFR 219.10 (e)].

The planning principles in the NFMA regulations [36 CFR 219.10 (b)] have been used in the planning process. These principles are:

- Establishment of goals and objectives for multiple-use and sustained-yield management of renewable resources without impairment of the productivity of the land;
- Consideration of the relative values of all renewable resources, including the relationship of nonrenewable resources, such as minerals, to renewable resources;
- Recognition that the National Forests are ecosystems and their management for goods and services requires an awareness and consideration of the interrelationships among plants, animals, soil, water, air, and other environmental factors within such ecosystems;
- Protection and, where appropriate, improvement of the quality of renewable resources;
- Preservation of important historic, cultural, and natural aspects of our national heritage;
- Protection and preservation of the inherent right of freedom of American Indians to believe, express, and exercise their traditional religions;
- Provisions for the safe use and enjoyment of the forest resources by the public;
- Protection, through ecologically compatible means, of all forest and rangeland resources from depredations by forest and rangeland pests;
- Coordination with the land and resource planning efforts of other Federal agencies, State and local governments, and Indian tribes;
- Use of a systematic, interdisciplinary approach to ensure coordination and integration of planning activities for multiple-use management;
- Early and frequent public participation;
- Establishment of quantitative and qualitative standards and guidelines for land and resource planning and management;
- Management of National Forest System Land in a manner that is sensitive to economic efficiency; and

- Responsiveness to changing conditions of land and other resources and to changing social and economic demands of the American people.

Land management prescriptions and standards and guidelines are statements of the management direction in this Plan; however projected outputs, services, and rates of implementation are dependent on the annual budget process. Implementation schedules may be modified to reflect the actual annual budgets and amended accordingly following appropriate public notification.

Organization of the Forest Plan

Chapter 2 of this Forest Plan describes the significant issues and concerns and how this Forest Plan responds to these issues and concerns.

Chapter 3 is a summary of the analysis of the management situation. It discusses the circa 1986 production levels, projected supply, and expected future use of goods and services in the Forest.

Chapter 4 details the mission, goals, objectives, vicinity, and timing of management practices; and describes management direction, prescriptions and associated resource management standards and guidelines.

Chapter 5 is the monitoring plan.

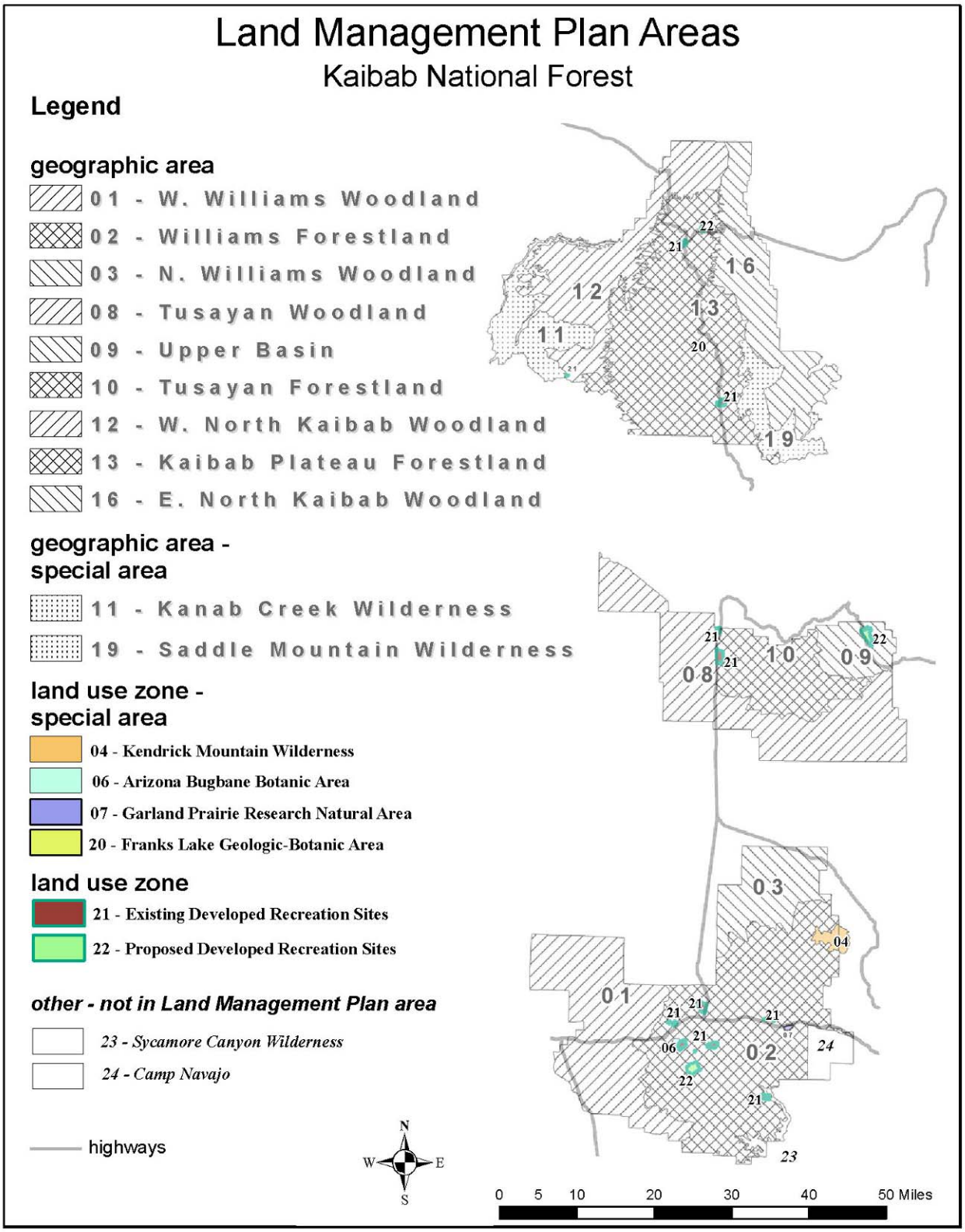
The **Glossary** defines terms used in this Plan.

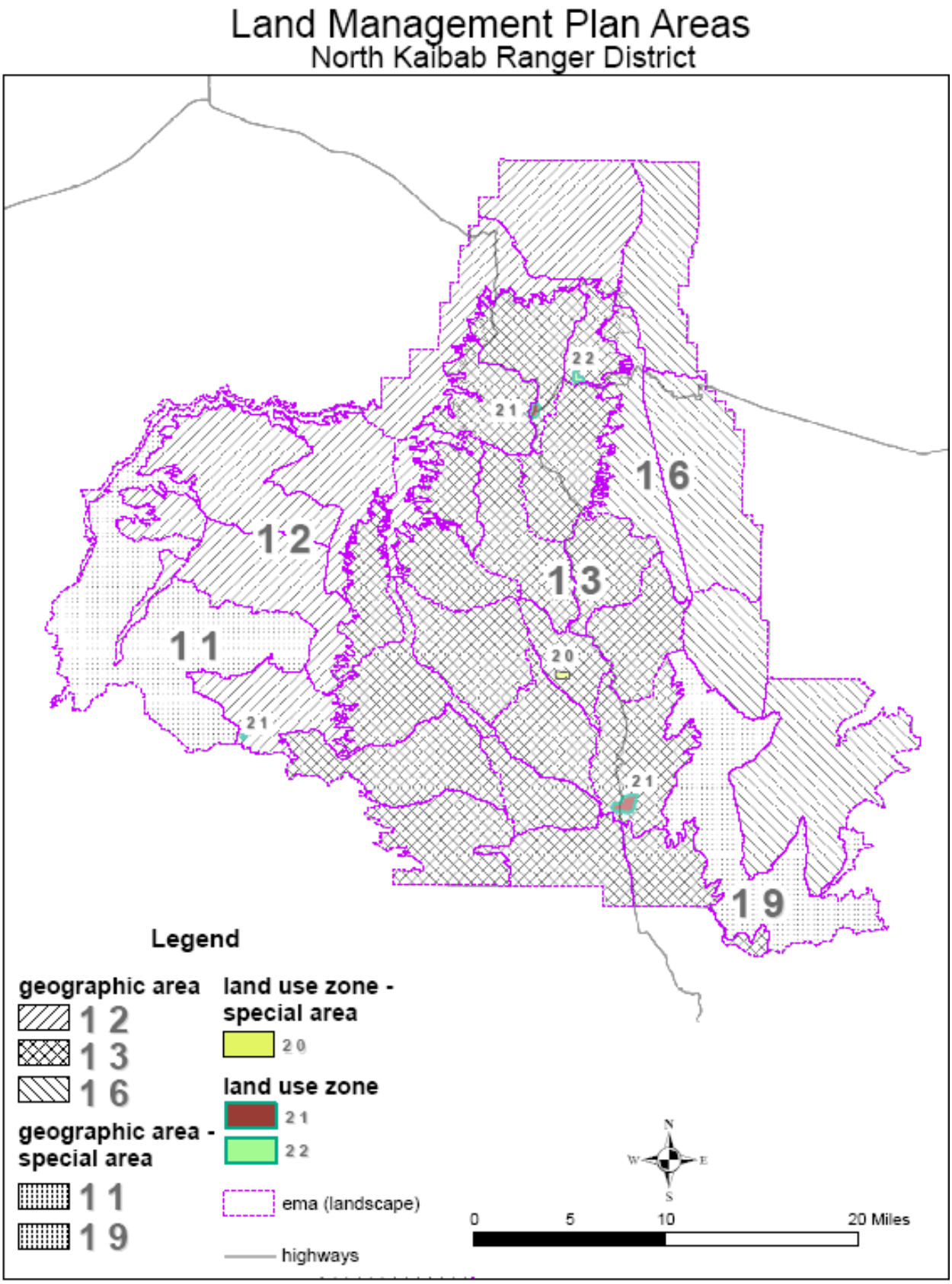
Planning Area Description

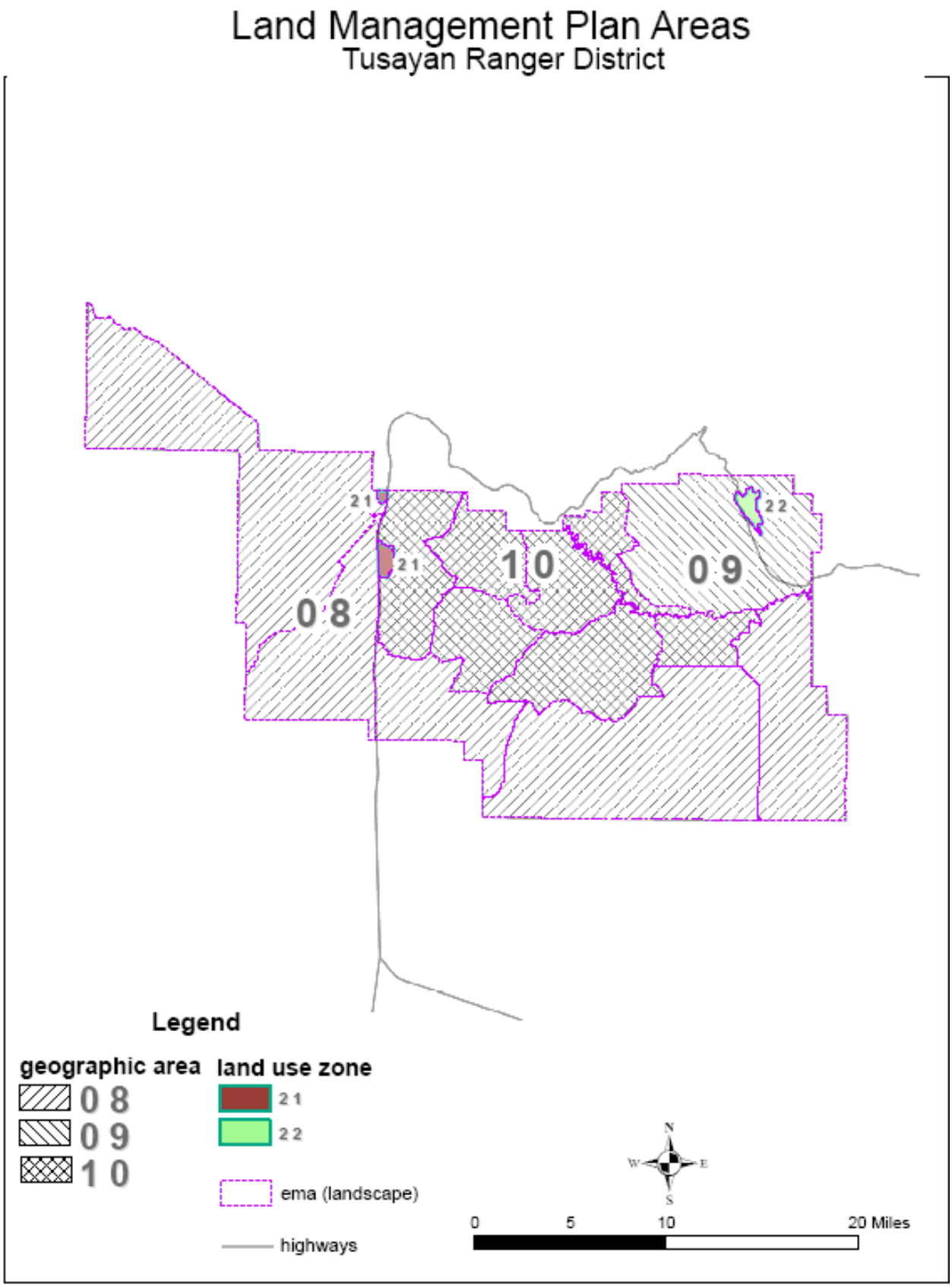
The Kaibab National Forest is comprised of three separate land areas located in the northern (Arizona Strip) and north central area of Arizona. Communities near or adjacent to the Forest are Fredonia, Jacob Lake, Tusayan, Grand Canyon Village, Parks, Williams, and Ash Fork. The nearest large city is Flagstaff.

This National Forest is comprised of 1.6 million acres, of which 43.5 thousand acres are in other ownerships. It has three Ranger Districts: Williams RD (formerly Williams and Chalender RDs), North Kaibab RD, and Tusayan RD. The Forest lies principally in Coconino County, but there are small areas in Yavapai and Mohave Counties. There is one designated National Game Preserve, the Grand Canyon National Game Preserve, and all or part of four designated Wilderness Areas, Sycamore Canyon, Kanab Creek, Kendrick Mountain, and Saddle Mountain within this National Forest. The Kaibab NF Plan applies to the Kendrick Mountain Wilderness, including the Coconino NF portion. The Coconino NF Plan applies to the Sycamore Canyon Wilderness, including the Kaibab NF portion.

Maps of the entire Forest and each Ranger District, showing Geographic Areas, Land Use Zones and Special Areas are displayed on the following pages. The Ranger District maps also display the additional planning designations of Ecosystem Management Areas or landscapes.


Land Management Plan Areas
Kaibab National Forest
Legend
geographic area
01 - W. Williams Woodland
02 - Williams Forestland
03 - N. Williams Woodland
08 - Tusayan Woodland
09 - Upper Basin
10 - Tusayan Forestland
12 - W. North Kaibab Woodland
13 - Kaibab Plateau Forestland
16 - E. North Kaibab Woodland
geographic area - special area
11 - Kanab Creek Wilderness
19 - Saddle Mountain Wilderness
land use zone - special area
04 - Kendrick Mountain Wilderness
06 - Arizona Bugbane Botanic Area
07 - Garland Prairie Research Natural Area
20 - Franks Lake Geologic-Botanic Area
land use zone
21 - Existing Developed Recreation Sites
22 - Proposed Developed Recreation Sites
other - not in Land Management Plan area
23 - Sycamore Canyon Wilderness
24 - Camp Navajo
highways
N
W
E
S
0 5 10 20 30 40 50 Miles


Land Management Plan Areas
North Kaibab Ranger District
22
21
16
12
13
11
20
21
21
19
Legend
geographic area
12
13
16
geographic area - special area
11
19
land use zone - special area
20
land use zone
21
22
ema (landscape)
highways
N
W
E
S
0
5
10
20 Miles


Land Management Plan Areas
Tusayan Ranger District
21
21
22
08
10
09
Legend
geographic area
08
09
10
land use zone
21
22
ema (landscape)
highways
N
W
E
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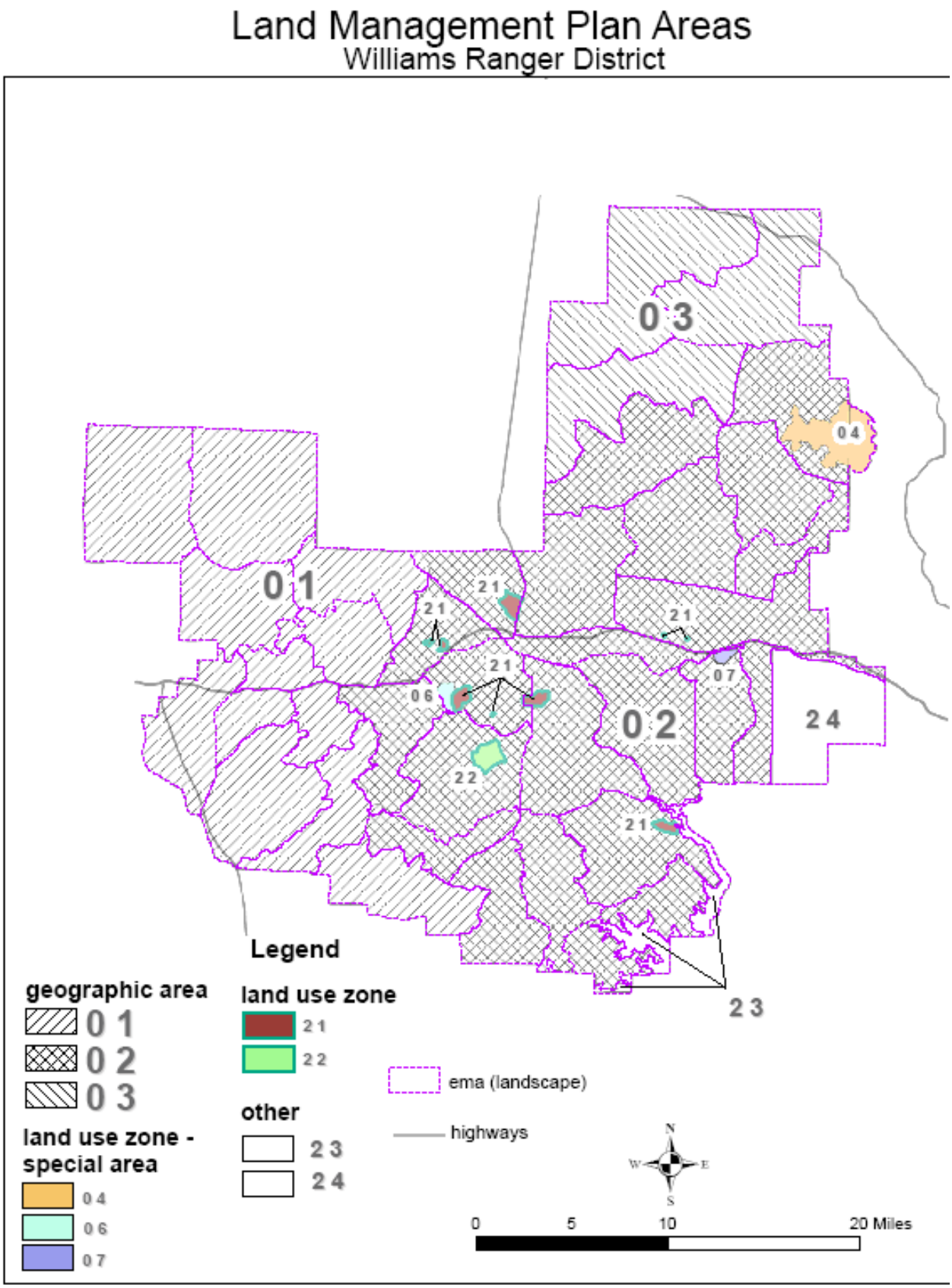
0
5
10
20 Miles


Land Management Plan Areas
Williams Ranger District
0 3
0 4
0 1
2 1
2 1
2 1
2 1
0 6
0 7
0 2
2 4
2 2
2 1
2 3
Legend
geographic area
0 1
0 2
0 3
land use zone - special area
0 4
0 6
0 7
land use zone
2 1
2 2
other
2 3
2 4
ema (landscape)
highways
N
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10
20 Miles

Chapter 2 - Public Issues and Management Concerns

Overview

The significant issues relating to the management and use of the Kaibab National Forest have been identified as part of the planning process. The Forest Plan, and alternatives to it are designed to respond to these issues as well as the RPA Program objectives assigned to the Forest in the Southwestern Regional Guide.

Issues were identified during the scoping process from such sources as the Regional Guide, comment solicited from the public, Forest Service employees, other agencies, and Indian tribes. People made their comments known at a series of public meetings and open houses, and by written comment through an information and response form mailed to interested and affected people.

Comments were analyzed to identify the most significant issues. Identified issues were further analyzed, screened, and studied to form a list of final issues that has guided the planning process.

Direction from the Secretary of Agriculture led to additional public involvement relative to the wilderness issue and a re-evaluation of the Forest's roadless areas. In August of 1983, two State-wide and three local open houses were held to gather input on the roadless area review. Subsequently, the wilderness issue was resolved with the approval of the Arizona Wilderness Act on August 28, 1984.

It became evident in the spring of 1985 that minerals management and mining in the Kaibab National Forest is controversial, and based on public comment, the issue regarding minerals management was added for the Kaibab National Forest.

Forest Plan Implementation and Ecosystem Management

The purpose of the management direction in Chapter 4 is to provide an operational framework to carry out an ecological approach to multiple-use resource management. Chapter 4 advances the principles of land stewardship and ecosystem management. These principles are imbedded in the forest plan implementation operations and improvement work through their integration in the standards and guidelines.

All resource operations and improvements aim at attaining resource management objectives and contribute to bringing desired conditions into being. All desired conditions focus on conservation of the ecosystem and the human environment. The ensure the focus is on the ecosystem, this amended Forest Plan establishes landscapes, or Ecosystem Management Areas (EMAs). For purposes of the Plan, a landscape is usually a contiguous portion of one Geographic Area, or GA. GAs are similar to the larger Management Areas in the original (1988) Plan except for some minor boundary changes and logical combinations made as more complete information about physical resources has been acquired. The smaller Management Areas from the unamended Plan are now referred to as Land Use Zones (LUZs).

Two GAs and three LUZs also have a designation significant to the Plan as Special Areas (SAs). SAs are areas with special management designations identified by Congress or at various executive branch levels.

Landscapes are the scale at which usual resource operations and improvements are initially analyzed, proposed and monitored for effectiveness. This is one scale above that which most resource operations and improvements are actually carried out. At the project level, analysis and planning are generally carried out at the project scale and one or two scales smaller. An example of this process is listed in the following table.

The units in the table below, and this Forest Plan are generally consistent with Table 1 in "Ecological Subregions of the United States: Section Descriptions". The differences which exist are practical matters which arise when human interests in existing biophysical resources (such as existing old growth stands, goshawk nest sites or campgrounds) are taken into account when considering management activities.

Planned activities, including proposals to amend this Plan, assess landscape existing and desired conditions and proposals to carry out resource operations and improvements are all published four times per year in the Kaibab National Forest NEPA Calendar.

Table 1. Relationship of Ecological Hierarchy to Planning and Management

Units	Name	General Purpose and Use	General Size Range
Section	Forest Plan & Others' Plans	Strategic coordination across administrative boundaries. Consistent guidance for large-scale issues.	Thousands of square miles
Sub-section	Forest Plan Geographic Area (GA)	Coordination and regulation of resources and issues within the Forest.	Hundreds to tens of square miles
Landtype Association	Landscape or EMA	Scale for assessments of existing and desired conditions, leading to specific project proposals.	Thousands to hundreds of acres
Landtype, location, species territory	Various	Scale at which many resource operations are regulated to ensure appropriate species and soils responses.	Hundreds to ten acres
Landtype phase, site, tree group	Various	The most specific scale at which resource operations and improvements are planned and executed.	Ten to less than one acre

Issues

The Forest Plan responds to the significant issues in specific ways. This chapter briefly describes how the Forest Plan responds to the issues; however for a thorough discussion of this response refer to Chapter 4 of the Environmental Impact Statement that accompanies this document.

The following are the significant issues treated in the Forest Plan. They are described in detail in the EIS.

- Commercial Timber
- Fuelwood
- Range
- Watershed
- Developed Recreation
- Dispersed Recreation
- Transportation System
- Wildlife Habitats
- Heritage Resources
- Wilderness and Special Areas
- Land Ownership Adjustments
- Minerals Management

Commercial Timber

There are approximately 1,394,309 forested acres in the Kaibab; 490,368 are classified as tentatively suitable timberland. This Plan allocates 479,132 acres, or 98 percent of the tentatively suitable timberland, to timber production. This area is estimated to have a maximum annual long-term sustained yield capacity of 108,000 MBF (21,620 MCF). Implementation of this Forest Plan will achieve approximately 68 percent of this capacity or 77,000 MBF (15,380 MCF) annually.

The actual average annual sawtimber harvest level for 1970 to 1985 is 60,100 MBF; the actual average annual roundwood and other products harvest level for 1962 to 1985 is 6,100 MBF. The total of the annual allowable sale quantities specified in the previous timber management plans is 91,200 MBF. This includes 64,200 MBF of sawtimber and 27,000 MBF of ponderosa pine roundwood, aspen, and other products. These figures demonstrate that during the past 15 years the actual harvest of sawtimber and products has been less than the total allowable sale quantity specified in the timber management plans.

In this Forest Plan the sawtimber component of the annual allowable sale quantity increases from 64,200 MBF to 72,000 MBF and the roundwood and other products component decreases from 27,000 MBF to 4,900 MBF. The sawtimber increase responds to demand for this component. The roundwood and other products component decreases because there is no established market for this component in the North Kaibab Ranger District and the annual ponderosa pine roundwood harvest in South Kaibab Ranger Districts has decreased from 12,000 MBF to almost nothing. The allowable sale quantity in this Forest Plan reflects these shifts in timber demand.

The conflict between the management of the timber resource and wildlife habitat needs is addressed through the (1) incorporation of standards to guide stand treatments that respond to habitat diversity goals, (2) reduction in the number of acres allocated for commercial timber production, (3) allocation of stands with rotations extended to not less than 210 years, and (4) formulation and incorporation of standards that guide the management and protection of critical habitat elements, e.g. snags, cover areas, riparian areas, openings, nesting areas, roost-tree groups, and water sources.

Insect and disease situations are addressed, on a priority basis, through the application of silvicultural measures based on integrated pest management principles (IPM).

Visual concerns are addressed by specifying visual quality objectives for visually sensitive topographic features and road corridors.

Fuelwood

There is a lack of reliable fuelwood information concerning the fuelwood resource in this Forest. This Plan provides for the collection of inventory information from all forested acres, and as a minimum, stand mapping and vegetative and condition class typing of all forested acres.

Commercial and personal-use fuelwood programs are concentrated in the pinyon-juniper woodland. These programs are a cost-effective mechanism to accomplish timber management, wildlife habitat,

Table 2. Average Annual Allowable Sale Quantity

	Units	This Plan	Previous Plan
Sawtimber and Products	MBF	77,000	91,000
	MCF	15,380	18,240

soil and watershed, and range management objectives. Commercial and personal-use sales of Gambel oak and aspen are made to accomplish wildlife habitat improvements. Increased substitution of pine slash for Gambel oak and aspen is encouraged.

This Plan provides for a fuelwood output that exceeds the estimated demand of 11.1 MMBF per year. Approximately 57 percent of this demand is supplied with green pinyon and juniper. The remaining 43 percent is supplied from the coniferous residue of commercial timber sales. The quantity of available coniferous residues exceeds the total estimated future demand. This additional volume is available if the actual demand should exceed that which is anticipated.

Range

This Plan balances permitted grazing use with grazing capacity and improves management. More intensive management, coupled with the re-treatment of range non-structural improvements and the maintenance of structural improvements generates a modest increase in grazing capacity across the planning horizon. Additional grazing capacity, resulting from soil and watershed improvements and transitory forage produced after timber and fuelwood harvesting, is also available. The amount of rangeland in unsatisfactory condition is expected to decrease in direct response to the intensity of range management specified in the Plan.

Watershed

There are approximately 350,000 acres in unsatisfactory watershed condition in this Forest. Watershed condition is improved on 139,385 acres. This is a reduction from 349,425 acres in unsatisfactory condition to 210,040 acres and the result of restoration treatment accomplished through watershed and wildlife habitat improvements. This eliminates 40 percent of the unsatisfactory acreage. On-site soil loss is reduced 13 percent; all of this reduction occurs in the woodland vegetative type. Water yield varies from 299,922 acre-feet per year in period 2 to 302,746 acre-feet.

Developed Recreation

This Plan provides for management of all public sector sites at the standard service level.

Replacement of substandard facilities and improvement of public sector campgrounds will upgrade sites to their original design standards. The additional capacity needed to meet projected demand for developed recreation is largely

Table 3. Average Annual Fuelwood Output (MBF)

Units	Green Pinyon-juniper	Conifer Residues Available from Commercial Timber Sales	Total
MBF	6,300	8,500	14,800
MCF	1,260	1,700	2,960

Table 4. Average Annual Grazing Capacity and Intensity of Range Management

Grazing Capacity	Intensity of Range Management (Full Capacity Acres)				
	R1	R2	R3	R4	R5
71,000 AUM	4,719	0	648,220	137,761	0

R1 through R5 are levels of livestock grazing management. They are defined in the Glossary.

provided through the expansion of existing lodge facilities and the construction of new private sector campgrounds.

Dispersed Recreation

The desire for additional dispersed recreation opportunities is met through the construction of hiking, equestrian, and cross-country ski trails, trail heads, interpretive sites and fisheries. Under this plan, popular dispersed camping areas and trails receive regular inspection and maintenance.

Output projections exclude average annual highway use of 691,800 RVD and use associated with wildlife activities.

The existing acreage in each Recreation Opportunity Spectrum class is maintained. Additional areas are closed to off-road vehicle use to protect sensitive soils, vegetation and important aquatic habitats.

Transportation System

The Forest Transportation System consists of 946 miles of arterial and System collector roads and 5,744 miles of local roads. The major concerns in this issue are restricted versus unrestricted access, road management, and road location. Densities and standards are addressed through the transportation system road management planning process to be completed in 1988. Project planning includes transportation analysis to eliminate recurrence of these problems. Maintenance and design standards to ensure a safe and economic road system are specified in the Plan.

The Plan provides for the closure of approximately 800 miles of local terminal roads and the obliteration of over 750 miles of undesirable road. Roads that are retained on the system will be maintained at the level determined by the resource access-travel management plan and provide safe access for (1) high clearance vehicles on low-use roads, (2) low clearance vehicles on smooth-surfaced, high-use roads, and (3) an adequate sign system for traveller safety and information. The surface replacement for gravel-surfaced roads is scheduled for 20-year average intervals.

Table 5. Average Annual Developed Recreation Output (RVD)

Development Sector	This Plan	Previous Plan
Public Sector	314,027	314,027
Private Sector	275,855	222,984
Total Output	589,882	537,011

Table 6. Average Annual Dispersed Recreation Output (RVD)

	This Plan	Previous Plan
Projected Output	279,000	254,800

Table 7. Acres Closed to Off-Road Vehicle Use*

	This Plan	Previous Plan
Acres Closed	32,683	11,392

*These figures do not include acres of classified wilderness also closed to ORV use or significant landforms on the Forest effectively closed because of rough terrain.

Wildlife Habitat

The desire for consumptive and non-consumptive wildlife benefits is expected to increase. This Plan addresses this increasing demand with increased effort to improve and maintain habitats through direct and indirect methods. It concentrates on improving diversity, providing quality old-growth habitats, and composition of successional stages of vegetation and integrating desired wildlife habitat characteristics as a major consideration in the design of all vegetative treatments, whether they are for habitat improvement or for other purposes.

This Plan establishes guidelines for timber stand size and location, timing of treatments, establishment, management, and protection of blocks or units of old-growth communities, protection of sensitive habitats, and measures for the recruitment, protection, and management of snag habitats.

Direct habitat improvement is greatly increased and includes (1) prescribed burning, (2) seeding and planting of desirable browse and herbaceous species, (3) water developments, and (4) the creation of wildlife openings. Actions are also included to locate, survey and inventory riparian and aquatic habitats as well as plant species requiring protection.

The increased levels of direct and indirect habitat improvement are expected to improve habitat quality and diversity in both the short and long-term.

Table 8. Change in Habitat Diversity Index (%)	
This Plan	+13.6
Previous Plan	0

Table 9. Old-Growth Habitat (Acres)	
This Plan	174,625
Previous Plan	69,000

Table 10. Average Annual Wildlife and Fish Use (WFUD)	
This Plan	193,400
Previous Plan	175,000

Heritage Resources

This Plan provides for heritage resource surveys in advance of all ground disturbing activities. In addition, increased funding is provided for (1) heritage resource survey of non-project areas and (2) heritage resource site evaluations and nominations to the National Register.

Interpretive displays and brochures are developed for Historic Trails and National Register sites.

Wilderness and Special Areas

Wilderness character and quality are protected and maintained by focusing administrative effort in heavily used areas and along wilderness boundaries. The Plan provides adequate funding for regular inspection and maintenance of wilderness trails, the construction of new Wilderness hiking trails, boundary posting and maintenance, and publication of maps and information brochures.

An opportunity has been identified to provide an area for scientific study through establishment of a research natural area. This Plan nominates and establishes the Garland Prairie Research Natural Area with 300 acres for the study of the Arizona fescue-mountain muhly open-prairie bunchgrass ecosystem.

Realty Management

This Plan identifies particular tracts of National Forest Land that are suitable for exchange to meet the needs for community expansion in the vicinity of Tusayan, Parks, Ash Fork and Williams. Other program funding provides for the acquisition of rights-of-way, efficient management of special land uses and continuation of the land ownership boundary line management program.

Minerals Management

This Plan also provides for the timely analysis and processing of locatable and leasable mineral prospecting, exploration, leasing and development proposals. Lands potentially valuable for uranium and oil and gas production are available for exploration and development. Important wildlife habitats, visually sensitive areas, habitats of threatened and endangered plants and animals, and areas with large capital investments are protected through oil and gas lease special surface use stipulations and surface occupancy restrictions imposed on locatable mineral activities.

Chapter 3 - Summary Of The Analysis Of The Management Situation

Overview

An analysis of the management situation was made in 1982 and subsequently revised in 1985. The record of this analysis (AMS) is on file in all Kaibab National Forest offices and the Regional Office in Albuquerque, New Mexico. This analysis demonstrates the productive capacity of the Kaibab National Forest to supply various goods and services under certain presumed conditions. The AMS document is incorporated by reference for analysis purposes into the Environmental Impact Statement and Forest Plan. The AMS is summarized in detail in Chapter 3, Affected Environment, of the Environmental Impact Statement.

Table 11 displays the estimated supply and projected use of selected outputs from the Kaibab National Forest for Planning Period 1 and Planning Period 5. These supply and use estimates have been analyzed in order to predict and schedule necessary investments, resolve issues, and eliminate or minimize future conflicts. This Forest Plan displays the allocation of the amounts and kinds of forest resource investments that are necessary to produce the goods and services to satisfy projected demand across the planning horizon and maintain and enhance the resource base of the Kaibab National Forest in a cost effective manner.

Table 11. Comparison of Selected Outputs to Potential Supply and Projected Use

Resource Output	Unit of Measure	Forest Plan		Potential Supply		Projected Use	
		Period 1	Period 5	Period 1	Period 5	Period 1	Period 5
Sawtimber and Roundwood ASQ[1]	MBF	768,520	898,180	1,157,990	1,160,290	768,520	898,180
Grazing Capacity	AUM	710,000	753,000	750,700	1,097,000	713,200	771,600
Permitted Grazing Use	AUM	777,150	727,000	750,000	1,097,000	780,500	745,700
Wilderness Recreation Use	RVD	74,600	109,800	234,000	234,000	74,600	109,800
Dispersed Recreation Use	MRVD	9,707	11,175	27,000	27,000	9,707	11,175
Wildlife-fish Recreation Use	MWFUD	1,934	1,989	1,943	3,500	2,320	5,002
Developed Recreation Use[2]	MRVD	5,899	9,975	5,949	14,941	5,899	9,975

[1]ASQ - Allowable Sale Quantity [2]Includes both private and public sectors.

These data indicate that this Forest is able to satisfy projected use for timber, wilderness, and dispersed and developed recreation across the five-decade planning horizon under the desired resource conditions presumed when the AMS was made. Permitted grazing use exceeds grazing capacity in Planning Period 1; however permitted grazing use is brought into balance with grazing capacity before the end of Planning Period 1 through reduction in permitted grazing use and increase in grazing capacity. Increases in grazing capacity in all planning periods are predicated on the maintenance of existing range structural improvements by the range allotment permittee, re-treatment of existing non-structural (forage) improvements, investment in additional non-structural improvements made in association with commercial thinning in timber stands, regeneration cutting in pinyon-juniper stands, and watershed improvements. The projected future demand for wildlife and fish recreation use exceeds the amount supplied in the Forest Plan in all planning periods

Chapter 4 - Management Direction

Overview

This chapter contains the management direction for the Kaibab National Forest. It begins with a Forest-wide mission statement, followed by the goals for managing individual program components. Next, a table maps out which standards and/or guidelines apply to each of the GAs or LUZs and where they may be found in the document. Regionally consistent (Forest-wide) Standards and Guidelines, adopted with the June, 1996 Record of Decision follow the table. The next section presents descriptions, standards and guidelines for GAs 2, 10 and 13, as amended with the June, 1996 Record of Decision. This section is followed with management direction for each of the remaining 16 GAs or LUZs not specifically addressed in the June, 1996 Record of Decision, including a general description of the GA or LUZ and management direction for every resource component. In the case of wilderness, special botanical, and recreation development GAs or LUZs, there is also a listing of their specific standards and guidelines.

A number of tables, formerly included within each GA or LUZ (Management Area, formerly) have been moved to Appendix C. This was done because the information contained in these tables was informational only and did not represent decisions made in the Forest Plan.

These tables include:

- Objectives for each program component with the specific numeric objectives from the analysis;
- A summary table of work activities initially scheduled in that GA; and,
- Land classification acerage tables for each GA.

This management direction guides land and resource use and management until the plan is revised or amended.

The Forest is divided into 11 geographically discrete GAs.. All of the land within a given GA (unless overridden by direction in an overlapping LUZ) is managed under the same emphasis to ensure consistency, efficiency and integration of management practices across the GA. LUZs are areas that contain additional or special direction within one or more GAs.

The multi-resource prescription is a set of resource practices for recreation, fish and wildlife, range, timber, soil and water, minerals, landownership, land management planning, facilities, wildland and prescribed fire, and general administration. Resource practices in management prescriptions for classified wilderness areas include wilderness, range, wildlife and fish, landownership, land management planning, fire management, and general administration. The set of management practices in proposed and existing recreation development sites includes recreation, minerals, soil and water, land management planning, fire protection, and general administration. Each practice consists of one or more major work activities. Work activities are the basic units of work that are performed to produce the goods and services that represent the goals and objectives of this plan. Standards and/or guidelines specify how the work activity is to be conducted or carried out. Standards and/or guidelines for certain work activities are not specified, because the policy guiding its conduct is established either in Federal law and regulation, state or local law and regulation, professional protocol, Forest Service Directives, or some combination of the above.

Mission

A mission is a guiding principle toward which management practices focus and contribute. Mission statements are very general. They describe the general direction of the organization and are broad, comprehensive statements. They contain statements about the purpose of organizational existence and what it is expected to accomplish. They are used to validate organizational objectives.

The mission of the Forest is to manage National Forest Lands and resources using the best methods available to meet the needs and desires of present and future generations, while protecting and enhancing the environment and efficiently administering Forest programs. Conflicts involving the allocation of resources are inevitable and will increase. The management challenge is to be responsive, equitable, efficient, and understanding in making resource management decisions.

Goals

A goal is "a concise statement that describes a desired condition to be achieved sometime in the future . . . it has no specific date by which it is to be completed." [36 CFR 219.3].

The Forest is attempting to reorient its management to emphasize long range improvement of land productivity and the protection and enhancement of resource values. North Kaibab Ranger District (NZ): The goal is to achieve a situation that can provide a wide mix of outdoor recreation opportunities, including hunting and fishing, which range from primitive to urban, and that can respond to local and regional demands for water, forage, wildlife habitats, and wood products. South Zone – Tusayan and Williams Ranger Districts (SZ): The goal is to achieve a situation that can provide a wide mix of outdoor recreational opportunities responsive to current and future public demand by maintaining or enhancing recreation settings, while protecting sensitive scenic and heritage resources, and while providing for local and regional demands for water, forage, wildlife habitats, wood products, and fire protection.

These outputs would be produced on a sustained basis while maintaining soil, air, and water resources at or above minimum applicable standards. Levels of outputs and uses are adjusted to be within long-term supply potentials, and to ensure the harmonious and coordinated management of all resources without impairing the productivity of the land. Non-renewable resources are adequately protected to ensure their future availability.

Goals have been identified for each resource element:

Outdoor Recreation

- NZ: Manage the recreation resource and provide facilities to increase opportunities for a wide variety of developed and dispersed experiences.
- SZ: Manage a wide spectrum of desired settings that provide opportunities for the public to engage in a variety of developed and dispersed recreational activities, in concert with other resource management and protection needs.
- Manage facilities and use to minimize resource degradation, and to provide for the safety and well being of the public while in the Forest.
- NZ: Design resource activities to maintain and enhance visual quality.
- SZ: Protect and enhance the scenic and aesthetic values of the Kaibab National Forest.
- Provide visitor information services [VIS] to interpret the resources, uses, and management of the Forest.
- Maintain a variety of Forest trails, considering people's needs and desires for horseback and foot travel, winter sports, and motorized and challenge and adventure opportunities, as well as opportunities for the handicapped.

- Establish off-road vehicle [ORV] closures as needed to maintain other resource objectives. Manage ORV use to provide ORV opportunities while protecting resources and minimizing conflicts with other users.
- Coordinate the management of recreation resources and activities with the Grand Canyon National Park, Coconino County, and the State of Arizona to complement their roles in providing outdoor recreation.
- Inventory, evaluate, nominate, protect, study, interpret, and enhance heritage resources in accordance with the management prescriptions. Coordinate planning for these activities with the State Historic Preservation Office, State Archaeologist, and other State and Federal agencies.

Wilderness

- Manage wilderness use to maintain or enhance enduring, high quality wilderness values while providing for quality wilderness recreation experiences. Allow wildland fire to play a more natural role. Protect the current status of air quality related values [AQRV's] in the Sycamore Canyon Wilderness Class I Airshed and in other wildernesses.

Wildlife and Fish

- Improve wildlife habitats through expanding knowledge of species requirements, development of habitat quality and diversity, and the identification and protection of key habitats.
- Cooperate with the Arizona Game and Fish Department to achieve management goals and objectives specified in the Arizona Wildlife and Fisheries Comprehensive Plan, and in carrying out the cooperative agreement for the management of the Grand Canyon National Game Preserve. Support the Arizona Game and Fish Department in meeting its objectives for the state.
- Improve habitats for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered. Work toward recovery and de-listing of species.
- Identify and protect areas that contain threatened, endangered, and sensitive species of plants and animals. Consult with the U.S. Fish and Wildlife Service when activities have the potential to impact protected species.
- Expand agency, conservationist, and citizen understanding and cooperation in wildlife and fishery habitat management, activities, and use.

Riparian Habitats

- Inventory all riparian areas. Woody riparian communities and riparian communities dominated by shrub and herbaceous species shall be in satisfactory or better condition.

Range Grazing

- Produce the maximum amount of forage, consistent with other resource values, for use by wildlife and livestock on a sustained yield basis. Benefits are improved watershed condition, range forage, wildlife habitat, and enhanced visual quality.
- Manage the Double A Wild Burro territory to maintain a viable population of burros while minimizing impacts on range forage and wildlife habitats.
- Cooperate with private range owners and other agencies to develop coordinated range management systems of livestock grazing where lands of other ownership are intermingled or adjacent to the National Forest.

Timber

- Manage suitable timberland to provide a sustained level of timber outputs to support local dependent industries. Apply integrated resource management to improve age-class distribution, diversity, and to reduce losses from forest insect and disease pests. Continue

developing genetically superior tree stock for use in reforestation.

- Apply silvicultural practices in accordance with federal regulations, and to resolve public issues and concerns and site specific resource objectives.
- Concentrate fuelwood programs in the pinyon-juniper woodland to accomplish, wildlife habitat, soil and watershed, and range improvement objectives. Encourage substitution of coniferous residues from commercial timber harvest for preferred fuelwood sources.
- Collect reliable information from unsuitable and suitable lands necessary for both operational and long-range planning.

Soil, Water, and Air Quality

- Maintain soil productivity and watershed condition. Rehabilitate non-productive lands on a planned basis to eliminate unsatisfactory watershed condition by 2020. Maintain a high quality sustained water yield for Forest users and others. Identify and protect wetlands and floodplains.

Minerals

- Administer the mineral laws and regulations to minimize adverse surface resource impacts. Support sound energy and minerals exploration and development.

Lands

- Acquire lands that are needed for landownership consolidation and improved management efficiency through land exchange, purchase, or donation.
- Acquire the road and trail rights-of-way needed to administer the Forest and provide public access.
- Identify and locate landlines to protect National Forest landownership by detecting and resolving unauthorized occupancy and trespass.
- Administer the Small Tracts Act to best serve the public and the resources.
- Administer special uses to best meet public needs.
- Minimize the number of electronic sites and utility corridors consistent with appropriate public services that require the use of Forest lands.

Transportation and Administrative Facilities

- Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for the construction and reconstruction, maintenance, seasonal and special closures of Forest roads; and obliteration of unnecessary roads.
- Provide administrative facilities for resource and activity needs and that meet Federal and State pollution abatement standards where applicable.
- Rehabilitate or replace administrative facilities and sewer and water systems as needed to improve management efficiency and insure public and employee health and safety.

Fire Protection and Use

- Use prescribed fire and wildland fire use as resource management tools where they can effectively accomplish resource objectives. Areas approved for wildland fire use implementation and their prescriptive criteria will be identified within the fire management plan. Fire management, prevention, and control are used to protect life, property, and resources.

Law Enforcement

- Cooperate with State and local law enforcement agencies to properly protect Forest resources, employees, visitors, and property.

Special Areas

- Identify, recommend, and protect potential Research Natural Areas.
- Manage specially designated areas according to the enabling orders and to protect their special qualities.

Public Affairs

- Provide for public participation in and information about Forest management. Involve the public at appropriate points in every decision making process. Seek advice and counsel from people who are affected by Forest management.

Human Resources

- Manage human resource programs to provide employment, rehabilitation, or other designated objectives while meeting natural resource goals.

Land Management Planning

- Provide coordination and ensure interdisciplinary input for implementing, monitoring, and updating the Forest Plan.

General Administration

- Provide the organization and administrative support needed to ensure responsive and efficient public land management.

Forest Pest Management

- Prevent any new noxious or invasive weed species from becoming established, contain or control the spread of known weed species, and eradicate species that are the most invasive and pose the greatest threat to biological diversity and watershed condition.

Table 12. Standard and Guideline Page Schematic for
Geographic Areas and Land Use Zones

Area Type[1]	Area Number	Regionally Consistent & Forest-wide Standards and Guidelines[1]	Management Direction[2]	Work Activities, S&Gs[3]	Standards [4]	Guidelines[5]
GA	1	pages 22 – 34-2	pages 49 – 51	pages 69 – 87	N/A	N/A
	3		pages 52 - 54			
	8		pages 55 – 58			
	9		pages 59 - 61			
	12		pages 62 - 65			
	16		pages 66 - 68			
	2, 10, 13		N/A	N/A	pages 38 - 39	pages 39 - 48
LUZ-SA	4		page 88	pages 88 - 91	N/A	N/A
	6		page 92	pages 92 - 94		
	7		page 95	pages 95 - 96		
GA-SA	11		pages 97 – 98	pages 98 – 100		
	19		page 102	pages 102 - 104		
LUZ-SA	20		page 105	pages 105 - 107		
LUZ	21		N/A	pages 108 - 111		
	22		N/A	pages 112 - 114		

[1] GA – Geographic Area. LUZ – Land Use Zone. SA – Special Area.

[2] These standards and guidelines come from the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, June, 1996 (6/96 Record of Decision). They apply to the entire Forest, regulating management with respect to Mexican spotted owl habitats, northern goshawk habitats, grazing management and old growth. The difference between these standards and guidelines is discussed on page 87 of the referenced document and in the Glossary of the associated Final Environmental Impact Statement. Standards are primary constraints, while guidelines may occasionally contain discretionary elements, as indicated by their wording.

[3] Management Direction, if present, provides general guidance for Geographic Areas and Land Use Zones.

[4] These standards and guidelines remain from the Forest Plan, as amended through April 5, 1990, except as specifically identified and amended by the 6/96 Record of Decision on pages 45 and 46 of that document. Standards and guidelines are not differentiated and are, in effect, standards.

[5] These standards are listed on pages 46 through 48 of the 6/96 Record of Decision and derive directly from the Proposed Kaibab National Forest Plan, Amended (June, 1994), page 13. Consistent with the previous discussion, standards as defined on pages 12 and 13 in the referenced document, are "... a required course of action or a level of attainment .... Deviation from compliance with a standard requires amendment of the Forest Plan."

[6] Guidelines listed on pages 49 through 51 and 56 through 72 of the 6/96 Record of Decision derive directly from the Proposed Kaibab National Forest Plan, Amended (June, 1994), page(s) 14 and 38 through 45. In contrast with the above "standards and guidelines", "guidelines", as defined on page 13 in the referenced document, state that they "... provide guidance for the conduct of various resource operations or improvements. Deviation from compliance with a guideline does not require amendment of the forest plan, but departure from a guideline must be discussed in the appropriate decision document." This definition of guideline is used only for guidelines referenced in the "Guidelines" column, above. While the June, 1994 document intended to apply some of these guidelines to the entire Forest, the 6/96 Record of Decision restricted their application to GAs 2, 10 and 13 only.

Regionally Consistent Standards and Guidelines

Standards and guidelines to be added to each forest plan for Mexican spotted owl habitat, northern goshawk habitat, grazing utilization, and old growth designation follow. Standards and guidelines are the bounds or constraints within which all management activities are to be carried out in achieving forest plan objectives. The following standards and guidelines are packaged in parallel format. Parallel format means that a set of standards is described first which gives the primary constraint. Following the standards are guidelines which provide additional details on how each standard will be implemented. For example, one of the Mexican spotted owl standards is to "establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989".

The corresponding guidelines read "Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided".

"The Protected Activity Center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center."

"The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat."

"Protected Activity Center boundaries should not overlap."

"Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys."

As the foregoing example shows, the guidelines are the detailed information about implementation of the standards. While standards and guidelines both specify the management bounds and constraints, the standards contain no discretionary elements and the guidelines may occasionally contain discretionary elements. For example one of the Mexican spotted owl guidelines is "The Protected Activity Center should enclose the best possible owl habitat...". The terms "should" and "best" imply some discretion on the part of the person implementing the guideline.

Mexican Spotted Owl

Standards:

Provide three levels of habitat management - protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape.

Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas.

Restricted areas include all mixed-conifer, pine-oak, and riparian forests outside of protected areas.

Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas

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Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area.

Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989.

Allow no timber harvest except for fuelwood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with US Fish and Wildlife Service.

Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years.

Limit human activity in protected activity centers during the breeding season.

In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict.

Monitor changes in owl populations and habitat needed for de-listing.

Guidelines:

A. General

Conduct surveys following Region 3 survey protocol.

Breeding season is March 1 to August 31.

B. Protected Areas

Protected Activity Centers

Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided.

The Protected Activity Center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center.

The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat.

Protected Activity Center boundaries should not overlap.

Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys.

Road or trail building in protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons.

Generally allow continuation of the level of recreation activities that was occurring prior to listing.

Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a sub-permit under the U.S. Fish and Wildlife Service Master endangered species permit. The permit should stipulate the

sites, dates, number of visits and maximum group size permissible.

Harvest fuelwood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl.

Retain key forest species such as oak.

Retain key habitat components such as snags and large downed logs.

Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below.

Treat fuel accumulations to abate fire risk.

Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas.

Designate a 100 acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center.

Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100 acre "no treatment" area.

Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.

Select and treat additional protected activity centers in 10% increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods.

Use light prescribed fire in non-selected protected activity centers on a case-by-case basis. Burning should avoid a 100 acre "no treatment" area around the activity center. Large woody debris, snags, clumps of broad-leafed woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar.

Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement. (See monitoring guidelines)

Steep Slopes (Mixed conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years)

No seasonal restrictions apply. Treat fuel accumulations to abate fire risk.

Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire.

Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the root collar.

Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines)

Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas)

Allow fire use where appropriate.

C. Restricted Areas (Mixed Conifer, Pine-Oak, And Riparian Forests)

Mixed Conifer and Pine-oak Forests (See glossary definition)

Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species.

The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional 15% of area at 150 basal area. The variables are for stand averages, are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a district-wide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the district-wide or larger landscape analysis shows there is a surplus.

Table 13. Minimum Percentage of Restricted Area Managed for Nest/Roost Characteristics

VARIABLE	MC ALL RU	MC BR-E RU[1]	MC OTHER RU[2]	PINE-OAK[3]
Restricted area %	10	+10	+15	10
Stand Averages for:				
Basal Area	170	150	150	150
18 inch+ trees/ac	20	20	20	20
Oak basal area	NA	NA	NA	20
% total existing stand density index by size class:				
12-18"	10	10	10	15
18-24"	10	10	10	15
24+"	10	10	10	15

[1] Does not apply to the Kaibab NF.

[2] Applies to the Kaibab NF.

[3] Applies to the Williams RD, Kaibab NF.

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions.

Maintain all species of native trees in the landscape including early seral species.

Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.

Emphasize uneven-aged management systems. However, both even-aged and uneven-aged systems may be used where appropriate to provide variation in existing stand structure and species diversity. Existing stand conditions will determine which system is appropriate.

Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached.

Save all trees greater than 24 inches dbh.

In pine-oak forests, retain existing large oaks and promote growth of additional large oaks.

Encourage prescribed and wildland fire use to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire.

Retain substantive amounts of key habitat components: Snags 18 inches in diameter and larger down logs over 12 inches midpoint diameter hardwoods for retention, recruitment, and replacement of large hardwoods

Riparian Areas

Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should move degraded riparian vegetation toward good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented.

Domestic Livestock Grazing

Implement forest plan forage utilization standards and guidelines to maintain owl prey availability, maintain potential for wildland fire use while inhibiting potentially destructive wildland fire, maintain and restore riparian ecosystems, and promote development of owl habitat. Strive to attain good to excellent range conditions.

Old Growth

Except where otherwise noted, implement forest plan old growth standards and guidelines to maintain and promote development of owl habitat.

D. Other Forest And Woodland Types

Apply ecosystem approaches to manage for landscape diversity mimicking natural disturbance patterns, incorporating natural variation in stand conditions and retaining special features such as snags and large trees, fire use, and retention of existing old growth in accordance with forest plan old-growth standards and guidelines.

E. Specific Recovery Units on the Kaibab NF

Colorado Plateau (Tusayan and North Kaibab RDs)

No special additional guidelines apply

Upper Gila Mountains (Williams RD)

No special additional guidelines apply

F. Monitoring

Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups.

Population monitoring should be a collaborative effort with participation of all appropriate resource agencies.

Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies.

Habitat monitoring of treatment effects (pre and post treatment) should be done by the agency conducting the treatment.

Prepare an annual monitoring and evaluation report covering all levels of monitoring done in the previous year. The annual report should be forwarded to the Regional Forester with copies provided to the recovery unit working groups, USFWS Ecological Services field offices, and the USFWS Regional Office.

Range-wide

Track gross changes in acres of owl habitat resulting from natural and human caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy.

In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre and post treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown.

Upper Gila Mountain Recovery Units

Assist the recovery team and recovery unit working group to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories. Twenty percent of the quadrats will be replaced each year at random.
Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum.

Ecosystem Management In Northern Goshawk Habitats

Applicability: The northern goshawk standards and guidelines apply to the forest and woodland communities described below that are outside of Mexican spotted owl protected and restricted areas. Within Mexican spotted owl protected and restricted areas, the Mexican spotted owl standards and guidelines take precedence over the northern goshawk standards and guidelines. One or the other set of standards and guidelines apply to all forest and woodland communities but the Mexican spotted owl standards always take precedence in areas of overlap.

Standards:

Survey the management analysis area prior to habitat modifying activities including a 1/2 mile beyond the boundary.

Establish, and delineate on a map, a post-fledgling family area that includes six nesting areas per pair of nesting goshawks for known nest sites, old nest sites, areas where historical data indicates goshawks have nested there in the past, and where goshawks have been repeatedly sighted over a two year or greater time period but no nest sites have been located.

Manage for uneven-age stand conditions for live trees and retain live reserve trees, snags, downed logs, and woody debris levels throughout woodland, ponderosa pine, mixed conifer and spruce-fir forest cover types. Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape. Sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition across the landscape. Provide foods and cover for goshawk prey.

Limit human activity in nesting areas during the breeding season.

Manage the ground surface layer to maintain satisfactory soil conditions i.e. to minimize soil compaction; and to maintain hydrologic and nutrient cycles.

When activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict.

Within the ranges of the Kaibab pincushion cactus, *Pediocactus paradinei*, and the Arizona leatherflower, *Clematis hirsutissima arizonica*, management activities needed for the conservation of these two species that may conflict with northern goshawk standards and guidelines will be exempt from the conflicting northern goshawk standards and guidelines until conservation strategies or recovery plans (if listed) are developed for the two species.

Guidelines:

General

Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should restore degraded riparian areas to good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented.

Refer to USDA Forest Service General Technical Report RM-217 entitled "Management Recommendations for the Northern Goshawk in the Southwestern United States" for scientific information on goshawk ecology and management which provide the basis for the management guidelines. Supplemental information on goshawk ecology and management may be found in "The Northern Goshawk: Ecology and Management" published by the Cooper Ornithological Society as Studies in Avian Biology No. 16. In woodland forest cover types, use empirical data to determine desired habitat conditions.

Inventory

Use the R3 survey protocol to get complete coverage of the management analysis area (Kennedy and Stahlecker 1993, as modified by Joy, Reynolds, and Leslie 1994.) Management analysis areas should be entire ecosystem management areas if possible. Complete at least one year of survey, but two years of survey should be done to verify questionable sightings, unconfirmed nest sites, etc. If nesting goshawks are found during the first year of inventory, a second year of inventory is not needed in that territory.

For areas where complete inventories cannot be done, use aerial photographs to locate vegetative structural stages (VSS) 4-6 within the project area and inventory just those sites for goshawk nest areas using R3 inventory protocol. All un-inventoried areas (VSS 1-3) will be managed to post-fledgling family area (PFA) specifications while in that stage. If, while using this inventory option, evidence suggests goshawks are present (such as finding plucking perches or molted goshawk feathers) conduct a complete inventory as outlined above.

If forests have goshawks commonly nesting in stands classified as VSS 1-3, use the complete inventory methods for those areas. There may be situations where an area is classified as a VSS 3, based on the predominant VSS class, but in actuality a combination of VSS 4 & 5 predominate the area. For those situations, use the complete inventory methods.

Home Range Establishment

Post-fledgling family areas (PFA) will be approximately 600 acres in size. Post-fledgling family areas will include the nest sites and consist of the habitat most likely to be used by the fledglings during their early development.

Establish a minimum of three nest areas and three replacement nest areas per Post-fledgling family area. The nest areas and replacement nest areas should be approximately 30 acres in size. A minimum total of 180 acres of nest areas should be identified within each post-fledgling family area.

Nest site selection will be based first on using active nest sites followed by the most recently used historical nest areas. When possible, all historical nest areas should be maintained.

Manage for nest replacement sites to attain sufficient quality and size to replace the three suitable nest sites.

Management Scale

Distribution of habitat structures (tree size and age classes, tree groups of different densities, snags, dead and down woody material, etc.) should be evaluated at the ecosystem management area level, at the mid-scale such as drainage, and at the small scale of site.

Vegetation Management

Landscapes outside Goshawk post-fledgling family areas

General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS1), 10% seedling-sapling (VSS2), 20% young forest (VSS 3), 20% mid-aged forest (VSS4), 20% mature forest (VSS 5), 20% old forest (VSS6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or - up to 3%.

The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 - 2.5 mile spacing across the landscape.

Snags are 18" or larger DBH and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape.

The order of preferred treatment for woody debris is: 1) prescribed burning, 2) lopping & scattering, 3) hand piling or machine grapple piling, 4) dozer piling.

Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3).

Spruce-fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40%, mature forest (VSS 5) should average 60+%, and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide two groups of reserve trees per acre with six trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre (including the downed logs).

Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%, mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain one

group of reserve trees per acre of 3-5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre, (including the downed logs).

Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+%, and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3-5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5-7 tons of woody debris per acre, (including the downed logs).

Woodland: Manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris.

Within post-fledgling family area's

General: Provide for a healthy sustainable forest environment for the post-fledgling family needs of goshawks. The principle difference between within the post-fledgling family area and outside the post-fledgling family area is the higher canopy cover within the post-fledgling family area and smaller opening size within the post-fledgling family area. Vegetative Structural Stage distribution and structural conditions are the same within and outside the post-fledgling family area.

Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+% and for mature (VSS 5) and old forest (VSS 6) should average 70+%.

Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+%.

Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 50+%. Mature (VSS 5) and old forest (VSS 6) should average 50+%.

Woodland: Maintain existing canopy cover levels.

Within Nesting Areas

General: Provide unique nesting habitat conditions for goshawks. Important features include trees of mature to old age with high canopy cover.

The structure of the vegetation within nest areas is associated with the forest type, and tree age, size, and density, and the developmental history of the stand. Table 5 of RM-217 presents attributes required for goshawks on locations with "low" and "high" site productivity.

Preferred treatments to maintain the desired structure are to thin from below with non-uniform spacing and use of handtools and fire use to reduce fuel loads. Lopping and scattering of thinning debris is preferred if prescribed fire cannot be used. Piling of debris should be limited. When necessary, hand piling should be used to minimize compaction within piles and to minimize displacement and destruction of the forest floor and the herbaceous layer. Do not grapple or Dozer pile debris. Manage road densities at the lowest level possible to minimize disturbance in the nest area. Use small, permanent skid trails in lieu of roads for timber harvesting.

Spruce-fir, Mixed Conifer and Ponderosa Pine Cover Types: The nesting area contains only mature to old forest (VSS 5 & 6) having a canopy cover (measured vertically) between 50-70% with mid-aged VSS 6 trees 200-300 years old. Non-uniform spacing of trees and clumpiness is desirable.

Woodland: Maintain existing canopy cover levels.

Human Disturbance

Limit human activities in or near nest sites and post-fledgling family area's during the breeding season so that goshawk reproductive success is not affected by human activities.

The breeding season extends from March 1 through September 30.

Low intensity surface fires are allowed at any time in all forested cover types, but high intensity crown fires are not acceptable in the post-fledgling family area or nest areas. Avoid burning the entire home range of a goshawk pair in a single year. For fires planned in the occupied nest area, a fire management plan should be prepared. The fire management plan should minimize the risk of goshawk abandonment while low intensity surface fire burns in the nesting area. Prescribed fire within nesting areas should be planned to move with prevailing winds away from the nest tree to minimize smoke and risk of crown fire developing and driving the adults off or consuming the nest tree.

Ground Surface Layer (All forested cover types)

Manage road densities at the lowest level possible. Where timber harvesting has been prescribed to achieve desired forest condition, use small, skid trails in lieu of roads.

Piling of debris should be limited. When necessary, hand or grapple piling should be used to minimize soil compaction within piles and to minimize forest floor and herbaceous layer displacement and destruction.

Limit dozer use for piling or scattering of logging debris so that the forest floor and herbaceous layer is not displaced or destroyed.

Grazing Management

Standards:
Forage use by grazing ungulates will be maintained at or above a condition which assures recovery and continued existence of threatened and endangered species.

Guidelines:

Identify key ungulate forage monitoring areas. These key areas will normally be 1/4 to 1 mile from water, located on productive soils on level to intermediate slopes, and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres. In some situations such as high mountain meadows with perennial streams, key areas may be closer than 1/4 mile from water and less than 20 acres. Within key forage monitoring areas, select appropriate key species to monitor average allowable use.

In consultation with US Fish and Wildlife Service, develop site-specific forage use levels. In the event that site-specific information is not available, average key species forage utilization in key forage monitoring areas by domestic livestock and wildlife should not exceed levels in the following table during the forage growing season.

Table 14 is based on composition and climatic conditions typical of sites below the Mogollon Rim. On sites with higher precipitation and vegetation similar to sites above the Mogollon Rim, allowable use for ranges in poor to excellent condition under deferment or rest strategies may be increased by 5%. The guidelines established in the above table are applicable only during the growing season for the identified key species within key areas. Allowable use for key forage species during the dormant season is not covered in the above table. These guidelines are to be applied in the absence of more specific guidelines currently established through site specific NEPA analysis for individual allotments.

Guidelines for allowable use for specific allotment(s) management or for grazing strategies not covered in the above table will vary on a site-specific basis when determined through the Integrated Resource Management (IRM) process.

Allowable use guidelines may be adjusted through the land management planning revision or amendment process. Guidelines established through this process to meet specific ecosystem objectives, will also employ the key species and key area concept and will be monitored in this manner.

Table 14. Allowable Use Guide (Percent) By Range Condition And Management Strategy *

Range Condition **	Continuous Season-long Use	Defer 1 Year in 2	Defer 1 Year in 3	Defer 2 Years in 3	Rest 1 Year in 2	Rest 1 Year in 3	Rest 2 Years in 3	Rest > 2 Years in 3
Very Poor	0	10	5	15	15	10	20	25
Poor	10	20	15	20	20	15	30	35
Fair	20	25	20	30	30	25	40	45
Good	30	35	35	35	35	35	45	50
Excellent	30	35	35	35	35	35	45	50

* Site-specific data may show that the numbers in this table are substantially high or low. These numbers are purposefully conservative to assure protection in the event that site-specific data is not available.

** Range Condition as evaluated and ranked by the Forest Service is a subjective expression of the status or health of the vegetation and soil relative to their combined potential to produce a sound and stable biotic community. Soundness and stability are evaluated relative to a standard that encompasses the composition, density, and vigor of the vegetation and physical characteristics of the soil.

Old Growth

Standards:

Until the forest plan is revised, allocate no less than 20 percent of each forested EMA to old growth as depicted in the table below.

In the long term, manage old growth in patterns that provide for a flow of functions and interactions at multiple scales across the landscape through time.

Allocations will consist of landscape percentages meeting old growth conditions and not specific acres.

Guidelines:

All analyses should be at multiple scales - one scale above and one scale below the EMAs. The amount of old growth can be provided and maintained will be evaluated at the EMA level and be based on forest type, site capability, and disturbance regimes.

Strive to create or sustain as much old growth compositional, structural, and functional flow as possible over time at multiple-area scales. Seek to develop or retain old growth function on at least 20 percent of the naturally forested area by forest type in any landscape.

Use information about pre-European settlement conditions at the appropriate scales when considering the importance of various factors.

Consider the effects of spatial arrangement on old growth function, from groups to landscapes, including de facto allocations to old growth such

as goshawk nest sites, Mexican spotted owl protected activity centers, sites protected for species behavior associated with old growth, wilderness, research natural areas, and other forest structures managed for old growth function.

In allocating old growth and making decisions about old growth management, use appropriate information about the relative risks to sustaining old growth function at the appropriate scales, due to natural and human-caused events.

Use quantitative models at the appropriate scales when considering the importance of various factors. These models may include, but are not limited to: Forest Vegetation Simulator, BEHAVE, and FARSITE. Forested sites should meet or exceed the structural attributes to be considered old growth in the five primary forest cover types in the southwest as depicted in the following table.

Table 15. Old Growth Habitat Characteristics									
Forest Cover Type, Name	Piñon-Juniper		Interior Ponderosa Pine		Aspen	Mixed-Species Group		Engelmann Spruce Subalpine Fir	
Forest Cover Type, SAF Code	239		237		217	210, 211, 216, 219		206, 209	
Site Capability Potential Break Between Low/High Site			55 Minor			50 Douglas-fir Edminster & Jump		50 Engelmann Spruc Alexander	
Site	Low	High	Low	High	All	Low	High	Low	High
1. Live Trees in Main Canopy:									
Trees/Acre	12	30	20	20	20	12	16	20	30
DBH/DRC	9"	12"	14"	18"	14"	18"	20"	10"	14"
Age (Years)	150	200	180	180	100	150	150	140[c]/ 170[d]	140[c]/ 170[d]
2.Variation in Tree Diameters									
(Yes or No)	ND	ND	ND	ND	No	ND	ND	ND	ND
3. Dead Trees									
Standing:									
Trees/Acre	0.5[a]	1	1	1	ND	2.5	2.5	3	4
Size, DBH/DRC	9"	10"	14"	14"	10"	14"	16"	12"	16"
Height (Feet)	8'	10'	15'	25'	ND	20'	25'	20'	30'
Down									
Pieces/Acre	2	2[b]	2	2	ND	4	4	5	5
Size (Diameter)	9"	10"	12"	12"	ND	12"	12"	12"	12"
Length (Feet)	8'	10'	15'	15'	ND	16'	16'	16'	16'
4. Tree Decadence									
Trees/Acre	ND	ND	ND	ND	ND	ND	ND	ND	ND
5. Number of Tree Canopies	SS/MS	SS/MS	SS/MS	SS/MS	SS	SS/MS	SS/MS	SS/MS	SS/MS
6. Total BA, Square Feet/Acre	6	24	70	90	ND	80	100	120	140
7. Total Canopy Cover, Percent	20	35	40	50	50	50	60	60	70

[a] Dead limbs help make up dead material deficit.
[b] Unless removed for firewood or fire burning activities.
[c] Where Englemann spruce is less than 50 percent of the stand composition.
[d] Where Englemann spruce is greater than or equal to 50 percent of the stand composition.

ND is "not determined; SS is single-storied; and MS is multi-storied.

Other Forest-wide Standards

1. Incorporate measures to control invasive species into project planning, implementation and monitoring.
2. Recreation/Wilderness and Scenery Management coordination will be accomplished for all management activities.
3. Update Wilderness ROS as needed in coordination with the adjacent forests sharing management responsibility.
4. SZ: Where existing conditions do not meet mapped ROS or Scenic Integrity Objectives (SIOs), design and implement projects to move the area toward desired conditions.

Exceptions

Tables 16 and 17 display exceptions to standard ROS and SMS direction that has been developed in response to the critical need for forest health, grassland restoration, and fuels treatments to move forests toward desired conditions.

5. *Motor vehicle use off the designated system is prohibited on the Williams Ranger District, except as identified on the Motorized Vehicle Use Map (MVUM).*

Other Forest-wide Guidelines

1. Use the Appendix B "Design Features, Best Management Practices and Mitigation Measures" in the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds on the Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, Arizona" (2004) for specific mitigation measures. Deviance from Appendix B does not trigger the need for a Forest Plan Amendment, however Required Protection Measures from Section 7 consultation (Endangered Species Act) must be followed. If as a result of environmental analysis, Best Management Practices or Mitigation Measures are modified, document the reason(s) in a NEPA decision.
2. Use the 1986 ROS Book, 1995 Landscape Aesthetics: A Handbook for Scenery Management, Recreation Opportunity Spectrum (ROS) and Scenery Management System (SMS) mapping, and Kaibab National Forest ROS-SMS Guidebook (ROS-SMS Guidebook) for forest management decisions, project analysis, and project implementation.
3. SZ: The ROS-SMS Guidebook will be followed unless there is an exception made in a site- or project-specific analysis. Exceptions to Guidebook Guidelines will require documentation in project-level analysis, but will not require a Forest Plan amendment.

   To use these exceptions, provide written documentation in the project level decision that elaborates on the timeline for completion and final expectation for appearance. Interim mitigations may be developed in response to extended timelines. At the completion of the project, the entire project area landscape must meet the mapped ROS class and corresponding SIO. Monitoring of projects will track activities and assure accomplishment and compliance with Forest Plan Standards.

Table 16. Exceptions to Standard ROS Direction

Primitive-Wilderness	Semi-Primitive Non-Motorized-Wilderness	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Roaded Modified	Rural
No exceptions allowed.	No exceptions allowed.	Up to 25% of an individual area may be mechanically treated at one time.*	Up to 25% of an individual area may be mechanically treated at one time.*	See SIO exceptions.	See SIO exceptions.	See SIO exceptions.

*Areas larger than 25% may be considered if treatment activities cause minimal visual impacts and/or treated area recovers within SIO 2 standard timeline. Treated areas must achieve the assigned ROS class and corresponding SIO before further large-scale treatments in the area may be initiated. This exception is not intended to limit the size of prescribed fires.

Table 17. Exceptions to Standard SMS Direction

SIO Level 1	SIO Level 2	SIO Level 3	SIO Level 4	SIO Level 5
Projects usually completed within one year. No exceptions allowed.	Projects usually completed within one year. May temporarily drop one level during critical project or management activities.	Projects usually completed within two years. May temporarily drop one level during critical project or management activities	Projects usually completed within three years. Timeline could be extended, but the SIO will not drop to Level 5.	Used only for inventory and existing condition mapping. Will not be used as a desired SIO.

Specific Recreation Opportunity Setting Standards – SZ

The KNF (SZ) will use the following ROS classes and accompanying ROS mapping to manage outdoor recreation settings.

- Primitive-Wilderness
- Semi-Primitive Non-Motorized-Wilderness
- Semi-Primitive Non-Motorized
- Semi-Primitive Motorized
- Roaded Natural
- Roaded Modified
- Rural

Prohibit competitive off-highway vehicle events in all ROS classes.

Manage commercial and institutional recreation special use opportunities based on assessed needs and within area capacity in all ROS classes.

Restrict motorized uses in SPNM designated areas, except for necessary minimal administrative activities, permitted activities, and emergency access needs.

Avoid construction of permanent or temporary roads in SPNM areas, unless required by valid permitted activity. Construct and maintain roads with SPNM classes to lowest maintenance level required for the intended use. Roads should be obliterated when no longer needed.

Specific Scenery Management Standards – SZ

The KNF (SZ) will use the following SIOs and accompanying SIO/Scenic Class mapping.

SIO Level 1	SIO Level 2	SIO Level 3	SIO Level 4	SIO Level 5
Very High	High	Moderate	Low	Very Low

Descriptions, Standards and Guidelines - Geographic Areas **2, 10 and 13**

Geographic Area **2** – Williams Forestland**: 308,394 Acres**

Geographic Area 2 was formerly Management Areas 2 and 5 on the Williams and Chalender Ranger Districts. It is the coniferous forest and some coniferous woodland above the Mogollon Rim in the Williams Ranger District. It includes parts of the Cedar-Deadman, Partridge Creek, Upper Verde, Sycamore Canyon and Cataract-Spring Valley watersheds. This area is an elevated plain interspersed with isolated cinder hills and volcanic mountains. Elevations range from 6,500 feet to 9,388 feet. Drainage systems are generally ill-defined with ephemeral flow. The average annual precipitation is approximately 22 inches. The City of Williams and several rural subdivisions are located in this management area.

Management Area 2 contains most of the suitable timberland in the Williams Ranger District. The predominant vegetation in this area is ponderosa pine with scattered inclusions of aspen and Gambel oak and coniferous woodland composed of ponderosa pine, pinyon pine, alligator juniper, and one-seed juniper. Typical understory in the lower elevations is blue grama; mountain muhly, junegrass and squirreltail are typical at higher elevations. There are extensive prairies of seral grass. Douglas-fir and white fir are found at higher elevations. Cliffrose, ceanothus, and mountain mahogany are found on shallow soils. The sensitive plant species *Potentilla multifoliolata* and *Chrysothamnus molestus* are known to occur in this area with other sensitive species occurrence possible.

Geographic Area 2 is habitat for a variety of animals. The endangered peregrine falcon and bald eagle seasonally use part of the

area. Mexican spotted owls, a threatened species, have designated territories and some habitat present. This habitat takes the form of pine/oak stands dispersed around the unit and islands of mixed conifer vegetation situated on Sitgreaves and Bill Williams Mountains. Red squirrels also live in these mixed conifer islands. The northern goshawk, a sensitive species, nests and forages in almost all parts of the area. The forested area, broken by several large seral grass prairies, is summer habitat for mule deer, elk, pronghorn antelope, turkey, black bear, and some white-tail deer. In lower elevations, pine stringers provide roost-trees for turkey.

Management indicator species where present are mule deer, elk, pronghorn antelope, turkey, Abert squirrel, hairy woodpecker, goshawk, pygmy nuthatch, cinnamon teal, and yellow bellied sapsucker. The riparian indicator species are Lucy's warbler, yellow breates chat and aquatic macroinvertebrates.

Riparian and aquatic areas consisting of scattered ponds and ephemeral lakes provide some breeding habitat and are important resting stops for migrating waterfowl and shorebirds. Several small lakes and ponds provide fishing opportunities as well as nesting habitat for waterfowl, shorebirds and osprey.

The unit has low potential for locatable and leasable minerals. Cinder material pits and many potential sites are located throughout the unit. Most of the special land uses and linear rights-of-way in the Williams District are in this management area. It also contains three classified electronic sites.

A substantial portion of this management area has been inventoried for heritage resources. Site densities vary from low to high. All sites have not been fully inventoried nor evaluated for disposition. The Beale Wagon Road Historic Trail and the Overland Road Historic Trail cross portions of the unit.

Recreation use within this area is moderate to high. Primary recreation activities are big game hunting, dispersed camping, fishing, sight-seeing, and hiking. There is some off-road vehicle use. The predominate recreation opportunity spectrum classification is roaded and natural appearing.

The area is summer range for cattle and sheep; most of the area is satisfactory range condition. Permitted grazing use is generally in balance with grazing capacity.

The fuel profile is conducive to high intensity wildland fires that can result in destruction or heavy damage to resources and developed facilities. Prompt appropriate management response must be instituted when the threat of high intensity fire exists.

Geographic Area **10** – Tusayan Forestland**: 86,250 Acres**

This area is located in the central section of the Tusayan Ranger District. It is an elevated plain with numerous drainage systems. Elevations range from 6,700 feet to 6,900 feet. Drainage systems are well-defined and flows are ephemeral. The average annual precipitation is approximately 18 inches.

Ponderosa pine vegetation makes up the majority of this management area. Gambel oak is scattered throughout as an understory component. Pinyon pine and Utah juniper comprise a substantial component of the vegetative type. Big sagebrush, snakeweed, blue grama, mutton bluegrass, mountain muhly, and junegrass are the predominant forage species.

The principal elk calving, deer and pronghorn antelope fawning, and turkey nesting habitat in the Tusayan District are located here. The category two sensitive species, *Chrysothamnus molestus*, is known to occur in this area with other sensitive species occurrence possible. The only fishery is Russell Tank. Where present, the management indicator species are elk, turkey, mule deer, goshawk, pygmy nuthatch, hairy woodpecker, pronghorn antelope, and plain titmouse.

Riparian indicator species are Lucy's warbler, yellow breasted chat, Lincoln's sparrow and aquatic invertebrates.

The area has moderate potential for uranium. Copper and other minerals may be found in association with uranium deposits. The area has low to moderate potential for oil and gas.

There are high densities of heritage resource sites, but inventoried heritage resource sites have generally not been evaluated for final disposition. Hull Cabin Historic District and Grandview Lookout Tower/Cabin are listed in the National Register of Historic Places and are interpreted to the public.

Recreation use within the unit is moderate, although there are several areas of concentrated use. Use consists mostly of dispersed camping, hunting, and sight-seeing. A portion of the Arizona Trail crosses the management area. The predominate recreation opportunity spectrum class is roaded and natural appearing.

Most of the area is grazed by cattle from late spring until fall. Permitted grazing use is not presently in balance with grazing capacity. Proper distribution of livestock is difficult to obtain due to the lack of water.

The fuels profile is variable with areas of high hazard fuel loading and areas of very sparse fuels.

Geographic Area **13** - Kaibab Plateau Forestland**: 268,719 Acres**

Geographic Area 13 was formerly Management Areas 13, 14, 15, 17 and 18. This area is located in the middle of the North Kaibab Ranger District. It is part of an elevated plain dissected by numerous drainage systems. Elevations range from 7,000 feet to over 9,000 feet. Drainage systems are well-defined and flows are ephemeral. Annual precipitation ranges from 18 to 30 inches.

Ponderosa pine predominates in most of this management area, except at higher elevations and

on cooler sites. Understory species include mutton bluegrass, blue grama, squirreltail, junegrass, *Carex* sp., and mountain muhly.

Mixed conifer and spruce-fir vegetation cover a major portion of this area. Aspen is scattered throughout in pure stands and as a component of both the overstory and understory vegetation. In openings and thinned stands important forage producers are pine dropseed, mountain muhly, tall oatgrass, weeping brome, and smooth brome. The forb component includes yarrow, ragweed, columbine, sandwort and cinquefoil. In dense conifer stands, *Carex* sp. and the forb component is essentially the only understory vegetation.

Pine stringers are an important feature in the southwestern part of this area and are valuable turkey habitat. The pine component along the western edge of the mixed conifer provides summer turkey and mule deer habitat and provides travelways between summer and winter ranges. Overall, this area provides important summer turkey and mule deer habitat. All of the area provides habitat for Kaibab squirrels, with red squirrels in the mixed conifer. Numerous openings in the forest including old, small clearcuts in the mixed conifer type, aspen stands and grassy meadows provide biotic diversity. The sensitive plant species *Castilleja kaibabensis*, *Lesquerella kaibabensis*, and *Penstemon virgatus* ssp. *pseudoputus* are known to occur in this management area with other sensitive species occurrence possible. The sensitive plant species *Rosa stellata* was thought to occur in this management area. Recent surveys have not found *Rosa stellata* on the Forest, but potential habitat is present and populations are nearby. Pure aspen stands have, historically, provided the best foraging areas, however invasion by conifers has suppressed the diversity and abundance of this forage resource. Management indicator species where present are turkey, mule deer, Kaibab squirrel, goshawk, red squirrel, plain titmouse, hairy woodpecker, pygmy nuthatch, and yellow-bellied sapsucker. All of this management area is in the Grand Canyon National Game Preserve.

Oxidized copper ores were produced from numerous prospects in the Jacob Lake and Warm Springs area until 1950. The United States acquired the surface estate of these copper properties through land exchanges; however the mineral rights are reserved to third parties until 2000. Occasional prospecting of these properties is expected to continue, although no development proposals are anticipated. The area has moderate potential for uranium, but the entire unit is closed to entry under the mining laws. The area has low to moderate potential for oil and gas; leases have been issued for portions of the unit north of Jacob Lake. Oil and gas prospecting activities, and possibly exploration, are likely to continue.

The wide range of vegetation types represented in the area provide visual diversity which is a major feature of this scenic area. Forest roads access vista points on the rim of the Grand Canyon and other dispersed recreation attractions. These vista points and other attractive spots provide dispersed camping and sight-seeing, which along with hunting, are the major recreational activities in the area. In the fall, many visitors enjoy the scenic contrast provided by the colorful aspen foliage. Some cross-country skiing and snowmobiling activity has developed during the winter. The entire unit is classified as roaded and natural appearing.

This area provides summer grazing for cattle and horses. Open grassy parks and seeded openings in the forest provide most of the grazing capacity. Permitted grazing use is in balance with estimated grazing capacity.

The fuel profile is conducive to large high intensity wildland fires with a potential for very high resource damage.

Standards:

The following additional standards apply only to GAs 2, 10 and 13. Deviation from compliance with a standard requires amendment of the Forest Plan.

1. Implement resource operations and improvements which contribute to achievement of desired conditions and fulfillment of the Forest Service mission. (Resource operations and improvements are specified in Forest Service Handbook (FSH) 1309.16, National Activity Structure Handbook).
2. Identify habitat management territories for threatened, endangered, or sensitive plant or animal species that are consistent with the conservation strategy and the recovery plan established for the species through on-the-ground surveys or record searches. Habitat needs for Federally listed species will take precedence over unlisted species, endangered species take precedence over threatened species and sensitive species take precedence over non-sensitive species.
3. Identify heritage properties through on-the-ground survey or record search that may be affected by resource operations or improvements; evaluate these properties for their eligibility for inclusion in the National Register of Historic Places. When eligible properties are found, apply criteria of effect as specified in the applicable protocol.
4. Identify and portray, describe, or quantify existing conditions in the landscape. If the land area selected for implementation of a resource operation or improvement is not a specified landscape, an ad hoc area shall be defined and geographically located during the initial stages of Forest Plan Implementation. Standards that apply to the implementation of resource operations or improvements in landscapes, apply as well to resource operations or improvements in ad hoc areas.
5. Formulate and portray, describe, or quantify management objectives and desired conditions for the landscape. In landscapes that involve habitat for threatened, endangered, or sensitive plant or animal species, formulate management objectives and desired conditions for each designated management territory. Formulate, design, and implement resource operations or improvements that contribute to the achievement or maintenance of these management objectives and desired conditions.
6. Consult with appropriate tribal, state, county, or local government agencies regarding existing conditions, desired conditions, management objectives, proposed intervention and resource improvement actions for the landscape.
7. Formulate, design, and propose resource operations or improvements that contribute, over time, to the achievement or maintenance of desired resource or ecological conditions in landscapes. Consult when applicable:
   a. Survey and inventory protocols for TE&S species.
   b. Recovery plans and conservation strategies for TE&S species.
   c. Formal Consultation Reports.
   d. Guidelines for resource operations and improvements.
   e. Intergovernmental agreements and memoranda of understanding.
   f. Forest Service Manuals and Handbooks.
   g. Management review and resource monitoring evaluation reports.
   h. Technical reports and bulletins, research papers, handbooks, monographs, and other documents in the literature.
   i. Tribal, state, and local government input.
   j. Public input.
8. Consult with appropriate Indian tribes and individuals regarding the formulation and design of on-the-ground resource operations, research activities, or improvements in areas with known or suspected socio-cultural or religious significance.

9. Prepare a biological assessment and evaluation (BA&E) to document the effect of the selected action on the habitat and on each individual in the population of threatened or endangered species.

10. For selected actions that require preparation of an environmental analysis or environmental impact statement, prepare a biological assessment and evaluation (BA&E) to document the effect of the selected action on the viability of the population of the sensitive species in the EMA.

Guidelines

These additional guidelines apply only to resource operations and improvements in GAs 2, 10, and 13. Consistent with the published "Draft Environmental Impact Statement for the Proposed Kaibab National Forest Plan, Amended" and "Proposed Kaibab National Forest Plan, Amended", under which these guidelines were analyzed, the following direction from the proposed Plan applies:

> "These provide guidance for the conduct of various resource operations or improvements. Deviation from compliance with a guideline does not require amendment of the forest plan, but a departure from a guideline must be discussed in the appropriate decision document."

This direction applies to the following guidelines. It does **not** apply to guidelines for Mexican spotted owls, northern goshawks, old growth or grazing which were developed in the regional amendment and listed previously in this document.

Planning Guidelines:

Planning guidelines provide guidance for planning resource operations or improvements in EMAs or landscapes.

1. Identify, describe, and geographically locate existing conditions in the implementation land area, regarding:
   a. National Forest lands.
   b. Research natural areas.
   c. Wilderness and other administrative designations.
   d. Ecosystem Management Areas.
   e. Landscapes.
   f. Ad hoc areas.
   g. Administrative, fire, and other facilities.
   h. Water locations and water rights.
   i. Roads, trails, airports, and heliports.
   j. Fuel loadings.
   k. Ecological land units (aka TES units or SM units).
   l. Range allotments and pastures.
   m. Range utilization, condition and trend.
   n. Range improvements.
   o. Heritage resource properties.
   p. Utility corridors and other special land uses.
   q. NZ: Visual quality objectives; SZ: Scenic Integrity Objectives.
   r. Existing vegetation.
   s. Meadows and grasslands.
   t. Management territories for threatened, endangered, or sensitive species.
   u. Management territories for other plant or animal species.
   v. Wetlands.
   w. Recreation opportunity spectrum.
   x. Recreation sites, including RARE II areas.
   y. Mineral sites.
   z. Off-road vehicular closure areas.

2. Identify and portray desired forest site conditions for the landscape or ad hoc area at the twenty-year and forty-year timemarks.

3. Identify, interpret, and expose public issues, management concerns, and resource opportunities relevant to the landscape.

4. Describe and geographically locate, using geographic information systems technology,

the selected set of proposed intervention or resource improvement actions designed to accelerate progress toward desired conditions or maintain desired conditions. Also:

a. Geographically identify and locate, the analysis area (aka affected area) relevant to each proposed intervention or resource improvement action.

b. For each analysis area, predict the expected effects and resultant forest-site conditions for the five-year, twenty-year, and forty-year timemarks.

c. For each analysis area, predict the expected effects and resultant forage conditions for the one-year, five-year, and ten-year timemarks.

d. Identify and geographically locate possible conflicts between proposed land use, occupancy, or resource intervention or improvements actions and tribal, state, or local governmental agency interests, missions, or ordinances. Disclose these conflicts and the effects of not being in compliance with the local requirement in the environmental impact statement or environmental assessment. Decision to override a local requirement must be explained in the appropriate decision document.

e. Identify and establish monitoring activities for each proposed intervention or resource improvement action.

5. Formulate alternatives to proposed intervention or resource improvement actions not categorically excluded from documentation in an environmental document.

6. Document findings of environmental analysis, disclose the expected environmental effects of proposed actions, and publish implementation decisions as prescribed by NEPA and its implementing regulations or regulations of the Secretary of Agriculture.

Implementation Guidelines

The following guidelines are to be considered in the conduct of various resource operations and improvements.

Guidelines for Heritage Resource Operations:

1. Revise heritage overviews to meet specific management needs.

2. In consultation with the SHPO and the Advisory Council on Historic Preservation, manage heritage resource sites during the conduct of undertakings to achieve a "No Effect" finding, when possible. When sites will be affected, consult on appropriate treatment measures.

3. Provide necessary site protection in advance of undertakings. Utilize rejection, denial, redesign or relocation of proposed resource operations to provide in-place preservation of heritage resources in the following circumstances:

   a. Present methods of investigation and data recovery cannot realize the current research potential of the sites.

   b. Sites are likely to have greater importance for addressing future research questions than current ones.

   c. Heritage values derive primarily from qualities other than research potential, and those values are fully realized only when the heritage remains exist undisturbed in their original context (e.g., association with significant historical persons or events, special ethnic or religious values, or unique interpretive values).

   d. Heritage resources are important primarily for the quality of their architecture and the integrity of their setting.

e. In place preservation is necessary to accomplish the objectives of the State Historic Preservation Plan.In-place preservation is necessary to accomplish the objectives of the State Historic Preservation Plan.

f. Site densities make data recovery economically infeasible, or require unattainable operating conditions.

4. Include site protection and liability clauses in Forest contracts, permits and leases that are likely to affect heritage resources.
5. Consult with concerned Indian tribes and individuals for advice and input regarding heritage resource site data recovery programs.
6. Base the frequency and priority for site inspection and monitoring on its relative susceptibility to rapid deterioration or human disturbance. Monitor sites listed and nominated to the National Register biannually. Inspect eligible sites periodically.
7. Use signing, fencing, administrative closure, increased patrolling, investigations, interpretive programs, stabilization and data recovery, as appropriate, to protect heritage resources.

Guidelines for Recreation Resource Operations and Improvements:

1. NZ: Refer to Recreation Opportunity Spectrum Map for recreation management objectives.
2. Consult with Indian tribes regarding development of interpretive opportunities of prehistoric occupations.
3. Monitor off-road vehicle (ORV) use; prevent resource damage and user conflicts.
4. Prepare district recreation operation and maintenance plans annually.
5. Revise recreation opportunity guides as necessary.
6. Operate and maintain heavily used dispersed areas and facilities to standard service management.
7. Formulate and implement control measures where and when the following damage occurs:
   a. Soil compaction.
   b. Loss of vegetative cover.
   c. Tree damage and mortality.
   d. Deterioration of water quality.
8. Prohibit competitive ORV events.
9. Maintain trails to maintenance level 3 or better.

Guidelines for Visual Resource Operations:

1. NZ: Refer to Visual Quality Objective (VQO) Map for visual management objectives and the location of visual features.
2. NZ: Manage visual features to meet their assigned visual quality objective.
3. NZ: Enhance visual resource diversity in areas with retention VQO.

Guidelines for Rangeland Resource Operations and Improvements:

1. Favor native species in all revegetation activities.
2. Restrict livestock access to 30 percent of the shoreline of the stock tanks that have stable water levels with the capacity to grow emergent aquatic vegetation.
3. In pronghorn antelope range, remove net wire fences; in the interim, modify every one-half mile of such fence to facilitate movement.

Guidelines for Wildlife and Fish Resource Operations and Improvements:

1. In other coniferous forest timberland:
   a. Encourage and promote oak and aspen.
   b. Encourage diversity of plant species in the overstory, understory, and ground cover.
   c. Turkey summer and winter home ranges.
      (1) Provide not less than four roost-tree groups per 640 acres in winter range.
      (2) Provide not less than two roost-tree groups per 640 acres in summer range.
      (3) Minimize human disturbance in turkey nesting areas from April 15 to July 1.
   d. Provide one permanent water source per 640 acres.
2. In seral grassland.
   a. Maintain existing openings and create additional openings with high forb composition (25 percent).
   b. Provide one permanent water source per 640 acres.
3. Establish an osprey nesting territory around existing nesting trees. Provide the following desired forest conditions in osprey nesting territories.
   a. Provide, for every ten surface acres of water, not less than five acres of mature and overmature trees with not less than four snags, with heights, equal to, or greater than, the surrounding trees, and not less than 18 inches in dbh, per acre, for potential osprey nesting sites.
   b. Minimize adverse activities within active nesting territories between April 1 and August 15.
   c. Provide uneven-aged or irregular-aged stand conditions within a 10-chain zone around aquatic areas with five or more surface-acres of water.

Guidelines for Air and Watershed Resource Operations and Improvements:

1. Define, geographically identify and locate best management practices for the landscape during landscape planning and analysis. Apply best management practices to mitigate adverse effects of activities and maintain site soil productivity.

These practices include:

   a. Installation of water control structures or seeding lands in poor and very poor condition where the revegetation potential is moderately high to high and the slope is less than 40 percent.
   b. Designate stream courses during landscape planning and analysis process.
   c. Rehabilitate areas impacted by wildfire.
2. Exclude domestic livestock from treated areas for not less than two growing seasons.
3. Maintain not less than three age classes of woody riparian species with ten percent of the woody plant cover in sprouts, suckers, seedlings, and saplings.
4. Maintain not less than 90 percent of the potential stream shading from May to September along all perennial cold or cool water streams. Provide shade with tree and other vegetational cover.
5. Maintain not less than 90 percent of the potential shrub cover in riparian areas.
6. Maintain not less than 90 percent of total linear streambank in stable condition.
7. Woody riparian communities in addition to riparian communities which are dominated by shrub and herbaceous species are rated in satisfactory or better condition.
8. Select riparian areas for treatment based on relative scorecard condition rating with the lowest rating assigned to first treatment.

Guidelines for Timber Resource Operations and Improvements:

1. Inventory all forested lands on a 20-year cycle.
2. Apply group selection silviculture system and progress toward uneven-age site conditions.
3. Tree-group size should range from one to four contiguous acres in area, excepting areas with retention VQO (NZ), where tree-group regeneration areas should not exceed one-half acre in area.
4. Select tree-groups for entry (cutting) that contribute, both short-term and long-term, to progress toward desired distribution of tree-group conditions in the landscape.
5. Select tree-groups for regeneration cutting to achieve and maintain, over time, a diverse geographic distribution of tree-groups recognizing forest type, tree-size, and tree-group density.
6. Reserve three to five, adjacent, mistletoe-free trees (i.e. reserve-trees), 18 inches or larger at dbh, per acre in ponderosa pine tree-group regeneration areas.
7. Reserve six, adjacent, mistletoe-free trees (i.e. reserve-trees), 18 inches or larger at dbh, per acre in mixed conifer tree-group regeneration areas.
8. Reserve two groups of six adjacent, mistletoe-free trees (i.e. reserve-trees), 18 inches or larger at dbh, per acre in spruce-fir tree-group regeneration areas.
9. In northern goshawk existing nest areas, the nesting area may be thinned from below removing suppressed and intermediate trees, using prescribed fire or hand operated tools.
10. In northern goshawk replacement nest areas, tree-groups may be thinned from below; removing, in order: (1) mistletoe infected, (2) suppressed, (3) intermediate, and (4) codominant individuals. Promote varied, irregular spacing between trees.
11. In forested areas, tree-groups may be thinned from below to achieve the desired tree-group conditions; removing, in order: (1) mistletoe infected, (2) suppressed, (3) intermediate, (4) codominant, and (5) dominant trees. Promote varied, irregular spacing between trees within tree-groups; promote interlocking tree crowns.
12. Salvage stands, or parts thereof, that are moderately or severely damaged by dwarf mistletoe, insects, fire, or windthrow using the uniform shelterwood or clearcutting with planting methods; restrict ORV use during stand re-establishment.
13. Logging residues from commercial sale areas may be made available for personal-use fuelwood.

Guidelines for Geologic and Mineral Resource Operations:

1. NZ: Discontinue common variety mineral material disposals from existing sources, rehabilitate existing material pits and prevent development of potential sites in:
   a. Areas with semi-primitive or semi-primitive motorized recreation opportunity spectrum classifications.
2. Evaluate transportation proposals for mineral development based on:
   a. Integration with other resource management uses.
   b. NZ: Impacts on visual quality objectives.
   c. Impacts on areas of concentrated recreation use.
   d. NZ: Avoidance or mitigation of impacts on areas with recreation opportunity spectrum classifications of semi-primitive and semi-primitive motorized.

3. Impose the following operating constraints on leasable mineral prospecting and exploration activities to maintain visual and special resource objectives:
   a. Restrict surface use and occupancy yearlong within foreground of heritage resource sites with National Register status.
4. Incorporate the following limited surface use stipulations in oil and gas leases:
   a. Prohibit surface occupancy yearlong in recreation, administrative and special use sites.
   b. Restrict use and occupancy yearlong on slopes of 15 percent or greater to prevent loss of soil productivity and vegetative cover.
   c. Prohibit surface occupancy yearlong within foreground of all sites listed on the National Register to protect historic values
   d. Require replanting of areas impacted by operations in tree plantations at the cessation of project.
5. Prohibit the construction of oil and gas well surface facilities in the following areas:
   a. Within foreground of heritage resource sites with National Register status.
6. Evaluate the need for the creation or development of areas with substitute or surrogate habitats, facilities and structures to replace areas of substantial loss or destruction from mineral activities.
7. Impose the following operating constraints on locatable mineral prospecting and exploration activities to maintain wildlife habitat components and visual and special resource objectives:
   a. Restrict surface use and occupancy yearlong in foreground of heritage resource sites with National Register status.
8. Incorporate the following limited surface use stipulations in locatable mineral plans of operations for exploration:
   a. Prohibit surface occupancy yearlong in recreation, administrative and special use sites.
   b. Restrict use and occupancy yearlong on slopes of 15 percent or greater to prevent loss of soil productivity and vegetative cover.
   c. Prohibit surface occupancy yearlong in foreground of all sites listed on the National Register to protect historic values
   d. Require replanting of areas impacted by operations in tree plantations at the cessation of project.
9. Prohibit the construction of mine surface facilities in the following areas:
   a. In foreground of heritage resource sites with National Register status.
10. Evaluate the need for the creation or development of areas with substitute or surrogate habitats, facilities and structures to replace areas of substantial loss or destruction from mineral activities.

Guidelines for Realty Operations and Improvements:

1. Allow expansion of existing major utility corridors and clearing of new corridors (refer to Corridor Map for location of major utility corridors). Attempt to avoid the following areas:
   a. NZ: Areas with pristine, primitive or semi-primitive recreation opportunity spectrum classifications.
   b. Areas with high heritage resource values.

c. Important wildlife habitat areas

d. NZ: Visually sensitive areas.

e. ORV closure areas.

f. Lands classified as suitable timberland.

2. Provide for joint use in corridors and combine uses to the extent possible in light of technical and environmental constraints.

3. Electronic site permittees shall comply with technical standards and development provisions of site management plans. Site authorizations are restricted to those types of electronic installations specified in site management plans. The following guidelines apply to all classified electronic sites:

   a. Maximize the number of compatible electronic uses on a minimum site area. If a proposed use can be accommodated on a site, but is incompatible with installations in existing buildings, additional buildings may be authorized. Additional buildings are subject to the same joint-use stipulations that apply to existing structures. The Forest Service reserves the right to issue a prospectus for the construction of any building on-site.

   b. Each non-exclusive permit reserves the right of the Forest Service to authorize other uses on the site, building, or antenna structures of the holder provided that such use does not interfere with holder's operations. Permittee improvements so used are entitled to reasonable compensation.

   c. The Forest Service determines the combination of joint occupants, location of permittee improvements on site and the compatibility of users. Each proposed use is evaluated based on consideration of its impact on existing uses, potential future uses and demonstrated need.

   d. Access development, improvement and maintenance shall be borne by a permittee or permittee association and must be authorized by a separate permit.

   e. A Federal Communications Commission (FCC) license is required for all non-federal government permittees. Authority for enforcing the terms of an FCC license is vested in the FCC. Applicants are responsible for resolving interference problems with existing users. Within the terms of special-use permits and applicable regulations, the Forest Service reserves the right to determine which special-use permits or proposals must be terminated or denied when interference problems cannot be resolved.

   f. NZ: Buildings and antennas are subject to painting, design and location requirements imposed by the Forest Service to meet visual quality objectives.

   g. Permittees are required to organize and be members of a site users association.

5. For Bill Williams Mountain electronic site, existing facilities may be replaced or remodeled with approval by the Forest Service. No new sites are available.

6. Conduct annual field inspections of all special use permits and right-of-way grants. Review permit files annually for payment of fees, termination dates and adequacy of permit clauses. Adjust fees based on fair market value at five year intervals or when permits or grants are reissued. Update land use reporting system during annual file reviews.

7. Attempt to acquire the Bull Basin private land tract adjacent to Kendrick Mountain Wilderness, the Sunflower Flat, and the Tule private land tracts by purchase or exchange to reduce potential for encroachment of nonconforming

uses. Acquire key wildlife areas such as riparian areas through acquisition authorities.

8. Refer to Land Adjustment Map for location of lands identified for disposal and acquisition.

9. Evaluate land exchange proposals in the Tusayan area with these additional criteria:

   a. Consideration of State and Grand Canyon National Park management objectives for the Grand Canyon.

   b. Contribution to coordinated community development.

   c. Social and economic impacts on other communities dependent on Grand Canyon tourism.

   d. Support of the Coconino County Planning and Zoning Commission with necessary zoning changes.

   e. Forest Service and Coconino County review of detailed development plans submitted by the proponent as part of the land exchange proposal.

10. On lands designated as base-in-exchange:

    a. Limit capital investments in range structural or non-structural improvements, recreation improvements, administrative improvements, or timber stand improvements, etc, to those that can be amortized during the anticipated period of continued government ownership.

    b. Design heritage practices, such as timber sales, to protect or enhance real estate values by modifying marking prescriptions to retain a component of mature trees, ensuring timely disposal of activity slash and in designing location of permanent roads.

    c. Avoid, where possible, the authorization of encumbering special uses that detrimentally effect real estate values and, where possible, locate those that must be accommodated in a manner to minimize impacts to the value of real estate.

[Continued on next page.]

Guidelines for Facility Operations and Improvements:

1. Transportation Facilities includes roads, motorized trails, and user created wheel-tracks. Guidance for other trails is in the Recreation Resource Operations.
2. Close local roads and skid trails to vehicular travel with signing and physical obstructions such as gates or barriers.
3. Obliterate all temporary roads and skid trails; restrict ORV use until revegetated.
4. Maintain commensurate share roads for intended commercial use.
5. Maintain signs with routine maintenance and replacement schedule based on inventory and field inspection.
6. Replace surfacing at the rate of five percent per year.
7. Reestablish drainage and subgrade stabilization at the rate of two percent per year.

Guidelines for Activity and Natural Fuel Operations and Improvements:

1. In northern goshawk suitable nesting areas, preferred method for treating woody debris is fire use, next lopping and scattering, and lastly, hand piling.
2. In northern goshawk replacement nesting areas, preferred method for treating woody debris is fire use, next, lopping and scattering, and last, hand piling. Avoid slash piling with crawler tractor.
3. In northern goshawk PFAs, preferred method for treating woody debris is, in order, fire use, lopping and scattering, hand piling, machine grapple piling, and lastly, crawler tractor piling.
4. In other forested areas, preferred method for treating woody debris is, in order, fire use, lopping and scattering, hand piling, machine grapple piling, and lastly, crawler tractor piling.
5. Priority for fuel treatment investment is given to:
   a. Wildland-urban interface.
   b. Areas which exceed the burning conditions which yield the historical, 50 percentile rate of fire spread in fuel model K (National Fire Danger Rating System).
   c. Maintenance of existing fuelbreaks and fuel reduction corridors.

Guidelines for Fire Protection Operations and Improvements:

1. Do not allow wildland fires to spread to lands of other ownership.
2. Protect human life and improvements.
3. Provide fire protection to restrict wildland fire size to 20 acres.
4. Minimize acreage burned by high intensity fires(200+ BTU/FT/SEC).
5. Long term average annual burned area should not exceed 70 acres.
6. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared a wildland fire use action.
7. Wildland fires which exceed, or are expected to exceed, the size objective for the GA or LUZ are considered escaped and appropriate management response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA will consider at least the following:
   a. The resource management emphasis of threatened GAs or LUZs.

b. Suppression costs commensurate with resources protected.
c. Effects on air quality, aesthetics, soil, and watershed.
d. Social acceptance of acreage burned.
e. Current availability of suppression resources.
f. Size objectives are based on continuous area of high intensity burn.
g. Impacts on heritage resources.

Descriptions and Specific Management Direction

Geographic Area **1** – Western Williams Woodland**: 169,041 Acres**

This area is situated in the western portion of the Williams Ranger District. An elevated plain interspersed with isolated cinder cones and steep scarp slopes, it contains portions of the Partridge Creek, Upper Verde, and Sycamore Canyon watersheds and yields water into the Verde River. Elevations range from 5,500 feet to 6,800 feet. Drainage systems are ill-defined and flows are ephemeral. Average annual precipitation is 16 inches.

Woodland vegetation is present over most of this area. This biotic community is dominated by pinyon pine, Utah juniper, one-seed juniper, and on the more moist sites, alligator juniper. There is also some ponderosa pine, which typically includes varying concentrations of woodland species. The understory grasses are dominated by blue gramma.

The area provides quality winter and summer habitat for elk and deer. Open areas are used by small herds of pronghorn antelope. The pine stringer habitats are important winter roosting areas for turkey and travel corridors for big game. Management indicator species where present are mule deer, elk, turkey, pronghorn antelope, plain titmouse, and hairy woodpecker. Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

This area is the principal Arizona source of sandstone products. Sandstone quarries are scattered throughout the area. The unit has low potential for locatable and leasable minerals. Several major utility corridors are located in this area.

This GA contains sensitive travelways, including Interstate 40 and State Highway 89. There are also important scenic features such as background views of Bill Williams Mountain, as well as foreground and middleground views of rugged canyons and mountains. Recreation resources include historic wagon routes and mountain bike trails. SIOs include areas of High (Level 2), Moderate (Level 3) and Low (Level 4).

The area is known to have high densities of heritage resource sites, however little is known of their significance. Stretches of the Beale Wagon Road Historic Trail and Historic Route 66, a National Register site, cross portions of this management area.

There are five ROS classes represented in this GA, including areas of Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Roaded Modified, and Rural.

Permitted use presently exceeds capacity on some allotments. About 17,000 acres of this area have been converted to seral grassland through past treatments. There are also large areas of mature, dense pinyon-juniper with very little forage production. The Double A Wild Burro Territory consists of 27,189 acres.

The fuel profile in this area is not conducive to large, high intensity fires. The potential for resource damage is very low and most fires are beneficial and not damaging.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual and heritage resources. Make periodic inventories and surveys of recreation, visual, and cultural opportunities and resources. Provide integration and coordination for recreation, visual, and heritage resources in land and resource management planning. Provide modest level of administration, operation, and maintenance of recreation sites and facilities. Provide off-road vehicle area closures to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Capital investment will be assessed, and planning will proceed as needed to increase recreational opportunities. Maintain areas with Semi-Primitive recreational opportunities. Establish SIO to protect scenic resources. Maintain and enhance the scenic integrity of this area.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure moderate level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat investments to improve habitat components and diversity through vegetative manipulations. Improved habitat diversity and capability accrue through the coordinated interaction of other planned resource practices with planned habitat vegetative manipulations. Develop resource habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Provide for extensive management of livestock use of the range resource. Make periodic inventory of range resource components on all National Forest System lands. Provide range resource integration and coordination in land and resource management planning. Structural improvements and physical movement are utilized in concert to control livestock use of range resources; provide for the periodic maintenance and replacement of structural improvements. Improved forage generally accrues through other resource investments, such as timber stand thinnings, habitat improvement, soil improvements, or catastrophic agents. Long-term grazing use and capacity is kept in balance through the removal or addition of permitted livestock use. Maintain range resource inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources. Make soil and watershed resource inventories and analyses to ensure the conservation of soil and water resources and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning. Changes in site productivity generally result from the interaction of other resource practices or catastrophic agents with the hydrologic condition present in the watershed. Formulate and execute land treatment measures to (1) close, revegetate, and thereby obliterate, system roads not needed for resource actions and (2) establish ground-cover improvements in degraded, unsatisfactory watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements. Maintain soil and water inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the timber resource without personal or commercial timber uses. Make timber stand inventories, surveys, and analyses on all National Forest System lands. Provide timber resource integration and coordination in land and resource management planning. The sale of timber is made only in support of other resource practices. Maintain timber stand inventory and information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of mineral resources to protect surface resource and other environmental values. Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, and heritage resources nominated or posted to the National Register. Impose operating

and occupancy restrictions on exploration, development, and operation activities associated with locatable and leasable mineral entry to protect important wildlife habitat. Evaluate the need for creation or development of areas with substitute or surrogate habitats, facilities, structures etc., to replace areas of substantial loss or destruction from mineral activities. Permit removal of building stone under contract in existing sources not encumbered by mining claims. Allow development of new mineral material sources in accordance with the management direction for recreation, wildlife, and soil and water resources.

Management Direction for Transportation Facilities: Provide for extensive management of the Forest Transportation System. Make inventories, surveys and analyses, formulate plans, and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access to National Forest System lands. Maintain local terminal roads that support intermittent and short-term resource actions in a ?closed-to-traffic? mode except during said periods of intermittent use. Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access to National Forest System lands in an ?open-for-traffic? mode. Provide integration and coordination for transportation and facility management in National Forest land and resource management planning and with other Federal, State, County, and other local transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the Management Direction for Soil and Water Resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildland fire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 3400 acres. Fires from natural ignitions may exceed these size limits when burning within an approved ara and declared a wildland fire use action. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value GAs.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to protect National Forest landownership by detecting and resolving unauthorized land occupancy and trespass. Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest landownership.

Geographic Area **3** – Northern Williams Woodland**: 65,533 Acres**

This management area consists of the lower elevation woodland at the north end of the Chalender Ranger District. Located within the Cataract-Spring Valley and Cedar-Deadman watersheds, it is an elevated plain with interspersed isolated cinder cones. Drainage systems are ill-defined with ephemeral flows. Elevations range from 6,500 feet to 7,700 feet.

The soils in this management area are moderately deep with moderate to high suitability for management actions, but about one third is shallow soils or steep, inaccessible slopes. Precipitation is about 15 inches annually.

Most of this area is pinyon-juniper woodland where one-seed juniper and pinyon pine are the dominant tree species and coniferous woodland composed of ponderosa pine, pinyon pine, alligator juniper, and one-seed juniper. The understory grass component is dominated by blue gramma with lesser amounts of mutton bluegrass, Indian ricegrass, spike muhly, junegrass, Needle and Thread, winterfat, and four-wing saltbush. The sensitive plant species *Potentilla multifoliolata* and *Chrysothamnus molestus* are known to occur in this management area with other sensitive species occurrence possible.

This management area is valuable winter habitat for mule deer, elk, pronghorn antelope, and turkey. Ponderosa pine inclusions support Abert squirrel and pygmy nuthatch yearlong with northern goshawk using the pine stringers mainly during the breeding season. There are few reliable sources of water, but ephemeral lakes provide limited breeding habitat for waterfowl and shorebirds. Where present, the management indicator species are mule deer, elk, turkey, plain titmouse, pronghorn antelope, and cinnamon teal. Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The unit has low potential for locatable and leasable minerals, but there is some use of cinder materials.

This area contains some sensitive travelways, including US Hwy 180 and State Highway 64, and the Great Western Trail. Important scenic features include background views of the San Francisco Peaks, Red Butte, Red Mountain, Kendrick Mountain, and numerous cinder cones. There are foreground and middleground views of Ebert Mountain and other scenic canyons and mountains. The SIOs in this area include areas of High (Level 2) and Moderate (Level 3).

This area has high densities of heritage resource sites, however large portions of the management area have not been surveyed. Portions of the Beale Wagon Road Historic Trail cross the unit.

This area is grazed by cattle and sheep, with most of the area in satisfactory range condition. Permitted use presently exceeds capacity on some allotments. Some areas of pinyon-juniper vegetation have been treated in the past to increase forage and browse production.

The Great Western Trail traverses this area. This GA includes areas of ROS classes Roaded Natural, Semi Primitive Motorized, Semi-Primitive Non-Motorized, Roaded Modified, and a very small area of Rural.

The fuel profile is not conducive to large, high intensity fires, with a very low potential for damaging fires.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual, and heritage resources. Make periodic inventories and surveys of recreation, visual, and heritage resources. Provide integration of recreation, visuals, and heritage resources in project design and management planning. Provide a moderate level of operation and maintenance of recreation sites and facilities. Determine the level of capital investment that will

be needed to maintain and enhance existing opportunities and increase specific recreational opportunities as needs are identified. Maintain areas with Semi-Primitive Non-Motorized and Motorized recreational opportunities. Follow SIOs to maintain or enhance scenic quality. Provide off-road vehicle area closures and manage ORV use that occurs on other areas to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure high level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat investments to improve habitat components and diversity through vegetative manipulations and the coordinated interaction of other planned resource practices. Develop resource habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Provide for extensive management of livestock use of the range resource. Make periodic inventory of range resource components on all National Forest System lands. Provide range resource integration and coordination in land and resource management planning. Structural improvements and physical movement are utilized in concert to control livestock use of range resources; provide for the periodic maintenance and replacement of structural improvements. Improved forage generally accrues through other resource investments, such as timber stand thinnings, habitat improvement, soil improvements, or catastrophic agents. Long-term grazing use and capacity is kept in balance through the removal or addition of permitted livestock use. Maintain range resource inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the timber resource with the objective of protecting and enhancing wildlife habitat and watershed values. Make timber stand inventories, surveys, and analyses as needed to support these activities. Provide timber resource integration and coordination in management planning and project design for other resource uses. The sale of timber is made only in support of other resource practices and values. Maintain timber stand inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources to ensure their conservation and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning decisions. Formulate and execute land treatment measures to (1) close, revegetate, and hence obliterate, system roads not needed for resource actions, (2) establish ground cover improvements in degraded watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements and the periodic maintenance and replacement of structural improvements. Make soil and water resource analyses and maintain inventory information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of mineral resources to protect surface resource and other environmental values. Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, and heritage resources nominated or posted to the National Register. Impose operating and occupancy restrictions on exploration,

development, and operation activities associated with locatable and leasable mineral entry to protect important wildlife habitat. Evaluate the need for creation or development of areas with substitute or surrogate habitats, facilities, and structures to replace areas of substantial loss or destruction from mineral activities.

Management Direction for Transportation Facilities: Provide for extensive management of the Forest Transportation System. Make inventories; surveys; analyses; formulate plans; and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access. Maintain local terminal roads that support intermittent and short-term resource actions in a closed-to-traffic mode except during said periods of intermittent use. Provide for seasonal closures of transportation facilities as needed to protect resource values. Reconstruct, maintain and manage use of arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access. Provide integration and coordination for transportation in land and resource management planning and with other Federal, State, County, and other local transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the Management Direction for Soil and Water Resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildfire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 1300 acres. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared a wildland fire use action. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value management areas.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to protect National Forest landownership by detecting and resolving unauthorized land occupancy and trespass. Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest landownership.

Geographic Area **8** – Southern Tusayan Woodland**: 195,118 Acres**

This area is situated across the southern portion of the Tusayan unit. It is an elevated plain dissected with numerous drainage systems and isolated scarp slopes. Elevations range from 6,200 feet to 6,700 feet. Drainage systems are well defined and flows are ephemeral. The average annual precipitation is 16 inches.

The majority of the area is woodland vegetation dominated by pinyon pine, Utah juniper and big sagebrush. Grass species include mutton bluegrass, squirreltail, junegrass, Indian ricegrass, and blue gramma. Winterfat, fourwing saltbush, and needle and thread are found with blue gramma and Indian ricegrass on calcareous soils. The category two sensitive plant species *Chrysothamnus molestus* is known to occur in this management area with other sensitive species occurrence possible.

A small proportion of this area is coniferous woodland, characterized by ponderosa pine with pinyon pine and Utah juniper. Big sagebrush and Gambel oak may also be present, but these species are localized. Herbaceous forage species are blue gramma, mutton bluegrass, squirreltail, and junegrass.

This area is winter habitat for mule deer and is used to some extent by wintering elk. Important pine stringer habitat is in this area, which contributes significant diversity to this area. Winter turkey roost tree-groups are a very important feature. The eastern portion of the area provides most of the winter habitat for pronghorn antelope using the area. The management indicator species where present are mule deer, elk, pronghorn antelope, turkey, hairy woodpecker, and plain titmouse. Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The management area has moderate to high potential for uranium. Prospecting and exploration activities have occurred on numerous uranium prospects throughout the unit. In the past, small amounts of oxidized copper ore have been produced from several prospects within the unit. Copper and other base and precious metals have sometimes been found in association with breccia pipe deposits of uranium. The area has low to moderate potential for oil and gas. Oil and gas leases have been issued for portions of the unit.

The area contains sensitive travelways such as Highway 64, and the Arizona Trail, important scenic features such as Red Butte, and recreation resources such as the historic Anita Station and Moqui Stage Station. SIO include High (Level 2), Moderate (Level 3), and Low (Level 4). A major utility corridor crosses the southern portion of this unit. The unit is suited for expansion of the existing corridor. Avoid location or expansion of additional utility corridors in areas with High (Level 2), or Moderate (Level 3) SIO.

Heritage resource site densities are generally high; however large portions of the unit have not been inventoried. Relatively little is known about the distribution and significance of heritage resource sites in the area, however, it is known historically as a winter use area for the Havasupai people.

The Moqui Stage segment of the Arizona Trail traverses this area. The area encompassing Red Butte is closed to all vehicles. This GA includes areas of Rural, Roaded Natural, Roaded Modified, Semi-Primitive Motorized, and Semi-Primitive Non-Motorized ROS classes.

Open grasslands are scattered throughout the area and are important forage areas for livestock. Grazed by cattle and horses, about sixty percent of the area is in satisfactory condition. Permitted grazing use is not presently in balance with grazing capacity. Proper distribution of livestock is difficult to obtain due to the lack of water.

The fuel profile is not conducive to large, high

intensity fires. The potential for resource damage is very low and most fires are more beneficial than damaging.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual and heritage resources. Make periodic inventories and surveys of recreation, visual, and cultural opportunities and resources. Provide integration and coordination for recreation, visual, and heritage resources in land and resource management planning. Determine the level of capital investment that will be needed to maintain and enhance existing opportunities, and increase specific recreational opportunities as needs are identified. Maintain areas with Semi-Primitive recreational opportunities. Maintain and enhance the scenic quality of the area. Provide off-road vehicle area closures to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure high level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat investments to improve habitat components and diversity through vegetative manipulations and the coordinated interaction of other planned resource practices. Plan and execute cooperative habitat projects with conservation groups and volunteers. Develop resource habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Range resource management is extensive and accomplished principally through the physical movement of livestock. Structural improvements, rest rotation and deferral are used to control forage use by livestock. Make periodic inventory of range condition. Provide range resource integration and coordination in land and resource management planning. Grazing use and capacity are kept in balance through the addition or removal of livestock. Investments for new structural developments, such as fences and waters, and forage improvements are limited. Forage improvement is principally through other resource investments, such as wildlife habitat improvement projects, watershed treatments and prescribed fire. Provide for the periodic maintenance and replacement of structural improvements. Maintain range resource inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources. Make soil and watershed resource inventories and analyses to ensure the conservation of soil and water resources and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning. Changes in site productivity generally result from the interaction of other resource practices or catastrophic agents with the hydrologic condition present in the watershed. Formulate and execute land treatment measures to (1) close, revegetate, and thereby obliterate, system roads not needed for resource actions and (2) establish ground-cover improvements in degraded, unsatisfactory watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements. Maintain soil and water inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the forest acres with the objective of protecting and enhancing wildlife habitat and watershed values. Make timber stand inventories, surveys, and

analyses on all National Forest lands. Provide tree resource and silvicultural support for land management planning, and project and activity design. The sale of timber products is done only in support of other resource practices. Maintain timber stand inventory and information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of mineral resources to protect surface resource and other environmental values. Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, and heritage resources nominated or posted to the National Register. Impose operating and occupancy restrictions on exploration, development, and operation activities associated with locatable and leasable mineral entry to protect important wildlife habitat. Evaluate the need for creation or development of areas with substitute or surrogate habitats, facilities, and structures to replace areas of substantial loss or destruction from mineral activities.

Management Direction for Transportation Facilities: Provide for extensive management of the Forest transportation system. Make inventories; surveys; analyses; formulate plans; and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access. Maintain local terminal roads that support intermittent and short-term resource actions in a closed-to-traffic mode except during said periods of intermittent use. Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access to National Forest System Lands in an open-for-traffic mode. Provide integration and coordination for transportation and facility management in land and resource management planning and with other transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the Management Direction for Soil and Water Resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildland fire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 3900 acres. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared a wildland fire use. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value management areas.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to protect National Forest land ownership by detecting and resolving unauthorized land occupancy and trespass.

Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest land ownership.

[Continued on next page.]

Geographic Area **9** – Upper Basin**:** **43,377 Acres**

This area is in the northeastern part of the Tusayan Ranger District. It is an elevated plain dissected with numerous drainage systems and isolated scarp slopes. Elevations range from 6,200 feet to 6,700 feet in elevation. Drainage systems are well-defined and flows are ephemeral. The average annual precipitation is 16 inches.

The area is principally woodland vegetation, dominated by pinyon pine and Utah juniper interspersed by openings characterized by big sagebrush. Grass species in the area include mutton bluegrass, squirreltail, junegrass, Indian ricegrass, and blue gramma. On degraded sites, blue gramma is the only forage species found. Parts of the area have been reseeded with crested wheatgrass. Winterfat, fourwing saltbush, and needle and thread are dominant or co-dominant with blue gramma and Indian ricegrass on calcareous soils. The category two sensitive plant species *Chrysothamnus molestus* is known to occur in this management area with other sensitive species occurrence possible.

This area is winter habitat for mule deer and is used to some extent by wintering elk. Coconino Rim provides the only extensive black bear habitat in the Tusayan District. The management indicator species where present are mule deer, elk, antelope, turkey, hairy woodpecker, and plain titmouse. Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The area has moderate to high potential for uranium. Prospecting and exploration activities have occurred throughout the area. It has low potential for oil and gas.

This area contains sensitive travel corridors including State Hwy 64, and scenic features such as the Coconino Rim escarpment. Recreation features include the Arizona Trail, Grandview Lookout Tower, cross-country ski trails and historic sites. SIOs in this area include areas of High (Level 2), Moderate (Level 3), and Low (Level 4).

Heritage resource site densities are generally high, however large portions of the unit have not been inventoried. Little is known about the distribution and significance of heritage resource sites in the management area.

Some concentrated use occurs along the Highway 64 corridor. This GA includes areas of Roaded Natural, Semi-Primitive Motorized, and Semi-Primitive Non-Motorized ROS classes.

Open seral grasslands are scattered throughout the area and are important forage areas for livestock and big game. Permitted grazing use is not presently in balance with grazing capacity. Proper distribution of livestock is difficult to obtain due to the lack of water. About one third of the area is in satisfactory range condition.

The fuel profile is not conducive to large, high intensity fires. The potential for resource damage is very low and most fires are more beneficial than damaging.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual, and heritage resources. Make periodic inventories and surveys of recreation, visual, and heritage resources. Provide for nomination of eligible properties to the National Register of Historic Places. Provide integration of recreation, visuals, and heritage resources in project design and management planning. Determine the amount capital investment needed to maintain and enhance dispersed recreational opportunities. Maintain areas with Semi-Primitive recreational opportunities. The Coconino Rim escarpment is closed to motorized vehicles. Provide other off-road vehicle area closures and manage ORV use that occurs on other areas to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure high level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat investments to improve habitat components and diversity through vegetative manipulations and the coordinated interaction of other planned resource practices. Plan and carry out cooperative habitat projects with conservation groups and volunteers. Develop resource habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Provide for extensive management of livestock use of the range resource. Make periodic inventory of range condition and components. Provide range resource integration and coordination in land and resource management planning and project and activity design. Structural improvements and physical movement are utilized in concert to control livestock use of range resources. Provide for the periodic maintenance and replacement of structural improvements. Improved forage accrues through other resource investments, such as habitat improvement, watershed treatment or prescribed fire and limited re-treatment of woodland areas. Long-term grazing use and capacity is kept in balance through the removal or addition of permitted livestock use. Maintain range resource inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the timber resource with the objective of protecting and enhancing wildlife habitat and watershed values. Make timber stand inventories, surveys, and analyses on all National Forest System lands. Provide timber resource integration and coordination in land and resource management planning. The sale of timber is made only in support of other resource practices. Maintain timber stand inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources. Make soil and watershed resource inventories and analyses to ensure the conservation of soil and water resources and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning and project design. Formulate and execute land treatment measures to (1) close, revegetate, and thereby obliterate, system roads not needed for resource actions and (2) establish ground-cover improvements in degraded, unsatisfactory watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements. Maintain soil and water inventory and information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of mineral resources to protect surface resource and other environmental values. Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, and heritage resources nominated or posted to the National Register. Impose operating and occupancy restrictions on exploration, development, and operation activities associated with locatable and leasable mineral entry to protect important wildlife habitat. Evaluate the need for creation or development of areas with substitute habitats, facilities and structures to replace areas of substantial loss or destruction from mineral activities

Management Direction for Transportation Facilities: Provide for extensive management of

the Forest transportation system. Make inventories, surveys, analyses, formulate plans and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management. Provide safe public access to National Forest System lands. Maintain local terminal roads that support intermittent and short-term resource actions in a closed-to-traffic mode except during said periods of intermittent use. Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access. Provide integration and coordination for transportation and facility management in National Forest land and resource management planning and with other Federal, State, County, and other local transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the management direction for Soil and Water Resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildland fire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 900 acres. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared a wildland fire use action. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value management areas.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to protect National Forest landownership by detecting and resolving unauthorized land occupancy and trespass. Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest landownership.

Geographic Area **12** Western North Kaibab Woodland**: 146,480 Acres**

This management area includes portions of the western, northern, and eastern sides of the North Kaibab Ranger District and includes the west half of the woodland zone. This area is in the Kanab Creek, Coyote Wash, and Houserock-Marble watersheds. It is an elevated plain dissected by numerous drainage systems and displaying karst topographical features such as solution basin, sinkholes, etc. Elevations range from 5,200 feet to 6,800 feet. Drainage systems are well-defined and flows are ephemeral. The annual precipitation ranges from 14 to 18 inches.

Most of this area is dominated by woodland vegetative species and characterized by pinyon pine, cliffrose, and Utah juniper, with Gambel oak at higher elevations. The understory is mainly big sagebrush, snakeweed and rabbitbrush. Impacted range sites are dominated by blue gramma, but squirreltail, junegrass, Indian ricegrass, and mutton bluegrass are present on better sites.

The area is critical winter range for approximately 65 percent of the North Kaibab mule deer herd which depends heavily on the cliffrose, big sagebrush and the early spring grasses and forbs. The category two sensitive plant species *Rosa stellata* is known to occur in this area with other sensitive species occurrence possible. In the higher elevations there are ponderosa pine stringers and coniferous woodland pine-juniper fringe which is turkey winter roost habitat. Gambel oak provides important cover and mast for turkey. The management indicator species where present are mule deer, plain titmouse, pronghorn antelope, turkey and pygmy nuthatch.

Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The management area has moderate to high potential for uranium; however the entire area is located within the Grand Canyon National Game Preserve and thus closed to entry under the mining laws. The area has low to moderate potential for oil and gas. Oil and gas leasing, prospecting and exploration activities have been concentrated in the northern portion of the unit.

Several gravel material pits are located within the unit.

Visually sensitive areas occur along Highway 89A, FDR 422, the rim of the Grand Canyon and several forest roads leading to points overlooking Grand Canyon. Management activities in these areas are visually subordinate to the characteristic landscape.

This area has densities of heritage resource sites varying from low to high, however less than 2 percent of the area has been inventoried for these archeologic and historic sites and little is known about the distribution and significance of sites in the area.

Moderate use areas occur along roads that access points overlooking the Grand Canyon. Several of these roads also lead to trail heads which provide access to Kanab Creek Wilderness Area and Grand Canyon National Park. The predominate ROS classification is roaded and natural appearing, although there are several large areas classified as semi-primitive.

The area is grazed by cattle and most of the area is winter range. Permitted grazing use is in balance with estimated grazing capacity, but about one third of the area is still in unsatisfactory condition.

The fuel profile is not conducive to large, high intensity fires. The potential for resource damage is very low and most fires are more beneficial than damaging.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual, and heritage resources. Make periodic inventories and surveys of recreation, visual, and heritage resources. Provide integration of recreation, visuals, and heritage resources in project design and management planning. Ensure a moderate standard of operation and maintenance of recreation sites and facilities. Formulate and execute capital investments to increase recreation opportunities for hiking, riding, fishing, camping, viewing scenery, and interpretation of historic or heritage trails and sites. Work with cooperators, conservation groups, and volunteers to construct and maintain facilities. Maintain areas with non-motorized recreation opportunities. Establish visual quality objectives to protect and enhance visual resources in transportation corridors. Corridors along Highway 89A, and along the Grand Canyon Rim are managed visually with retention or partial retention objectives. Establish off-road vehicle area closures and manage ORV use to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure moderate level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat investments to improve habitat components and diversity through vegetative manipulations. Improved habitat diversity and capability accrue through the coordinated interaction of other planned resource practices with planned habitat vegetative manipulations. Develop habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Provide for extensive management of livestock use of the range resource. Make periodic inventory of range resource components on all National Forest System lands. Provide range resource integration and coordination in land and resource management planning. Structural improvements, rest rotation and deferment are utilized in concert to control livestock use of range forage. Provide for the periodic maintenance and replacement of structural improvements. Improved forage accrues through other resource investments, such as wildlife habitat improvement, watershed improvements, and prescribed fire. Long-term grazing use and capacity is kept in balance through the removal or addition of livestock use. Maintain range resource inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources. Make soil and watershed resource inventories and analyses to ensure the conservation of soil and water resources and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning. Changes in site productivity generally result from the interaction of other resource practices or catastrophic agents with the hydrologic condition present in the watershed. Formulate and execute land treatment measures to (1) close, revegetate, and thereby obliterate, system roads not needed for resource actions and (2) establish ground-cover improvements in degraded, unsatisfactory watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements. Maintain soil and water inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the timber resource with the objective of protecting and enhancing wildlife habitat and watershed values. Make timber stand inventories, surveys, and analyses on all National Forest System lands. Provide timber resource integration and coordination in land and resource management planning. The sale of timber and other forest products is made only in support of other resource practices. Maintain timber stand inventory and information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of leasable mineral resources to protect surface resources and other environmental values. Impose operating and occupancy restrictions on exploration, development, and operation activities associated with leasable mineral entry to protect visually sensitive road corridors and important wildlife habitat. Evaluate the need for creation or development of areas with substitute habitats, facilities, structures etc., to replace areas of substantial loss or destruction from mineral activities. Discontinue removal of common variety minerals and rehabilitate existing sources located within visually sensitive road corridors and other areas with visual quality objective of retention and partial retention. Prevent further development of common variety sites in such areas. Prohibit construction of oil and gas well surface facilities in the visible foreground of Highway 89A.

Management Direction for Transportation Facilities: Provide for extensive management of the Forest Transportation System. Make inventories; surveys; analyses; formulate plans; and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access to National Forest System lands. Maintain local terminal roads that support intermittent and short-term resource actions in a closed-to-traffic mode except during said periods of intermittent use. Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access to National Forest System Lands in an open-for-traffic mode. Provide integration and coordination for transportation and facility management in National Forest land and resource management planning and with Federal, State, County, and local transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the Management Direction for Soil and Water Resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildland fire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 2900 acres. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared wildland fire use action. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value management areas.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to

protect National Forest landownership by detecting and resolving unauthorized land occupancy and trespass. Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest landownership.

Geographic Area **16** – Eastern North kaibab Woodland**: 131,221 Acres**

This management area includes the Buffalo Ranch and the extreme eastern side of the North Kaibab Ranger District. It includes portions of the Coyote Wash and Houserock-Marble watersheds. It is an elevated plain dissected by numerous well-defined drainages. Water flows are ephemeral, except for several springs in the area. Elevations range from 5,200 feet to about 8,200 feet at Tater Point. Precipitation ranges from 14 to 18 inches per year.

The majority of this area is dominated by woodland vegetation consisting largely of pinyon pine and Utah juniper. At higher elevations there are ponderosa pine stringers. The understory typically includes big sagebrush, snakeweed and rubber rabbitbrush. On rocky slopes, cliffrose is also common. Impacted range sites are dominated by blue grama although squirreltail, junegrass, Indian ricegrass and mutton bluegrass are present on the better sites. *Pediocactus paradinei*, is known to occur in this management area with other sensitive species occurrence possible. Recent surveys have not found Rosa stellata on the Forest, but potential habitat is present.

The area provides important winter range for mule deer, and year-long habitat for antelope and for a bison herd of about 100 head. Approximately 70 percent of this management area is in the Grand Canyon National Game Preserve. The management indicator species where present are mule deer, plain titmouse, pronghorn antelope, turkey and pygmy nuthatch.

Riparian indicator species are Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The management area has moderate potential for uranium; however only that portion of the area not in the Grand Canyon National Game Preserve is open to entry under the mining laws. The area has low to moderate potential for oil and gas.

The area contains densities of heritage resource sites varying from low to high; however less than two percent of the area has been inventoried for heritage resource sites. Little is known about their distribution and significance.

Recreation use within the area is low. Moderate use occurs along roads that access points overlooking Marble Canyon. Several of these roads also access trail heads which provide access to Saddle Mountain Wilderness Area. The principal visitation is by big game hunters. All of this area is classified as semi-primitive or semi-primitive motorized.

Shrub-grasslands and pinyon-juniper understory forage provide grazing capacity for cattle and bison. Cattle graze portions of the area seasonally during the summer and winter. Permitted grazing use is within the estimated grazing capacity.

The fuel profile is not conducive to large, high intensity fires. The potential for resource damage is very low and most fires are more beneficial than damaging.

Management Direction for Recreation Resources: Provide extensive management of recreation, visual and heritage resources. Make periodic inventories and surveys. Provide integration and coordination for recreation, visual, and heritage resources in land and resource management planning and project design. Provide modest level of administration, operation, and maintenance of recreation sites and facilities. Investments are needed to increase recreation opportunities for hiking, equestrian use, and interpretation of historic or heritage trails and sites. Maintain areas with non-motorized recreation opportunities. Visual quality objectives are established for retention or partial retention of landscape elements in the foreground along

Highway 89A, the Arizona Trail and FDR 249. Provide for maintenance and protection of visual qualities in other areas through the interaction of planned resource actions with the various elements present in the landscape. Provide off-road vehicle area closures as needed and manage ORV use occurring on other areas to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Management Direction for Wildlife and Fish Resources: Provide for intensive management of wildlife and fish habitats. Make habitat surveys, analyses, and formulate plans in concert with the Arizona Game and Fish Department to ensure moderate level of habitat diversity and capability. Provide wildlife and fish resource integration and coordination in land and resource management planning. Formulate and execute habitat projects to improve habitat components and diversity through vegetative manipulations. Plan and develop projects with the assistance of cooperators, conservation groups and volunteers. Improve habitat diversity and capability through the coordinated interaction of other planned resource practices . Develop resource habitat management plans for all threatened and endangered and sensitive plant and animal species. Maintain habitat inventory and management record system.

Management Direction for Range Resources: Provide for extensive management of livestock use of the range resource. Make periodic inventory of range resource components on all National Forest System lands. Provide range resource integration and coordination in land and resource management planning. Structural improvements and physical movement are utilized in concert to control livestock use of range resources. Provide for the periodic maintenance and replacement of structural improvements. Improved forage generally accrues through other resource investments, such as wildlife habitat improvement, watershed improvements, or prescribed fires. Long-term grazing use and capacity is kept in balance through the removal or addition of permitted livestock use. Maintain range resource inventory and information systems.

Management Direction for Timber Resources: Provide for environmental management of the timber resource with the objective of protecting and enhancing wildlife habitat and watershed values. Make timber stand inventories, surveys, and analyses on all National Forest System lands. Provide timber resource integration and coordination in land and resource management planning. The sale of timber is made only in support of other resource practices. Maintain timber stand inventory and information systems.

Management Direction for Soil and Water Resources: Provide for intensive management of soil and watershed resources. Make soil and watershed resource inventories and analyses to ensure the conservation of soil and water resources and to avoid significant and permanent impairment of site productivity. Provide soil and water resource integration and coordination in land and resource management planning. Formulate and execute land treatment measures to (1) close, revegetate, and thereby obliterate, system roads not needed for resource actions and (2) establish ground-cover improvements in degraded, unsatisfactory watersheds to return them to satisfactory condition. Provide for the long-term maintenance of vegetative ground-cover improvements. Maintain soil and water inventory and information systems.

Management Direction for Mineral Resources: Provide intensive management of prospecting, exploration, and development of mineral resources to protect surface resource and other environmental values. Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, important recreation sites and facilities, and heritage resources eligible for nomination or posted to the National Register. Impose operating

and occupancy restrictions on exploration, development, and operation activities associated with locatable and leasable mineral entry to protect visually sensitive road corridors and important wildlife habitat. Evaluate the need for creation or development of areas with substitute or surrogate habitats, facilities, and structures to replace areas of substantial loss or destruction from mineral activities. Discontinue removal of common variety minerals and rehabilitate existing sources located within road corridors and other areas with visual quality objective of retention and partial retention. Prohibit development of additional common variety sites in these areas. Prohibit construction of mine and oil and gas well facilities in the visible foreground of Highway 89A.

Management Direction for Transportation Facilities: Provide for extensive management of the forest transportation system. Make inventories; surveys; analyses; formulate plans; and execute construction, reconstruction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access. Maintain local terminal roads that support intermittent and short-term resource actions in a closed-to-traffic mode except during said periods of intermittent use. Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing, long-term resource practices and public access. Provide integration and coordination for transportation and facility management in land and resource management planning and with other Federal and State transportation authorities. Identify and obliterate unneeded system roads and facilities in accordance with the management direction for soil and water resources.

Management Direction for Fire Protection: Provide fire protection to restrict wildland fire size to 200 acres. Emphasize suppression responses and tactics which minimize fire fighting costs. Long term average annual burned area should not exceed 2,600 acres. Fires from natural ignitions may exceed these size limits when burning within an approved area and declared a wildland fire use action. Priority for fuel treatment investment is low and should be limited to rural/urban interface and protection of adjacent, higher value management areas.

Realty Management Direction: Provide for efficient management of realty resources that responds to needs for special land uses, rights-of-way, adjustments to land ownership, and property corner and boundary establishment and maintenance. Provide timely evaluation, administration, and termination of special land uses. Minimize the amount of land allocated to electronic sites and utility corridors consistent with appropriate accommodation for these public services that can be met only on National Forest System lands. Acquire lands and interests in lands to provide consolidated land ownership, public and administrative access to National Forest Lands, and efficient resource management. Identify property corners and boundaries to protect National Forest landownership by detecting and resolving unauthorized land occupancy and trespass. Administer the Small Tracts Act to resolve trespass and improve and consolidate National Forest landownership.

Work Activities, Standards and Guidelines - Geographic Areas 1, 3, 8, 9, 12 & 16

These work activities apply to Management Areas 1, 3, 8, 9, 12, and 16. They do not apply to GAs in the suitable timber base, wilderness, special areas, or developed recreation areas; work activities and their standards and guidelines for these areas are in the management direction for the respective management area.

Each work activity and its associated standards and guidelines is a management practice, i.e. "a specific action, measure, course of action, or treatment" (36CFR 219.3). Work activities are defined and described in Appendix A of this document. When applied in concert with the resource management direction established for each management area, the following work activities and their standards and guidelines form the integrated management prescription specified for on-the-ground application in the management area. The purpose of the management prescription is to attain: (1) multiple use and (2) the goals and resource objectives established in Chapter 4 of this document. The vehicle for transferring the Management Direction that is specified in this document to on-the-ground application is termed "integrated resource management". This means of on-the-ground application is described and set forth in Integrated Resource Management, 4th Edition, 1993, Southwest Region, USDA Forest Service. Integrated Resource Management provides for an interdisciplinary approach that coordinates public participation, preparation, analysis, execution, and the subsequent monitoring and evaluation of those management practices that are specified in this Forest Plan.

Recreation Planning

Dispersed Recreation:

1. NZ: Refer to Recreation Opportunity Spectrum Map for recreation management objectives.
2. NZ: Use traffic counts, trail counts, and visitor registration systems to determine dispersed recreation use (RIM reliability class 4). Use visitor counts and length of stay data to determine use of popular dispersed facilities and areas (RIM reliability class 3). Update recreation opportunity spectrum inventory and classifications at 5-year intervals beginning in 1990. Monitor off-road vehicle (ORV) use during scheduled patrols and revise the ORV plan to prevent resource damage and user conflicts. Prepare district recreation operation and maintenance plans annually for dispersed areas. Revise district recreation opportunity guides as necessary.

   SZ: Use National Visitor Use Monitoring (NVUM), traffic counts, trail counts, and visitor registration systems to determine dispersed recreation use. Update ROS inventory and classifications at 5-year intervals beginning in 2010. Monitor off-road vehicle (ORV) use during scheduled patrols and revise the ORV plan to prevent resource damage and user conflicts. Prepare district recreation operation and maintenance plans annually for dispersed areas. Revise district recreation opportunity guides as necessary.
3. Manage the Beale Wagon Road Historic Trail, Overland Road Historic Trail and Moqui Stage segment of the Arizona Trail corridors on National Forest System lands and associated historic sites and side trails for their historic significance. Use of motorized vehicles on any portion of the routes not already designated for general vehicle travel is prohibited. Emphasize foot and horse travel recreation activities on intact portions of the

routes. Provide adequate off-road vehicle (ORV) signing to advise the public of motorized restrictions. Formulate comprehensive trail management plans to promote the historic and cultural significance of the trails, incorporating the direction outlined in this plan. Recognize the needs of the disabled and those with limited mobility in developing access facilities for the trails. Propose recreational facilities for the trails which are related to significant interpretive and recreational points of interest, on, or adjacent to the trails. Emphasize protection for the historic value of the trail routes. Maintain one representative visual logo for each trail. Revise and expand current publications in cooperation with local sponsors.

Heritage Resources:

1. Comply with various legal mandates related to the management of heritage resources, including the Programmatic Agreement Regarding Cultural Property Protection and Responsibilities.
2. Coordinate all phases of heritage resource management with planning activities of the State Historic Preservation Officer (SHPO) and State Archeologist, and with other State and Federal agencies. Coordinating activities include: consultation and meetings; sharing of data, plans, reports, interpretations and other documents; coordination on National Register nominations, and; participation in the State heritage resources planning process.
3. Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known socio-cultural or religious significance.

NZ: Visual Resources:

1. Refer to Visual Quality Objective Map for management objectives and the location of visual features.
2. Manage visual features specified is site-specific analysis to meet their assigned visual quality objectives in accordance with the following standards:
   a. Visual resource management standards for visual features in coniferous forest foreground areas with assigned retention or partial retention objective are:
      (1) Treat vegetation to achieve the following condition class distribution within the visual feature for retention objective:
         (a) Seedling and sapling: 10 to 30 percent of area.
         (b) Immature and mature poletimber: 10 to 30 percent of area.
         (c) Mature and overmature sawtimber: 60 to 80 percent of area.
      (2) Treat vegetation to achieve the following condition class distribution within the visual feature for partial retention objective:
         (a) Seedling and sapling: 10 to 30 percent of area.
         (b) Immature and mature poletimber: 20 to 40 percent of area.
         (c) Mature and overmature sawtimber: 40 to 60 percent of area.
      (3) Provide for prompt cleanup of activity slash.
      (4) Created opening is not larger than two acres in retention and not larger than four acres in partial retention.
      (5) Maintain or enhance species diversity.

(6) Modify intermediate or any even-aged vegetation treatments to:

(a) Reduce typical stand size to 10 - 60 acres.

(b) Maintain relatively high residual basal area to minimize visual vulnerability.

(c) Feather edges of treatment areas.

(d) Maintain vertical diversity through retention of groups of older and larger trees.

b. NZ: Visual resource management standards for visual features in woodland foreground areas with assigned retention or partial retention objective are:

(1) Treat vegetation to enhance visual diversity in large homogenous areas in the visual feature.

(2) Prompt cleanup of activity slash.

(3) Modify vegetation treatments to:

(a) Reduce typical stand size.

(b) Maintain relatively high residual basal area to minimize visual vulnerability.

(c) Feather edges of treatment areas.

(d) Maintain vertical diversity through retention of groups of older and larger trees.

c. NZ: Vegetation treatments in middleground and background areas with assigned retention and partial retention visual quality objective are visually subordinate to the characteristic landscape. Modify Treatments to:

(1) Reduce typical stand size.

(2) Maintain relatively high residual basal area to minimize visual vulnerability.

(3) Feather edges of treatment areas.

(4) Maintain vertical diversity through retention of groups of older and larger trees.

d. NZ: Use the viewshed corridor plan for State Highway 67.

Inventory

Heritage Resources:

1. Heritage Resource overviews have been completed for the Forest. Review and update overviews as new information becomes available or to meet specific management or planning needs.

2. Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement. In consultation with the SHPO and the Advisory Council on Historic Preservation, manage heritage resource sites during the conduct of undertakings to achieve a "No Effect" or "No Adverse Effect" finding when possible. When sites will be affected, consult on appropriate treatment measures. Provide for heritage resource survey and related site inventory, preliminary evaluation and marking in advance of undertakings, with preference given to site avoidance over other methods of site protection. Design inventory standards according to parameters specified in the Programmatic Agreement and Forest Service Handbook.

3. Consider rejection, denial, redesign or relocation of proposed resource uses or projects to allow in-place preservation of heritage resources in the following circumstances:

(a) Present methods of investigation and data recovery cannot realize the current research potential of the sites.

(b) Sites are likely to have greater importance for addressing future research questions than current ones.

(c) Cultural values derive primarily from qualities other than research potential, and those values are fully realized only when the cultural remains exist undisturbed in their original context (e.g., association with significant historical persons or events, special ethnic or religious values, or unique interpretive values).

(d) Heritage Resources are important primarily for the quality of their architecture and the integrity of their setting.

(e) Preservation in-place is necessary to accomplish the objectives of the State Historic Preservation Plan.

(f) Site densities make data recovery economically infeasible, or require unattainable operating conditions.

4. Initiate a program of heritage resource survey of areas not scheduled for ground disturbing activities. Preference shall be given to areas with known or inferred high site densities, those expected to yield important information regarding the historic or prehistoric occupations of the Forest and areas of high risk for vandalism or natural destruction of heritage resource properties. At a minimum, survey of such areas shall be conducted in conjunction with annual update training for para-professional archeologists.

5. Participate in the development and implementation of a Cultural Resources Allocation Plan.

NZ: Visual Management:

1. Inventory the existing visual condition (EVC) and visual absorption capability (VAC) of the landscape in this planning period; revise the existing visual resource inventory.

Heritage Resource Evaluation and Assessments

Evaluate and nominate sites to the National Register of Historic Places based on the criteria, frequency, schedule and priorities established in the Forest overview documents,

Heritage Resource Protection and Enhancement

Include site protection and liability clauses in Forest contracts, permits and leases that have the potential to affect heritage resources. Monitor sites within undertakings to determine the effectiveness of protection measures and the need for site stabilization, damage assessment and liability. At a minimum, inspect and document the findings of at least one site, and not less than 20 percent of the sites, designated for protection within each undertaking. Inspect all sites listed in, nominated to or formally determined eligible for the National Register within each undertaking. Follow damage assessment procedures specified in the Programmatic Agreement and Forest Service Handbook.

Outside the area of undertakings, inspect sites to assess the impact of vandalism, natural destruction, and determine the need for site stabilization. The frequency and priority for site inspection and monitoring shall be based on its relative susceptibility to rapid deterioration or human disturbance. All sites listed in or nominated to the National Register shall be inspected biannually. Inspect eligible sites periodically. Include a priority listing of sites requiring stabilization in the Cultural Resource Assessment Plan based on criteria established in the Programmatic Agreement.

Use signing, fencing, administrative closure, increased patrolling, investigations, interpretive programs, stabilization and data recovery, as appropriate, for site protective measures. Consult

with Indian tribes to obtain tribal advice and input in the development and implementation of heritage resource site data recovery programs.

Recreation Facility and Site Management

Consult with Indian tribes to obtain tribal advice and input in the development of interpretive opportunities of prehistoric occupations.

Recreation Use Administration

Operate and maintain heavily used dispersed areas and facilities to standard service management by providing regular scheduled patrols throughout the recreation season. Provide control measures for areas where the following resource damage occurs: (1) soil compaction, (2) loss of vegetative cover, (3) tree damage and mortality, and (4) deterioration of water quality.

Enforce the 14 day stay limit.

NZ: Close project specific areas to off-road vehicle traffic; refer to ORV Map for location of closure areas. SZ: Close project specific areas to off-road vehicle traffic; refer to ORV Map for location of closure areas, and ROS Map for location of SPNM areas.

Close the Big Springs (South Kaibab), Junction Tank, MC Tank, Kennedy Dam, Russell Tank, Lockett Lake and Big Springs (North Kaibab) fisheries to off-road vehicle use upon construction.

Prohibit off-road competitive events.

Implement permanent, temporary or seasonal closures of areas to off-road vehicle traffic to protect soil, vegetation, visual, wildlife, wildlife habitat and cultural and historic resources.

Trail Construction

Make trail improvements and investments as specified in project level analysis and the following guidelines:

1. Construct the Saginaw Trail, South Bill Williams Trail, North Kendrick Trail, Kendrick Cross Country Ski Trail, and Ten-X Trail. Close to motorized vehicles.
1. Close the Arizona Trail to motorized vehicles.
2. Provide interpretive signing at points of interest along trails and prepare and publish information brochures.
3. Allow private sector construction and operation of the Jacob Lake Nordic ski trail and separate snowmobile trail system.
4. Evaluate the feasibility of the Coconino Rim Trail.

Trail System Maintenance and Operation

Inspect recreation trails annually. Maintain trails to maintenance level 3 or higher (as defined in FSH 1309.11a 1986-1990).

Wildlife, Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration

Habitat management for Federally listed species will take precedence over unlisted species. Habitat management for endangered species will take precedence over threatened species. Habitat management for sensitive species will take precedence over non-sensitive species.

Survey, inventory, monitor, and evaluate habitat diversity; species composition; impact of management activities; and the distribution and density of management indicator species, threatened and endangered species, and sensitive species. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Monitor management practices and evaluate their impact within occupied and potential habitats of Apache trout, bald eagle, and peregrine falcon. Determine need for consultation with USDI Fish and Wildlife Service. Implement recovery plans for threatened and endangered species. Prepare and implement an area management plan to conserve and protect the peregrine falcon in a manner consistent with recovery goals.

Monitor management practices and evaluate their impact within occupied and potential habitats of candidate species. Manage habitats to sustain species viability and prevent listing as threatened and endangered.

Take all reasonable precautions, consistent with policies regarding jeopardy to human life and property, during fire suppression, search and rescue, or other emergency operations to conserve and protect threatened and endangered species, candidate species, sensitive species and their habitats.

Apply standards and guidelines on an assessment area basis, (approximately 10,000 acres) except for old-growth habitat, to ensure distribution of habitat components throughout the range of dependent species. Improve stand diversity and

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habitat for wildlife through Integrated Resource Management.

Survey and evaluate assessment areas during IRM. Design projects to achieve the following habitat standards:

1. Forage.
   a. Provide forage cover ratios of 40:60 to 60:40. in areas where TES species habitat requirements do not conflict.
   b. Give priority to areas in need of additional forage for elk and mule deer when scheduling pinyon-juniper fuelwood special cutting for wildlife habitat non-structural improvement. Treatments are usually done in areas removed from disturbance to maximize habitat effectiveness.
   c. Increase efforts to resolve conflict with livestock grazing in all critical wildlife habitats to achieve resource management objectives. In areas of conflict, new winter grazing use by livestock will be allowed when such use does not adversely affect wildlife objectives. Allocate forage to (a) maximize habitat capability for threatened and endangered species and (b) provide habitat capability for indicator and harvest species in the range specified in the State Comprehensive Wildlife Plan.
   d. When determined that wildlife populations are damaging the range resource, the Forest Supervisor will advise the Arizona Game and Fish Department to address Wildlife population numbers and, or wildlife management to correct the problem.

2. Cover.
   a. Provide for at least 40 percent cover where TES species habitat requirements do not conflict.
   b. Emphasize cover in travelways, bedding areas, reproductive areas, and areas adjacent to water sources and openings. Cover areas will be at least 10 chains in width.
   c. Provide for hiding and thermal cover in fawning and calving areas. Restrict logging activities from May 15 to July 1 for elk and from June 15 to August 10 for mule deer.
   d. Provide for not less than 10 percent thermal cover in assessment areas. Emphasize thermal cover management in travelways, reproductive areas, and bedding areas.
   e. Provide for not less than 10 percent hiding cover in assessment areas. Emphasize hiding cover adjacent to water sources and openings, along travelways, and in pine stringers. Hiding cover shall not be less than 10 chains in width.

3. Snags and cavity, cull, and damaged trees.
   a. Provide for the following snag and other tree objectives:
      (1) Regionally consistent Standards and Guidelines apply for snag management in ponderosa pine, mixed conifer and spruce-fir cover types.
      (2) Pinyon-juniper type: not less than 100 snags et al., 9 inches and larger DRC and 12 feet in height, per 100 acres over 65 percent of the forested area.
   b. Select larger trees for retention from the following categories in sequence:
      (1) Existing snags and dying trees.
      (2) Living trees with cavities.
      (3) Trees with dead tops, spike tops, and damaged tops.
      (4) Living cull and damaged trees.
      (5) Living diseased trees, excepting mistletoe infected trees, not accounted for in 1 through 4 above.
      (6) Living healthy trees.
      (7) Avoid retention of mistletoe infected trees.

c. Intensively manage emphasis areas (forest opening edges, water sources) to meet snag et al. objectives.

4. Personal-use fuelwood standards.
   a. Ponderosa pine, Douglas fir, and spruce:
      (1) Any dead and down tree.
      (2) Any standing dead tree less than 12 inches DBH.
      (3) Any standing dead tree less than 15 feet in total height.
   b. Juniper:
      (1) Any dead and down tree.
      (2) Any standing dead tree without green foliage).
      c. Pinyon pine:
      (1) Any dead and down tree.
      (2) Any standing dead tree less than 12 inches DRC (10"DBH).
      (3) Any standing dead tree less than 12 feet in height.
   d. Gambel oak:
      (1) Any dead and down tree.
      (2) Any standing dead tree less than 8 inches in DBH.
   e. Quaking aspen:
      (1) Any dead and down tree.
      (2) Any standing dead tree less than 12 inches in DBH.

5. Turkey habitat.
   a. Leave not less than four turkey roost-tree groups per section in turkey winter range.
   b. Leave not less than two turkey roost-tree groups per section in turkey summer range.
   c. Emphasize turkey winter habitat in areas within 40 chains of pine stringers (pine stringers are defined as non-contiguous, linear communities of predominately ponderosa pine, up to 40 chains in width, that extend into pinyon-juniper woodland).
   d. Provide not less than 10 acres of untreated slash for nesting habitat within one-half mile of water. Consider slope, canopy, distribution and distance to water in the selection of treatment areas.
   e. Restrict activities in nesting areas from April 15 to July 1.

6. Peregrine falcon habitat.
   a. Prohibit activities which disturb nesting birds between March 15 and August 15. If birds arrive in their territories before March 15, suspend disturbing activities immediately. Extend this period if the birds are strongly attached to the nest site after August 15.
   b. Take all reasonable precautions, consistent with policies regarding jeopardy to human life and property, during fire suppression, search and rescue, or other emergency operations from March 15 through August 15 to protect peregrine nesting sites and their confidentiality.

7. Raptor habitat except northern goshawk and Mexican spotted owl.
   a. Retain raptor nest tree-groups and a non-activity buffer around raptor nest sites as follows:
      (1) Cooper's hawk: 7-chain buffer zone around the nest.
      (2) Sharp-shinned hawk: 6-chain buffer zone around the nest.
      (3) Bald eagle:
         (a) Provide a 10-chain uncut buffer zone around existing and potential bald eagle winter roosts.
         (b) Identify and protect foraging perches and potential roost sites.
      (4) Osprey:
         (a) Provide an 8-chain uncut buffer area around existing (occupied or unoccupied) nests.
         (b) Restrict logging activities within 20 chains of active nest sites between April 1 and August 15.
         (c) Provide, for every ten surface acres of water, not less than five acres of

mature and overmature trees with not less than four snags, with heights, equal to, or greater than, the surrounding trees, and not less than 20 inches in DBH, per acre, for potential osprey nesting sites.

(d) Provide uneven-aged and, or irregular-aged stand conditions within a 10-chain zone around aquatic areas with five or more surface-acres of water.

(e) Provide artificial nesting platforms as needed for habitat improvement.

(f) Prohibit road construction in roost areas and buffer zones.

(5) Others: 3-chain buffer zone around the nest.

8. Tassel-eared squirrel habitat.
   a. Manage for at least 40 percent of potential habitat capability for tassel-eared squirrels in assessment areas as determined by the Forest Habitat Capability Model. To maintain habitat capability, retain one nest tree group per five acres. Retain all trees within a 26-foot one-half chain radius from the nest (1/20 acre ponderosa pine only). This does not apply in regeneration areas.

9. Red squirrel habitat.
   a. Manage for at least 40 percent of potential habitat capability for red squirrels in assessment areas as determined by the Forest Habitat Capability Model. As needed to meet habitat capability, protect red squirrel primary caches at a density of one cache per two acres. Retain all trees within a 26-foot one-half chain radius from the cache (1/20 acre mixed-conifer only). This does not apply to regeneration areas.

10. Pronghorn antelope habitat.
    a. In key antelope ranges, maintain existing openings and create additional openings as provided for in Wildlife Non-structural Habitat Improvement. Provide for high forb composition (25 percent).
    b. In antelope range, remove all net wire fences; in the interim, modify every one-half mile of such fence to facilitate movement.

11. Riparian Vegetation. Riparian areas are geographically delineable areas with distinctive resource values and characteristics that are comprised of aquatic and riparian ecosystems. Riparian ecosystem is a transition between aquatic ecosystems and adjacent terrestrial ecosystem identified by soil characteristics or distinctive vegetation communities that require free or unbound water; terrestrial ecosystems characterized by hydric soils and plant species that are dependent on the water table (saturated zone) and, or its capillary zone.
    a. Inventory all riparian areas; collect data regarding location, size, classification and condition of the riparian.
    b. Maintain not less than three age classes of woody riparian species, with ten percent of the woody plant cover in sprouts, suckers, seedlings, and saplings.
    c. Maintain not less than 90 percent of the potential stream shading from May to September along all perennial cold or cool water streams. Provide shade with tree and other vegetational cover.
    d. Maintain not less than 90 percent of the potential shrub cover in riparian areas.
    e. Maintain not less than 90 percent of total linear streambank in stable condition.
    f. Woody riparian communities in addition to riparian communities which are dominated by shrub and herbaceous species are to rate in satisfactory or better condition.
    g. Select riparian areas for treatment based on relative scorecard condition rating with

the lowest rating assigned to first treatment.

Wildlife Non-structural Habitat Improvement

Do non-structural wildlife habitat improvement as specified in project level analysis and the following guidelines using special cutting, burning, seeding, and planting.

1. Created openings in pinyon-juniper woodland.
   a. Opening is not larger than 40 acres.
   b. The maximum width of the opening is 10 chains.
   c. The maximum sight distance within the opening is 15 chains.
   d. The minimum distance between any two openings is 10 chains.
   e. Retreat these areas by burning and seeding at 20 to 40 year intervals.
   f. Coordinate identification and planning of treatment areas with the Arizona Game and Fish Department.
   g. Protect cliffrose plants larger than 4 inches DBH or 8 feet tall to the extent possible when prescribe burning. Protect where possible during prescribe burning activities stands of cliffrose where densities exceed 100 plants per acre and plants are at least 2 feet tall.
   h. Exclude livestock from seeded areas for not less than two of three growing seasons immediately following treatment.

2. Gambel oak.
   a. Manage Gambel oak for increased hard mast production, cavities, and deciduous foliage volume to promote and enhance wildlife habitat.
   b. Retain all standing oak trees eight inches and larger at DBH.
   c. Personal and commercial cutting of oak will be done in designated areas only from May 15 to October 15 inclusive.
   d. Consider age class distribution in project planning.

3. Alligator juniper.
   a. Retain live, large alligator juniper for wildlife habitat where it occurs with ponderosa pine.

4. Quaking aspen.
   a. Treat aspen using special cutting methods.
   b. Optimum size of the treatment area is four acres although in some situations larger areas (10 acres+) can be treated.
   c. Prohibit grazing of improvement areas for not less than one growing season immediately following treatment.
   d. Remove coniferous understory during treatment.

5. Sagebrush.
   a. Periodically burn drainage bottoms dominated by sagebrush.

Structural Habitat Improvement

Do structural habitat improvement as specified in project level analysis and the following guidelines:

1. Install protective fences, watering structures, brush piles, road closure devices, nesting structures and pothole developments.

2. Prevent livestock access to 70 percent of the shoreline of the stock tanks that have stable water levels with the capacity to grow emergent aquatic vegetation. In addition, fence up to five acres and seed to low height cover species.

3. Provide for one permanent water source per square mile.

4. Install structures to promote recharge of wet meadows and riparian areas.

5. Construct, improve, and, or stabilize lakes to improve aquatic habitat for desirable fish species.

6. Maintain or improve nesting cover and waterfowl forage on existing waterfowl islands and shorelines and in conjunction with construction of waterfowl islands.

Range Resource Planning

1. Manage grazing allotments at the range management level determined on a project basis. Less than satisfactory range conditions are corrected through implementation of the range management program in the allotment management plan. Revise existing allotment management plans during first plan period. to bring permitted grazing use in line with grazing capacity on all grazing allotments by the end of the Forest Plan period.

2. Manage livestock use in riparian areas to meet riparian area objectives. This normally will be by providing adequate rest. Fence to exclude livestock from riparian areas when alternative means are not feasible. In sheep allotments, sheep will be herded and may use riparian areas on a once through lightly basis (less than 20 percent of available forage) unless the permittee is instructed to not use an area; riparian areas will not be grazed more than one time during the grazing season.

3. Prepare allotment management plans using Integrated Resource Management to implement Forest Plan resource management direction and achieve resource objectives. Allotment management planning will consider innovative livestock management practices and techniques, stocking rate adjustments and non-use agreements, and structural and non-structural range improvements to achieve integrated resource objectives.

4. Increase efforts to resolve grazing conflicts in all critical wildlife habitats to achieve resource management objectives. Consider season of use, forage improvements, deferred entry, and reductions in livestock and/or wildlife use to insure proper forage management. In areas of conflict, new winter grazing use by livestock will be allowed when such use does not adversely affect wildlife objectives. Allocate forage to (a) maximize habitat capability for threatened and endangered species and (b) provide habitat capability for indicator and harvest species in the range specified in the State Comprehensive Wildlife Plan. When determined that wildlife populations are damaging the range resource, the Forest Supervisor will advise the Arizona Game and Fish Department to address Wildlife population numbers and, or wildlife management to correct the problem.

Range Resource Inventory

Concentrate inventory and analysis work on problem allotments. A static or upward trend in range condition indicates a non-problem allotment. Conversely, a downward trend in range condition indicates a problem allotment. A problem allotment is also identified when other resources or activities are adversely affected by livestock management practices. Allotments are categorized as being problem or non-problem as a result of range monitoring conducted annually on all allotments. Production-utilization studies are done in conjunction with monitoring and re-analysis.

Conduct range analysis or reanalysis on all allotments with a downward trend in range condition at least one time in 5 years and on allotments with a static or upward trend in range condition at least one time in 10 years. Trend in range condition is identified through range inspection monitoring conducted annually on all

allotments. Production-utilization studies are made in conjunction with monitoring and re-analysis. In allotments where forage is determined to be limiting because of livestock-wildlife conflict, production-utilization studies will be made in all pastures of the allotment in conjunction with annual inspections. Allotments with downward trends in range condition and/or conflict for forage between livestock and wildlife have priority for inspection and analysis.

Range Non-Structural Improvement

1. Re-treat improved forage areas as determined in project level analysis using mechanical, chemical or fire use means and in accordance with the following guidelines:
   a. The area to be re-treated is situated on one or more of the following soil mapping units: 8, 16, 17, 18, 19, 23, 27, 30, 32, 40, 112, 162, 250, 251, 254, 255, 256, 257, 258, 260, 261, 263, 264, 272, 273, 280, 289, 502, 503, 507, 513, 514, 520, 543, 588, 590, 599, 632, 633, and 634.
   b. Opening is not larger than 40 acres excepting that in primary pronghorn antelope range.
   c. The maximum width of the opening is 10 chains excepting that in primary pronghorn antelope range.
   d. The maximum sight distance within the opening is 15 chains excepting that in primary pronghorn antelope range.
   e. The minimum distance between any two openings is 10 chains.
   f. Exclude livestock from seeded areas for not less than two growing seasons.
2. Seed stands that are (a) thinned to GSL of 60 square feet of basal area per acre, or less and (b) have a forage production rating of moderate or high to forage species following intermediate cutting as specified in project level analysis.

Range Structural Improvements

Replace existing and add new structural improvements needed for the prescribed management level.

Range Improvement Maintenance

Permittees maintain improvements as specified in the grazing permit.

Range Administration and Management

Administer all grazing permits annually. Make inspections on all allotments annually. Based on range studies and revised allotment management plans, adjust livestock numbers and grazing seasons to reflect actual capacity of the range. Bring permitted grazing in line with grazing capacity on overstocked for each allotment by the end of first planning the Forest Plan period.

Timber Resource Management Planning and Inventories

1. Complete forest inventory on all forested lands in the management area and revise on a 10-year cycle.
2. During the several phases of Integrated Resource Management, inventory, identify, and assess, in accordance with all applicable standards and guidelines, the conditions, needs, and opportunities for all resources, (e.g. wildlife habitats, old-growth, visual and scenic resources), that are present in the assessment area. Formulate, identify, and prepare, in phases 1 through 4 of Integrated Resource Management, based on the goals, objectives, and direction in this Forest Plan and appropriate public input, an integrated set of multi-resource goals and objectives for the assessment area. Assess and consider these goals, objectives, and resource values in the identification and selection of the appropriate

system of management for each stand. Formulate, consider, and evaluate all stand management systems taking into consideration various resource factors, such as, improvement of stand condition, stocking, composition, and growth; biodiversity; diversity of wildlife habitats and capability; visual quality (NZ) or SIO (SZ); ROS, and watershed condition.

Regeneration Harvest in Coniferous Stands

Make regeneration cuttings in accordance with project level analysis and the following guidelines:

1. Manage stands on an uneven-age basis to achieve the multi-resource goals and objectives established for each stand. Identify the capability of each silvicultural regeneration method (or methods) to secure these multi-resource goals and objectives.
2. The clearcutting method shall be applied only where insect and or disease conditions, windthrow, fire or other damaging agents leave insufficient healthy trees to form a satisfactory uneven-aged stand.
3. NZ: Stand size shall range from 10 acres to 60 acres excepting those stands assigned a visual quality objective of: (a) retention, foreground; (b) partial retention, foreground; (c) partial retention, middleground; and (d) retention middle ground for which there shall be no minimum or maximum stand size.
4. A principal goal in choosing and laying out of stands for regeneration is the improvement of diversity of stands through their arrangement and physical location in terms of the range of their relative sizes, shapes, aspects, densities, species composition, and other characteristics.
5. Do not cut any tree larger than 40 inches at DBH.
6. Ensure the species mix in the regenerated stand is consistent with the existing habitat type as defined in the R-3 Handbook on S.W. Habitat Types.
7. Harvests within the ecotone between woodlands and ponderosa pine habitat types will not be initiated unless there is reasonable assurance that regeneration of ponderosa pine will occur within five years following a regeneration harvest. The selection regeneration methods will be the preferred method of regenerating stands within this ecotone.

Intermediate Harvest in Coniferous Stands

Make intermediate harvests as specified in project level analysis and the following guidelines:

1. Stand size: minimum 10 acres, maximum 60 acres, typical 30 acres.
2. Make intermediate harvests to specified growing stock levels (GSL) in stands with a DMR of 2.0 or less.
3. Complete logging activities and slash treatment in one season to control *Ips* beetle populations.
4. Maximize utilization of all trees cut during intermediate harvests.
5. Do not cut any tree larger than 40 inches at DBH.
6. A principal goal is to increase and improve the diversity of timber stands through the manipulation of their arrangement and physical location in terms of their relative size, shape, aspect, density or stocking, species composition, and other characteristics. To achieve this goal, divide large stands, in accordance with item 1. above, into several smaller stands through the application of intermediate harvests by reducing stand stocking by a difference of at least 30 square feet of basal area per acre.

7. To provide for future snags requirements as specified in Wildlife Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration, 3. a. (1) and (2), retain at least at least 400 live trees, 14 inches DBH and larger, per 100 acres, on 65 percent of the treatment acres in ponderosa pine stands; and at least 600 live trees, 14 inches DBH and larger, per 100 acres, on 65 percent of the treatment acres in mixed conifer stands. Select larger trees for retention from the following categories in sequence:
   a. Living trees with cavities.
   b. Trees with dead tops, spike tops, and damaged tops.
   c. Living cull and damaged trees.
   d. Living diseased trees, excepting mistletoe infected trees, not accounted for in a through c above.
   e. Living healthy trees.
   f. Avoid retention of mistletoe infected trees.

Silvicultural Examination and Prescription

Complete stand delineation, mapping, vegetative and condition class typing, and acreage assignment for all lands in the management area. Maintain ADP stand information system. Apply standards and guidelines on an assessment area basis (approximately 10,000 acres), rather than on an individual timber sale basis, to ensure distribution of habitat components throughout the range of dependent species. Improve stand diversity and habitat for wildlife through integrated resource management on lands allocated to timber or fuelwood production.

Reforestation

Do reforestation as specified in project level analysis and the following guidelines:

1. Prepare forest floor for regeneration, following regeneration cutting, with broadcast burning or other means, prior to first good cone crop.
2. Make stocking surveys four and seven years following site preparation.
3. Make plantation survival surveys one, three, and five years following planting.
4. Satisfactory stocking is 120 to 350 trees per acre depending on, species, site class, and management objectives (Reference: FSM 2470).
5. Protect plantations until seedlings are established and assign no grazing capacity.

Timber Stand Improvement

Make precommercial thinnings as specified in project level analysis and the following guidelines:

1. Complete timber stand improvement evaluation survey within one year following treatment.
2. Limit cutting to July through December in areas where *Ips* bark beetle problems are likely to occur.
3. Complete logging activities and slash treatment in one season to control *Ips* beetle populations.
4. Maximize utilization of all trees cut during intermediate harvests.

Timber Sale Preparation

Make commercial timber, pulpwood, commercial and personal-use fuelwood, and miscellaneous forest product sales in accordance with project level analysis and the standards and guidelines for Wildlife Non-Structural Habitat Improvement, Regeneration Harvest in Coniferous Stands, Intermediate Harvest in Coniferous Stands, Improvement, and, for the NZ, Recreation Planning (Visual Management). Make coniferous residue from commercial sale areas available for personal-use fuelwood.

Utilization standards:

1. Sawtimber: 9-inch d.b.h. + to 6-inch d.i.b. top.
2. Pulpwood: 5-inch d.b.h. + to 4-inch d.i.b. top.
3. Fuelwood: Sizes vary by objectives.

Timber Harvest Administration

Administer timber sales, pulpwood sales, permits for forest products, firewood, and miscellaneous forest products sales. This activity includes accountability, financial management, field inspections, and contract interpretation and enforcement. Close local terminal roads until the next entry by signing and physical obstructions such as gates or barriers. Obliterate temporary roads and return to production. Impose ORV restrictions until revegetated.

Nursery Management

Maintain a 10-year supply of seed from each zone for each species.

Genetic Forest Tree Improvement

Implement the Regional Tree Improvement Plan.

Improvement

Implement land treatment and structural measures in accordance with project specific analysis and the following guidelines. Land treatment measures are (1) closure and revegetation of system roads identified for obliteration in the transportation inventory; and (2) ground cover improvements in the following soil mapping units: 8, 12, 16, 17, 18, 19, 27, 30, 32, 40, 162, 165, 250, 251, 254, 255, 257, 258, 260, 261, 263, 264, 272, 273, 280, 281, 288, 289, 502, 503, 507, 513, 514, 520, 542, 543, 587, 588, 590, 592, 599, 632, and 634.

1. Created opening is not larger than 40 acres.
2. Maximum width of the opening is 10 chains.
3. Maximum sight distance within the opening is 15 chains.
4. Minimum distance between any two openings is 10 chains.
5. Exclude livestock from treated areas for not less than two growing seasons.

Administration

Through the use of best management practices, the adverse effect of planned activities are mitigated and site productivity is maintained. These practices are determined (after problem assessment, examination of the alternatives and appropriate review by local or State agencies and public participation) to be the most effective practicable means of preventing or reducing the amount of pollutants generated by non-point sources to levels compatible with water quality goals. These practices are involved in activities affecting the Forest and grassland resource and include:

1. Install water control structures and, or intercede on poor and very poor condition ranges where revegetation potential is moderately high to high on slopes less than 40 percent.
2. Designate stream courses in timber sale planning to protect watershed values. Include in this protection control on skidding in riparian areas and along or across designated stream courses.
3. Rehabilitate areas impacted by wildfire to minimize loss of site productivity.

Processing of Mineral Exploration Proposals

Impose the following operating constraints on leasable and locatable mineral prospecting and exploration activities to maintain wildlife habitat components and visual and special resource objectives:

1. Restrict use and occupancy within one-quarter mile of breeding, calving and fawning areas from May 15 to August 10.
2. Restrict use and occupancy within one-quarter mile of raptor nest sites and permanent waters from April 1 to August 15.
3. NZ: Prohibit surface use and occupancy in the visible foreground of Highway 67, and Highway 89A from May 1 to October 31.
4. Restrict surface use and occupancy yearlong

in the foreground of heritage resource sites with National Register status.

Processing of Oil and Gas Lease Applications

Incorporate the following limited surface use stipulations in oil and gas leases:

1. Prohibit surface occupancy yearlong in recreation, administrative and special use sites.
2. Restrict use and occupancy yearlong on slopes of 15 percent or greater to prevent loss of soil productivity and vegetative cover.
3. Prohibit surface occupancy yearlong in the foreground of all sites listed on the National Register to protect historic values
4. Require replanting of areas impacted by operations in tree plantations at the cessation of project.
5. Restrict use and occupancy yearlong in areas supporting populations of Threatened and Endangered and sensitive plants.
6. Restrict use and occupancy within one mile of Threatened and Endangered raptor nest sites from March 1 to August 15.
7. Prohibit surface use and occupancy in the visible foreground of Highway 67, and Highway 89A from May 1 to October 31.
8. Prohibit use and occupancy within one-quarter mile of turkey and raptor nest sites from March 1 to July 30.
9. Prohibit use and occupancy within one-quarter mile of breeding, calving and fawning areas from May 15 to August 10.
10. Restrict use and occupancy yearlong within one-quarter mile of permanent water sources to allow unrestricted access to water sources.

Discontinue common variety mineral material disposals from existing sources, rehabilitate existing material pits and prevent development of potential sites in:

1. NZ: The visible foreground of Highway 67 and Highway 89A.
2. Within one-quarter mile of turkey and raptor nest sites and permanent water sources.
3. NZ: Areas with semi-primitive or semi-primitive motorized recreation opportunity spectrum classifications.

Processing of Site Specific Mineral Development Proposals

Evaluate transportation proposals for mineral development based on:

1. Integration with other resource management uses.
2. Avoidance or mitigation of impacts on wildlife habitats including breeding, calving and fawning areas, primary big game foraging and cover areas, turkey nesting and roost areas, and important aquatic habitats.
3. NZ: Impacts on visual quality objectives.
4. Impacts on areas of concentrated recreation use.
5. NZ: Avoidance or mitigation of impacts on areas with recreation opportunity spectrum classifications of semi-primitive and semi-primitive motorized.

Prohibit the construction of mine and oil and gas well surface facilities in the following areas:

1. NZ: In the visible foreground of Highway 67, and Highway 89A.
2. In the foreground of heritage resource sites with National Register status.

Evaluate the need for the creation or development of areas with substitute or surrogate habitats, facilities and structures to replace areas of substantial loss or destruction from mineral activities.

Special Use Management (Non-Recreation)

Allow expansion of existing major utility corridors and clearing of new corridors (refer to Corridor Map for location of major utility corridors). Attempt to avoid the following areas:

1. NZ: Areas with pristine, primitive or semi-primitive recreation opportunity spectrum classifications.
2. Areas with high heritage resource values.
3. Important wildlife habitat areas.
4. NZ: Visually sensitive areas.
5. NZ: ORV closure areas.
6. Lands classified as suitable timberland.

Provide for joint use in corridors and combine uses to the extent possible in light of technical and environmental constraints.

The following standards and guidelines apply to all classified electronic sites:

1. Maximize the number of compatible electronic uses on a minimum site area. If a proposed use can be accommodated on a site, but is incompatible with installations in existing buildings, additional buildings may be authorized. Additional buildings are subject to the same joint-use stipulations that apply to existing structures. The Forest Service reserves the right to issue a prospectus for the construction of any building on-site.
2. Each non-exclusive permit reserves the right of the Forest Service to authorize other uses on the site, building, or antenna structures of the holder provided that such use does not interfere with holder's operations. Permittee improvements so used are entitled to reasonable compensation.
3. The Forest Service determines the combination of joint occupants, location of permittee improvements on site and the compatibility of users. Each proposed use is evaluated based on consideration of its impact on existing uses, potential future uses and demonstrated need.
4. Access development, improvement and maintenance shall be borne by a permittee or permittee association and must be authorized by a separate permit.
5. A Federal Communications Commission (FCC) license is required for all non-federal government permittees. Authority for enforcing the terms of an FCC license is vested in the FCC. Applicants are responsible for resolving interference problems with existing users. Within the terms of special-use permits and applicable regulations, the Forest Service reserves the right to determine which special-use permits or proposals must be terminated or denied when interference problems cannot be resolved.
6. NZ: Buildings and antennas are subject to painting, design and location requirements imposed by the Forest Service to meet visual quality objectives.
7. Permittees are required to organize and be members of a site users association.

Right-of-Way Grants for Roads and Trails

Conduct annual field inspections of all special use permits and right-of-way grants. Review permit files annually for payment of fees, termination dates and adequacy of permit clauses. Adjust fees based on fair market value at five year intervals or when permits or grants are reissued. Update land use reporting system during annual file reviews.

Land Exchange

Refer to Land Adjustment Map for location of lands identified for disposal and acquisition.

Evaluate land exchange proposals in the Tusayan area with these additional criteria:

1. Consideration of State and Grand Canyon National Park management objectives for the Grand Canyon.
2. Contribution to coordinated community development.
3. Social and economic impacts on other communities dependent on Grand Canyon tourism.
4. Support of the Coconino County Planning and Zoning Commission with necessary zoning changes.

5. Forest Service and Coconino County review of detailed development plans submitted by the proponent as part of the land exchange proposal.

On lands designated as base-in-exchange:

1. Limit capital investments in range structural or non-structural improvements, recreation improvements, administrative improvements, or timber stand improvements, etc., to those that can be amortized during the anticipated period of continued government ownership.
2. Design cultural practices, such as timber sales, to protect or enhance real estate values by modifying marking prescriptions to retain a component of mature trees, ensuring timely disposal of activity slash and in designing location of permanent roads.
3. Avoid, where possible, the authorization of encumbering special uses that detrimentally affect real estate values and, where possible, locate those that must be accommodated in a manner to minimize impacts to the value of real estate.

Land Acquisition

Attempt to acquire the Bull Basin private land tract adjacent to Kendrick Mountain Wilderness, the Sunflower Flat, and the Tule private land tracts by purchase or exchange to reduce potential for encroachment of non-conforming uses. Acquire key wildlife areas such as riparian areas through acquisition authorities.

Rights-of-Way Acquisition

Carry out site-specific analysis to determine whether to acquire the rights-of-way specified in Table 14.

Transportation System Planning and Inventory

1. Identify and obliterate all system roads not required for resource management in accordance with the Management Direction for Soil and Water Resources.
2. Close local terminal roads to traffic until the next entry with signing and, or physical obstructions e.g. gates and barriers.
3. Obliterate all temporary roads and return to production.
4. Restrict off-road vehicle use of closed and or obliterated roadways to facilitate revegetation of the roadway.

Road Operation

Road maintenance standards are:

1. Maintain commensurate share roads for intended commercial use.
2. Maintain local roads, closed to traffic, at maintenance level 1.
3. Maintain local service roads, open to traffic, to at least a maintenance level 2.
4. Maintain arterial and collector roads at maintenance level 4 or 5.
5. Maintain signs with routine maintenance and replacement schedule based on inventory and field inspection.
6. Maintain local service roads with more than 50 ADT, and to dispersed recreation sites, at maintenance level 3.
7. Replace surfacing at the rate of five percent per year.
8. Re-establish drainage and subgrade stabilization at the rate of two percent per year.

Fire Management Planning and Analysis

1. Do not allow fires to spread to lands of other ownership.
2. Protect human life and improvements.

Escaped Fire Suppression

Fires which exceed, or are expected to exceed, the size objective for the Management Area are considered escaped and appropriate response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA will consider at least the

following:

1. The resource management emphasis of threatened management areas.
2. Suppression costs commensurate with resources protected.
3. Effects on air quality, aesthetics, soil, and watershed.
4. Social acceptance of acreage burned.
5. Current availability of suppression resources.
6. Size objectives are based on continuous area of high intensity burn.
7. Impacts on heritage resources.

Treatment of Activity Fuels

NZ: All activity created fuels are promptly removed from areas designated with visual management objectives of "retention foreground" or "partial retention foreground" (VQO Map).

Activity created fuels in other areas are treated so that maximum size objectives can be met under the burning conditions which yielded the historical, 50 percentile rate of spread in fuel model "K" (National Fire Danger Rating System).

Fuel treatment objectives are met with a combination of treatment methods. Preferred treatments are: (1) fuelwood utilization, (2) broadcast burning (prescribed fire and wildland fire use), (3) pile and burn, and (4) mechanical rearrangement such as chipping and lopping.

[continued on next page]

Descriptions and Specific Management Direction for Special Areas

Land Use Zone – Special Area **4** – Kendrick Mountain Wilderness**:** **6,651 Acres**

This management area is the Kendrick Mountain Wilderness Area located in the Williams Ranger District of the Kaibab National Forest and the Peaks Ranger District of the Coconino National Forest. It is a steep volcanic mountain situated within the Cataract-Spring Valley and Cedar-Deadman watersheds. Elevations range from 7,000 feet to over 10,000. Average precipitation ranges from 24 inches to 28 inches per year.

Vegetation is diverse due to the effect of aspect. North slopes are dominated by mixed conifer species including Douglas-fir, white fir, ponderosa pine, and southwestern white pine. The south slopes and lower elevations are essentially ponderosa pine with a component of alligator juniper. Relatively pure aspen stands as well as aspen with regenerating conifer species are found scattered throughout the mixed conifer zone.

This area is one of few "islands" of mixed conifer vegetation in the Williams Ranger District. Suitable habitat may be present for the sensitive species *Cimicifuga arizonica* in this management area. It is important habitat for red squirrel and spotted owl. The management indicator species are spotted owl, elk, yellow-bellied sapsucker, red squirrel, goshawk, and pygmy nuthatch.

The area is not open to mineral entry, and there are no mining claims or mineral leases.

A small cabin listed in the National Register of Historic Places exists near the summit of Kendrick Mountain. Other historic or heritage resources in the area are unknown at this time.

Kendrick Mountain is used primarily for hiking, hunting and other day-use activities. Use is concentrated along the trail system in the semi-primitive wilderness opportunity spectrum class.

Parts of the area are grazed by cattle. Permitted numbers are within the estimated grazing capacity, and the range is in satisfactory condition.

A fire lookout tower, which predates wilderness designation, is located on the top of Kendrick Mountain. This lookout is paramount to the detection of wildland fires in the southern units of the Kaibab and northern part of the Coconino National Forests. The tower is currently staffed, supplied, and maintained by primitive means.

Management Direction for Wilderness: Provide for intensive management of wilderness resources. Give priority to managing activities with a potential to affect the wilderness character of the area. Provide appropriate actions based on ROS classifications and intensity of use that is occurring. Focus administrative effort on heavy use areas and wilderness boundaries. Make regular inspections of wilderness areas, maintain trails and signs, post boundaries, monitor use, and provide maps and information concerning the area.

Recreation Planning

Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known socio-cultural or religious significance.

Manage Kendrick Mountain for the Very High (Level 1) SIO.

Inventory

Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Trail System Maintenance and Operation

Maintain Pumpkin, Bull Basin, and connector trails to Maintenance Level 1 and the Kendrick Trail to Maintenance Level 2.

Wilderness Planning

Refer to Recreation Opportunity Spectrum Map for wilderness management objectives.

Wilderness Inventory

Monitor visitor numbers, use patterns and activities using traffic counters at trailheads, voluntary registration systems and information gathered during wilderness patrols (RIM reliability class 4). Implement "Limits of Acceptable Change" concept by selecting indicators for areas within each ROS classification. Monitor indicators to determine impacts of use.

Evaluate desirability and identify alternatives for increasing acreage toward the Pristine wilderness opportunity spectrum classification.

Identify areas within the wilderness where opportunities exist for challenge, risk and complete self-sufficiency. Revise district recreation opportunity guide to reflect wilderness recreation opportunities.

Wilderness Use Administration

Inspect and administer areas within all ROS classifications during regular scheduled patrols throughout the recreation season. Increase frequency of patrols along wilderness boundaries and in the Semi-Primitive Non-Motorized-Wilderness ROS areas during hunting season. Patrol wilderness boundaries and trailheads. Post signs and construct fencing where necessary to restrict vehicle access. Limit party sizes to a maximum of 25 persons. Manage campsites at standard service management. Prevent deterioration of campsites in condition classes 1-3. Discourage use of campsites that fall below condition class 3. Dismantle improvised camp structures encountered during patrols.

Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration

Survey habitat diversity, species composition, distribution and density of management indicator species, threatened and endangered species, and sensitive species. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Survey and monitor activities of bald eagle and peregrine falcon use and habitat annually to determine need for consultation with USDI Fish and Wildlife Service. Evaluate impacts of management activities.

Where sensitive wildlife or plant habitats are present, make decisions on trails and trailheads, utilizing an interdisciplinary resource access travel management process. Encourage public involvement and consider public concerns.

Inventory all riparian areas. This inventory will include location, size, classification and condition of the riparian.

Range Resource Planning

Manage grazing allotments at existing (R-3, moderate) level. Less than satisfactory range conditions are corrected through implementation of the range management program outlined in the allotment management plan. Revise existing allotment management.

Range Resource Inventory

Production-utilization studies are done in conjunction with monitoring and re-analysis.

Range Structural Improvements

Install and, or replace minimal level structural improvements to protect wilderness resources and values, and, or maintain grazing capacity.

Range Improvement Maintenance

Permittees maintain improvements as specified in the grazing permit.

Range Administration and Management

Administer all grazing permits annually. Make inspections annually. Based on range studies and revised allotment management plans, adjust livestock numbers and grazing seasons to reflect actual capacity of the range. Maintain permitted grazing use in line with grazing capacity.

FA & O Facility Maintenance

Maintain Kendrick Mountain lookout tower to present state. Prevent expansion of lookout tower and electronic facilities. Service and maintain facilities by primitive means.

Fire Management Planning and Analysis

1. Permit lightning fires to play, as nearly as possible, their ecological role. Minimize the suppression impacts and acreage burned by human-caused fires.
2. Do not allow fires to spread to lands of other ownership.
3. Protect human life and improvements.
4. Allow fire to exceed wilderness boundary only if the objectives of the threatened management area can be met.
5. Maximum size objective for lightning fires is 150 acres.
6. Maximum size objective for human-caused fires is 20 acres.

Initial Attack Fire Suppression

1. Mechanized equipment, except line building equipment, can be used if approved by the Forest Supervisor and if it is necessary to meet fire suppression objectives. The use of mechanized line building equipment must be approved by the Regional Forester.
2. Monitor all lightning fires and confine when necessary to meet size objective.
3. Economically control all human-caused fires within the size objective.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the size objective are considered escaped and appropriate response is determined by an escaped fire situation analysis (EFSA). The EFSA will consider at least the following:

1. Safety of personnel.
2. If lightning caused, the appropriateness of the predicted burn with respect to the objectives of fire management in wilderness.
3. Resource management emphasis and protection objectives of threatened management area.
4. Suppression costs commensurate with resources protected.
5. Effects of suppression tactics on wilderness values, air quality, aesthetics, soil, and watershed.
6. Social acceptance of acreage burned.
7. Current availability of suppression resources.
8. Ignition source of the fire (lightning or human-caused).

Treatment of Natural Fuels

Use fire with both prescribed fire and wildland fire use to break up unnaturally large areas of continuous fuel and create a more natural "mosaic" of fuelbeds. Target stand size is 50 to 150 acres.

Forest Pest Management - Surveys and Technical Assistance

Make annual ground and, or aerial survey to identify and evaluate the forest pest situation in this area.

[continued on next page]

Land Use Zone – Special Area **6** – Arizona Bugbane Botanic Area**:**
490 Acres

This area is a botanical area for the protection of *Cimicifuga arizonica*, Watson, Arizona bugbane, a candidate species for threatened status. It is located in a canyon bottom on the north face of Bill Williams Mountain.

This species was given the status of Candidate Species, Category I, by the USDI Fish and Wildlife Service on December 15, 1980. Category I candidates are those species which the USDI Fish and Wildlife Service has sufficient information to support the biologic appropriateness for listing as Threatened or Endangered.

This species was first collected on Bill Williams Mountain by Mr. and Mrs. J. G. Lemmon in 1884. Only a few population areas of this plant are known in Northern and Central Arizona. It is found in montane riparian habitats characterized by Douglas-fir, maples, and bracken ferns. At the present time, the predominate threat to this species consists of possible trampling by hikers in areas where access to such populations is easy.

Management indicator species are red squirrel, spotted owl, hairy woodpecker, pygmy nuthatch, goshawk, yellow-bellied sapsucker and *Cimicifuga arizonica*.

Management Direction: Manage hiking use of the area to prevent ecologic changes to the site. The trail is closed to motorized vehicle use.

Because of the steep terrain, boundary fencing to exclude livestock is not necessary. Do not construct range improvements that attract livestock within or adjacent to the area.

Control the collection of *C.arizonica* specimens to prevent damage to the plant colony.

Design fire suppression actions to prevent damage to the plant colony and habitat.

Do not feature this area in public information or recreational brochures, but identify the area on the ground for its protection.

Recreation Planning

Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known socio-cultural or religious significance.

Manage Bill Williams Mountain for partial retention background visual quality objective.

Inventory

Conduct heritage resource site surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Trail Reconstruction

Reconstruct the North Bill Williams Trail.

Trail System Maintenance and Operation

Inspect recreation trails annually. Maintain trails to maintenance level 3 or higher (as defined in FSH 1309.11a 1986-1990).

Surveys, Planning, Prescriptions, Monitoring, Coop and Administration

Survey habitat diversity, species composition, distribution and density of management indicator species, threatened and endangered species, and sensitive species. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Survey, and monitor Peregrine falcon activities and habitat use. Evaluate, annually, the impacts of management practices on this species and its habitat to determine the need for consultation with USDI Fish and Wildlife Service.

Prepare and implement an area management plan to conserve and protect Category 1 sensitive plant species *Cimicifuga arizonica*.

Range Resource Planning

Exclude livestock grazing. Do not assign grazing

capacity to the area.

Range Resource Inventory

Make periodic assessment to determine if reasons for exclusion of livestock remain valid.

Range Structural Improvements

Construct and replace fences as needed to provide for exclusion of livestock.

Range Structural Improvements - Maintenance

Maintain fences needed for exclusion of livestock.

Timber Resource Management Planning and Inventories

Complete forest inventory on all forested acres and revise on a 10- year cycle.

Silvicultural Examination and Prescription

Complete stand delineation, mapping, vegetative and condition class typing, and acreage assignment for all lands in the management area. Maintain ADP stand information system.

Processing of Mineral Exploration Proposals

Impose the following operating constraint on leasable mineral prospecting and exploration activities to protect sensitive plant habitat:

1. Prohibit surface use and occupancy yearlong.

Processing of Oil and Gas Lease Applications

Incorporate the following limited surface use stipulation in oil and gas leases:

1. Prohibit surface use and occupancy yearlong to protect sensitive plant habitat.

Processing of Site Specific Mineral Development Proposals

Prohibit the construction of oil and gas well surface facilities.

Special Use Management (Non-Recreation)

Issue only special use permits that contribute to the management goals of the area.

Right-of-Way Grants for Roads and Trails

Issue only right-of-way grants that contribute to the management goals of the area.

Withdrawals, Modifications and Revocations

Withdraw this area to locatable mineral entry.

Fire Management Planning and Analysis

1. Protect human life and improvements; minimize acreage burned.
2. Do not allow fires to spread to lands of other ownership.
3. The maximum fire size objective is one acre.
4. The average annual burned area objective is 1/10 acre.

Initial Attack Fire Suppression

Direct attack and control all fires.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the maximum size objective are considered escaped fires and appropriate response is determined by a Wil;dland Fire Situation Analysis (WFSA). The WFSA considers at least the following:

1. Resource management emphasis of threatened management areas.
2. Suppression costs commensurate with resources protected.
3. Minimization of acreage burned in the analysis area.

Treatment of Activity Fuels

Dispose of all activity created slash.

[continued on next page]

Land Use Zone – Special Area **7** - Garland Prairie Research Natural Area**:** **300 Acres**

This management area is the Garland Prairie Research Natural Area located in the Chalender Ranger District. Soils in this management area are moderately deep, fine textured, and strongly developed. This area is typical of the high elevation grassland ecotone dominated by Arizona fescue and mountain muhly.

Historically, this area was grazed by sheep, but in recent years the area has been grazed by cattle in the summer. There are no range improvements. Boundary fences are needed to prevent the entry of livestock. No grazing capacity is assigned.

Research Natural Areas are a part of a national network of field ecological research areas established for the purpose of non-manipulative research, observation, and study. They are selected and established to preserve a wide spectrum of pristine areas that typify important habitat types and serve to preserve and maintain genetic diversity, maintain baseline or reference areas for the study of ecologic changes, and as a control to other similar habitats being manipulated for research or management purposes.

Management Direction: Prepare an establishment record, and carry out measures to protect the area from activities that directly or indirectly modify ecologic processes. After establishment, use of the area by responsible scientists and educators is encouraged. Research must be coordinated with the Rocky Mountain Forest and Range Experiment Station under a cooperative agreement or special use permit.

Inventory

Conduct heritage resource site surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Recreation Use Administration

Close this area to off-road vehicles.

Surveys, Planning, Prescriptions Monitoring, Coop, and Administration

Apply standards and guidelines on an assessment area basis (approximately 10,000 acres) to ensure distribution of habitat components throughout the range of dependent species. Utilize habitat attributes of unsuitable timberlands in adjacent assessment areas to meet assessment area objectives; however credit for any attribute from an adjacent area shall not satisfy more than one-third of the minimum habitat requirement for the assessment area.

Range Resource Planning

Complete establishment report for this research natural area.

Range Structural Improvement

Construct standard fence around the area with crossing stiles on two sides, but without gates as identified in project level analysis.

Range Structural Improvements - Maintenance

Maintain boundary fence annually.

Timber Resource Management Planning and Inventories

Complete inventory on all forested acres and revise on a 10-year cycle.

Processing of Mineral Exploration Proposals

Impose the following operating constraint on leasable mineral prospecting and exploration activities:

1. Prohibit surface use and occupancy yearlong.

Processing of Oil and Gas Lease Applications

Incorporate the following limited surface use stipulation in oil and gas leases:

1. Prohibit surface use and occupancy yearlong to prevent disturbance of vegetation.

Processing of Site Specific Mineral Development Proposals

Prohibit the construction of oil and gas well surface facilities.

Special Use Management (Non-Recreation)

Issue only special use permits that contribute to the management goals of the area.

Right-of-Way Grants for Roads and Trails

Issue only right-of-way grants that contribute to the management goals of the area.

Withdrawals, Modifications and Revocations

Withdraw this area to locatable mineral entry.

Fire Management Planning and Analysis

1. Permit lightning fires to play, as nearly as possible, their ecological role. Minimize the suppression impacts and acreage burned by human-caused fires.
2. Do not allow fires to spread to lands of other ownership.
3. Protect human life and improvements.
4. Allow fires to exceed area boundary only if the objectives of the threatened management area can be met.
5. Allow lightning fires to burn naturally within the area.
6. Maximum size objective for human-caused fires is one acre.

Initial Attack Fire Suppression

1. Do not construct fire line or apply chemical retardant in the area.
2. Monitor lightning fires within the area and initiate appropriate response to meet objectives of threatened analysis areas.
3. Direct attack and control all human-caused fires.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the size objective are considered escaped and appropriate response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA considers at least the following:

1. Ignition source of the fire (lightning or human-caused).
2. If lightning caused, consider the appropriateness of the predicted burn with respect to the objectives of fire management in natural area.
3. Resource management emphasis and protection objectives of threatened management area.
4. Suppression costs commensurate with resources protected.
5. Effects on air quality, aesthetics, soil, and watershed.
6. Current availability of suppression resources.
7. Minimize suppression impacts.
8. Time interval since the area was last burned.

Geographic Area – Special Area **11** - Kanab Creek Wilderness**: 68,340 Acres**

This is the Kanab Creek Wilderness, located in the western part of the North Kaibab Ranger District. The management area is typical of canyonland formations with steep scarp slopes and narrow drainage bottoms. Almost 80 percent of this area has slopes in excess of 40 percent. Elevations range from 3,500 feet to 6,000 feet. Climate in this area is semi-arid. It is characterized by hot dry summers, and cool moist winters. The hottest months are June and July and the coldest are December and January. Mean annual precipitation ranges from eight inches to 12 inches.

Vegetation is dominated by the desert shrub blackbrush. Forage species are sand drop-seed, needle-and-thread and Indian ricegrass. In the drainage bottoms, riparian species are present, including cottonwood, desert almond, red bud and single-leaf ash.

The area above the scarps is critical winter range for mule deer. Peregrine falcon habitat is present in this area. Suitable desert bighorn sheep habitat is present and re-introduction of this species is expected. Riparian habitats have been degraded by livestock; however, they are now recovering rapidly in response to bringing permitted grazing in line with capacity and initiating a deferred system of livestock management. Salt cedar is present along the riparian area at the expense of native cottonwood and willow communities. An introduced species, chukar partridge, is unique to this area. The majority of this management area is within the Grand Canyon National Game Preserve.

The management indicator species are mule deer, plain titmouse, Lucy's Warbler, yellow breasted chat and aquatic macroinvertebrates.

The management area has moderate to high potential for uranium. The Arizona Wilderness Act of 1984 withdrew the area to entry under the mining and mineral leasing laws subject to rights established before the date of its wilderness designation. The bottoms of Kanab Creek and Snake Gulch form a portion of the north and west boundaries of the Grand Canyon National Game Preserve which is also closed to locatable mineral entry. There is a narrow strip of land, north of Snake Gulch and west of Kanab Creek, which is outside of the Grand Canyon National Game Preserve, but within this wilderness area. Numerous mining claims were located in this portion of the management area prior to its wilderness designation in 1984. The status of these mining claims is undetermined.

There are seven National Register-listed prehistoric sites in Snake Gulch as well as a significant collection of prehistoric rock art sites.

Use of this Wilderness is low and is concentrated in the bottom of Kanab Creek and Snake Gulch and along the trail system which links the area to adjacent lands of Grand Canyon National Park. Estimated capacity for Kanab Creek Wilderness is low relative to its size because of the characteristic sparse vegetation and rugged topographic features. All wilderness opportunity spectrum classifications are represented in the area.

The area is grazed from December to March by cattle. The usable areas are principally found in canyon bottoms. Most of the area is unsuitable for grazing because of steep topography and poor access. Permitted grazing use is in balance with grazing capacity.

Management Direction for Wilderness: Provide for a moderate level of wilderness management. Give priority to managing activities with a potential to affect the wilderness character of the area. Provide appropriate actions based on

wilderness opportunity spectrum classifications and intensity of use that is occurring. Focus administrative effort on heavy use areas and wilderness boundaries. Make regular inspections of wilderness areas, maintain trails and signs, post boundaries, monitor use, and provide maps and information concerning the area.

Recreation Planning

Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known socio-cultural or religious significance.

Manage Kanab Creek Wilderness for the visual quality objective of preservation background.

Inventory

Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Initiate a program of heritage resource survey of areas not scheduled for ground disturbing activities. Preference shall be given to areas with known or inferred high site densities, those expected to yield important information regarding the historic or prehistoric occupations of the Forest and areas of high risk for vandalism or natural destruction of heritage resource properties.

Trail System Maintenance and Operation

Maintain trails to maintenance level 1. Heavily used trail segments may be maintained to maintenance level 2.

Wilderness Planning

Refer to Wilderness Opportunity Spectrum Map for wilderness management objectives.

Wilderness Inventory

Monitor traffic counters and voluntary registration systems at trailheads and adjust use estimates with visitor count data gathered during wilderness patrols (RIM reliability class 4). Implement "Limits of Acceptable Change" concept by selecting indicators for areas within each wilderness opportunity spectrum classification. Monitor indicators to determine impacts of use.

Wilderness Use Administration

Inspect and administer areas within the transition and semi-primitive wilderness opportunity spectrum classifications by regular scheduled patrols throughout the recreation season. Increase frequency of patrols along wilderness boundaries and in the transition wilderness opportunity spectrum areas during hunting season. Patrol wilderness boundaries and trailheads. Post signs and construct fencing where necessary to restrict vehicle access. Limit party sizes to a maximum of 25 persons.

Manage campsites at standard service management. Prevent deterioration of campsites in condition classes 1 to 3. Discourage use of campsites that fall below condition class 3. Dismantle improvised camp structures encountered during patrols.

Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration

Survey, inventory, monitor and evaluate habitat diversity; species composition; impact of management activities; and the distribution and density of management indicator species, threatened and endangered species, and sensitive species to determine the need for consultation with USDI, Fish and Wildlife Service. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Survey and evaluate assessment areas during project design and plan projects to achieve the following habitat objectives:

1. Peregrine falcon habitat.
   a. Prohibit activities which disturb nesting birds between March 15 and August 15. Extend this period if the birds are strongly attached to the nest site after August 15.
2. Riparian Vegetation.
   a. Inventory all riparian areas; collect data regarding location, size, classification and condition of the riparian.
   b. Maintain not less than three age classes of woody riparian species, with ten percent of the woody plant cover in sprouts, suckers, seedlings, and saplings.
   c. Maintain not less than 90 percent of the potential shrub cover in riparian areas.
   d. Maintain not less than 90 percent of total linear streambank in stable condition.
   e. Woody riparian communities in addition to riparian communities which are dominated by shrub and herbaceous species are to rate in satisfactory or better condition by the end of decade one.
   f. Select riparian areas for treatment based on relative scorecard condition rating with the lowest rating assigned to first treatment.

Range Resource Planning

Manage grazing allotments at existing (R-3, moderate) level. Less than satisfactory range conditions are corrected through implementation of the range management program outlined in the allotment management plan. Revise existing allotment management plans.

Range Resource Inventory

Production-utilization studies are done in conjunction with monitoring and re-analysis.

Range Structural Improvements

Install and, or replace minimal level structural improvements to protect wilderness resources and values, and, or maintain grazing capacity.

Range Improvement Maintenance

Permittees maintain improvements as specified in the grazing permit.

Range Administration and Management

Administer all grazing permits annually. Make inspections annually. Based on range studies and revised allotment management plans, adjust livestock numbers and grazing seasons to reflect actual capacity of the range. Maintain permitted grazing use in line with grazing capacity.

Processing of Exploration Proposals

Conduct mineral examinations in conjunction with exploration proposals to confirm rights established prior to formal wilderness designation.

Impose the following operating constraints on locatable mineral prospecting and exploration activities to maintain wildlife habitat components and wilderness characteristics:

1. Prohibit surface use and occupancy within one mile of Threatened and Endangered raptor nest sites from March 1 to August 15.
2. Prohibit the construction of access roads to exploration sites.
3. Minimize the area of disturbance of exploration sites.
4. Revegetate exploration sites with plant species common to the area.

Processing of Site Specific Development Proposals

Prohibit the construction of mine surface facilities within the wilderness area.

Forest Pest Management - Surveys and Technical Assistance

Make annual ground and, or aerial survey to identify and evaluate the forest pest situation in this area.

Fire Management Planning and Analysis

1. Permit lightning fires to play, as nearly as possible, their ecological role. Minimize the suppression impacts and acreage burned by human-caused fires.
2. Do not allow fires to spread to lands of other ownership.
3. Protect human life and property.
4. Allow fire to exceed wilderness boundary only if the objectives of the threatened management area can be met.
5. Allow lightning fires to burn naturally within the wilderness.
6. Maximum size objective for human-caused fires is 200 acres.

Initial Attack Fire Suppression

1. Mechanized equipment, except line building equipment, can be used if approved by the Forest Supervisor and if it is necessary to meet fire suppression objectives. The use of mechanized line building equipment must be approved by the Regional Forester.
2. Monitor all lightning caused fires and confine within the wilderness.
3. Economically control all human-caused fires within the size objective.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the size objective are considered escaped and appropriate response is determined by a Wildfire Fire Situation Analysis (WFSA). The WFSA will consider at least the following:

1. Ignition source of the fire (lightning or human-caused).
2. If lightning caused, the appropriateness of the predicted burn with respect to the objectives of fire management in wilderness.
3. Resource management emphasis and protection objectives of threatened analysis area.
4. Suppression costs commensurate with resources protected.
5. Effects of suppression tactics on wilderness values, air quality, aesthetics, soil, and watershed.
6. Social acceptance of acreage burned.
7. Current availability of suppression resources.

Treatment of Natural Fuels

Use prescribed fire and wildland fire use to reduce unnatural accumulations of fuel.

Geographic Area – Special Area **19** - Saddle Mountain Wilderness**:** **40,610 Acres**

This is the Saddle Mountain Wilderness, located in the southeast section of the North Kaibab Ranger District. This area is within the Houserock-Marble watershed which is characterized by narrow drainage bottoms adjacent to steep and very steep ascending scarp slopes. Elevations range from 6,000 feet to over 8,000 feet. Annual precipitation varies from 16 inches at the lower elevations, to about 30 inches at the higher elevations.

Vegetation is diverse, because of aspect, soils, elevation, and slope. In the lower areas pinyon pine-Utah juniper is dominant. Other species there include big sagebrush, cliffrose, blue grama, junegrass, squirreltail, and mutton bluegrass. In the higher elevations, mixed conifer prevails, including aspen, smooth brome, weeping brome, and pine dropseed. On steep south aspects the overstory component is dominated by Gambel oak with white fir, Douglas fir and ponderosa pine.

North Canyon Creek has a viable introduced population of the threatened Apache trout. This population is outside of this species historic range, nonetheless it contributes to population stability and the conservation of this genotype. The sensitive plant species *Rosa stellata* was thought to occur in this management area with other sensitive species occurrence possible. Recent surveys have not found *Rosa stellata* on the Forest, but potential habitat is present and populations are nearby.

The lower elevations provide valuable mule deer winter range. A large, twenty year old, burned area in the southern portion of this area provides suitable summer habitat for deer and blue grouse. South Canyon Spring and Tater Canyon Springs provide numerous sources of water in the lower elevations for deer, pronghorn antelope, and bison. All of this management area is in the Grand Canyon National Game Preserve.

The management indicator species where present are mule deer, turkey, pygmy nuthatch, plain titmouse and spotted owl. Riparian indicator species are Lincoln's sparrow, Lucy's warbler, yellow breasted chat and aquatic macroinvertebrates.

The management area has low potential for uranium and oil and gas. The Arizona Wilderness Act of 1984 withdrew the area to entry under the mining and mineral leasing laws. There are no mining claims of record or oil and gas leases within the area.

The entire management area is essentially unsurveyed for heritage resource sites, but surveys of adjacent non-wilderness lands have revealed high densities of heritage resource sites. Similar densities can be inferred for low elevation lands within Saddle Mountain Wilderness. Little is known about the distribution and significance of heritage resource sites in the unit.

Recreation use within this area is low and most use is associated with hiking and camping along the twenty mile trail system. Scenic vistas overlooking the wilderness and certain trail segments receive a considerable amount of day use because of the proximity to the Grand Canyon National Park. Most of the area has the wilderness opportunity spectrum classification of semi-primitive.

Most of the area is inaccessible to livestock, but the usable portions of the area provide summer range for cattle and parts of the year-long bison range.

Parts of the area have heavy fuel accumulations with a potential for resource damaging wildfires, however most of the Wilderness can be managed to maintain a natural mosaic of fuels.

Management Direction for Wilderness: Provide for a moderate level of wilderness management. Give priority to managing activities with a potential to affect the wilderness character of the area. Provide appropriate actions based on wilderness opportunity spectrum classifications and intensity of use that is occurring. Focus administrative effort on heavy use areas and wilderness boundaries. Make regular inspections of wilderness areas, maintain trails and signs, post boundaries, monitor use, and provide maps and information concerning the area.

Recreation Planning

Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known socio-cultural or religious significance.

Manage Saddle Mountain Wilderness for the visual quality objective of preservation background.

Inventory

Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Initiate a program of heritage resource survey of areas not scheduled for ground disturbing activities. Preference shall be given to areas with known or inferred high site densities, those expected to yield important information regarding the historic or prehistoric occupations of the Forest and areas of high risk for vandalism or natural destruction of heritage resource properties.

Trail System Maintenance and Operation

Maintain trails to maintenance level 1. Heavily used trail segments may be maintained to maintenance level 2.

Wilderness Planning

Refer to Wilderness Opportunity Spectrum Map for wilderness management objectives.

Wilderness Inventory

Monitor traffic counters and voluntary registration systems at trailheads and adjust use estimates with visitor count data gathered during wilderness patrols (RIM reliability class 4). Implement "Limits of Acceptable Change" concept by selecting indicators for areas within each wilderness opportunity spectrum classification. Monitor indicators to determine impacts of use.

Wilderness Use Administration

Inspect and administer areas within the transition and semi-primitive wilderness opportunity spectrum classifications by regular scheduled patrols throughout the recreation season. Increase frequency of patrols along wilderness boundaries and in the transition Wilderness Opportunity Spectrum areas during hunting season. Patrol wilderness boundaries and trailheads. Post signs and construct fencing where necessary to restrict vehicle access. Limit party sizes to a maximum of 25 persons.

Manage campsites at standard service management. Prevent deterioration of campsites in condition classes 1 to 3. Discourage use of campsites that fall below condition class 3. Dismantle improvised camp structures encountered during patrols.

Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration

Survey, inventory, monitor and evaluate habitat diversity; species composition; impact of management activities; and the distribution and density of management indicator species, threatened and endangered species, and sensitive species to determine the need for consultation with USDI, Fish and Wildlife Service. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Survey and evaluate assessment areas during project design and plan projects to achieve the following habitat standards:

1. Apache Trout.
   a. Re-distribute Apache trout upstream in North Canyon Creek when appropriate.
   b. Monitor aquatic macroinvertebrates biannually. Maintain a minimum Biotic Condition Index of 80.
   c. Consider the establishment of other populations of this species at suitable introduction sites to promote and secure the genetic integrity and viability of this species.
2. Peregrine falcon habitat.
   a. Prohibit activities which disturb nesting birds between March 15 and August 15. Extend this period if the birds are strongly attached to the nest site after August 15.
3. Riparian Vegetation.
   a. Inventory all riparian areas; collect data regarding location, size, classification and condition of the riparian.
   b. Maintain not less than three age classes of woody riparian species, with ten percent of the woody plant cover in sprouts, suckers, seedlings, and saplings.
   c. Maintain not less than 90 percent of the potential shrub cover in riparian areas.
   d. Maintain not less than 90 percent of total linear streambank in stable condition.
   e. Woody riparian communities in addition to riparian communities which are dominated by shrub and herbaceous species are to rate in satisfactory or better condition by the end of decade one.
   f. Select riparian areas for treatment based on relative scorecard condition rating with the lowest rating assigned to first treatment.

Structural Habitat Improvement

Construct 20 single log structures, using primitive means, to improve and stabilize Apache trout habitat in North Canyon Creek.

Range Resource Planning

Manage grazing allotments at existing (R-3, moderate) level. Less than satisfactory range conditions are corrected through implementation of the range management program outlined in the allotment management plan. Revise existing allotment management plans.

Range Resource Inventory

Production-utilization studies are done in conjunction with monitoring and re-analysis.

Range Structural Improvements

Install and, or replace minimal level structural improvements to protect wilderness resources and values, and, or maintain grazing capacity.

Range Improvement Maintenance

Permittees maintain improvements as specified in the grazing permit.

Range Administration and Management

Administer all grazing permits annually. Make inspections annually. Based on range studies

revised allotment management plans, adjust livestock numbers and grazing seasons to reflect actual capacity of the range. Maintain permitted grazing use in line with grazing capacity.

Fire Management Planning and Analysis

1. Permit lightning fires to play, as nearly as possible, their ecological role. Minimize the suppression impacts and acreage burned by human-caused fires.
2. Protect the aquatic habitat in North Canyon.
3. Do not allow wildfires to spread to lands of other ownership.
4. Protect human life and property.
5. Allow wildland fire to exceed wilderness boundary only if the objectives of the threatened management area can be met.
6. Allow lightning fires to burn naturally within the wilderness.
7. Maximum size objective for human-caused fires is 200 acres.
8. The maximum size objective for any wildfire within a two mile radius of North Canyon Spring is five acres.

Initial Attack Fire Suppression

1. Mechanized equipment, except line building equipment, can be used if approved by the Forest Supervisor and if it is necessary to meet fire suppression objectives. The use of mechanized line building equipment must be approved by the Regional Forester.
2. Monitor all lightning caused fires and confine within the wilderness.
3. Economically control all human-caused fires within the size objective.
4. Use appropriate suppression methods to control all wildfires within a 2-mile radius of North Canyon Spring.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the size objective are considered escaped and appropriate response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA will consider at least the following:

1. Ignition source of the fire (lightning or human-caused).
2. If lightning caused, the appropriateness of the predicted burn with respect to the objectives of fire management in wilderness.
3. Resource management emphasis and protection objectives of threatened analysis area.
4. Suppression costs commensurate with resources protected.
5. Effects of suppression tactics on wilderness values, air quality, aesthetics, soil, and watershed.
6. Social acceptance of acreage burned.
7. Current availability of suppression resources.

Treatment of Natural Fuels

Fire use should be considered to reduce unnatural accumulations of fuel.

Forest Pest Management - Surveys and Technical Assistance

Make annual ground and, or aerial survey to identify and evaluate the forest pest situation in this area.

Land Use Zone - Special Area **20** - Franks Lake Geologic-Botanical Area**:** **145 Acres**

The Franks Lake Geologic-Botanical Area at 8,550 feet elevation is located within the subalpine and montane conifer forest and represents a relatively undisturbed example of limestone sinks, or karsts. There are three such sinks within the geologic-botanical area. The easternmost sink is known as Franks Lake and contains a grassy meadow and small pond.

Within the water, typical plants are bulrush, cattail, and pondweed. Grasses and grasslike plants are sedges, rushes and Kentucky bluegrass. The tree community is characterized by blue spruce, Englemann spruce, ponderosa pine, and quaking aspen.

The lake supports nesting mallards, and various shorebirds. Typical birds around the lake are evening grosbeak, Clark's nutcracker, Audubon's warbler, western bluebird, goshawk, and violet-green and tree swallows. Management indicator species are Kaibab squirrel, goshawk, red squirrel, hairy woodpecker, pygmy nuthatch, and yellow-bellied sapsucker. All of this management area is in the Grand Canyon National Game Preserve. Riparian indicator species are Lucy's warbler, yellow breasted chat, Lincoln's sparrow and aquatic macroinvertebrates.

The three sinks, and their tributary drainage, represent various stages of geologic and vegetative development associated with the Kaibab limestone geology which dominates the Kaibab Plateau.

Management Direction for Franks Lake: Management is directed at preserving the natural features and perpetuating the natural ecologic processes affecting the area. Activities are designed to minimize the effects of human intervention. The area is closed to off-road vehicle use.

Recreation Planning

Manage Franks Lake and immediate surrounding area for the visual quality objective of partial retention foreground.

Inventory

Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Use Administration

Close the area to camping and off-road vehicle use.

Wildlife Surveys, Planning, Prescriptions, Monitoring, Coop, and Administration

Survey, inventory, monitor and evaluate habitat diversity; species composition; impact of management activities; and the distribution and density of management indicator species, threatened and endangered species, and sensitive species to determine the need for consultation with USDI, Fish and Wildlife Service. Evaluate habitat for those species in Threatened Native Wildlife in Arizona.

Survey and evaluate assessment areas during project design and plan projects to achieve the following habitat standards:

1. Riparian Vegetation.
    a. Inventory all riparian areas; collect data regarding location, size, classification and condition of the riparian.
    b. Maintain not less than three age classes of woody riparian species, with ten percent of the woody plant cover in sprouts, suckers, seedlings, and saplings.
    c. Maintain not less than 90 percent of the potential shrub cover in riparian areas.

d. Maintain not less than 90 percent of total linear streambank in stable condition.
e. Woody riparian communities in addition to riparian communities which are dominated by shrub and herbaceous species are to rate in satisfactory or better condition by the end of decade one.
f. Select riparian areas for treatment based on relative scorecard condition rating with the lowest rating assigned to first treatment.

Range Resource Planning

Exclude livestock grazing.

Range Structural Improvements

Construct boundary fences as determined through project level analysis.

Timber Resource Management Planning and Inventories

Complete forest inventory on all forested acres and revise on a 10-year cycle.

Silvicultural Examination and Prescription

Complete stand delineation, mapping, vegetative and condition class typing, and acreage assignment for all lands in the management area. Maintain ADP stand information system.

Processing of Exploration Proposals

Impose the following operating constraint on leasable mineral prospecting and exploration activities to protect sensitive plant and wildlife habitat:

1. Prohibit surface use and occupancy yearlong.

Processing of Lease Applications

Incorporate the following limited surface use stipulation in oil and gas leases:

1. Prohibit surface use and occupancy yearlong to protect sensitive plant and wildlife habitat.

Processing of Site Specific Development Proposals

Prohibit the construction of oil and gas well surface facilities.

Special Use Management (Non-Recreation)

Issue only special use permits that contribute to the management goals of the area.

Right-of-Way Grants for Roads and Trails

Issue only right-of-way grants that contribute to the management goals of the area.

Fire Management Planning and Analysis

1. Protect human life and improvements. Minimize acreage burned.
2. Do not allow fires to spread to lands of other ownership.
3. The maximum fire size objective is one acre.
4. The average annual burned area objective is 1/10 acre.

Initial Attack Fire Suppression

Direct attack and control all fires.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the maximum size objective are considered escaped fires and appropriate response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA considers at least the following:

1. Resource management emphasis of threatened management areas.

2. Suppression costs commensurate with resources protected.
3. Minimization of acreage burned in the analysis area.

Treatment of Activity Fuels

Dispose of all activity created slash.

Land Use Zone **21** – Existing Developed Recreation Sites**: 1,556 Acres**

This management area includes the 15 major existing public and private sector developed recreation sites and other smaller sites (trailheads, interpretive sites, etc.) on the Kaibab National Forest. The major sites can accommodate 3,457 persons at one time. Developed recreation sites in both sectors are generally operating at or near their physical capacities. Expansion of existing recreation development sites in both the public and private sectors can provide an additional capacity of approximately 2,000 persons at one time.

Ponderosa pine is the predominate vegetation in this management area. Aspen and Gambel oak are present in some developed recreation sites usually as understory vegetation. Vegetation typical of the woodland and ponderosa pine transition zone is prevalent on developed sites in the Tusayan district.

Cooler temperatures typical of the high elevation coniferous forest are prevalent for most developed recreation sites. Many visitors to the Forest campgrounds and lodges come from the Phoenix metropolitan area for climatic relief from extreme summer temperatures.

Most of the fishing use in the Forest occurs in this management area. All fish are stocked by Arizona Game and Fish Department. Lakes are treated periodically for algae and undesirable fish species.

Most campgrounds in the Williams unit are adjacent to impoundments that offer water oriented recreation activities. With the exception of White Horse Lake, all of these impoundments are water storage facilities for the City of Williams. Campground capacity is established to ensure preservation of water quality.

All existing developed recreation sites, except Moqui Lodge are withdrawn to entry under the mining laws. Surface use and mineral development activities may be restricted or prohibited adjacent to the Bill Williams Ski Area to accommodate the proposed development and facilities in this area.

NZ: The visual management objective of partial retention for developed recreation sites allows management activities that remain visually subordinate to the characteristic landscape.

Recreation Planning

Compile use data of developed recreation sites gathered during 85 percent of operating seasons by approved statistical sampling methods (RIM reliability class 1). Prepare district recreation operation and maintenance plans annually for developed sites. Revise district recreation opportunity guides as necessary. Review and revise existing interpretive plans for developed sites annually.

NZ: Manage developed recreation sites for the visual quality objective of partial retention foreground.

Inventory

Conduct heritage resource site surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Recreation Facility and Site Reconstruction

Prepare and implement site concept plans for the following public sector reconstruction projects: Consult with and involve all potentially affected interests in the planning and conceptual design aspects of site reconstruction.

1. Cataract Lake Campground: Analyze and evaluate alternative recreation use strategies.

Upgrade facilities in RIM condition class 2 to RIM condition class 1. Reconstruct or replace substandard facilities (e.g. tables, fire rings, toilets, pads, etc.) in the following public sector developed sites:

1. White Horse Lake Campground.
2. Kaibab Lake Campground.
3. DeMotte Campground.
4. Cataract Lake Campground.
5. Ten-X Campground.
6. Dogtown Lake Campground.
7. Indian Hollow Campground.
8. Jacob Lake Campground.

Allow reconstruction and improvement of private sector developed sites within current site capacity allocations.

Recreation Facility and Site Construction

Prepare and implement site concept plans for the following expansion and construction proposals. Consult with and involve all potentially affected interests in the planning and conceptual design aspects of site development.

1. Ten-X Campground: Expand existing campground. Construct group campsites, expanded potable water systems, group ramadas and interior campground road systems.
2. Private sector developments: Increase North Kaibab commercial lodge facilities by approximately 325 PAOT. Increase Tusayan commercial lodge facilities by approximately 1500 PAOT. Exact capacity allocations to be determined during site specific planning, analysis and evaluation.

Recreation Facility and Site Management

Operate and maintain the following public sector sites at standard service management during the operating season. Maintain facilities to RIM condition class 1.

1. White Horse Lake Campground, from May 15 to October 31.
2. Kaibab Lake Campground, from May 15 to October 31.
3. Cataract Lake Campground, from May 15 to October 31.
4. Dogtown Lake Campground, from April 15 to October 31.
5. Ten-X Campground, from May 1 to October 31.
6. Jacob Lake Campground, from May 15 to October 31.
7. DeMotte Campground, from May 15 to October 31.
8. Indian Hollow Campground, from May 1 to October 31.
9. Chalender District Office, from May 1 to October 31.
10. Williams District Office, from May 1 to October 31.
11. North Kaibab District Office, from May 15 to October 31.
12. Tusayan District Office, from May 1 to October 31.
13. Jacob Lake Information Center, from May 15 to October 15.
14. Benham Snowplay Area, from December 1 to March 1.
15. Garland Prairie Vista, from April 15 to October 31.
16. Oakhill Snowplay Area, from December 1 to March 1.
17. Parks Rest Area Interpretive Trail, from April 1 to December 1.
18. Highway 89A Overlook, from June 1 to October 31.

Provide information services at district offices on weekends during the summer and fall seasons.

Enforce 14-day stay limit in all public sector development sites during the operating season.

Provide volunteer hosts at all public sector fee campgrounds.

Operate the Kaibab Plateau Visitor Center at Jacob Lake under full Forest Service management.

Review and revise, biennially, LWCF user fee schedules for all public sector sites.

Administer LWCF fee program daily at the following public sector development sites:

1. White Horse Lake Campground.
2. Kaibab Lake Campground.
3. Cataract Lake Campground.
4. Dogtown Lake Campground.
5. Ten-X Campground.
6. Jacob Lake Campground.
7. DeMotte Campground.

Administer the following private sector development recreation sites during the operating season.

1. Williams Golf Course, from May 1 to September 30.
2. Bill Williams Ski Area, from December 15 to April 1.
3. Jacob Lake Inn, from April 1 to December 31.
4. Kaibab Lodge, from June 1 to October 20.
5. North Rim Store, from May 15 to September 30.
6. Moqui Lodge, from April 1 to December 31.

Recreation Use Administration

Close the area within one-half mile of all public sector campgrounds to off road vehicle use and camping.

Processing of Mineral Exploration Proposals

Impose the following operating constraints on leasable mineral prospecting and exploration activities to protect recreation values:

1. Prohibit surface use and occupancy within one-half mile of developed recreation sites from May 1 to October 31.

Processing of Oil and Gas Lease Applications

Incorporate the following limited surface use stipulations in oil and gas leases:

1. Prohibit surface use and occupancy within one-half mile of developed recreation sites from May 1 to October 31.

Processing of Site Specific Mineral Development Proposals

Prohibit the construction of oil and gas well surface facilities within one-quarter mile of developed recreation sites.

Withdrawals, Modifications and Revocations

Withdraw Moqui Lodge and Bill Williams Ski Area to locatable mineral entry.

Road Operation

Maintain roads accessing developed recreation sites to maintenance level 4 or higher.

Dam Administration and Management

Inspect and maintain Cataract Lake, Dogtown Lake, Kaibab Lake and White Horse Lake dams annually.

Potable Water System Administration and Management

Monitor potable water systems in accordance with Safe Drinking Water Act.

Fire Management Planning and Analysis

1. Protect human life and improvements. Minimize acreage burned.
2. Do not allow fires to spread to lands of other ownership.
3. The maximum fire size objective is one acre.

4. The average annual burned area objective is five acres.

Initial Attack Fire Suppression

Direct attack and control all fires.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the maximum size objective are considered escaped fires and appropriate response is determined by a Wildfire Fire Situation Analysis (WFSA). The WFSA considers at least the following:

1. Resource management emphasis of threatened management areas.
2. Suppression costs commensurate with resources protected.
3. Effects on air quality, aesthetics, soil, and watershed.
4. Social acceptance of acreage burned.
5. Current availability of suppression resources.
6. Minimization of acreage burned in the analysis area.

Treatment of Activity Fuels

NZ: Dispose of all activity created slash.

Treatment of Natural Fuels

Encourage utilization of natural fuels in and adjacent to this area for on-site fuelwood needs.

Land Use Zone **22** – ProposedDdeveloped Recreation Sites**: 2,228 Acres**

The private sector has the capability to accommodate increased recreation demand associated with visitation to Grand Canyon National Park. New major developed recreation facilities in both the public and private sectors will increase the total Forest capacity by 800 persons at one time.

Ponderosa pine is the dominant vegetation in most proposed recreation development sites. Most stands are immature or mature condition class and have been managed as part of the suitable timberland base. Temperatures and precipitation in the management area are indicative of the high elevation coniferous forest.

None of the proposed sites are associated with an existing water impoundment. Construction of the Cougar Lake campground is predicated on the development of Cougar Lake.

Cougar Dam will provide fishing opportunities and waterfowl and bald eagle habitat.

Proposed recreation sites are open to mineral entry; however it appears that none of the sites involve lands known to contain valuable mineral resources. Surface use and occupancy restrictions will be imposed on all new recreation site developments.

The ultimate location of a proposed developed recreation site is generally based on a combination of desirable attributes of a given area. The landscape setting is one important factor that determines an area's suitability for development. Various landscape elements of proposed recreation sites provide essential visual diversity.

NZ: The need for additional recreation facilities can be met with the construction of new public and private campgrounds, lodge facilities and visitor information centers.

Recreation Planning

Compile use data of developed recreation sites gathered during 85 percent of operating seasons by approved statistical sampling methods (RIM reliability class 1). Prepare district operation and maintenance plans annually for developed sites. Revise district recreation opportunity guides as necessary. Review interpretive plans for developed sites annually.

Analyze, using Integrated Resource Management, the environmental, social and physical suitability of the Adams Lake water impoundment site for recreation site development.

Consult with, and involve, all potentially affected interests (PAI's) in the planning, conceptual design and decision-making for all development sites.

Consult with Indian tribes to obtain tribal advice and input in the development and implementation of projects proposed in areas of known sociocultural or religious significance.

NK: Manage proposed developed recreation sites for the visual quality objective of partial retention foreground.

Inventory

Conduct surveys and evaluate impacts of specific undertakings in project-level analyses in accordance with 36 CFR 800 and the Programmatic Agreement.

Recreation Facility and Site Construction

Prepare and implement site concept plans for the following public sector construction proposals:

1. Cougar Lake Recreation Area: Prepare site concept and design plans for a recreation development site in conjunction with the construction of Cougar Lake.

Prepare prospectus, review concept plan, issue and administer special use permit for the construction, operation, and maintenance of the

following new private sector campgrounds. Design each site to accommodate approximately 400 PAOT, and provide facilities equal to or better than those in public sector LWCF fee collection sites:

1. Upper Basin Recreation Area.
2. DeMotte II Recreation Area.

Close the existing public sector DeMotte Campground with the construction of the new DeMotte II private sector campground.

Standards and guidelines for management of the proposed Bill Williams Ski Area will be implemented in accordance with the record of decision for the Bill Williams Ski Area EIS.

Recreation Facility and Site Management

Administer the following private sector developed recreation sites during the operating season:

1. Upper Basin Recreation Area, from May 1 to October 31.
2. DeMotte II Recreation Area, from May 15 to November 1.

Recreation Use Administration

Close the area within one-half mile of all new public and private sector campgrounds to off road vehicle use and camping.

Range Resource Planning

Until the proposed sites are developed, manage grazing to correspond with grazing level of the surrounding allotment. Do not assign grazing capacity and do not develop range improvements within these sites.

Inventory

Complete level 2 soil inventory of areas proposed for recreation site development.

Rights/Use Management

Obtain water rights for proposed Cougar Lake.

Processing of Mineral Exploration Proposals

Impose the following operating constraints on leasable mineral prospecting and exploration activities to protect recreation values:

1. Prohibit surface use and occupancy within one-half mile of new developed recreation sites from May 1 to October 31.

Processing of Oil and Gas Lease Applications

Incorporate the following limited surface use stipulations in oil and gas leases:

1. Prohibit surface use and occupancy within one-half mile of new developed recreation sites from May 1 to October 31.

Processing of Site Specific Mineral Development Proposals

Prohibit the construction of oil and gas well surface facilities within one-quarter mile of developed recreation sites.

Withdrawals, Modifications and Revocations

Withdraw proposed recreation sites to locatable mineral entry.

Road Operation

Maintain roads accessing developed recreations sites to maintenance level 4 or higher. Maintain roads within constructed, reconstructed and expanded sites to level 5.

Dam Administration and Management

Inspect and maintain Adams Lake dam annually.

Potable Water System Administration and Management

Design, construct, maintain and monitor potable water systems for new public sector recreation sites in accordance with the Safe Drinking Water Act.

Fire Management Planning and Analysis

1. Protect human life and improvements.

Minimize acreage burned.

2. Do not allow fires to spread to lands of other ownership.
3. The maximum fire size objective is one acre.
4. The average annual burned area objective is 2 acres.

Initial Attack Fire Suppression

Direct attack and control all fires.

Escaped Fire Suppression

Fires which exceed or are expected to exceed the maximum size objective are considered escaped fires and appropriate response is determined by a Wildland Fire Situation Analysis (WFSA). The WFSA considers at least the following:

1. Resource management emphasis of threatened management areas.
2. Suppression costs commensurate with resources protected.
3. Effects on air quality, aesthetics, soil, and watershed.
4. Social acceptance of acreage burned.
5. Current availability of suppression resources.
6. Minimization of acreage burned in the analysis area.

Treatment of Activity Fuels

NZ: Dispose of all activity created slash.

Treatment of Natural Fuels

Encourage utilization of natural fuels in and adjacent to this area for on site fuelwood needs.

Chapter 5 - Monitoring Plan

Introduction

This monitoring plan determines if (1) management prescriptions are applied as directed in the plan, (2) standards and guidelines for work activities are followed, (3) the objectives of the forest plan are accomplished as scheduled, and (4) the effects and costs of implementing the forest plan are as predicted.

An annual monitoring action plan is prepared to guide specific applications, intensity of sampling, and identify costs of monitoring and evaluation. An annual evaluation report documents the items reviewed, analyzed, and evaluated by the forest interdisciplinary team and its recommendations to the forest supervisor. These recommendations can include (1) no action, (2) recommend appropriate action for correction of the management practice involved, (3) modify the management prescription through amendment of the forest plan, (4) revise the schedule of projected practices, outputs, or effects, and (5) initiate revision of the plan. An annual evaluation report of monitoring activities and decisions will be prepared for the Regional Forester.

Monitoring: Provide for a quantitative evaluation of the performance of the forest plan.

Objective: by comparing the actual quantities produced of the following services and outputs with those same quantities projected in the forest plan on an annual and cumulative basis for the forest and land area.

Measures

Timber 1

1. Item: Precommercial Thinning
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Achieve improved stand growing stock levels, biotic diversity, pest management, and economic efficiency of management practices.
5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 2

1. Item: Commercial Thinning (Intermediate Harvest)
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Achieve improved stand growing stock levels, biotic diversity, pest management, forage production, and economic efficiency.
5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.

9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 3

1. Item: Shelterwood Seed Cutting (Regeneration cutting)
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition:Achieve improved age class distribution, stand growing stock levels, biotic diversity and pest management.
5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 4

1. Item: Shelterwood Removal Cutting
2. Unit of Measure: Acres
3. Purpose:Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Achieve improved age class distribution, stand growing stock levels, biotic diversity and pest management.
5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 5

1. Item: Adequate restocking of Regeneration Cuttings
2. Unit of Measure: Acres
3. Purpose: Ensure adequate restocking of regenerated stands through natural regeneration.
4. Expected Future Condition: Adequately stocked seedling or sapling stand following removal cutting.
5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the number of inadequately stocked acres exceeds 30 percent of the stand area it is evaluated by the forest interdisciplinary team.

Timber 6

1. Item: Adequate Restocking of Planted Areas.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Adequately stocked seedling stands.

5. Method of Monitoring: Timber Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the number of treated acres that are inadequately stocked five years following planting exceeds 30 percent of the stand area it is evaluated by the forest interdisciplinary team.

Timber 7

1. Item: Review maximum size limits for harvest areas to determine whether prescribed size limits should be continued.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Wildlife habitat is improved through timber harvest by manipulation of stand sizes, methods of cut, and juxtaposition of stands, both spatially and temporally.
5. Method of Monitoring: A sampling of openings will be checked to see if reason exists to change the size of stands prescribed. ID team review of 10 percent of the openings created per year.
6. Frequency: Annually
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the stand size limits vary by plus or minus 25 percent at the five year interval is evaluated by the forest interdisciplinary team.

Timber 8

1. Item: Net Sawtimber Sold and Harvested.
2. Unit of Measure: MBF
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Provide for dependent industry.
5. Method of Monitoring: Timber Management Information System and Sales Tracking and Reporting System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 9

1. Item: Pinyon-Juniper Fuelwood Sold and Harvested.
2. Unit of Measure: MBF
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Provide fuelwood on sustained yield basis and ensure economic efficiency of management practices.
5. Method of Monitoring: Timber Management Information System, Automated Timber Sale Accounting, Sales Tracking and Reporting System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Timber 10

1. Item: Evaluation of Unsuitable Timberlands
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Review of unsuitable timber lands, and lands not appropriate for timber harvest, to improve definitions of unsuitable timber lands for use in forest planning.
5. Method of Monitoring: Resource Management Information Systems and ID team annual field review of 20 percent of the stands examined.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: Review and evaluate all lands classified as not suitable in the forest plan; based on economic, technologic, and biologic criteria reclassify all not suitable as either not suitable or as tentatively suitable for the next round of forest planning. This evaluation is done on an annual basis.

Protection 1

1. Item: Determine that destructive insects and disease organisms do not increase to unacceptable levels following management activities.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and Federal regulation.
4. Expected Future Condition: Through various silvicultural activities, slash treatment and various control methods, insect and disease problems are not expected to have serious adverse effects in timber stands. Monitoring of insect and disease levels will provide information necessary to determine future impacts.
5. Method of Monitoring: Periodic aerial surveys, ID team review of 5 percent of the stands: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually
7. Precision and Reliability: +- 40 percent / +- 30 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: Data will be evaluated to determine if the buildup results from a management practice. If a buildup occurs, an evaluation of significance is made by the ID team.

Range 1

1. Item: Wild Burro Population.
2. Unit of Measure: Number of animals
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Herd size will be maintained within capacity (not less than 22 and not to exceed 35)
5. Method of Monitoring: Range Management Information System and ID team review of burro census.
6. Frequency: Annually.
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Range 2

1. Item: Permitted Grazing Use and Grazing Capacity.
2. Unit of Measure: AUM
3. Purpose: Forest issue, concern, or development opportunity; measure of

prescription and effects; and federal regulation.
4. Expected Future Condition: Permitted grazing use and grazing capacity are brought into equality on allotment basis by the tenth year.
5. Method of Monitoring: Range management Information System and ID team review and evaluation of range allotment analysis data.
6. Frequency: Annually following range allotment analysis.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: Provide for equality of permitted use and grazing capacity by allotment in the next planning cycle.

Range 3
1. Item: Range Structural Improvements.
2. Unit of Measure: Number of Structures
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Increased grazing capacity through better utilization of range resources.
5. Method of Monitoring: Range Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the structures: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Range 4
1. Item: Range Non-structural Retreatments.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintenance of existing grazing capacity through maintains of range forage resources.
5. Method of Monitoring: Range Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the areas: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 1
1. Item: Public Sector Developed Recreation Use.
2. Unit of Measure: RVD
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Demand for public sector recreation facilities is partially satisfied.
5. Method of Monitoring: Recreation Information Management System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 2

1. Item: Private Sector Developed Recreation Use.
2. Unit of Measure: RVD
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Demand for private sector recreation facilities is satisfied.
5. Method of Monitoring: Recreation Information Management System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 3

1. Item: Operation and Maintenance of Public Sector Developed Recreation Sites.
2. Unit of Measure: PAOT-DAY
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Well maintained facilities and optimal use of site capacity.
5. Method of Monitoring: Recreation Information Management System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the desired management service level is not achieved plus or minus 20 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 4

1. Item: Private Sector Developed Recreation Site Construction.
2. Unit of Measure: PAOT
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Recreation site capacity expanded in accordance with plan projections.
5. Method of Monitoring: Recreation Information Management System and ID Team review of one project.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 5

1. Item: Dispersed Recreation Site Investments.
2. Unit of Measure: PAOT
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Dispersed recreation sites constructed in accordance with plan projections.
5. Method of Monitoring: Recreation Information Recreation System and ID Team review of one project.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Recreation 6

1. Item: Wildlife and Fish Recreation Use.
2. Unit of Measure: WFUD

3. Purpose: Forest issue, concern, or development opportunity; and federal regulation.
4. Method of Monitoring: Recreation Information Recreation System and information system of the Arizona Game and Fish Department.
5. Frequency: Annually.
6. Precision and Reliability: +- 10 percent / +- 10 percent.
7. Time for Reporting: fifth and tenth years.
8. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Heritage Resources 1

1. Item: Protection of Heritage Resource Properties.
2. Unit of Measure: Properties
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Protection of heritage resource properties during ground disturbing activities; elimination of heritage resource site vandalism.
5. Method of Monitoring: Heritage Resource clearance reports and ID Team review of 10 percent of identified sites at completion of project.
6. Frequency: Annually.
7. Precision and Reliability: No variance allowed.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: Site marking, monitoring and protection measures will be evaluated by the forest interdisciplinary team upon detection of any inadvertent site damage or site vandalism.

Heritage Resources 2

1. Item: Evaluation of Heritage Resource Properties.
2. Unit of Measure: Properties
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Eventual disposition of heritage resource sites.
5. Method of Monitoring: Number of heritage resource site evaluations; target accomplishment of two evaluations per year for each professional archeologist employed on a full time basis, or one thematic or multiple property nomination per year.
6. Frequency: Annually.
7. Precision and Reliability: Not applicable.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of site evaluations varies by plus or minus 25 percent at the five year interval, site selection and target accomplishments are evaluated by the forest interdisciplinary team.

Heritage Resources 3

1. Item: Heritage Resource Inventory of Non-Project Related Areas.

2 Unit of Measure: Acres

3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Eventual identification of all heritage resource properties.
5. Method of Monitoring: Acres of non-project related heritage resource survey; target accomplishment of 75 acres per year for each para-professional archeologist employed by the Forest.
6. Frequency: Annually.
7. Precision and Reliability: Not applicable.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval, area selection and target accomplishments are evaluated by the forest interdisciplinary team.

Wilderness

1. Item: Wilderness Use.
2. Unit of Measure: RVD
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Use and management of classified wilderness areas within capacity constraints and within limits of acceptable change parameters established for each area in each Wilderness Opportunity Spectrum (WOS) class (NZ) or Recreation Opportunity Spectrum (ROS) Class (SZ).
5. Method of Monitoring: Recreation Information Management and Limits of Acceptable Change systems, and ID Team review of one classified wilderness area annually.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval, or if a decline in the WOS classification is detected, wilderness management systems will be evaluated by the forest interdisciplinary team.

Visual Resources (NZ) and Scenery Management (SZ)

1. Item: Effects of Resource Management Practices on Visual Quality (NZ) and Scenic Integrity (SZ).
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintenance or enhancement of visual diversity in visually sensitive road corridors (NZ) and Scenic Integrity (SZ)
5. Method of Monitoring: ID team review of stands or areas: (1) proposed for treatment, (2) in treatment, and (3) treated within past 3 to 8 years within one road corridor identified as visually sensitive (NZ) and past 5 years (SZ).
6. Frequency: Annually (NZ) and annually or as needed (SZ).
7. Precision and Reliability: Not applicable.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: NZ - If resource management practices are not expected to achieve visual quality objectives related to visual diversity, age class distribution and slash disposal, visual constraints applied to management practices is evaluated by the forest interdisciplinary team.

SZ - If resource management practices meet the project-level timeline and progress toward desired conditions. Slash and other implementation effects were adequately mitigated and area meets Scenic Integrity Objective.

Soil

1. Item: Unsatisfactory Watershed Condition.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Improved watershed conditions through reduction in the amount of watershed in unsatisfactory condition.
5. Method of Monitoring: Soil and Watershed Management Information System and ID Team review of 5 percent of the soil resource improvement projects: (1) proposed for

treatment, (2) in treatment, and (3) treated within the past 3 to 8 years.

6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Land Management Planning

Item: Resource Information Management Systems and Resource Inventory and Data Collection Systems for Timber; Range, Soil and Water; Recreation, Wilderness, and Heritage Resources; Transportation and Facilities; Wildlife and Fish Habitat; Forest Protection (fire, fuels, and pests);

[Continued on next page.]

[Continued on next page.]

Geometronics; Minerals; Landownership; and Cost Accounting.
2. Unit of Measure: Not applicable
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Resource inventory information, cost information, maps, aerial photographs and other imagery, and other resource management information is of the kind, accuracy, and precision to be easily accessible, usable, and retrievable for long-range strategic planning and short-range operational planning.
5. Method of Monitoring: Annual review and use of these information systems by the forest interdisciplinary team.
6. Frequency: Annually.
7. Precision and Reliability: Not applicable
8. Time for Reporting: fifth and tenth years.
9. Evaluation: Forest ID team annually monitors and reviews the products of all resource inventory and information systems with evaluations of all systems in the fourth and eight years.

Wildlife 1

1. Item: Wildlife and Fish Non-structural Habitat Improvements.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Increased habitat capacity through more and better forage and cover.
5. Method of Monitoring: Wildlife and Fish Management Information System and forest interdisciplinary team review and evaluation of 5 percent of the areas: (1) proposed for treatment, (2) in treatment, and (3) treated within the past 3 to 6 years.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Wildlife 2

1. Item: Wildlife and Fish Structural Habitat Improvements.
2. Unit of Measure: Number of Structures
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Increased habitat capacity through the development of structural improvements.
5. Method of Monitoring: Wildlife and Fish Management Information System and ID Team review of 5 percent of the structural habitat improvement projects: (1) proposed for treatment, (2) in treatment, and (3) treated within past 3 to 6 years.
6. Frequency: Annually.7. Precision and Reliability: +- 10 percent / +- 10 percent.
8. Time for Reporting: fifth and tenth years.
9. Evaluation: If the quantity of actual output or treatment varies by plus or minus 25 percent at the five year interval it is evaluated by the forest interdisciplinary team.

Wildlife 3

1. Item: Goshawk and Spotted Owl - amount of old growth habitat
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Applied management achieves desired stand

characteristics for old-growth and indicator species so they do not significantly decline.
5. Method of Monitoring: Old-growth inventory, compartment exams and habitat capability modeling.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Any 10,000 acre block without 15 percent of the capable forested land meeting old-growth conditions or being managed to display old growth characteristics.

Wildlife 4
1. Item: Goshawk and Spotted Owl - nest location, occupancy, and productivity.
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain population and habitat effectiveness.
5. Method of Monitoring: Follow-up on known nests, project reconnaissance.
6. Frequency: Annual (spring and early summer)
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 15 percent drop in nesting numbers over 10-year period.

Wildlife 5
1. Item: Pygmy Nuthatch - amount of old growth habitat.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Applied management achieves desired stand characteristics for old-growth and indicator species so they do not significantly decrease.
5. Method of Monitoring: Old-growth inventory, compartment exams and habitat compatibility modeling
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Any 10,000 acre block without 15 percent of the capable forested land meeting old-growth conditions or being managed to display old growth characteristics.

Wildlife 6
1. Item: Pygmy Nuthatch - snag densities and sizes (existing and future)
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Snag inventories and project reconnaissance
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed snag densities and sizes and recruitment trees not met on at least 50 percent of the area evaluated over 5-year period

Wildlife 7
1. Item: Turkey - roost density
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness

5. Method of Monitoring: Project reconnaissance
6. Frequency: Annually on 90 percent of affected projects.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed roost densities not met on at least 50 percent of area evaluated over 5-year period.

Wildlife 8

1. Item: Turkey - population trend
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet population goal.
5. Method of Monitoring: Arizona Game and Fish Department surveys.
6. Frequency: Annual
7. Precision and Reliability: +- 25 percent / +- 25 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Comprehensive Plan goal not met, 25 percent decrease in population over 5-year period. Evaluated over 5-year period.

Wildlife 9

1. Item: Red Squirrel - amount of suitable habitat
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Project reconnaissance and habitat capability modeling.
6. Frequency: Annually on 90 percent of affected projects
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed habitat capability levels are not met on at least 50 percent of area.

Wildlife 10

1. Item: Elk and Mule Deer - amount of hiding and thermal cover
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Project reconnaissance and habitat capability modeling.
6. Frequency: Annually on 90 percent of affected projects
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed levels of cover are not met on at least 75 percent of area evaluated over 5-year period.

Wildlife 11

1. Item: Elk and deer - reproductive and key area parameters
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Project reconnaissance.
6. Frequency: Annually on 90 percent of affected projects
7. Precision and Reliability: +-10 percent / +-10 percent.

8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed standards are not met, new areas or habitat components are determined to be important.

Wildlife 12

1. Item: Elk and deer - browse and forage use and age class structure of browse.
2. Unit of Measure: Acres.
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness.
5. Method of Monitoring: Field surveys, production-utilization surveys, browse transects.
6. Frequency: Annually in spring and 9-13 years on each allotment.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Exceeds established standards of use.

Wildlife 13

1. Item: Elk and Mule Deer - population trends and distribution.
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet population goal.
5. Method of Monitoring: Arizona Game and Fish Department surveys.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Comprehensive Plan goals not met by -5 percent for elk, by -5 percent for deer.

Wildlife 14

1. Item: Tassel-eared Squirrel - amount of suitable habitat
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Project reconnaissance and habitat capability modeling.
6. Frequency: Annually on 90 percent of affected projects.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed habitat capability levels are not met on at least 50% of area.

Wildlife 15

1. Item: Tassel-eared Squirrel - population trend
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet population goal
5. Method of Monitoring: Arizona Game and Fish Department surveys.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Comprehensive plan goals not met by -5 percent

Wildlife 16

1. Item: Hairy Woodpecker and Yellow-Bellied sapsucker - snag densities, sizes, and species (existing and future).
2. Unit of Measure: Acres

3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Snag inventories, project reconnaissance and habitat capability modeling.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: When prescribed snag densities and sizes and recruitment trees are not met on at least 50 percent of area evaluated over 5-year period.

Wildlife 17

1. Item: Plain Titmouse - amount of old growth habitat.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Old-growth surveys, stand exams and habitat capability modeling.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Any 10,000 acre block without 15 percent of the capable forested land meeting old-growth conditions or managed to display old growth characteristics

Wildlife 18

1. Item: Plain Titmouse - snag densities and sizes
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Snag inventories and project reconnaissance
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Prescribed snag densities and recruitment trees are not met on at least 50 percent of area evaluated over 5-year period.

Wildlife 19

1. Item: Antelope - forage use.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Field surveys, production-utilization surveys, habitat capability modeling.
6. Frequency: 9-13 years on each allotment and annually.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 20 percent decrease in available forage from most recent study.

Wildlife 20

1. Item: Antelope - population trends
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet population goal
5. Method of Monitoring: Arizona Game and Fish Department surveys.

6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Comprehensive plan goals not met by -5 percent

Wildlife 21
1. Item: Cinnamon Teal - amount of suitable nesting habitat.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Field surveys (height density method).
6. Frequency: Every 5 years on selected wetlands.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 10 percent decrease in habitat from previous 5 years.

Wildlife 22
1. Item: Cinnamon Teal - nesting success.
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet population goal
5. Method of Monitoring: Systematic field sampling.
6. Frequency: Every 5 years on selected wetlands.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 10 percent decrease from previous 5 years.

Wildlife 23
1. Item: Riparian Areas - habitat condition.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Forest related issues.
5. Method of Monitoring: Systematic field sampling.
6. Frequency: 20 percent of riparian acres annually.
7. Precision and Reliability: +- 5 percent / +- 5 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 10 percent of acres decrease in condition ratings.

Wildlife 24
1. Item: Riparian Indicator Species - (Lincoln's Sparrow and Yellow-breasted chat) - population trends.
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Forest Issue related.
5. Method of Monitoring: Systematic field sampling and habitat capability modeling.
6. Frequency: Every 5 years on selected sites.
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 10 percent decrease on estimated numbers from previous years.

Wildlife 25
1. Item: Aquatic Macroinvertebrates - Species diversity and biomass
2. Unit of Measure: Biotic Condition Index (BCI)

3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Maintain habitat effectiveness
5. Method of Monitoring: Systematic field sampling (modified surber sampling).
6. Frequency: Every 2 years on streams.
7. Precision and Reliability: +- 5 percent / +- 5 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: Dominance and Taxa Diversity Index (DAT) falls below 11 (Good) BCI index falls below 80 (Good)

Wildlife 26

1. Item: Threatened and Endangered Species - amount of suitable habitat.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet Federal regulations.
5. Method of Monitoring: Field surveys.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 5 percent decline in local populations

Wildlife 27

1. Item: Threatened and Endangered Species - population trends.
2. Unit of Measure: Numbers
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet Federal regulations.
5. Method of Monitoring: Field surveys, U.S. Fish and Wildlife Service surveys.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 5 percent decline in local populations

Wildlife 28

1. Item: Sensitive Species - amount of suitable habitat and population trends.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Manage at appropriate levels to prevent listing species as threatened or endangered.
5. Method of Monitoring: Field surveys.
6. Frequency: Annual
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years
9. Evaluation: 10 percent decrease in local populations.

Wildlife 29

1. Item: Diversity - successional stages of major vegetation types.
2. Unit of Measure: Acres
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: Meet Federal regulations
5. Method of Monitoring: Field surveys, Forest Habitat Capability Model, timber inventory.
6. Frequency: 5 years - Forest wide
7. Precision and Reliability: +-10 percent / +-10 percent.
8. Time for Reporting: fifth and tenth years

9. Evaluation: 15 percent change from predicted levels.

Facilities

1. Item: Forest transportation system.
2. Unit of Measure: Miles of local roads closed and obliterated.
3. Purpose: Forest issue, concern, or development opportunity; measure of prescription and effects; and federal regulation.
4. Expected Future Condition: There are currently 6,691 miles of road in the Forest. This includes constructed roads and "two-track" travelways. Travelways, in many instances, involve resource damage, are unneeded for management or area access, and contribute to excessive road density. In the first period, 766 miles of road is scheduled for obliteration and 813 miles is scheduled for closure. Similar reductions are scheduled for the second period. This decreases road density and contributes to a more efficient transportation system.
5. Method of Monitoring: National Forest Transportation Information System.
6. Frequency: Annually.
7. Precision and Reliability: +- 10 percent and +- 10 percent.
8. Time for Reporting: Third, sixth, and ninth years.
9. Evaluation: Evaluation at 3-year intervals indicates the effectiveness of road and trail management. Change in system size that exceed +- 25 percent of planned levels requires evaluation by the ID Team.

Glossary

ACRE-EQUIVALENT A unit of habitat output related to fish or wildlife habitat improvement projects. Acre equivalents are based on the acres of habitat that are influenced by an acre of habitat actually modified by the project. For example, an acre of winter range burned is credited with influencing five acres of summer range.

ACRE-FOOT A water volume measurement equal to the amount of water that would cover one acre to a depth of one foot (43,560 cubic feet or 325,851 gallons).

ACTIVITY FUELS Woody debris generated from any activity on the Forest such as fuelwood gathering, precommercial thinning, timber harvesting, and road construction, which increases fire potential.

ADMINISTRATIVE SITE A site which primarily exists for general administrative purposes. It normally will include office, warehouse, outside storage, and parking areas. It may include housing and pasture for livestock. A work center may be part of an administrative headquarters site.

AFFECTED ENVIRONMENT The biological, physical, social, and economic environment subject to changes that will or may take place, as a result of proposed human activity.

AGE CLASS Interval of years, commonly twenty, into which trees are grouped for management. Example: 1 to 20 years, 21 to 40 years.

ALIENATED MINERAL RIGHTS Ownership of the mineral rights is by someone other than the surface rights owner.

ALLOCATION The assignment of management prescriptions to particular land areas to achieve the goals and objectives of an alternative.

ALLOWABLE SALE QUANTITY (ASQ) The quantity of timber that may be sold from the area of land covered by the Forest Plan for a time period specified by the plan. The quantity is usually expressed on an annual basis as the average annual allowable sale quantity.

ALTERNATIVE A proposition or situation offering a choice between two or more management methods, only one of which may be chosen.

AMENITY The pleasurable, educational, or aesthetic features of the land or resources.

ANALYSIS AREA One or more sites combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects.

ANALYSIS OF MANAGEMENT SITUATION (AMS) A determination of the ability of the planning area to supply goods and services in response to society's demand for those goods and services.

ANIMAL MONTH (AM) One animal grazing for one month.

ANIMAL UNIT MONTH (AUM) The quantity of forage required by one mature cow (1,000 pounds) or the equivalent for one month.

AQUATIC Pertaining to standing and running water in streams, rivers, lakes, and reservoirs.

ARTERIAL ROADS Roads that provide service to large land areas and usually connect with public highways or other Forest arterial roads to form an integrated network of primary travel for maximum mobility and travel efficiency, rather than specific resource-management service. They are usually developed and operated for long-term land and resource management purposes and constant service.

ARTIFACT An object that has been modified, used, or constructed by man. Stone tools, pottery, buildings, roads, and mines are examples of artifacts.

ASSESSMENT The Renewable Resource Assessment required by the Resources Planning Act (RPA).

AUM See "Animal Unit Month."

AVAILABLE FOREST LAND Land which has not been legislatively withdrawn by Congress or administratively withdrawn by the Secretary of Agriculture or Forest Service Chief from timber production.

B/C VALUES See "Benefit/Cost Ratio."

BACKGROUND (VISUAL DISTANCE ZONE) The distant part of a landscape; surroundings, especially those behind something, and providing harmony and contrast; area located from three to five miles to infinity from the viewer.

BASAL AREA Measurement of how much of a site is occupied by trees. It is determined by measuring the square feet of the cross-section of all the trees per acre at breast height (4.5 feet).

BASE TIMBER HARVEST SCHEDULE The timber harvest schedule in which the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade of the planning period, and this planned sale and harvest for any decade is not greater than long-term sustained yield capacity. (36 CFR 219.3[c] NFMA Regulations)

BENCHMARK A category of Forest Planning alternatives used to establish standards by which to compare alternatives considered in detail. Benchmark alternatives include minimum level, minimum acceptable level, maximum resource levels, and maximum present net value levels.

BENEFIT/COST RATIO The total discounted benefits of any activity divided by the total discounted costs.

BIG GAME The larger species of wild animals that are hunted, such as elk, deer, bighorn sheep.

BIOLOGICAL POTENTIAL The maximum production of a selected organism that can be attained under optimum management.

BLM Bureau of Land Management.

BOARD FOOT Measure of an amount of lumber equivalent to a piece 12" x 12" x 1". The boards bought at a lumber store are somewhat smaller because they have been planed smooth.

BOARD FOOT/CUBIC FOOT CONVERSION RATIO Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree

species, diameter, height, and form factors.

BROWSE Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are utilized by big game animals or domestic livestock for food.

BUFFER-FILTER STRIP A designated land or water area, along the perimeter of some land use, where activities are regulated so as to prevent unwanted effects into areas beyond the buffer.

CABLE LOGGING A method for transporting logs from stumps to collecting points which utilizes a cable system as the main device for moving them.

CANOPY The more or less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth.

CAPABILITY The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fires, insects, and disease.

CAPABILITY AREA An area of land delineated for the purpose of estimating responses to various management practices, resource values, output coefficients, and multi-resource or joint production functions. Capability areas may be synonymous with ecological land units, ecosystems, or land response units. Capability areas are the single geographic delineations used to describe characteristics of the land and resources in integrated forest planning.

CAPABLE FOREST LAND Land with a biological growth potential which is equal to or exceeds the minimum standard for timber production (an average annual growth rate of at least twenty cu. ft. per acre).

CAPABLE RANGE Land that can produce forage for animal consumption without impairing other forage values; generally considered as land that is not being cultivated.

CARRYING CAPACITY The optimum density of a species which a given environment or range is capable of sustaining, without deteriorating that environment or range.

CAVITY The hollow excavated in trees by birds or other natural phenomena; used for roosting and reproduction by many birds and mammals.

CEQ Council on Environmental Quality.

CFR Code of Federal Regulations.

CHAIN A Chainlike measuring instrument, or its measure of length: a surveyor's chain, commonly used in the Forest Service, is 66 feet long.

CHEMICAL WATER QUALITY Measurements of chemical parameters (alkalinity, dissolved oxygen, dissolved iron, etc.) used to describe the quality of water.

CLEARCUTTING Harvesting of all trees in one cut on an area for the purpose of creating a new, even-aged stand. The area harvested

may be a patch, stand, or strip large enough to be mapped or recorded as a separate age class in planning. Regeneration is obtained through natural seeding, or through planting or direct seeding.

COLLECTOR ROADS Roads that serve smaller land areas and are usually connected to Forest arterial roads or public highways. They collect traffic from local roads and terminal facilities. Collector roads are operated for constant use.

COMMERCIAL FOREST LAND (CFL) Forest land which is producing or capable of producing crops of industrial wood and which has not been reserved or deferred from entry. This includes areas suitable for management to grow crops of industrial wood generally of a site quality capable of producing in excess of twenty cubic feet per acre of annual growth. This includes both accessible and inaccessible areas. Permanently inoperable or non-stockable areas are excluded because they are not suitable for silvicultural management. Conversely, non-stocked areas which could be stocked and otherwise meet this definition are included.

COMMERCIAL THINNING Cutting for the sale of products (poles, posts, pulpwood, etc.) in immature stands to improve the quality and growth of the remaining stand.

COMMODITY OUTPUTS A resource output with commercial value; all resource products which are articles of commerce.

COMMON VARIETY MINERALS See minerals, common variety.

COMMUNITY LIFE-STYLES The ways in which residents conduct their everyday routines and how the "way they live" is associated with National Forest.

CONCERN See management concern.

CONCESSION PERMIT A permit which authorizes private individuals or corporations to operate a facility on National Forest Land as a commercial profit-making venture.

CONDEMNATION In real property law, the process by which property of a private owner is taken for public use, without his consent, but requiring payment of just compensation.

CONIFER A group of cone bearing trees, mostly evergreen, such as the pine, spruce, fir, pinyon, juniper, etc.

CONSTRAINED MAXIMUM LEVEL BENCHMARK The highest level of a particular output that could be produced over time, subject to the production of minimum acceptable levels for all other outputs.

CONSTRAINT A quantification of the minimum or maximum amount of an output or cost that could be produced or incurred in a given time period.

CONSUMPTIVE USE Those uses of a resource that reduce the supply. For example, some consumptive uses of water are: irrigation, domestic, and industrial use.

CORD A unit of gross volume measurement for stacked round or split wood. A standard cord is 4' x 4' x 8' or 128 cubic feet. A standard cord may contain sixty to one hundred cubic feet of solid wood depending on the size of the pieces and the compactness of the stack.

CORRIDOR A linear strip of land which has ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility routes.

COST COEFFICIENTS Values which relate an acre of land to a particular dollar cost in a specific period of time.

COST EFFICIENCY A comparative measure of economic efficiency determined by maximizing the present net value of an alternative, subject to meeting the objectives of the alternative.

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies and advises the President on environmental matters.

COVER/FORAGE RATIO The ratio of cover (usually conifer types) to foraging areas (natural openings, clearcuts, etc.).

CRITICAL HABITAT That portion of a wild animal's habitat that is critical for the continued survival of the species. Under Endangered Species Act, specific area designated for that species that is essential to survival of the species and which may require special management or protection.

CULMINATION OF MEAN ANNUAL INCREMENT (CMAI) Point in the age of a forest stand in which the mean annual growth increment no longer increases.

DBH Diameter at breast height. Diameter of a tree approximately 4 1/2 feet above the ground.

DEMAND TRENDS The expected future need or desire for outputs, services, and uses.

DEPARTURE A timber harvest schedule which deviates from the principle of non-declining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future. A departure can be characterized as a temporary increase, usually in the beginning decade(s) of the planning period, over the base sale schedule that would otherwise be established, without impairing the future attainment of the Forest's long-term sustained yield capacity.

DEVELOPED RECREATION Recreation that requires facilities that result in concentrated use of an area. Examples are campgrounds and ski areas. Facilities might include: Roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings.

DIRECTIONAL DRILLING The art of drilling a borehole wherein the course of the hole is planned before drilling. Such holes are usually drilled with rotary equipment at an angle to the vertical, and are useful in avoiding obstacles or reaching side areas.

DISPERSED RECREATION Outdoor recreation which occurs on areas which are not developed for intensive recreation use. Dispersed areas include general undeveloped areas, roads, trails, and water areas not treated as developed sites.

DIVERSITY The relative degree of abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

EA Environmental Assessment.

EARLY FOREST SUCCESSION The biotic community that develops immediately following the removal or destruction of the vegetation in an area.

ECONOMIC EFFICIENCY ANALYSIS A comparison of the values of resource inputs (cost) required for a possible course of action with the values of resource outputs (benefits) resulting from such action. In this analysis, incremental market and non-market benefits are compared with investment and physical resource inputs.

ECONOMICS The study of how resources, goods, and services are allocated among competing uses.

ECOSYSTEM The system formed by the interaction of a group of organisms and their environment.

EDGE The place where different plant communities , successional stages or vegetative conditions border upon each other.

EFFECTS Results expected to be achieved relating to the physical, biological, and social (cultural and economic) factors resulting from a land use or activity. Examples of effects are tons of sediment, pounds of forage, person-years of employment, income, etc. There are direct effects, indirect effects, and cumulative effects.

ENDANGERED SPECIES Any species which is in danger of extinction throughout all or a significant portion of its range.

ENDEMIC Native or confined to a certain region; having a comparatively restricted distribution.

ENVIRONMENTAL ANALYSIS An analysis of alternative actions and their predictable short- and long-term environmental effects which include physical, biological, economic, social, and environmental design factors and their interactions.

ENVIRONMENTAL ASSESSMENT The concise public document required by the regulations for implementing the procedural requirements of NEPA (40 CFR 1508.9).

ENVIRONMENTAL IMPACT STATEMENT (EIS) The version of the statement of Environmental Effects required for major Federal actions under Section 102 of the National Environmental Policy Act (NEPA), and released to the public and other agencies for comment and review. It is a formal document which must follow the requirements of NEPA, the Council on environmental Quality (CEQ) guidelines, and directives of the agency responsible for the project proposal.

EROSION The wearing away of the land's surface by running water, wind, ice, or other geological agents. It includes detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

ESCAPED WILDLAND FIRE See Wildland Fire.

EVAPOTRANSPIRATION The conversion of water, whether open, as soil moisture, or within plants, into water vapor that is released into the atmosphere.

EVEN-AGED SILVICULTURE The combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore tree sizes) throughout the forest area. Regeneration

in a particular stand is obtained during a short period at or near the time that the stand has reached the desired age or size and is harvested. Clearcutting, shelterwood cutting, seed tree cutting, and their many variations are the cutting methods used to harvest the existing stand and regenerate a new one. In even-aged stands, thinnings, weedings, cleanings, and other cultural treatments between regeneration cuts are often beneficial. Cutting is normally regulated by scheduling the area of harvest cutting to provide for a forest that contains stands having a planned distribution of age classes. (36 CFR 211.3[k] NFMA Regulations.)

EVEN-FLOW Maintaining a relatively constant output of timber from decade to decade.

EXPERIENCE LEVELS The range of opportunities for satisfying basic recreation needs of people. A scale of five experience levels ranging from "primitive" to "modern" is defined for the National Forest System.

EXTENSIVE GRAZING Season-long use of rangelands, with distribution of livestock occurring through riding, salting, etc., instead of pasture rotation.

EYRIE The nesting site of a bird of prey, as an eagle or a hawk.

FACILITY CONDITION CLASS The rating system used in the Recreation Information Management system to classify the condition and maintenance needs of recreation sites and areas.

FAUNA The animals of a given region or period.

FEE SITE A Forest Service recreation area in which users must pay a fee. Fee sites must meet certain standards and provide certain facilities as specified in the Forest Service Manual.

FINAL CUT Removal of the last seed bearers or shelter trees after regeneration is considered to be established under a shelterwood system.

FIRE HAZARD The fuel in which a fire will ignite and burn.

FIRE MANAGEMENT AREA One or more parcels of land with clearly defined boundaries and with established fire management direction which is responsive to land and resource management goals and objectives.

FIRE MANAGEMENT/EFFECTIVENESS INDEX (FMEI) The index value measures effectiveness of annual fire management operational programs. It is a planning, attainment, analysis, and evaluation tool for both annual and long-term programs. Measured in dollars per thousand acres protected, the objective is to minimize the index value.

FIRE RISK The probability of a fire starting from natural or man-made causes.

FIRE USE The combination of wildland fire use and prescribed fire application to meet resource objectives.

FISHERIES HABITAT Streams, lakes, and reservoirs that contain and support fish.

FLOOD PLAIN Land adjacent to a channel which is covered with water when the stream overflows its banks.

FLOODPLAIN Low land and relatively flat areas joining inland and coastal waters, including debris cones and flood prone areas of offshore islands. The minimum

area included is that subject to a one percent (100-year recurrence) or greater change of flooding in any given year.

FLORA The plants of a given region or period.

FORAGE All non-woody plants (grass, grass-like plants and forbs) and portions of woody plants (browse) available to domestic livestock and wildlife for food. Only a portion of a plant is available for forage if the plant is to remain healthy.

FORAGE AND HERBAGE Forage refers specifically to all browse and non-woody plants that are available to livestock or game animals and used for grazing or harvested for feeding. Herbage may also include material not acceptable to grazing or browsing animals.

FORAGE UTILIZATION (1) The portion of current year's forage production by weight that is consumed or destroyed by grazing animals. Syn., degree of use. Expressed in percent of current year's growth utilized by grazing animals on an average over time based on a system of range management that will maintain the key forage species while achieving other management objectives such as the maintenance of watersheds, wildlife habitat, and recreational values and the protection of regenerating plants. (2) The percent expressed in the "Prescriptions for Management Areas" is the estimated average forage utilization allowable to meet the objectives of that prescription under sustained-yield management.

FORB Any herbaceous plant other than grass or grass-like plants.

FOREGROUND (VISUAL DISTANCE ZONE) The part of a scene, landscape, etc., which is nearest to the viewer, and in which detail is evident, usually one-half to one-quarter mile from the viewer.

FOREST AND RANGELAND RENEWABLE RESOURCES PLANNING ACT OF 1974 A Act of Congress requiring the preparation of a program for the management of the National Forests' renewable resources, and of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National System lands and renewable resources.

FOREST LAND Land at least ten percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for non-forest use.

(FOREST LAND) CAPABLE Forest land which is capable of growing industrial crops of wood at or above the minimum biological growth established by the Regional plan. The classification includes both accessible and inaccessible, stocked and non-stocked land.

(FOREST LAND) CAPABLE AND AVAILABLE Capable forest land which has not been legislatively withdrawn or administratively withdrawn from timber production by the Secretary or the Chief of the Forest Service.

(FOREST LAND) CAPABLE BUT NOT AVAILABLE Capable forest land which has been legislatively withdrawn or administratively withdrawn from timber production by the Secretary or Chief of the Forest Service. Capable but not available forest land is classed as not suited for timber production.

(FOREST LAND) CAPABLE-RESERVED Capable forest land which has been legislatively withdrawn or administratively withdrawn from timber production on a permanent basis. Examples of this classification are: Wilderness Areas, Primitive Areas, Research Natural Areas, or special interest areas, or similar formal withdrawals approved by the Chief or higher authority.

(FOREST LAND) NOT CAPABLE Forest land which is not capable of growing industrial crops of wood at least at the minimum biological growth potential of twenty cubic feet per acre annually as established in the Regional plan. Forest land not capable is classed as land not suited for timber production.

FOREST PLAN A process, required by Law, for assessing economic, social, and environmental impacts, which describes how land and resources will provide for multiple use and sustained yield of goods and services.

FOREST SUPERVISOR The official responsible for administering the National Forest System lands in a Forest Service Administrative unit, which may consist of one or more National Forests or all the Forests within a State. This person reports to the Regional Forester.

FOREST SYSTEM ROAD Roads that are part of the Forest development transportation system, which includes all existing and planned roads, as development transportation facilities.

FOREST-WIDE STANDARD A principle requiring a specific level of attainment, a rule to measure against. The Forest-wide standard applies to all areas of the Forest regardless of the other prescriptions applied.

FORPLAN A linear programming model used for developing and analyzing Forest planning alternatives.

FSH Forest Service Handbook.

FSM Forest Service Manual.

FUEL BREAK A zone in which fuel quantity has been reduced or altered to provide a position for suppression forces to make a stand against wildfire. Fuel breaks are designated or constructed before the outbreak of a fire. Fuel breaks may consist of one or a combination of the following: natural barriers, constructed fuelbreaks, man-made barriers.

FUEL MODEL A simulated fuel complex for which all the fuel descriptions required by the mathematical fire spread model have been specified.

FUELS Materials, including both living plants and dead, woody, vegetative materials, which are capable of burning.

FUELS MANAGEMENT Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.

FUELWOOD Wood that is round, split or sawed, and cut into short lengths for burning. Also known as firewood.

FULL SERVICE MANAGEMENT Management of developed recreation facilities to provide optimum maintenance and enhance visitor experience.

GAME SPECIES Any species of wildlife or fish for which seasons and bag limits have been prescribed, and which are normally harvested by hunters, trappers, and fishermen under State or Federal laws, codes, and regulations.

GAUGING STATIONS Continuous streamflow measuring station.

GOAL A concise statement of the state or condition that a land and resource management plan is designed to achieve. A goal is usually not quantifiable and may not have a specific date for completion. (36 CFR 219.2[1])

GOODS AND SERVICES The various outputs produced by forest and range land renewable resources, the tangible and intangible values of which are expressed in market and non-market terms.

GRAZING CAPACITY The maximum level at which animals can graze an area without damage to the vegetation or related resources.

GRAZING PERMITTEE An individual who has been granted written permission to graze livestock for a specific period on a range allotment.

GROUNDWATER Subsurface water in a saturated zone or geologic stratum.

GROUP SELECTION CUTTING Involves the removal of small groups of trees to meet a predetermined goal of age distribution and species in the remaining stand. The distance across an opening created by removal of a group of trees is usually no more than one to two mature tree heights.

GROWING STOCK LEVEL (GSL) Expressed in either stems per acre or square feet of basal area of timber growing on any area.

GUIDELINE an indication or outline of policy or conduct.

HABITAT The place where animals live. It can be water for beaver, fish, and aquatic insects; rocks for pika, bats, and some species of birds; or forested areas for many mammals, birds; or forested areas for many mammals, birds, and reptiles.

HABITAT CAPABILITY see Carrying Capacity.

HABITAT TYPE An aggregation of all land areas potentially capable of producing similar plant communities at climax.

HARDWOOD A conventional term for the timber of broad-leaved trees, and the trees themselves, belonging to the botanical group, Angiospermae.

HARVEST CUT The removal of a stand of trees as a final cut in even-aged management, or the removal of mature trees in uneven-aged management. Regeneration encouragement is emphasized.

HERBICIDE A chemical compound used to kill or control growth of undesirable plant species.

HERBIVORE An animal that feeds on plant substances.

HERITAGE RESOURCE The physical remains of past human cultural systems and places or sites of importance in human history or prehistory.

HIDING COVER Plants or other objects used by wildlife for concealment. Adequate big game cover is defined as vegetation capable of hiding ninety percent of a standing elk from a viewer at a distance of 200 feet or less.

HORIZONTAL STRUCTURE The arrangement of single age and size classes by stands. Stands representing different age and size classes should be distributed within a forested area.

HYDROLOGIC FUNCTION The ability of a watershed to sustain favorable conditions of streamflow. Favorable conditions of streamflow are measured in terms of water quality, quantity and timing.

IMPLEMENTING REGULATIONS Regulations generated by an agency to implement an Act of Congress, i.e., 36 CFR 219 contains implementing regulations for RPA and NFMA.

IMPROVEMENT Man-made developments such as roads, trails, fences, stock tanks, pipelines, power and telephone lines, survey monuments, and ditches.

IN-HOLDINGS Lands within the proclaimed boundaries of a National Forest that are owned by some other agency, organization, or individual.

INDICATOR SPECIES A wildlife species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Population changes are believed to indicate effects of management activities on a number of other wildlife species.

INDIGENOUS SPECIES Species historically native to an area; not introduced by man.

INSECTICIDE An agent used to control insect populations.

INSTREAM FLOW That streamflow necessary to meet seasonal streamflow requirements for maintaining aquatic ecosystems, visual quality, and recreational opportunities on National Forest lands at acceptable levels.

INTEGRATED PEST MANAGEMENT A management strategy for suppression of forest pests which integrates silvicultural mechanical, biological, and chemical suppression strategies which achieve greater efficiency and safety than the same strategies used alone.

INTEGRATED RESOURCE MANAGEMENT (IRM) Integrated resource management is defined as a land management philosophy which recognizes that all the natural resources are connected through an intricate series of interrelationships.

INTEGRATED STAND MANAGEMENT (ISM) A process used in designing timber sales. It specifies a unique treatment prescription for stands or portions of stands that incorporate management objective s for all resources.

INTENSIVE GRAZING Grazing management that controls distribution of cattle and duration of use on the range, usually by fences, so parts of the range are rested during the growing season. See Livestock Grazing Management Level R-4.

INTERDISCIPLINARY TEAM (ID Team) A group of individuals with differing complementary skills. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team member's interaction provides necessary insight to all stages of the process.

INTERMEDIATE CUTTING Any removal of trees from a stand between the time of its

formation and the regeneration cut. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage.

INTERMITTENT STREAM A stream which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

INTERPRETIVE SITES A developed site at which a broad range of natural or cultural history is interpreted or described for the enjoyment of the public.

INTOLERANT SPECIES Those plant species that do not grow well in shade.

INVASIVE SPECIES Invasive species is defined as a species that is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. (Executive Order 13112).

INVERSION A stable layer of air where the temperature of the air increases with height.

ISSUE A subject or question of widespread public discussion or interest regarding management of National Forest System Lands.

KEY AREA In grazing, that portion of a pasture or grazing unit, which because of its nature, serves to control the pattern of grazing use for the pasture as a whole. For wildlife, that specific portion of the habitat for a species which tends to limit the number of animals which can survive in that area, such as key winter range.

KEY HABITAT See Key Area.

K-V FUNDS In 1930, Congress passed the Knutson-Vandenberg Act (K-V Act) to authorize collection of funds (K-V Funds) for reforestation and timber stand improvement work on areas cut over by a timber sale.

LAND EXCHANGE The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.

LAND LINE For Forest Plan purposes, National Forest property boundaries.

LATE FOREST SUCCESSION A stage of forest succession where the majority of trees are mature or over-mature.

LEASABLE MINERALS See Minerals, Leasable.

LINEAR PROGRAM MODEL A mathematical method used to determine the best use of resources to achieve a desired result when limitations on available resources can be expressed in the form of equations.

LIVESTOCK GRAZING MANAGEMENT LEVELS

R-1 Livestock grazing is entirely eliminated or restricted to situations where it will meet other resource objectives, such as fuel hazard reduction in recreation areas. Areas managed under R-1 are not counted as full capacity range in the determination of livestock forage capacities.

R-2 Investment for administration and range improvements for management of livestock is at a low level. Improved forage results from other resource investments such as thinning timber

[continued on next page]

stands, and watershed and wildlife habitat improvement. Livestock control is accomplished primarily by moving livestock along with a minimal number of structural range improvements.

R-3 Investment for administration and range improvements for management of livestock is at a moderate level. Forage improvement is generally the result of other resource investments such as thinning timber stands, and watershed and wildlife habitat improvement. Livestock are controlled through the use of structural improvements and the physical movement of the livestock.

R-4 Areas under R-4 management are managed intensively for livestock grazing within an overall multiple-use concept. Any structural or non-structural (forage) improvement technique may be used as long as it fits with the natural environment. All reasonable and approved management techniques are applied to sustain capacity and use at high levels.

R-5 Management is applied to areas to achieve the maximum livestock production that the land can support. Any management technique can be applied as long as basic watershed values are protected. Some management activities, such as irrigating or large scale planting of non-native grass species, may change the natural character of the land.

R-U Unsatisfactory level of grazing management in which the range is overstocked and the general trend in range condition is downward.

LOCAL ROADS These roads connect terminal facilities with Forest collector or Forest arterial roads, or public highways. The location and standard are usually those required to serve a specific resource activity, such as campground access, or a timber sale, rather than overall travel efficiency.

LOCATABLE MINERALS See Minerals, Locatable.

LONG-TERM Action governed by the Forest Plan generally taking place over a period longer than ten years from the present.

LONG-TERM SUSTAINED YIELD CAPACITY (LTSYC) The highest uniform wood yield from lands being managed for timber production that may be achieved and sustained under a specified intensity of management consistent with multiple use objectives.

MAINTENANCE The upkeep of all Forest development transportation facilities, including surfaces and shoulders, parking and side areas, structures, and such traffic control devices as are necessary for its safe and efficient utilization (36 CFR 212.1, FSM 1023.4, 7732.05). Maintenance is not for the purpose of upgrading a facility, but rather, to bring it to the originally constructed or subsequently reconstructed condition.

MANAGEMENT AREA An area that has common direction throughout that differs from neighboring areas. The entire Forest is divided into management areas. Each is described, and policies and prescriptions relating to its use are listed.

MANAGEMENT CONCERN A matter of importance to the management of the National Forest System Lands, which is identified internally by the agency. An

issue or problem requiring resolution or a condition constraining management practices.

MANAGEMENT DIRECTION A statement of multiple-use and other goals and objectives, the management prescriptions, and the associated standards and guidelines for attaining them. (36 CFR 219.3[r] NFMA Regulations)

MANAGEMENT EMPHASIS A reflection of allocation choices for an analysis area. Management emphasis, as used in FORPLAN, is a six-letter identifier used to describe (name) a prescription in FORPLAN.

MANAGEMENT INDICATOR SPECIES See Indicator Species.

MANAGEMENT INTENSITY The relative cost of a possible management direction and/or management practice.

MANAGEMENT OPPORTUNITY A statement of general actions, measures, or treatments that address the public issue or management concern in a favorable way.

MANAGEMENT PRACTICE A specific action, measure, or treatment.

MANAGEMENT PRESCRIPTION Management practices selected and scheduled for application in a specific area to attain multiple use and other goals and objectives.

MANAGEMENT TEAM Decision-making group consisting of the Forest Supervisor, Program Staff Officers, and District Rangers.

MARGINAL ANALYSIS A type of analysis in which the only costs and benefits considered are those about which decisions can be made. Fixed benefits and costs are not considered.

MARKET-VALUED OUTPUTS Goods and services valued in terms of what people are willing to pay for them rather than go without, as evidenced by market transactions.

MASS MOVEMENT Downslope unit movement of a portion of the land's surface, i.e., a single landslide or the gradual simultaneous downhill movement of a whole mass of loose earth material on a slope face.

MAUM'S (THOUSAND AUM'S) A symbol to indicate 1,000 animal unit months of grazing or range forage.

MAXIMUM MODIFICATION (VQO) A visual quality objective meaning man's activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

MBF (THOUSAND BOARD FEET MEASURE) A symbol to indicate 1,000 board feet of wood fiber volume, either in log form or after conversion into lumber.

MCF (THOUSAND CUBIC FEET MEASURE) A symbol to indicate 1,000 cubic feet of wood fiber volume. Conversion factors between MCF and MCF vary; this Plan uses 5 MBF = 1 MCF.

MEAN ANNUAL INCREMENT (MAI) The total increase in girth, diameter, basal area, height, or volume of individual trees of a stand up to a given age divided by that age.

MIDDLEGROUND (VISUAL DISTANCE ZONE) That part of a scene or landscape which extends from the foreground zone to three to 5 miles from the observer.

MIGRATION ROUTE A travel route used routinely by wildlife in their seasonal movement from one habitat to another.

MIH CODES Management Information Handbook codes for defined activities, outputs and effects.

MINERAL DEVELOPMENT The preparation of a proven deposit for mining.

MINERAL ENTRY The right under the General Mining Law of 1872, as amended, to enter non-withdrawn public domain land, such as National Forests, and to explore for, extract, and process certain locatable minerals; rights are asserted by the filing of a lode, placer, or mill site claim.

MINERAL ENTRY WITHDRAWAL Public lands withdrawn from entry under the General Mining Laws and/or the mineral leasing laws.

MINERAL EXPLORATION The search for valuable minerals on lands open to mineral entry.

MINERAL PRODUCTION Extraction of mineral deposits.

MINERAL SOIL Weathered rock materials without any vegetative cover.

MINERALS, COMMON VARIETY Deposits which, although they may have value for use in trade, manufacture, the sciences, or in the mechanical or ornamental arts, do not possess a distinct characteristic that gives it special economic value or utility for such use over and above the normal uses of the general run of such deposits. May include sand, stone, gravel, pumicite, cinders, pumice (except that occurring in pieces over two inches on a side), clay, and petrified wood. Common variety mineral material disposals are made under the authority of the Mineral Materials Act of 1947, as amended. A mineral royalty is assessed for their removal.

MINERALS, LEASABLE Minerals such as coal, oil, gas, phosphate, sodium, potassium, oil shale, sulphur (in Louisiana and New Mexico), and geothermal steam which fall under the authority of the Mineral Leasing Act of 1920, as amended.

MINERALS, LOCATABLE Those minerals which qualify for the location of mining claims on public land. Generally, they are mined and processed for the recovery of the minerals; often metallic. May include certain nonmetallic minerals and uncommon varieties of mineral materials such as valuable and distinctive deposits of limestone or silica. May include any solid, natural inorganic substance occurring in the crust of the earth, except for the common varieties of mineral materials and leasable minerals. Locatable minerals are administered under the authority of the general mining laws.

MINIMUM LEVEL MANAGEMENT The management strategy that would meet only the basic statutory requirements of administering unavoidable, non-discretionary land uses, preventing damage to adjoining lands in other ownerships, and protecting the life, health, and safety of incidental users.

MINIMUM STREAMFLOWS A specified level of flow through a channel that must be

maintained by the users of the stream for biological, physical, or other purposes.

MINING CLAIM That portion of the public estate held for mining purposes in which the right to exclusive possession of locatable mineral deposits is vested in the locator of those deposits. The responsibility for the management of the surface resources of a mining claim is retained by the controlling agency.

MINING PATENTS See patented mining claims.

MITIGATE To lessen the severity.

MMBF (MILLION BOARD FEET MEASURE) A symbol to indicate 1,000,000 board feet of wood fiber volume either in log form or after conversion into lumber.

MMCF (MILLION CUBIC FEET MEASURE) A symbol to indicate 1,000,000 cubic feet of wood fiber volume. Conversion factors between MMCF and MMCF vary; this Plan uses 5 MMBF = 1 MMCF.

MODIFICATION (VQO) A visual quality objective meaning man's activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

MONITORING AND EVALUATION The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been and how closely management standards have been applied.

MULTIPLE USE The management of all various renewable surface resources of the National Forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

NATIONAL ENVIRONMENTAL POLICY ACT An act to declare a National policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

NATIONAL FOREST LANDSCAPE MANAGEMENT SYSTEM The art and science of planning and administering the use of forest lands in such ways that the visual effects maintain or upgrade man's psychological welfare. It is the planning and design of the visual aspects of multiple use land management.

NATIONAL FOREST MANAGEMENT ACT A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest Plans and the preparation of regulations to guide that development.

NATIONAL FOREST SYSTEM LAND National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

NATIONAL RECREATION TRAILS Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the National system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses in or reasonably accessible to urban areas.

NATIONAL REGISTER OF HISTORIC PLACES A listing (maintained by the National Park Service) of areas which have been designated as being of historical significance. The Register includes places of local and state significance as well as those of value to the Nation as a whole.

NATIONAL WILD AND SCENIC RIVER SYSTEM Rivers with outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act for preservation of their free-flowing condition.

NATIONAL WILDERNESS PRESERVATION SYSTEM All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

NEPA See National Environmental Policy Act.

NFMA See National Forest Management Act.

NO ACTION ALTERNATIVE The most likely condition expected to exist in the future if current management direction would continue unchanged.

NON-COMMERCIAL FOREST LAND See "(Forest Land) Not Capable."

NON-DECLINING YIELD A level of timber production designed so that the planned sale and harvest for any future decade is equal to or greater than the total planned sale and harvest for the preceding decade.

NON-FOREST LAND Land that has never supported forests and lands formerly forested where use for timber utilization is precluded by development for other use. Includes areas used for crops, improved pasture, residential areas, improved roads of any width and adjoining clearings, and powerline clearing of any width. If intermingled in forest areas, unimproved roads and non-forest strips must be more than 120 feet wide, and clearing more than one acre in size to qualify as non-forest land. The non- forest land is classified as land not suited for timber production.

NON-GAME SPECIES Animal species that are not usually hunted. This classification is determined by the State Legislature.

NON-STRUCTURAL RANGE IMPROVEMENT An improvement to grazing land consisting of a modification of existing vegetation. Examples are spraying or plowing sagebrush and seeding to grass.

NONCOMMODITY OUTPUTS A resource output that cannot be bought and sold.

NONCONSUMPTIVE USE Those uses of resources that do not reduce the supply. For example: Nonconsumptive uses of

water included hydroelectric power generation, boating, swimming, etc.

NONDECLINING YIELD A level of timber production designed so that the planned sale and harvest for any future decade is equal to or greater than the total sale and harvest for the preceding decade.

NONMARKET VALUED OUTPUTS Goods and services valued in terms of what reasonable people would be willing to pay rather than go without the output. Those obtaining the outputs do not pay all or part of what they would be willing to.

NONPOINT SOURCE POLLUTION Sources of pollution that are diffuse in origin, their transportation into receiving water not well defined or constant, their discharge occurring at many diffuse locations, and depending heavily on weather conditions such as rainstorms or snowmelt. Pollution from forest management is of this type.

NOTICE OF INTENT Written notice to the affected District Ranger by those who intend to engage in mineral activity in the Forest.

NOXIOUS WEED A legal term applied to plants regulated by Federal and State Laws, such as plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. 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 insect or disease, and being not native or new or not common to the United States or parts thereof. (Forest Service Manual 2080.5, Federal Noxious Weed Act of 1974, PL 93-629, as amended)

OBJECTIVE A clear and specific statement of planned results to be achieved within a stated time period. The results indicated in the statement of objectives are those which are designed to achieve the desired condition represented by the goal. An objective is measurable and implies precise time-phased steps to be taken and resources to be used which, together, represent the basis for defining and controlling the work to be done.

OBJECTIVE FUNCTION A term in linear programming describing the criterion to be optimized in the model. Examples of objective functions are: maximize timber, maximize livestock forage, or maximize present net value.

OBLITERATION The returning of the land occupied by a road or trail to resource production.

OCCUPANCY TRESPASS The illegal occupation or possession of National Forest Land.

OLD-GROWTH The last stage in forest succession. Old-growth habitat is the sum of the physical and biological components of old-growth forest that are essential to maintaining populations of certain old growth dependent species of wildlife.

ON-SITE SOIL LOSS The movement of soil away from one point to another location.

OPERATING PLAN A written plan, reviewed by and subject to approval by a Forest Officer, prepared by those engaged in mineral activity on the Forest, describing exploration, mining and mineral processing activities that will likely cause a significant disturbance of surface resources. An approved Plan of Operations is required prior to an operator undertaking any exploration or development activities which may cause significant surface disturbance.

OPPORTUNITY COSTS The value of the benefits foregone or given up due to the effect of choosing another management alternative that either impacts existing outputs or shifts resources away from other activities so that they are no longer produced and their benefits are lost.

ORV Off-road vehicles; this includes all mechanical means of transportation; passenger cars, four-wheel-drive vehicles, trail bikes, and snowmobiles that are capable of traveling over land where no road exists.

OUTPUT COEFFICIENT Values which relate an acre of land to a particular quantity of output in a specific period of time.

OUTPUTS The goods, services, products, and concerns which are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. Also goods, end products, or services that are purchased, consumed, or utilized directly by people. A broad term for describing any result, product, or service that a process or activity actually produces.

OVERSTORY That portion of the forest of more than one story forming the upper layer or uppermost canopy.

PAOT See "Persons-At-One-Time."

PARTIAL RETENTION (VQO) A visual quality objective which in general means man's activities may be evident but must remain subordinate to the characteristic landscape.

PARTICULATES Small particles suspended in the air and generally considered pollutants.

PATENTED MINING CLAIM A mining claim to which the Federal Government has granted the claimant all surface and some or all mineral rights. Patented mining claims are private land and may be sold or used for purposes other than mining, such as residential or recreational use.

PERENNIAL STREAM Streams that flow throughout the year and from source to mouth.

PERMITTED GRAZING Use of a National Forest range allotment under the terms of a grazing permit.

PERSONS-AT-ONE-TIME (PAOT) A recreation capacity measurement term indicating the number of people that can comfortably occupy and use a facility or area at one time.

PLANNING AREA The area covered by a Regional or Forest Plan.

PLANNING CRITERIA Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgements and decisions are based.

PLANNING HORIZON The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions.

PLANNING PERIOD One decade. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects and benefits.

PLANNING PROCESS A system that records decisions and activities that result from the process of developing, revising or amending a Forest Plan.

PLANTATION A forest crop or stand established by seeding or planting of young trees.

POLE TIMBER As used in timber survey, a size class definition, trees 5.0 to 8.9 inches at DBH. As used in logging operations, trees from which pole products are produced, such as telephone poles, pilings, etc.

POLICY A guiding principle on which to base a specific decision or set of decisions.

POTHUNTING Slang term used by professional archaeologists to describe illegal or non-professional collecting of relics.

PRACTICE See management practice.

PRECOMMERCIAL THINNING The selective felling, killing, or removal of trees in a young stand primarily to accelerate diameter growth on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain. A thinning done in a stand of trees not yet of commercial size.

PREDATOR An animal species that kills and feeds on other animals.

PREPARATORY CUT Removal of trees near the end of a rotation so as to permanently open the canopy and enlarge the crowns of seed bearers, with the intent of improving conditions for seed production and natural regeneration, as typically in shelterwood systems.

PRESCRIBED FIRE Any fire ignited by management actions to meet specefic objectives, documented in an approved prescribed fire plan and in compliance with NEPA requirements.

PRESCRIPTION See management prescriptions.

PRESENT NET VALUE The difference of net benefits and net costs, each discounted to the present.

PRESERVATION (VQO) A visual quality objective that provides for ecological change only.

PREPAREDNESS Activities required in advance of fire occurrence to ensure effective suppression action. Includes (1) recruiting and training fire forces; (2) planning and organizing attack methods; (3) procuring and maintaining fire equipment and other facilities necessary for the fire program.

PREPAREDNESS LEVEL Increments of planning and organizational readiness commensurate with increasing fire danger.

PRESCRIBED FIRE See Wildland Fire.

PRIMARY CAVITY NESTERS Wildlife species that excavate cavities in trees for nest sites.

PRIMITIVE ROS CLASS A classification of the recreation opportunity spectrum characterized by an essentially unmodified environment, where trails may be present but structures are rare, and where there is isolation from the sights and sounds of man.

PRODUCTION POTENTIAL The capability of the land or water to produce living organisms and their useful features (forage, habitat, wood, etc.).

PRODUCTION-UTILIZATION SURVEYS (P-U SURVEYS) Surveys of range land to determine where and how much forage is being produced, and how it is being used.

PRODUCTIVITY See site productivity.

PROGRAM DEVELOPMENT AND BUDGETING The process by which

activities for the Forest are proposed and funded through the Federal Budget.

PROPOSED ACTION In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency intends to implement or undertake and is the subject of an environmental assessment.

PUBLIC ACCESS A road or trail route over which a public agency claims a right-of-way available for public use.

PUBLIC ISSUE A subject or question of widespread public interest relating to the planning problem.

PUBLIC PARTICIPATION ACTIVITIES Meetings, conferences, seminars, workshops, tours, written comments, response to survey questionnaires, and similar activities designed and held to obtain comments from the general public and specific publics about National Forest System land management planning.

RANGE ALLOTMENT A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan.

RANGE CAPACITY LEVELS Levels are described as follows:

No allowable capacity - Lands that are incapable of sustaining grazing by livestock under reasonable management goals. Examples include areas that are incapable of producing vegetation, soils that cannot produce vegetation at a satisfactory rate to protect itself from erosion, and slopes over 45 percent.

Potential Capacity - Lands presently incapable of sustaining grazing, but which could be grazed if a management or other improvement were made. Examples are areas denuded but which could be revegetated, areas having a dense tree cover and no forage, or areas requiring access or water development to bring them up to full capacity.

Full Capacity - Land presently stable because effective ground cover is holding soil loss to acceptable levels, where forage is being produced and which is accessible and available to livestock.

RANGE CONDITION The state of the plant community on a range site in relation to the potential natural plant community for that site. It is usually rated in the general categories of Poor, Fair, Good, or Excellent.

RANGE CONDITION TREND The direction of change in range condition and soil productivity.

RANGE INVENTORY (ANALYSIS) The systematic collection and analysis of resource information needed for managing rangeland. Examples are mapping and measuring plant composition, density and vigor.

RANGELAND (RANGE) Land that supports vegetation useful for grazing. Vegetation is routinely managed through manipulation of grazing animals rather than cultural practices.

RANGER DISTRICT An administrative subdivision of the Forest supervised by a District Ranger who reports to the Forest Supervisor.

RARE II See Roadless Area Review and Evaluation II.

REAL INCOME Income based on real dollar values (values from which the effect of change in purchasing power of the dollar has been removed).

RECORD OF DECISION Under CEQ Regulations, a document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.

RECREATION CAPACITY The number of people that can take advantage of the supply of recreation opportunity without substantially diminishing the quality of the experience sought after.

RECREATION OPPORTUNITY SPECTRUM A land classification system which categorizes National Forest land into classes, each class being defined by its setting and by the probable recreation experiences and activities it affords. The six classes in the spectrum are primitive (or primitive-wilderness), semi-primitive, non-motorized-wilderness, semi-primitive, non-motorized , semi-primitive motorized, roaded natural, roaded modified, rural, and urban.

RECREATION RESIDENCE SITE House or cabin permitted on National Forest land for the recreational use of the owner, but not as a primary residence.

RECREATION VISITOR DAY (RVD) Recreational use of National Forest land which aggregates twelve hours. It may consist of one person for twelve hours, two people for six hours, or any combination that totals twelve hours.

RECREATIONAL RIVER Wild and Scenic Rivers Act Usage. 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.

REDUCED SERVICE MANAGEMENT Management of developed recreation facilities below optimum maintenance standards.

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

REGENERATION (1) The actual seedlings and saplings existing in a stand. (2) The act of establishing young trees naturally or artificially.

REGENERATION CUT Removal of trees with the intention of establishing a new crop of seedlings.

REGIONAL FORESTER The Forest Service official responsible for administering a single Region.

REGIONAL GUIDE The plan developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and established management standards and guidelines for the National Forest System lands of a given Region. It also disaggregates the RPA objectives assigned to the Region to the Forests within that Region.

REGULATED FOREST Forest land managed for timber production under sustained yield principles.

REGULATIONS 36 CFR refers to the Code of Federal Regulations for implementing the National Forest Management Act.

RESEARCH NATURAL AREAS An area in as near a natural condition as possible which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and aquatic features. This area is set aside to preserve a representative sample of an ecological community primarily for scientific and educational purposes; commercial and general public use is not allowed.

RESOURCE DATA BASE Information about resources stored in a computerized system.

REST-ROTATION A grazing schedule in which the pastures being grazed receive a year of rest for plant recovery.

RETENTION (VQO) A visual quality objective which in general, means man's activities are not evident to the casual forest visitor.

REVEGETATION The reestablishment and development of plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through seeding, planting, or other action.

RIGHT-OF-WAY Land authorized to be used or occupied for the construction, operation, maintenance, of a project facility passing, over, upon, under, or through such land.

RIPARIAN Referring to land adjacent to perennial streams, lakes, and reservoirs and including other well developed riparian vegetation (primarily intermittent streams). This land is specifically delineated by the transition ecosystem and defined by soil characteristics and distinctive vegetation communities that require free and unbound water.

ROAD DENSITY The measure of the degree to which the length of road miles occupies a given land area, i.e., 1 mi/sq. mi. is one mile of road within a given square mile.

ROAD MAINTENANCE LEVELS Levels are described as follows:

Level 1: Road normally closed to vehicle traffic. Basic custodial care to protect surrounding resources and the road investment.

Level 2: Road open to traffic- Level 1 care plus minimum maintenance for passage of high clearance vehicles.

Level 3: Road open for public traffic - Level 2 care plus maintenance needed for safe passenger car usage. User comfort (smooth surface) is not emphasized.

Level 4: Road open for public traffic. Level 3 care plus more consideration for safety at higher speeds and more traffic volume. User comfort is a consideration.

Level 5: Road open to public traffic. Level 4 care plus maintenance needed to ensure user safety and comfort. Maintained for highest traffic volumes.

ROAD PRISM The geometric features of a road structure including all the disturbed area within a given portion of road. These features include the cut bank, ditch, travel surface, and the fill slope.

ROADED AND NATURAL APPEARING ROS CLASS A classification of the Recreation Opportunity Spectrum that characterizes a predominantly natural environment with evidence of moderate permanent alternate

resources and resource utilization. Evidence of the sights and sounds of man is moderate, but in harmony with general environment. Opportunities exist for both social interaction and moderate isolation from sights and sounds of man.

ROADLESS AREA Undeveloped Federal land within which there are no roads maintained for travel by means of motorized vehicles.

ROADLESS AREAS REVIEW AND EVALUATION II (RARE II) A National program which had the purpose of identifying areas for wilderness and making recommendations to Congress regarding their designation.

RODENTICIDE An agent that kills, repels, or controls rodents.

ROS CLASS See "Recreation Opportunity Spectrum."

ROTATION The planned number of years between the start of a crop of trees and their final harvest. The rotation age will vary according to geographic location, tree species, and management objectives.

ROUNDWOOD Trees that are used without being milled (fence posts, telephone poles, pulpwood, etc.).

RPA The Forest and Rangeland Renewable Resources Planning Act of 1974. Also refers to the National Assessment and Recommended Program developed to fulfill the requirements of the Act. The most recent recommended program was done in 1980.

RPA NATIONAL ASSESSMENT A document compiled by the Secretary of Agriculture every ten years which contains facts and analyses to develop and guide public and private forest and range land policies and programs.

RPA NATIONAL PROGRAM A document compiled by the Secretary of Agriculture every five years which outlines Forest Service programs for National Forest System management, cooperative assistance to States and private landowners, and research.

RURAL ROS CLASS A classification of the Recreation Opportunity Spectrum that characterizes an area in which the sights and sounds of man are prevalent and the landscape has been considerably altered by the works of man.

RVD See "Recreation Visitor Day."

SALVAGE CUTTING Done to harvest trees in imminent danger of being killed or damaged by injurious agents. Dead and dying trees are included in salvage cuttings.

SAPLING As used in timber survey, a size class definition; trees 1.0 to 4.9 inches at DBH.

SATELLITE IMAGERY A pictorial representation of the earth obtained from a satellite.

SATISFACTORY RANGE CONDITION Rangeland in range condition class of at least fair with stable or upward trend.

SATISFACTORY WATERSHED CONDITION Ground cover conditions are effectively maintaining land productivity, and the frequency and severity of damaging floods is within management tolerances.

SAWTIMBER Trees that will yield logs suitable in size and quality for the production of lumber.

SCARIFICATION Loosening the topsoil in open areas to prepare for planting, seeding or natural seedfall.

SCENIC EASEMENT Relative to the Wild and Scenic Rivers Act (P.L. 93-621) 1975, and by definition of the act; the right to control the use of land (including the air space above such land) within the authorized boundaries of a component of the Wild and Scenic Rivers System, for the purpose of protecting the natural qualities of a designated wild, scenic or recreational river area, but such control shall not affect, without the owner's consent, any regular use exercised prior to the acquisition of the easement.

SCENERY MANAGEMENT SYSTEM (SZ) The system used to inventory, analyze, and manage the aesthetic values of National Forest lands. It is used to create and maintain landscapes having high scenic diversity, harmony, and unity for the benefit of society in general. Scenic Integrity Objectives of Very High (Level 1), High (Level2), Moderate (Level 3) and Low (Level 4) are used to evaluate deviations from or alterations to the landscape character that is valued for its aesthetic appeal.

SCENIC RIVER Wild and Scenic Rivers Act usage. 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.

SCOPING PROCESS (NEPA usage) The public and management activities used to determine the range of actions, alternatives, and impacts to be considered in an environmental impact statement.

SEDIMENT solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

SEED CUT A cutting which leaves adequately spaced seed-bearing trees and opens the stand to provide conditions for restocking and establishment of a new stand of trees. Under a shelterwood system, the first of the shelterwood cuttings.

SEEDLING As used in timber survey, a size class definition; trees less than one inch at DBH.

SELECTION CUTTING The annual or periodic harvest of trees, usually the oldest or largest trees, individually or in small groups from an uneven-aged forest, as a means for encouraging continuous natural reproduction and maintenance of an uneven-aged condition.

SEMI-PRIMITIVE MANAGEMENT AREA A wilderness management area characterized by moderate opportunity for solitude in a predominately unmodified natural environment, with a moderate degree of trail maintenance.

SENSITIVE AREAS Areas of high erosion hazard, areas that may be susceptible to compaction, or areas of unstable slopes.

SENSITIVE SPECIES Those plant and animal species identified for a Region for which population viability is a concern.

SERAL A transitory, developmental stage in the process of ecological succession for a biotic community.

SHEET EROSION The removal of a fairly uniform layer of soil from the land surface by runoff water, without the development of conspicuous water channels.

SHELTERWOOD CUT An even-age regeneration system designed to establish a new crop under a portion of the old stand, which provides both the seed source and shelter for the new seedlings. The mature trees are removed in two or more cuts. (1) The preparatory cut removes a portion of the mature trees and is intended to make the remaining trees more wind firm; preparatory cuts may be omitted where windfall is not a major concern. (2) The seed cut removes additional trees with the intent of allowing additional sunlight to reach the forest floor. The new trees become established following the seed cut. (3) The removal cut removes the last of the mature trees.

SHRUB/SEEDLING A forest successional stage in which shrubs and seedling trees are the dominant vegetation.

SIGHT DISTANCE In wildlife management, the distance at which hiding cover is effective. (See hiding cover)

SILVICULTURAL SYSTEM The entire process by which forest stands are tended, harvested, and replaced. It includes all cultural practices performed during the life of the stand such as regeneration cutting, thinning, improvement cutting, and use of genetically improved sources of tree seeds and seedlings. Silvicultural systems can be distinguished as either even- or uneven-aged.

SITE PREPARATION Preparation of the ground surface before planting or preparing a seedbed for natural regeneration; includes removal of unwanted vegetation, slash, stumps, and roots from a site.

SKID TRAIL Travelway used to drag or transport trees from the stump to the road.

SLASH Debris left after logging, pruning, thinning, or brush cutting. It includes logs, branches, bark, and stumps.

SMALL GAME Birds and small mammals normally hunted or trapped.

SNAG Standing dead tree larger than six inches in diameter at breast height.

SOFT SNAG A standing dead tree from which the leaves and most of the branches have fallen and which has started to rot internally.

SOFTWOOD A conventional term for both the timber and trees belonging to the botanical group, Gymnospermae.

SOIL PRODUCTIVITY The capacity of a soil in its normal environment, to produce a specific plant or sequence of plants under a specific system of management.

SOIL SURVEYS Systematic examinations of soils in the field and in laboratories for the purpose of describing, mapping and classifying them according to their adaptability and behavior. There are 5

[continued on next page]

classified orders of surveys, with order 1 being the highest intensity through order 5 (lowest intensity).

SPECIAL CUTTING Removal of trees for other than silvicultural purposes. This applies to unregulated area such as developed recreation and administrative sites where other uses or values are overriding.

SPECIAL USE PERMIT A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

STAND An aggregation of trees or other growth occupying a specific area and sufficiently uniform in composition (species), age arrangement, and condition as to be distinguishable from the forest or other growth on adjoining areas.

STAND EXAMINATION SURVEYS Procedures used to collect data on Forest stands.

STANDARD A principle requiring a specific level of attainment, a rule to measure against.

STATE AIR QUALITY REGULATIONS The legal guidelines for control of air pollution sources in a state.

STRUCTURAL DIVERSITY Variety in a forest stand that results from layering or tiering of the canopy. An increase in layering leads to an increase in structural diversity.

STRUCTURAL RANGE IMPROVEMENT Any type of range improvement that is man-made (fences, corrals, etc.).

SUBDIVISIONS Subdivided land. Areas of previously undeveloped land divided into individual homesites and/or blocks of lots with streets or roads and open spaces.

SUBSOIL The layer below the soil surface in which roots normally grow.

SUCCESSION Ecologic succession. An orderly process of biotic community development that involves changes in species, structure, and community processes over time.

SUITABILITY The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

SUITABLE RANGE Range which is accessible to livestock or wildlife, and which can be grazed on a sustained yield basis without damage to long-term productivity.

SUITABLE TIMBER LANDS Forest lands which can be managed for timber production on a sustained yield basis without damage to long term productivity.

SUPPLY A schedule of the quantity of a product or forest output that will be produced at various prices.

SUPPRESSION (FIRE SUPPRESSION) Any act taken to slow, stop, or extinguish a fire. Examples of suppression activities include line construction, backfiring, and application of water or chemical fire retardants.

SUSTAINED YIELD The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the

various renewable resources of the National Forest without impairment of the productivity of the land.

TARGETS Objectives assigned to the Forest by the Regional Plan.

TENTATIVELY SUITABLE FOREST LAND Land for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions. There is reasonable assurance that such lands can be adequately restocked as provided in CFR 219.13(h)(3).

TEMPORARY ROAD A road that will be physically obliterated and seeded after its primary use is completed (i.e., spur road for logging); it will never be used again. (See TERMINAL ROAD)

TERMINAL ROAD A road closed for a period of time (such as the interval between timber sales in an area), but planned to remain in place and be used again in the future.

THINNING Cutting made in an immature crop or stand, primarily to accelerate the diameter increment (annual growth) of the residual trees, but also by suitable selection, to improve the average form of the trees that remain.

THERMAL COVER Cover used by animals to reduce effects of weather; for elk, a stand of coniferous trees forty feet or more tall with an average crown closure of seventy percent or more, and a minimum of thirty acres in size.

THREATENED AND ENDANGERED SPECIES Threatened and endangered species are animals or plants identified by the Secretary of Interior in accordance with the 1973 Endangered Species Act. Threatened and endangered are separate classifications. Endangered means any species in danger of extinction throughout all or a significant part of its range. Threatened means any species that is likely to become endangered within the foreseeable future throughout all or a significant part of its range. Candidate species are: Category 1 are those species for which there is sufficient information to support listing, Category 2 are those species for which information is actively being sought to determine their status, and Category 3 are those species no longer being considered for listing, but which may be reevaluated if conditions warrant it.

THREE-STEP SHELTERWOOD An even-aged silvicultural system in which in order to provide a source of seed and/or protection for regeneration, the old crop (shelterwood) is removed in three successive cuttings.

TIERING Refers to the concept, when preparing an environmental impact statement, of avoiding repetitive discussions of any issues already covered in another, broader, environmental review. Subsequent environmental documents can incorporate issues already discussed in previous documents by reference only and concentrate on issues specific to the subsequent action.

TIMBER A general term for the major woody growth of vegetation in a forest area.

TIMBER BASE The lands within the Forest capable, available, and suitable for timber production.

TIMBER HARVEST SCHEDULE The quantity of timber planned for sale and harvest, by time period, from the area of land covered by the Forest Plan. The first period, usually a decade, of the selected harvest schedule provides the allowable sale quantity. Future periods are shown to establish that sustained yield will be achieved and maintained.

TIMBER PRODUCTION The growing, tending, harvesting, and regeneration of regulated crops of industrial wood. Industrial wood includes logs, bolts, or other round sections cut from trees for industrial or consumer use, except fuelwood.

TIMBER SALE See commercial timber sale.

TIMBER STAND IMPROVEMENTS (TSI) A loose term comprising all intermediate cuttings made to improve the composition, constitution, condition, and growth of a timber stand.

TOPSOIL The original or present dark-colored upper soil that ranges from a mere fraction of an inch to two or three feet deep.

TRACTOR LOGGING Any logging method which uses a tractor as the motive power for transporting logs from the stumps to a collecting point, whether by dragging or carrying the logs.

TRAFFIC SERVICE LEVELS Definitions of traffic service levels used as a basis for designing appropriate roads to fit the expected need. These are:

Level A Traffic is free flowing and mixed, with adequate passing facilities, and will accommodate expected traffic volume without restricting use. Safety features are a part of the design. User costs are minimized. Road surface is stable, smooth and relatively dust free for the normal use season.

Level B Similar to Level A, but accepts that congestion will occur, and some traffic controls will be needed during peak use periods.

Level C Traffic flow is slow and restricted, and may require backing or stopping to permit passing. User costs are considered, and a mix of users is allowed.

Level D Traffic flow is slow and restricted. Two way traffic may require backing to pass. Traffic volume is intermittent and normally associated with a single purpose. Minimal safety features are included. User costs are given little consideration. The road surface may be rough and irregular. Rutting and dusting is controlled only for soil and water protection.

TRAILHEADS The parking, signing, and other facilities available at the terminus of a trail.

TRANSITORY RANGE Land that is suitable for grazing use of a temporary nature over a period of time. For example, on particular disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage.

TRANSMISSION PIPELINE A pipeline which carries gas or liquid from a producing field for central collection facility to a storage or consumption facility, usually over long distances.

TRAVEL MANAGEMENT The administrative decision on the location and timing of road and trail closures.

TREE OPENING An opening in the forest cover created by the application of even-aged silvicultural practices.

TRESPASS The act of going on another's land or property unlawfully.

TSI See "Timber Stand Improvement."

TWO-STEP SHELTERWOOD An even-aged silvicultural system in which, in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in two successive cuttings.

TYPE CONVERSION The conversion of the dominant vegetation in an area from forested to non-forested or one tree species to another.

UNCONSTRAINED MAXIMUM Level of management defined as the highest possible level of a given output along with the costs associated with achieving it.

UNDERSTORY The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth (the overstory).

UNEVEN-AGED SILVICULTURE SYSTEMS The combination of action that result in the creation of forests or stands of trees, in which trees of several or many ages grow together. Cutting methods that develop and maintain uneven-aged stands are individual tree and group selection cutting methods.

UNPATENTED MINING CLAIM A claim made for possession of locatable minerals on public domain land (e.g., National Forests). A properly recorded claim entitles the claimant to reasonable access to the claim and exclusive right to extract and sell valuable minerals from the claim. Unpatented mining claims may be occupied and used solely for mining and related activity, and the responsibility to manage the surface estate of an unpatented mining claim is retained by the surface managing agency.

UNREGULATED HARVEST This harvest is not charged against the allowable sale quantity, and includes occasional volumes removed that were not recognized in calculations of the allowable sale quantity, such as cull or dead material and noncommercial species and products. It also includes all volume removed from non-suitable areas. Harvests from non-suitable areas will be programmed as needed for objectives such as research on experimental forests, to meet multiple use objectives such as research on experimental forests, to meet multiple use objectives other than timber production, and for improvement of administrative sites.

UNSATISFACTORY RANGE CONDITION Rangeland in poor or very poor range condition or in fair condition with a downward trend.

UNSATISFACTORY WATERSHED CONDITION Effective ground cover conditions are such that impairment of land productivity is occurring. The probability and frequency of damaging peak flows exceeds tolerable levels.

UNSUITABLE LANDS Lands not allocated to timber management or not suitable as determined through the suitability analysis.

URBAN ROS CLASS A classification of the Recreation Opportunity Spectrum in which the natural setting is dominated by man-made structures and the sights and sounds of man predominate.

USC United States Code. A codification of all the general and permanent laws.

UTILITY CORRIDOR A tract of land of varying width forming a passageway through which various commodities such as oil, gas, and electricity are transported.

UTILIZATION STANDARDS Standards established to guide the use and removal of timber and measured in terms of minimum size and percent soundness.

VARIETY CLASS A classification system for establishing three visual landscape categories according to the relative importance of the visual features. This classification system is based on the premise that all landscapes have some visual values, but those with the most variety or diversity of visual features have the greatest potential for having a high scenic value.

VEGETATIVE MANIPULATION The change of one vegetation type to another through some land treatment such as fire, chemicals, etc. This is done to improve forage production, benefit wildlife habitat, or achieve some other desired result.

VERTICAL DIVERSITY The diversity in an area that results from the complexity of the above ground structure of the vegetation; the more tiers of vegetation or the more diverse the species make-up, or both, the higher the degree of vertical diversity.

VIABLE POPULATIONS A wildlife or fish population of sufficient size to maintain its existence over time in spite of normal fluctuations in population levels.

VIS (VISITOR INFORMATION SERVICES) A service provided to the public by National Forests in which the public is supplied with information regarding activities and features on National Forest land.

VIS SITE Visitor Information Service Site which provides interpretative information (directional, historical, geographic, natural history, etc.) to the public.

VISITOR DAY A statistical measure of visitor use. The use of an area for a total of twelve person hours by one or more people, either continuously or over several visits.

VISUAL DISTANCE ZONES Areas of landscapes denoted by specified distances from the observer. Used as a frame of reference, in which to discuss landscape characteristics or activities of man. The three zones are Foreground, Middleground, and Background.

VISUAL MANAGEMENT PROGRAM Also refereed to as "Landscape Management" or "Visual Resource Management"; guiding the use of forest lands in such ways that the visual effects maintain or upgrade the human visual experience. It is the planning and design of visual aspects of multiple-use land management.

VISUAL QUALITY OBJECTIVE (VQO) A desired level of excellence based on

physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape.

Preservation (P). In general, human activities are not detectable to the visitor.

Retention (R). In general, human activities are not evident to the casual Forest visitor.

Partial Retention (PR). In general, human activities may be evident but must remain subordinate to the characteristic landscape.

Modification (M). Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middleground or background.

Maximum Modification (MM). Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

Enhancement. A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.

VISUAL RESOURCE The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

WATER YIELD The total net amount of water produced on the Forest including streamflow and groundwater recharge.

WATERSHED The entire area that contributes water to a drainage or stream.

WATERSHED CONDITION A description of the health of a watershed, or portion thereof, in terms of the factors that affect hydrologic function and soil productivity.

WETLANDS Areas with shallow standing water or seasonal to year-long saturated soils (includes bogs, marshes, and wet meadows).

WFUD (WILDLIFE AND FISH USER DAY) A unit for measuring wildlife and fish recreation user activities. A unit is the combination of use which aggregates to twelve visitor hours.

WHEELED SKIDDERS A motorized wheeled vehicle specifically designed to skid logs.

WILD AND SCENIC RIVER CORRIDOR See "Wild River" and "Scenic River."

WILD RIVER Wild and Scenic Rivers Act usage. 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.

WILDERNESS Under the 1964 Wilderness Act, wilderness is undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. It is protected and managed so as to preserve its natural conditions which (1) generally appear to have been affected primarily by the forces of nature with the imprint of man's activity substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and confined type of recreation; (3) has at least 5,000 acres or is of sufficient size to make practical its condition; and (4) may contain features of scientific, educational, scenic, or historical

value as well as ecologic and geologic interest.

WILDERNESS RECREATION OPPORTUNITY MANAGEMENT AREAS Delineated areas in wilderness which have different use characteristics and degrees of trail development. The four management areas are Transition, Semi-primitive, Primitive, and Pristine.

WILDERNESS STUDY AREA (WSA) One of the areas selected by Congress from an inventory of unroaded and undeveloped National Forest lands as having apparent high qualities for wilderness. They will be studied to determine whether they should be recommended for addition to the National Wilderness Preservation System.

WILDLAND FIRE Any nonstructure fire that occurs in the wildland. Four distinct types of fire have been defined:

- Wildfire: An unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.
- Wildland Fire Use: The application of the appropriate management response to naturally ignited wildland fires to accomplish specific resource management objectives in predefined designated areas outlined in the fire management plans.
- Prescribed Fire: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met prior to ignition.
- Escaped Wildland Fire: a wildland fire that exceeds the size objective for the Geographic Area or Land Use Zone; appropriate management response is determined by a WFSA.

WILDLIFE HABITAT The sum total of environmental conditions of a specific place occupied by a wildlife species.

WILDLIFE STRUCTURE A site specific improvement of a wildlife or fish habitat, such as a spring development or dugout to provide water, brushpile for cover, nestbox for birds, or rock and log placement in a stream for fish cover and pool creation.

WINTER RANGE The area occupied by an animal species during the winter.

WITHDRAWAL Withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program.

WORK CENTER A facility where crews assemble and are directed toward their various work assignments. A work center can be located at an administrative site. A work center normally will include storage and shop facilities and may include crew housing.