



United States
Department of
Agriculture

Forest
Service

Southwestern
Region

February 2011



Coconino National Forest Draft Land Management Plan

Notes for reviewers:

- This document is an initial draft of the Coconino National Forest's revised land management plan. It was made available for public review in February 2011.
- **Language highlighted in gray is incomplete or needs further attention.**

Draft Revised Land Management Plan

Prepared for:

**The Coconino National Forest
1824 S. Thompson St.
Flagstaff, AZ 86001**

and

**USDA Forest Service
Southwestern Region
333 Broadway SE
Albuquerque, New Mexico 87102**

Submitted by:

**Plan Revision Team
Coconino National Forest**

Contents

Draft Revised Land Management Plan i

Chapter 1. Background.....	1
Introduction.....	1
Purpose of the Land Management Plan	1
Summary of the Analysis of the Management Situation.....	1
Plan Content.....	2
Plan Decisions	2
Other Content	4
Guiding Future Projects, Program Plans, and Assessments.....	4
Transition in the Implementation of the Plan.....	5
Changes to the Plan.....	5
Plan Organization.....	6
Roles and Contributions of the Coconino NF.....	6
The Coconino National Forest’s Mission.....	9
The Coconino National Forest’s Vision	10
Chapter 2. Forestwide Management.....	11
Introduction.....	11
Landscape Character Zones	11
Ponderosa Pine Landscape Character Zone.....	11
San Francisco Peaks Landscape Character Zone	12
Volcanic Woodlands Landscape Character Zone.....	13
Anderson Mesa Landscape Character Zone	14
East Clear Creek Landscape Character Zone	15
Red Rock Landscape Character Zone	16
Verde Valley Landscape Character Zone.....	17
Painted Desert Landscape Character Zone.....	18
Air Resources.....	18
Air Quality.....	18
Aquatic Resources	19
Introduction to Aquatic Resources	19
Watershed Management, Water Quality and Quantity.....	20
Water Quantity and Quality.....	20
Constructed Waters	23
Stream Ecosystems	23
Wetlands and Reservoir/Lake.....	25
Springs.....	28
Biophysical Features.....	30
Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes	30
Paleontological Resources.....	32
Soils	33
Wildlife, Fish, and Botanical Resources	35
Vegetation	38
All Vegetation Types.....	38
Riparian Types	40
Cottonwood Willow Riparian Forest.....	43
Desert Communities	44

Semi-Desert Grasslands.....	46
Interior Chaparral	47
Piñon and Juniper	48
Ponderosa Pine	51
Dry Mixed Conifer	54
Wet Mixed Conifer.....	57
Montane/Subalpine and Great Basin Grasslands.....	60
Spruce Fir Forest	63
Alpine Tundra.....	65
Invasive Exotic Species Management.....	66
Community Forest Interface	66
Fire Management	66
Heritage Resources	68
General Description for Heritage Resources	68
Heritage Site Conservation and Evaluation.....	68
Heritage Collections	70
Heritage Enhancement and Interpretation.....	70
Tribal Relations and Uses	71
Infrastructure.....	72
Facilities	72
Roads	73
Lands.....	74
Land Adjustments.....	74
Range and Livestock Grazing.....	76
Energy and Minerals	79
Recreation	80
Developed Recreation	81
Dispersed Recreation.....	82
Scenic Resources	89
All Scenic Resources	89
Special Uses.....	92
Land Special Uses	92
Recreation Special Uses	93
Forest Products	96
Chapter 3. Management Areas.....	99
Introduction to Management Areas.....	99
Designated Special Areas.....	99
All Designated Wilderness Areas.....	99
Fossil Springs Wilderness	102
Kachina Peaks Wilderness	104
Munds Mountain Wilderness	105
Red Rock Secret Mountain Wilderness.....	106
Strawberry Crater Wilderness	107
West Clear Creek Wilderness.....	108
Wet Beaver Wilderness	109
Sycamore Canyon Wilderness.....	109
Recommended Wilderness	110
Wild and Scenic Rivers	111
National Trails and Scenic Byways.....	113

Experimental Forests	116
Research Natural Areas/Botanical and Geological Areas	116
Environmental Study Areas	119
Management Areas of Public Interest	120
Fort Valley/Mount Elden Management Area	120
Flagstaff Neighborwoods Management Area.....	120
Sedona/Oak Creek Management Area (Amendment 12 in the 1986 plan)	121
House Mountain-Lowlands Management Area.....	128
Sedona Neighborwoods Management Area	129
Walnut Canyon Management Area	130
Long Valley Management Area	132
Chapter 4. Suitable Uses	133
Introduction.....	133
Recreation and Transportation Suitability.....	133
Chapter 5. Monitoring Strategy	136
Introduction.....	136
Monitoring Plan	136
Appendix A. Maps:.....	142
Appendix B. Eligible Wild and Scenic Rivers.....	160
Appendix C. Glossary and Commonly Used Acronyms.....	161
Appendix D. PNVF Descriptions	165
Appendix E. Species Names.....	166
Appendix F. Southwestern Region Climate Change Trends and Forest Planning	167
Appendix G. Proposed and Probable Actions.....	168
Appendix H. List of Preparers	169
Appendix I. Index.....	170

List of Tables In progress

List of Figures In progress

Chapter 1. Background

Introduction

The Coconino National Forest (Coconino NF or the Forest) Land and Resource Management Plan (hereinafter referred to as the land management plan or plan) covers the National Forest System (NFS) lands within the boundary of the Coconino NF, excluding land designated as Experimental Forest.

The Coconino NF is located in north central Arizona (figure 1) in Coconino, Yavapai, and Gila counties and encompasses about 2 million acres. The Coconino NF is managed by the Forest Service, an agency of the United States Department of Agriculture (USDA). Ranger District offices are located in Flagstaff, the Village of Oak Creek, and Blue Ridge. The Forest Supervisor's office is located in Flagstaff.

Purpose of the Land Management Plan

This plan aims to promote responsible land management for the Coconino NF based on useful and current information and guidance. Land management planning guides the Forest Service in fulfilling its responsibilities for the stewardship of the Coconino NF to best meet the needs of the American people.

This plan provides strategic guidance and information for project and activity decisionmaking on the Coconino NF for approximately the next 15 years. It is intended to provide additional direction not already provided by existing law, regulation, or policy. This plan does not include site-specific project and activity decisions. Project and activity decisions are analyzed separately. All project and activity decisions, however, must comply with the guidance provided by this plan unless amendments are made to the plan that allow for deviation.

The plan provides a framework that contributes to sustaining native ecological systems by managing towards appropriate conditions that support native plant and animal diversity. The plan integrates forest restoration, watershed protection, resilience to changing climate, wildlife conservation, and contributions to social and economic values, goods, and services. The plan honors the continuing validity of private, statutory, or pre-existing rights.

Summary of the Analysis of the Management Situation

The Analysis of the Management Situation (AMS), published in May 2010, highlights the social, economic, and ecological conditions and trends in and around the Coconino NF, as detailed in the Forest's Economic and Social Sustainability Assessment (USDA Forest Service 2008), the Ecological Sustainability Report (USDA Forest Service 2009), as well as the Recreation, Grazing, Minerals, and Timber Demand Report (USDA Forest Service 2010a) for the Forest. The AMS

Figure 1. Vicinity Map of the Coconino NF



used these key findings, along with public input (see appendix XX), to identify areas in the existing plan direction that do not provide adequate guidance for the present and the future and attempts to consider potential implications of those plan needs for change to other resources. The draft AMS and its supporting materials were used by the Forest leadership team to determine the initial scope of plan revision topics.

Social and economic trends and conditions show increasing demand on the Forest for a wide variety of human uses. Ecological conditions and trends demonstrate there are current and future threats to the sustainability of some of the Forest's ecosystems and the species they support. Identified plan needs for change are summarized below and grouped into three broad topics:

1. **Recreation** (this includes updated plan components for recreation and scenery management and existing Special Areas),
2. **Community-Forest Interaction** (this includes updated plan language regarding open space values, potential future community expansion desires, energy and mineral development, forest products [including culturally important forest products], air quality and smoke emissions, and communication sites, and
3. **Maintenance and Improvement of Ecosystem Health** (this includes updated plan language for soil, riparian, aquatic, water resources, changing climate, habitat connectivity, non-invasive animals and grasses, and vegetation.

Other needs for change have been and will continue to be identified. New information and changing conditions will necessitate changes in management. Iterative and adaptive planning may facilitate the incorporation of new information into potential plan amendments. Under the National Forest Management Act (NFMA) of 1976, projects and activities must be consistent with the plan.

Plan Content

This plan includes “plan decisions” and “other content.” Once plan decisions are approved, any substantive changes to plan decisions will require a plan amendment. A change to “other content” may be made using an administrative correction process. Administrative corrections are also used to make non-substantive changes to plan decisions such as corrections or updates of data and maps and typographical errors. The public is notified of all plan amendments and administrative corrections.

Plan Decisions

Plan decisions are the equivalent of plan components. They include goals (hereafter identified as desired conditions), objectives, standards, guidelines, suitability, and monitoring.

Desired Conditions set forth the desired social, economic, and ecological goals of the Coconino NF. They attempt to paint a picture of what we (the public and the Forest Service) desire the forests to look like or the goods and services we desire them to provide. Desired conditions are generally expressed in broad, general terms however more specificity may be added to clarify the intent. They are timeless in that there is no specific date by which they are to be completed. Desired conditions may only be achievable over a long time frame (several hundred years). In some cases, a desired condition matches the current condition, so the goal is to maintain the existing condition.

Desired conditions are the focus of this plan; management of the Coconino NF's resources will be directed toward achieving the desired conditions. Desired conditions are the basis for the other plan components and describe the framework for future projects and activities. They are aspirations and are not commitments or final decisions approving projects. Variance at the project level requires a plan amendment.

- **Objectives** are concise, time-specific statements of measurable anticipated results that respond to desired conditions. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving desired conditions. The objectives represent just some of the outcomes or actions expected to accomplish movement towards desired conditions. Not every action or objective the Coconino NF may do is identified in the plan, just the primary ones.

Variation in achieving objectives, however, may occur during the next 15 years because of changes in environmental conditions, available budgets, and other factors. Objectives are strongly influenced by recent trends, past experiences, current and anticipated staffing levels and short-term budgets.

- **Standards** are constraints upon project and activity design. A standard is an absolute requirement to be met in the design of projects and activities. A project or activity is consistent with a standard when its design is in accord with the explicit provisions of the standard; variance from a standard is not allowed except by plan amendment.
- **Guidelines** are sideboards that guide management activities and provide specifications that a project or activity would adopt unless there is a compelling or defensible reason to vary from the guideline. Deviation from the explicit provisions of the guideline is permitted without a plan amendment, as long as the intent of a guideline is met. Deviation from the explicit provisions of a guideline, if it is meeting the intent of the guideline, must be documented in the project record. Projects that deviate from the guideline's intent must be accompanied by a plan amendment that would allow for the deviation.
- **Suitability** describes the appropriateness of applying certain resource management practices to a particular area of land. A unit of land may be suitable for a variety of individual or combined management practices.
- **Management Areas** are lands that have management direction that is more specific than forestwide and include lands with designations as Special Areas by Congress or another delegated authority. Special areas are identified because of their unique or special characteristics. Examples include wilderness, research natural areas, scenic byways, and national recreation trails.

- **Monitoring** is used to determine the degree to which on-the-ground management is maintaining or making progress toward desired conditions. The monitoring plan includes questions and performance measures designed to inform implementation and effectiveness of plan decisions. It helps ensure that the plan remains adaptive, in that new knowledge and information can be analyzed and the plan changed.

Other Content

Besides the plan decisions mentioned above, the plan also contains other content. Other content includes chapter one, certain sections in chapters 3 and 4 (i.e., background, management approaches, and related plan content), and all appendices. These sections are meant to provide information and assist in understanding the larger management context. These sections are not intended to be mandatory direction.

The **background** section provides a narrative regarding resource conditions. The primary sources for the information found in this section are derived from the Analysis of the Management Situation, the Ecological Sustainability Report, the Economic and Social Sustainability Assessment, and Resource Evaluations (see references on previous pages).

The **management approach** sections identify probable management actions to accomplish desired conditions and objectives. Management approaches describe the priorities and expectations for future program coordination. Partnerships and collaborative arrangements are also included as part of the management approaches for accomplishing desired conditions. Management approaches are strongly influenced by recent trends, past experiences, and anticipated staffing levels and short-term budgets. Decisions about what projects are actually proposed and approved, as well as details of project design, are determined by public involvement, science, and professional experience at the project or activity-level.

The related plan content section lists other portions of the plan that contains related information.

The plan includes several **maps** throughout the document. The following statement applies to all maps found within the plan:

The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those for which they were intended may yield inaccurate or misleading results. The USDA Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. This map is not a legal land line or ownership document. Public lands are subject to change and leasing, and may have access restrictions; check with local offices. Obtain permission before entering private land.

Guiding Future Projects, Program Plans, and Assessments

During implementation, management activities affecting the Coconino NF need to be consistent with the plan. This consistency is achieved in the following ways:

- Management activities are developed specifically to achieve the desired conditions of the plan. To the extent practicable, documentation for such projects should identify the elements of the desired conditions to be achieved by the project. It should not be expected that all projects or activities would contribute to all desired conditions, goals, or objectives, but rather to a limited subset. It should also be recognized that some projects designed to contribute to some desired conditions may have consequences considered adverse to the achievement of other desired conditions. In this situation, the responsible official for the project needs to identify and disclose these effects in the project documentation and make a decision that balances these considerations.
- Management activities for projects that are necessary but are not specifically related to one of these elements of the plan (e.g. routine road maintenance, facility maintenance, etc.) should be briefly evaluated to assess if they conflict or impede contribution to the desired conditions, goals, or objectives.
- Projects are expected to comply with suitability and standards and guidelines direction contained in the plan. Early in the project planning process, the applicable standards and guidelines and suitability considerations should be identified. To ensure compliance with the plan, each project should document consistency with these standards and guidelines.

Transition in the Implementation of the Plan

The plan is used as a direction source for future projects, plans, and assessments. It is not expected that this new direction be used to re-evaluate or change decisions that have been made under the previously existing plan. A smooth and gradual transition to the new plan is anticipated, rather than one that forces an immediate reexamination or modification of all contracts, projects, permits, and other activities that are already in progress. As new project decisions, contracts, permits, renewals, and other activities are considered, conformance to the new plan direction as described in the previous section is expected.

Changes to the Plan

A change to the plan requires either administrative correction or amendment. The following summarizes circumstances that warrant corrections or amendments to the plan:

1. **Administrative corrections:** are minor changes to the plan that do not substantively affect the management direction or create additional environmental consequences. These minor changes include the following:
 - Elements of the plan that are not plan decisions as described in the previous section, “Other Content.”
 - Corrections and updates of data published in the plan and minor changes to maps.
 - Changes in proposed or probable actions expected to occur during the plan period.
 - Minor text changes such as typographical errors, clarification of explanatory text, etc.

Unless otherwise required, administrative correction must be initially published as a proposed correction either on the Coconino NF’s Web page or in a local newspaper of record. The proposed correction must identify the language or map to be corrected, the

proposed correction, and the reason for the correction. The public will have an opportunity to comment on the proposed correction within a 30-day period following publication. After reviewing the comments received, the final correction may be similarly published and the plan corrected.

2. **Site-specific plan amendments:** occur to allow specific projects or other activities to deviate from certain plan direction. These amendments occur only for a specific area or a specific project. They do not lead to changes in plan language, and if changes are made to management area map layers, they are made only for the area affected. Such amendments are usually proposed with appropriate NEPA analysis for the site-specific project proposal. The procedures for processing a site-specific plan amendment are outlined in the applicable planning regulation.
3. **Programmatic plan amendments:** change the text and language of the plan decisions identified in the earlier section, “Plan Decisions,” and any other changes that cannot be addressed through administrative corrections or site-specific plan amendments. The procedures for addressing a regular plan amendment are outlined in the applicable planning regulation.

Plan Organization

This plan is organized into five chapters and appendices:

Chapter 1 (Background) briefly describes the Coconino NF, the analysis of the management situation, the purpose of this plan, plan content, and plan organization. For a quick preview of the plan structure, glance at the Table of Contents. This chapter does not contain any plan decisions.

Chapter 2 (Forestwide Direction) contains plan decisions and other content that are applicable forestwide.

Chapter 3 (Management Area Direction) contains plan decisions and other content that is applicable to particular management areas, in addition for forestwide direction.

Chapter 4 (Suitability) describes the appropriateness of certain resource management practices (uses) across the forests.

Chapter 5 (Monitoring Strategy) contains the monitoring plan decision and provides a framework for subsequent monitoring and evaluation.

Appendices XX

Hypertext is used throughout the plan – it allows the user of the electronic version of this plan to click on a word (indicated by blue underlined text) and be redirected to another area of the plan or an external reference. Note the first occurrence of words that are found in the glossary are hyperlinked, for example [Glossary](#).

Roles and Contributions of the Coconino NF

The distinctive characteristics of the Coconino NF frame the roles and contributions it provides to the local area, the State, the Southwestern Region, and the Nation. The approximately two million-acre Coconino NF is located in north central Arizona and is at the southern end of the

Colorado Plateau. It is one of six national forests in Arizona. The Forest shares borders with the Kaibab, Prescott, Tonto and Apache-Sitgreaves National Forests, private land, and lands administered by the State of Arizona and the National Park Service. It is within a couple miles of the Navajo Nation.

The Forest ranges in elevation between 2,600 and 12,633 feet. Numerous cinder hills and volcanoes of the San Francisco Peaks volcanic field are scattered across the northern portion. The north part of the Forest is dominated by the San Francisco Peaks, which includes Mount Humphreys, the highest point in Arizona. The Mogollon Rim, a 1,000-foot high cliff that runs for about 200 miles across central Arizona, delineates the southeast border of the Forest. Deep canyons containing several perennial streams dissect it. The Verde River forms the southwest boundary of the Forest while one of its major tributaries, Sycamore Canyon, separates the Coconino from the Kaibab and Prescott National Forests on the west. The Forest has a high diversity of vegetative communities due to the wide range of elevations, complex topography, and the presence of perennial and ephemeral water. Vegetative communities at the lowest elevations are desert communities and riparian areas supporting cottonwoods and willows while the highest elevation atop the San Francisco Peaks supports the only alpine tundra in Arizona. In between, are extensive areas of piñon-juniper, ponderosa pine, and mixed conifer forests interspersed with grasslands and scattered pockets of aspen at higher elevations. Riparian vegetation is supported by perennial and intermittent waters.

The Coconino NF contains more water than most of the surrounding landscapes. There are about 224 perennial stream miles on the Forest. Mormon Lake is Arizona's largest natural lake. There are 13 reservoirs, constructed primarily for municipal water use, recreation, and livestock. The Forest lies mainly in the Verde River and Little Colorado River Plateau groundwater basins. The areas of highest precipitation and groundwater recharge for these basins occur on Coconino NF lands. The Forest also contains about 78 riparian wetlands totaling about 10,186 acres, the second highest number on national forest lands in Arizona. Over 200 springs occur on the Forest.

The diverse ecosystems on the Forest provide habitat for a wide array of wildlife, fish, and plants. There are a number of rare species such as the Wupatki Arizona pocket mouse, Chiricahua leopard frog, Little Colorado spinedace and rare plants like the San Francisco Peaks groundsel, and Arizona cliffrose. Fifteen native fish species occur on the Forest. Portions of nearly 80 percent of the perennial streams support native fish. Some native fish are only known from this area.

The CNF is a regional, national, and international year-round recreation destination. Visitors are drawn to the diversity of settings provided, which range from: warm grasslands in the Verde Valley, cool riparian respite in canyons, and prominent red rock spires and buttes around Sedona to Flagstaff's snow covered peaks and forests. They visit the Coconino NF seeking a change from summer heat and city living. Many people gravitate to water or snow-based activities. Others enjoy the diverse scenery of red rocks, grasslands, desert, and cool forests. The activities that see the greatest number of participants are hiking/walking; driving for pleasure; and viewing natural features, wildlife, and archaeological sites.

The top five activities identified are as follows¹:

¹ USDA 2006, p. 14

- Viewing Natural Features (83.9 percent)
- Hiking/Walking (79.1 percent)
- Viewing Wildlife (70 percent)
- Relaxing (64.8 percent)
- Driving for Pleasure (54.8 percent)

Visitors enjoy the developed recreation sites throughout the Forest that include the Arizona Snow Bowl, popular lakes, and campgrounds. There are abundant year-round dispersed recreation activities. Ten wilderness areas provide opportunities for solitude and backcountry experiences. Several archaeological sites developed by the Forest for public interpretation and an abundance of private sector guided tours display the significant cultural heritage preserved on the Forest. Trails and roads provide numerous hiking, biking, horseback, and motorized vehicle access to natural areas in the Forest landscape. Wildlife viewing, big game hunting and fishing are popular activities. The Coconino NF is a destination for winter activities such as snow play, snowmobiling, skiing and snowshoeing.

American Indians and ranchers are a significant part of the Forest history and their traditional uses remain an important part of the cultural landscape of the Coconino NF.

Some additional features that make the Coconino NF unique on a regional and national scale include the following:

- The Coconino NF contains 55percent of the perennial stream miles in the Middle Little Colorado River 4th level hydrologic unit code (HUC) yet only 15percent of the 4th level HUC is on the Forest.
- The Coconino NF covers about 20percent of the total extent of the 4th level HUC watersheds that overlap the Forest yet has a proportionally higher 30percent of the perennial stream miles.
- The state of Arizona has designated two streams, Oak Creek and West Fork of Oak Creek, on the Coconino NF as being outstanding State resources and classified them as Outstanding Arizona Waters.
- The only two designated Wild and Scenic Rivers (WSR) in Arizona occur on the Coconino NF. The Verde River WSR is shared with the Prescott and Tonto National Forests. The Fossil Creek WSR is shared with the Tonto National Forest. Eleven additional segments in nine different streams are eligible for inclusion in the National Wild and Scenic Rivers System, including portions of the West Fork of Oak Creek.
- Fossil Creek contains the largest assemblage of native fish species in a creek that is free of non-native fish in the State of Arizona. In addition, the travertine formation in Fossil Creek is of international significance because it is of similar scale and significance with a handful of travertine systems in China, Afghanistan, Croatia, Italy, Guatemala and Turkey. Stream chemistry creates travertine formations and gives the stream its unique turquoise color.
- The Coconino NF contains the two largest natural lakes in Arizona: Mormon Lake and Stoneman Lake.

- Oak Creek has the largest number of caddisfly species reported in any drainage in Arizona.
- The Coconino NF has all of Arizona's big game species except buffalo and includes: pronghorn, black bear, bighorn sheep, elk, javelina, turkey, mountain lion, mule deer and white-tailed deer.
- Several factors make the Coconino NF unique for its bald eagle habitat. Edgar Mearns documented the first bald eagle nest in Arizona at Stoneman Lake in the late 1800's. The largest concentration of bald eagles ever counted in Arizona (120 eagles) was counted on the Forest near Mormon Lake. Fifteen to twenty percent of all bald eagles counted in Arizona in the winter occur on the Forest. The Forest contains both federally-listed (within low elevation areas) and separate Forest Service sensitive populations (within high elevation areas) of nesting bald eagles.
- Night sky viewing opportunities abound, and four observatories are located within or adjacent to the Coconino NF boundary. In recognition of the area's unique and valuable night sky viewing opportunities, Flagstaff became the world's first international "Dark Sky City".
- In addition to having six national monuments and four State parks as neighbors, the Coconino NF manages seven archaeological sites that are open to the public: Sacred Mountain, Honanki, Palatki, V-V and Red Tank Draw Petroglyph sites, Clear Creek Ruins, Old Caves Pueblo, and the award-winning Elden Pueblo Project, one of America's Hands on the Land designated sites.
- The Cinder Lakes volcanic field was used from 1968 to 1973 to train NASA astronauts in the Apollo 11 through Apollo 15 missions. This training was vital to the success of the Apollo program and the first U.S. landing on the moon by Neil Armstrong and Edwin Aldrin in July 1969.
- Coconino NF ranges from 2,600 feet in elevation in the Verde Valley to 12,633 feet atop Mount Humphreys. This wide range in elevation makes the Forest unique in Arizona because it contains all major biotic communities except true desert. All of the alpine tundra on Forest Service lands in Arizona is on the Coconino NF.
- The Coconino NF has one of the highest natural fire occurrences in the U.S. Over a 23-year period, the Forest had the highest natural fire occurrence in the U.S. for 18 years. It was in the top six every year.

The Coconino National Forest's Mission

"Caring for the Land and Serving People," is the Forest Service mission. This translates into sustaining the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. The overall goal of managing National Forest System lands is to sustain the multiple-uses of its resources in perpetuity while maintaining the long-term productivity of the land.

The Coconino NF's staff strives to effectively and efficiently manage National Forest System lands and resources to meet the needs and desires of the public while enhancing the environment.

The Coconino National Forest's Vision

The Coconino NF contains healthy ecosystems with an abundant and diverse flora and fauna. The Forest provides a variety of high quality outdoor recreation opportunities and serve as an important part of the rich southwestern scenic and cultural heritage. Historic uses such as timber harvesting and livestock grazing continue within sustainable levels and support rural economies..

DRAFT

Chapter 2. Forestwide Management

Introduction

This chapter sets forth plan decisions and other content that apply forestwide. See Chapter 1 for descriptions of plan decisions and other content. In the event of conflicts with other sections of this plan, the more restrictive plan decision always applies. However, a project or activity-level evaluation may be required to resolve the conflict.

Landscape Character Zones

The following landscape character zones provide a thematic and geographical context for forest management by highlighting unique geographic, geological, ecological, and cultural elements of different parts of the Forest. Landscape character zones not only provide the reference condition for scenery, but they also help identify unique resource values associated with different areas of the Forest that should be retained or enhanced by activities and developments. Scenery, but helps identify particular resource values associated with different areas of the Forest that should be retained or enhanced by activities and developments. These landscape character zones are intended to be used in conjunction with other plan direction that would be applicable to any given area of the Forest.

The desired landscape character for these zones may be very similar to the existing landscape. The edges of these zones are not always distinct on the ground and may vary over time with changes from natural disturbance and climate change. Map XX provides a general understanding of their location but areas around the boundaries may exhibit or blend with the character of the adjacent zone. On-the-ground interpretation of these zones is acceptable based on site-specific knowledge.

Ponderosa Pine Landscape Character Zone

General Description and Background for Ponderosa Pine Landscape Character Zone

The Ponderosa Pine Landscape Character Zone is the largest on the Forest and extends from the northern Forest boundary to the northern boundary of the East Clear Creek Watershed (add the watershed in HUC level format to be consistent with other parts of the plan). Western edge of the character zone is defined by the Mogollon Rim and features of this character zone may extend down its slope and into adjacent character zones. On the eastern boundary is Anderson Mesa Landscape Character Zone. The transition between these two character zones is defined by the presence of piñon-juniper and Great Basin grasslands. The transition is gradual, and there may be areas that have a mixed character. This character zone is a portion of the largest ponderosa pine landscape in Arizona.

This character zone overlaps with the Long Valley, Walnut Canyon, and the Flagstaff Neighborwoods Management Areas.

Desired Conditions for Ponderosa Pine Landscape Character Zone

The Ponderosa Pine Landscape Character Zone itself is flat to gently sloping with scattered, steeper landforms including Mormon Mountain, lands around Kendrick Peak, the West Clear Creek drainage, Walnut Canyon, Pumhouse Wash, Fry Canyon, Saddle Mountain, a number of

prominent hills and mountains in the northern portion of the character zone and various escarpments throughout. On the northern end, evidence of volcanic geology is more common.

This area is valued for its continuous stands of ponderosa pine, old-growth “yellow-belly” ponderosa pine stands, and beautiful lakes for boating and fishing. This character zone is comprised of ponderosa pine forest and piñon-juniper woodland vegetation types which cluster around broad expanses of grassy openings and picturesque lakes. Ponderosa pine is all-aged and has large trees with open, well-formed crowns. The Forest is a generally open and park-like with a diverse understory of grasses and shrubs. Denser tree conditions exist in places across the landscape including north facing slopes and canyon bottoms. The distribution and class of trees across the landscape corresponds with the ecological desired conditions for this vegetation type. Old growth ponderosa pine in groups or individual provides a valued landscape feature that adds to the sense of diversity and discovery in this zone. Snags, top-killed trees, down logs, and other evidence of fire and wind disturbance occur individually and in patches of varying sizes. They provide an intriguing feature that moves throughout the landscape with time. Standing dead trees provide character and wildlife habitat and they are retained (See ponderosa pine Vegetation Type Desired Conditions for details).

Small natural and artificial lakes and wetlands are scattered throughout this character zone. They are highly valued for their recreation opportunities, especially boating and fishing, and scenic attributes. Lakes provide a viewing platform for mountains and hillsides in the vicinity and the some provide views of the San Francisco Peaks. The presence of water provides for ecological diversity and wildlife viewing in these areas, and it is a highly valued scenic attribute.

Gambel oak and aspen provide contrast to the evergreen pine in fall. In winter, this character zone provides a refuge from noise for motorized and non-motorized recreationists in a white, snow-covered landscape that contrasts with evergreen trees. In the summer, it provides cool shady areas for a variety of recreation activities. Arizona walnut trees in Walnut Canyon are another valued feature in this character zone. It contributes an interesting bark and texture against the winter sky and yellow fall color.

Clear, dark night skies are valued for stargazing and as a professional astronomical astronomy resource. Astronomical facilities are present and visible in defined areas.

San Francisco Peaks Landscape Character Zone

General Description and Background for San Francisco Peaks Landscape Character Zone

The San Francisco Peaks Landscape Character Zone is located within the White Mountains-San Francisco Peaks-Mogollon Rim Ecological Section on the Coconino NF. This character zone is characterized by distinctive mountains with steep slopes and alpine peaks, including the highest point in Arizona, Mount Humphreys. The Arizona National Scenic Trail crosses this character zone.

The San Francisco Peaks, including the Kachina Peaks Wilderness, are sacred to many American Indian tribes as a significant religious landmark and traditional cultural place that contains many shrines and sacred places. For the Hopi, the Peaks are the single-most important place that is central to their religious beliefs. It is an icon that gives them their identity as a people. The San

Francisco Peaks are one of several mountains that demarcate the boundaries of the traditional and sacred heartland of the Hopi, Navajo, Zuni, Acoma, Apache, Havasupai, and Hualapai. Many tribes continue to conduct centuries-old religious observances on the San Francisco Peaks that are central to their culture and religion.

This character zone overlaps with the Fort Valley-Mount Elden and the Flagstaff Neighborwoods Management Areas.

Desired Conditions for San Francisco Peaks Landscape Character Zone

The San Francisco Peaks are a distinctive volcanic mountain with several alpine peaks and steep slopes. It is a focal point of background views from adjacent zones up to 80 miles away including the Grand Canyon National Park and the Verde Valley. The middleground of views from the Peaks is dominated by sky, air and clouds with background views of dry steep canyons and expansive forests.

Vegetation varies along the elevation gradient from open ponderosa pine stands with views of the surrounding landscape to sun-dappled shade of spruce-fir and mixed conifer to rocky and sparsely-vegetated alpine communities. Within these vegetation types, steep, cool drainages and fire disturbance create microclimates with a surprising diversity of landscape features such as high elevation mountain meadows, communities of bristlecone pine, and aspen that contrast to dark evergreen surroundings. Aspen and grasslands, in particular create openings that provide a sense of the surrounding landscape. The lower slopes of the zone gradually flatten and blend into the surrounding plateau.

The San Francisco Peaks are highly valued for their scenic character year-round. In autumn, aspen lights up the mountains with beautiful yellow, gold, and orange colors contrasted against dark conifer forests. Wildflowers provide dramatic splashes of color in mountain meadows in the spring and late summer. In winter, the snow-covered peaks can be viewed from great distances and the area is a destination for snowplay.

The San Francisco Peaks are sacred to many American Indian tribes and is a significant religious and traditional place. There are individual shrines and sacred places that are valued for their cultural setting on the mountain. The area is valued for its heritage resources and cultural importance, spectacular scenery and high scenic integrity, cool climate escape from desert heat, a diverse range of year-round recreation opportunities, and its distinctive landscape features.

Volcanic Woodlands Landscape Character Zone

General Description and Background for Volcanic Woodlands Landscape Character Zone

The Volcanic Woodlands Landscape Character Zone is part of the White Mountains-San Francisco Peaks-Mogollon Rim Ecological Section and the Painted Desert Ecological Section on the Coconino NF. It is largely defined by the north and northeast extents of the San Francisco Peaks volcanic field associated with more recent volcanic activity.

A number of cinder cones and mountains in this character zone are important cultural and religious places for several tribes. They are the sources spiritual force with shrines that are the focal point for prayers of several religious societies.

This character zone overlaps with the Flagstaff Neighborwoods Management Area.

Desired Conditions for Volcanic Woodlands Landscape Character Zone

This character zone is characterized by gently rolling topography with sudden inclusions of black, red, and gray cinder cones; volcanic craters; and rugged lava flows. Areas with these volcanic features have open growing ponderosa pines which may have unique forms and shapes due to the growing conditions. The forest understory is often sparse with patches of native grass or shrubs. Lava flow areas are distinctive and generally devoid of vegetation being dominated by the unique rock forms. Most of the character zone is characterized by piñon-juniper woodlands interspersed with grasslands on gently rolling to flat topography. Water is scarce throughout this character zone. Located in this character zone are Sunset Crater National Monument, Cinder Hills OHV recreation area, and Painted Desert Vista. Outside of the Cinder Hills OHV area, cinder cones are generally undisturbed by human activity. The area is valued for its volcanic scenery, motorized recreation opportunities, and distinctive features such as Red Mountain (a designated Geological Area), Cochrane Hill, and other cinder cones and lava flows. The southwestern boundary of this character zone blends gradually into the ponderosa pine characteristics of adjacent character zones.

Anderson Mesa Landscape Character Zone

General Description and Background for Anderson Mesa Landscape Character Zone

Anderson Mesa Landscape Character Zone is located within the White Mountain-San Francisco Peaks-Mogollon rim Ecological Section. The major vegetation types are piñon –juniper and Great Basin grassland. The western and southern parts of this character zone transition gradually to ponderosa pine. This area provides a background to Winona and areas east of the Forest. The Arizona Trail also crosses this character zone.

Anderson Mesa is the location of six large pueblos that are the last archaeological expression of the prehistoric Sinagua culture as it transforms into the nascent Hopi and Zuni cultures in the 1400's. It is also the location of early 20th century homesteads of several families that continue to practice traditional cattle ranching in the region today.

This zone does not overlap any management areas.

Desired Conditions for Anderson Mesa Landscape Character Zone

The Anderson Mesa Landscape Character Zone has mostly gently sloping to flat topography. Steep escarpments form the sides of the mesa. Steep canyons are interspersed along the eastern Forest boundary with Padre Canyon, Jacks Canyon, and East Clear Creek Canyon—distinctive inclusions in this character zone which is otherwise dominated by grasslands and piñon-juniper woodland. The Great Basin grasslands of the mesa provide large open landscapes with individual trees surrounded by piñon juniper and ponderosa pine forests. Grasslands are a valued component of the landscape character where they naturally occur. Anderson Mesa is a destination for hunting and wildlife viewing because of its outstanding wildlife habitat. Other distinctive features in this character zone are wetlands such as Marshall Lake, and lakes, such as Ashurst Lake, Hay Lake,

and Long Lake, that contribute to recreation settings and wildlife habitat (See Aquatic Resources for more details).

Clear, dark night skies are valued for stargazing and as a professional astronomical resource. Astronomical facilities are present and visible in defined areas. In spring and late summer, blankets of yellow wildflowers may dominate the grasslands.

The presence of large prehistoric pueblos and historic ranches that are still operating contribute to the sense of history and place that Anderson Mesa provides to the families of several Hopi and Zuni clans as well as Euroamerican ranching families today.

East Clear Creek Landscape Character Zone

General Description and Background for East Clear Creek Landscape Character Zone

The East Clear Creek Landscape Character Zone is located within the White Mountains-San Francisco Peaks-Mogollon Rim Ecological Section on the Coconino NF.

The Mogollon Rim makes up the southern boundary of the Forest and the southern limit of the Colorado Plateau, draining north into East Clear Creek. It is part of the traditional homeland of the Western Tonto Apache, the scene of numerous skirmishes during the Apache Wars of the 1860's to 1880's, and a passageway for many pioneering families who settled central Arizona in the latter part of the 19th and early 20th centuries.

This zone overlaps with the Long Valley Management Area.

Desired Conditions for East Clear Creek Landscape Character Zone

This character zone is characterized by the Mogollon Rim, a rugged escarpment with steep, rocky drainages and narrow canyons and ridges alternating from east to west. This canyon setting provides opportunities for quiet and solitude. Vegetation is composed mostly of ponderosa pine and mixed conifer forests with inclusions of maples, aspen and other deciduous trees offering variety year-round. In autumn, magnificent yellows, golds, and reds contrast against a dark conifer forest background. Distinctive features in this character zone include: C.C. Craigen Reservoir; Knoll Lake; Potato Lake; and scenic drainages including East Clear Creek, Barbershop Canyon, Dane Canyon, and Leonard Canyon, to name a few. Leonard Creek and East Clear Creek have perennial flowing water in a steep canyon setting.

The Apache wars and prehistoric/historic settlement are recognized as culturally significant features related to the General Crook National Recreation Trail which partly follows the "Palatkwabi Trail", an ancient travel route from the Hopi Mesas to the Verde Valley that was used by the Spanish, the American military, and early settlers." The Arizona National Scenic Trail provides long distance hiking, biking, and equestrian riding opportunities. Forest Road 300 along the Mogollon Rim provides views into adjacent forest lands and communities below. Past wildfires created views to distant vistas. The Apache-Sitgreaves National Forests to the east are similar in character to this character zone. North of East Clear Creek, the terrain starts to become more gradual and blends in to the Ponderosa Pine Landscape Character Zone.

Red Rock Landscape Character Zone

General Description and Background for Red Rock Landscape Character Zone

The Red Rock Landscape Character Zone makes up about four percent of the White Mountains-San Francisco Peaks-Mogollon Rim Ecological Section on the Coconino NF. However, most of this character zone is located in the Tonto Transition Ecological Section. To the north and northeast is the Ponderosa Pine Landscape Character Zone, which is sharply divided from the Red Rock Landscape Character Zone by the Mogollon Rim. To the south in the Verde Valley, there is gradual transition away from red rock formations to a semi-desert and desert community dominated landscape.

This zone overlaps with the Sedona-Oak Creek (including the Oak Creek Canyon Management Area) and Sedona Neighborwoods Management Areas.

Desired Conditions for Red Rock Landscape Character Zone

The Red Rock Landscape Character Zone is a truly distinct landscape where monumental buttes, soaring multi-hued cliffs, fantastic towering spires, and rugged canyons bombard the eye and the senses and vast sweeps of greenery refresh and inspire the spirit and fill the viewer with expectation. Unified by Oak Creek, the vital riparian link between the Mogollon Rim and the Verde Valley, the landscape is a museum of life, a living crossroads connecting people in time and space. There is no other region on earth exactly like it. This landscape has long been celebrated nationally and internationally as a year-round destination. This character zone is valued for its world renowned scenery, high and very high scenic integrity, lush riparian areas and perennial streams, historic and prehistoric resources, and primitive and developed recreation experiences. The landscape is defined by bright and vibrant variations in color and form such as blue water and skies juxtaposed with red rocks and dark green trees. The rolling terrain in the piñon-juniper forest provides a variety of visual experiences and panoramic views of the rock formations. The contrast created between the red rocks and soil and the gray-green piñon-juniper forest enhances the visual character of the landscape in terms of color, texture, and form. Scenic views from primary viewing areas such as highways, recreation sites, trails, and residential areas are maintained.

From an aerial perspective, the landscape is coarse-textured and has a vegetation pattern that varies from sparse to dense areas of trees and shrubs that range from dark evergreen to gray-green. The light red and reddish brown soil colors contrasts with the vegetation and rock outcrops to create a mottled appearance to the land surface. The large sandstone formations have a smooth appearance, with vegetation dotting the surface of the rocks in an irregular pattern.

With its intriguing human history and remarkable natural environment rich with plants and wildlife, red rock country offers individuals and families the gifts of discovery, inspiration, and solitude. When wandering the character zone, the visitor is free to imagine, explore, and reconnect with the land. Clear, dark night skies are valued.

Some red rock formations are particularly distinctive such as Bell Rock, Cathedral Rock, and Courthouse Butte. Certain locations, such as Crescent Moon Ranch/Red Rock Crossing, Airport Mesa/Airport Saddle, West Fork of Oak Creek, Call of the Canyon and Oak Creek Vista provide exceptional views of the red rock formations and are particularly valued by photographers, artists,

and visitors. The area is rich in prehistoric and historic cultural landscapes, including ranches, orchards, cliff dwelling, and rock art and sacred sites. Along the escarpment, that divides the Red Rock –Secret Mountain Wilderness from the lower country, there are several notable cliff dwellings of high scenic and interpretive value such as Palatki and Honanki.

Riparian areas are a destination for fall color viewing. In summer, they offer a respite from heat along shady banks. In winter, snow-covered red rock is a strong feature. During the monsoon season in late summer rainbows are common across the red rock sky.

Riparian areas, in particular Oak Creek, provide a lush dark green environment with perennial water, which begins in a narrow rich canyon and opens into piñon juniper and semi-desert communities. Interior chaparral vegetation adds to the diversity and interest in the area.

Evidence of fire disturbance generally does not detract from visitor experiences.

Visitors are drawn to the Chapel of the Holy Cross for its distinctive architecture and for the panoramic vistas of the surrounding red rock landscape. From the adjoining Chapel of the Holy Cross plaza, one can see several prominent rock formations including Eagle Head Rock, the Two Nuns, and the Madonna and Child. To the Yavapai and Tonto Apache people, the Red Rock formations and canyons are recognized as the locations of legendary events that relate to their origins in the Verde Valley/Red Rocks Country. The unique geology and local rock formations of the Red Rock Country make it a multi-cultural landscape that has been recognized for centuries. The unique geology and local rock formations of the Red Rock Country, combined with the distinctive architecture and historic significance of the Chapel of the Holy Cross, make it and the surrounding area a cultural landscape.

Verde Valley Landscape Character Zone

General Description and Background for Verde Valley Landscape Character Zone

The Verde Valley Landscape Character Zone is located within the Tonto Transition Ecological Section. The vegetation is predominantly semi-desert grasslands, desert communities, and riparian. The Verde Valley has a continuous history of human occupation, beginning with Clovis Paleo-Indian mammoth hunters of 12,000 years ago. The Verde Valley comprised the southern Sinagua culture area until A.D. 1400, as highlighted by Montezuma Castle, Montezuma Well, and Tuzigoot National Monuments and the Clear Creek Ruins, Red Tank Draw, Sacred Mountain, and V-V Rock Art Heritage Sites of the Coconino NF. About A.D. 1250, the northeastern Yavapai entered the Verde Valley, and later, the Tonto Apache. Both groups continue to live in the Verde Valley as the Yavapai-Apache Nation. Euroamerican miners, farmers, and ranchers spread into the Verde Valley starting in the 1860's, and several of those pioneering families still work in the Camp Verde and Sedona areas. Fort Verde State Park; the towns of Camp Verde, Cottonwood, and Clarkdale; the General George Crook Road; 13 Mile Rock; and scattered ranches represent the historic period growth of the Verde Valley. The Verde Valley has a long history of prehistoric and historic settlement as highlighted by national monuments and historic trails within the Forest's administrative boundary.

This zone overlaps with the House Mountain-Lowlands Management Area.

Desired Conditions for Verde Valley Landscape Character Zone

This character zone is defined by the large Verde River Valley and semi-desert grasslands and desert communities. Broad valleys with lonely rounded hills are common in the north and western portion of the zone and steep drainages characterize the eastern portion. The Verde River, designated as a Wild and Scenic River, separates the Prescott and Coconino National Forests on the southwest. The Wild and Scenic Verde River runs along the southern end of the Forest. Oak Creek, Sycamore Creek, West Clear Creek, Wet Beaver Creek and the Wild and Scenic Fossil Creek emerge from deep cottonwood and mixed broadleaf lined canyons which cut into the Mogollon Rim and continue as ribbons of riparian vegetation across the piñon juniper and semi-desert grasslands before merging with the Verde River. Canyons along the Mogollon Rim show evidence of past flooding and are periodically flooded. Cool shady pools of water in and along the rivers provide an ideal setting for water-based recreation activities and a refuge from the dry hot landscape that surrounds them. Escarpments, rocky outcrops, and mesas provide a diversity of landforms and leads to unexpected changes in vegetation. Some snow may occur but the transition is mild and gradual. Deciduous trees along riparian areas in the late fall provide some scenic benefits. Some of these riparian areas also have Arizona walnut, which contributes an interesting bark and texture against the winter sky and yellow fall color.

Painted Desert Landscape Character Zone

General Description and Background for Painted Desert Landscape Character Zone

The Painted Desert Landscape Character Zone is predominantly a transition zone between ponderosa pine and piñon juniper woodlands and the Painted Desert. Views of the Painted Desert are in the background from this area, but it lacks some of the characteristic features of the Ecological Section in the foreground.

This zone does not overlap any management areas.

Desired Conditions for Painted Desert Landscape Character Zone

Topography is relatively flat with the exception of Deadman Wash and lands around Doney Picnic Area. Vegetation is comprised of grasslands and piñon juniper woodlands opening onto a vast, largely undeveloped, desert landscape in the background. Cultural features and evidence of prehistoric habitation are the most predominant scenic attractions in this character zone. Panoramic views of volcanic fields and the characteristic Painted Desert land formations are visible from this character zone.

Air Resources

Air Quality

General Description and Background for Air Quality

Smoke occurs during wildfires and where fire is used to reduce fuels and restore fire-adapted ecosystems. Management activities that use fire are likely to increase atmospheric particulates.

The Environmental Protection Agency, as required by the Clean Air Act (1990) as amended, has established National Ambient Air Quality Standards (NAAQS) for six pollutants to protect human health, as well as to protect against decreased visibility, damage to animals, crops, vegetation, and buildings. These standards apply to the two airsheds (Little Colorado River Airshed and Verde River Airshed) that overlap the Forest. In addition the EPA established the Regional Haze Rule (40 CFR Part 51) (U.S. EPA 1999) for improved visibility in national parks and wilderness areas. Coconino NF overlaps a portion of the Sycamore Canyon wilderness which is a Class 1 area.

Management activities on the Forest are coordinated with the Arizona Department of Environmental Quality, as well as with adjacent agencies, to maintain and protect the air quality in the two airsheds and the Class 1 area.

Desired Conditions for Air Quality

Management activities do not exceed State or Federal emissions standards. Air quality on the Coconino NF meets state air quality standards including visibility and public health. Air quality related values, including high quality visual conditions, are maintained within the Class I Airshed over the Sycamore Wilderness.

Guidelines for Air Quality

Project design for prescribed burns and strategies for wildfires should incorporate as many Emission Reduction Techniques listed in Arizona Revised Statute (ARS) 18-2-15 as are feasible to reduce negative impacts to air quality, subject to economic constraints, technical feasibility, safety criteria, and land management objectives.

Decision documents for wildfires and prescribed burns should identify smoke sensitive areas² and include objectives and courses of action to mitigate impacts to those areas.

The public should be notified through methods, such as smoke warning signs along roads when visibility may be reduced due to wildland fire.

Management Approaches for Air Quality

Coordinate with Arizona Department of Environmental Quality (ADEQ) during prescribed burns to comply with State and Federal regulatory requirements for emissions and impacts to Class I and II airsheds.

Coordinate with ADEQ during wildfire to ensure ADEQ is aware of potential smoke impacts to receptors.

Aquatic Resources

Introduction to Aquatic Resources

The different types of aquatic resources described below are:

² Smoke sensitive areas are areas in which smoke from outside sources is intolerable, for reasons such as heavy population, existing air pollution, or intensive recreation or tourist use (from <http://www.nwcg.gov/pms/pubs/glossary/index.htm>)

- watershed management, water quality and quantity,
- stream ecosystems,
- wetlands and reservoirs
- springs, and
- constructed waters (such as earthen stock tanks or artificial drinkers).

Desired conditions for some aquatic resources are described using watershed scales to help provide their relative importance or niche. Conditions for larger land areas are described under the 4th to 5th level [HUC](#) watershed scale. More detailed descriptions for site-specific conditions are described at the 6th level HUC watershed scale. Not all aquatic resources require a description at each scale.

Watershed Management, Water Quality and Quantity

Desired Conditions for Watershed Management

Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their potential natural condition. The natural hydrologic, hydraulic, and geomorphic processes function at a level that allows retention of their unique physical and biological properties. They are resilient and recover rapidly from natural and human disturbances. They exhibit a high degree of connectivity along the stream, laterally across the floodplain and valley bottom, and vertically between surface and subsurface flows. They provide important ecosystem services such as high quality water, recharge of streams and aquifers, the maintenance of riparian communities, and moderation of climate variability and change. They maintain long-term soil productivity. They provide habitat that supports adaptive animal and plant communities that reflect natural processes.

Water Quantity and Quality

Desired Conditions for Water Quantity and Quality

Adequate quantity and timing of water flows are maintained to retain or enhance ecological functions, including aquatic species and riparian vegetation consistent with existing water rights and claims.

Ephemeral, intermittent, and perennial water courses slow water down, have access to the flood plain, transport bedload, and maintain longer sustained base flows on the landscape, rather than a flush of peak flows. This will reduce flood potential.

Water quality is sustained at a level that retains the biological, physical, and chemical integrity of the aquatic systems and benefits survival, growth, reproduction, and migration of native aquatic and riparian species.

Water quality meets or exceeds Arizona water quality standards and supports identified designated beneficial uses and native aquatic species.

Instream water rights are maintained or procured so that a minimum sufficient amount of water is guaranteed over time to ensure that long-term habitat is provided as well as provide for other needs on the Forest.

Water tables are high or elevated so minimal channel downcutting occurs.

Guidelines for Watershed Management, Water Quantity and Quality

Use of felt-soled waders should not be used in aquatic habitats. Cleaned lug-soled waders should be used instead to prevent the spread of aquatic invasive exotic species and diseases.

Approved Total Maximum Daily Load (TMDL) recommendations that maintain or improve water quality to meet or exceed Arizona water quality standards and support identified designated beneficial uses should be implemented. Because watershed loading can potentially be reduced through management of sedimentation and vegetative stability, implementation of this TMDL should include a review of upland and drainage stability to identify areas needing soil stabilization and channel improvements.

Treatments should be focused where protection of people, structures, and community infrastructure (e.g., roads, bridges, and power corridors) in and associated with the wildland-urban interface (WUI) are at risk.

High value, 6th level HUC priority watersheds should be restored and maintained in a properly functioning condition which includes ecosystem processes, resilient vegetation conditions, and natural disturbance regimes. These watersheds are identified using the Watershed Condition Assessment Tracking Tool in the Natural Resource Information System, and they are prioritized following the watershed condition framework.

Use of water quantity appropriated within existing water rights should be utilized to let excess water flow freely back into existing channel and riparian habitat.

Consistent with existing water rights and claims, existing diversion structures should be modified to ensure that native fish cannot be diverted from the natural stream system, and that in-channel movement is not hindered.

All equipment should be cleaned, inspected, and dried before leaving any water body to remove plants, fish or animals so organisms are not transported among water bodies.

Aquatic species should not be transferred through management activities from one 6th level HUC watershed to another to prevent degradation of native species habitat and the incidental or accidental introduction of disease or non-native species.

Surface-derived pollutants (e.g., oils, radiator fluids from cars) that originate from hardened surfaces such as asphalt or solidified soils should be intercepted before entering streams. Techniques such as settlement basins, overflow basins, or dry wells could be used.

At least 80percent of total stream bank linear distance should be maintained in a stable condition.

Instream flow water rights for fish, other wildlife, and recreation beneficial uses should be procured for those streams without current perfected water rights.

Objectives for Watershed Management

The Forest completes steps 1 and 2 of the 6th level HUC watershed condition framework including classification and prioritization within **XX** years following plan approval.

The Forest completes steps 3 and 4 of the 6th level HUC watershed condition framework including development and implementation of watershed condition action plans for identified priority 6th level HUC watersheds within 10 years following plan approval.

The Forest completes steps 5 and 6 of the 6th level HUC watershed condition framework including tracking costs and reporting accomplishments of implemented treatments and monitoring the effectiveness of treatments to assess if condition class was actually improved within 10 years following plan approval.

All Class 1 watersheds (functioning properly) are maintained as Class 1 watersheds in both 5th and 6th level HUCs during the 10 years following plan approval.

Class 2 (functioning at risk) and Class 3 (impaired) 6th level HUC watersheds are trending towards Class 1 watersheds in **XX** percent of identified, high priority 6th level HUC watersheds within 10 years following plan approval.

Projects in watersheds that contain recharge areas for designated and eligible Wild and Scenic River segments should consider the project's effect on water recharge to those segments.

Management Approaches for Water Quantity and Quality

File for water rights on appropriable waters following State procedures. Complete all documentation required for the adjudication process in the Little Colorado and Gila River (Verde watershed) specified by the courts.

Participate in State water rights adjudications and settlement discussions for negotiating water rights settlements outside of extended adjudication.

Secure water rights through purchase or severance and transfer when additional sources are needed.

Maintain and update annually an inventory of all water used on the Forest.

Implement the TMDL plan to achieve necessary load reductions, including from nonpoint sources of pollutants that may originate in the lake areas, to maintain water quality standards.

Utilize public education and coordination with landowners and stakeholders to prevent the introduction and spread of nonnative aquatic and riparian species.

Coordinate with County and State governments, landowners, and stakeholders to protect public health and safety with respect to water quality, specifically, the threat of fertilizers to downstream resources on the Coconino NF.

Coordinate with landowners and stakeholders on water rights issues that can be utilized to maintain or improve riparian attributes.

Maintain the native-fish-only status of Fossil Creek through public education, signage, and law enforcement.

Related Plan Content for Water Quantity and Quality

- See the following sections: Riparian Types, Streams, Springs, and Wetlands, Wild and Scenic Rivers, Monitoring Plan

Constructed Waters

Desired Conditions for Constructed Waters

Constructed waters provide water consistent with existing water rights and claims.

Guidelines for Constructed Waters

New water developments, including stock tanks, should not be constructed in ephemeral or intermittent stream courses so they do not alter stream course hydrology.

Water sources should be managed to reduce harm to wildlife.

Related Plan Content for Constructed Waters

- See the following sections: Range and Livestock Grazing

Stream Ecosystems

General Description and Background for Stream Ecosystems

Stream ecosystems have flowing water and include rivers, creeks, and streams and their associated riparian vegetation zones. Water flow is in one direction along a water course. There are microhabitats, such as riffles, pools, and backwaters. Plants, animals and micro-organisms are specialized to live in and around flowing water.

Stream ecosystems collect and transport water, sediment, and organic material from upslope and upstream and moderate flood events.

Riparian vegetation zone is the interface between the terrestrial uplands and water. It includes water dependent plants near the water and often a combination of upland and riparian species as distance from water increases. Riparian areas are more productive per acre in biomass of plants and animals than other vegetation types and provide large amounts of edge between adjoining vegetation types which adds significantly to ecosystem diversity.

Healthy riparian areas slow water which raises the water table and saturation zone and recharges aquifers. Riparian zones protect streams from excessive sedimentation, erosion, and pollution, and thus play a role in water quality. They provide shelter and food for aquatic animals and shade that is important for water temperature regulation. They dissipate stream energy which can result in a reduction in flood damage. They provide wildlife habitat, increased biodiversity, and wildlife corridors, enabling aquatic and riparian organisms to move along river systems and thus avoiding isolated communities. They can provide forage. Soils within riparian zones play a key role in nutrient and water storage and distribution.

Natural disturbances in stream ecosystems are animals such as beavers, flooding, and changing climatic conditions, such as extended drought. The seasonality and quantity of water in floods are key factors in the germination and establishment of riparian vegetation. Fire is an infrequent disturbance and is dependent on the fire regime in adjacent vegetation types.

Stream ecosystems provide water, forage, shelter, and habitat for nesting, roosting, and bedding and are among the most important habitats for wildlife on the Coconino NF. Species that require water for part of their life cycle (aquatic and semi-aquatic species) on the Forest are entirely dependent on these limited and scattered water sources. Ninety-three percent (14 out of 15) of the native fish species on the Forest are considered special status species. All three native leopard frogs on the Forest are either federally listed or considered sensitive. Riparian areas make up less than one percent of the Forest yet are one of the most biologically diverse ecosystems. Two of the four most imperiled species in the Southwestern Region, Little Colorado spinedace and spikedace, occur in stream ecosystems on the Forest. Additional special status species are supported by stream ecosystems, such as the southwestern willow flycatcher and Northern Mexican and narrow-headed garter snakes. Riparian areas provide migration corridors important for birds and bats.

On the Coconino NF, there are three types of water courses: ephemeral, intermittent, and perennial. They differ in the timing and duration of water flow and corresponding vegetation. Ephemeral water courses flow short-term in response to storm events. Intermittent water courses flow seasonally usually in response to snowmelt and may contain perennial pools. Perennial stream courses flow year-round, and some of their flows may be below the surface. Water courses include their associated drainages and floodplains.

Three main types of riparian vegetation associated with intermittent and perennial systems on the Coconino NF are cottonwood willow riparian forest (cottonwood willow), mixed broadleaf deciduous riparian forest (mixed broadleaf), and montane willow riparian forest (montane willow). These are described in the vegetation section. The vegetation in ephemeral drainages is not as diverse as perennial systems but supports different vegetative species than in the adjacent uplands.

Desired Conditions for Stream Ecosystems

Riparian corridors and associated stream courses are resilient to natural disturbances and changing climate conditions and are functioning across the landscape. They are in properly functioning condition as determined by on-site assessment by Forest interdisciplinary teams.

Streams maintain their natural sinuosity, and associated floodplains are intact. Channel depths allow for floodplains to be wetted during flood events. Watercourses and the riparian zone have access to their flood plains so that when floods do occur, energy can be dissipated without causing damage to the streambanks of the channel.

Water courses, associated flood plains, and riparian zones are capable of filtering sediment, capturing and/or transporting bedload, aiding floodplain development, improving flood-water retention, improving or maintaining water quality and providing ground water recharge within their natural potential. Stream ecosystems are not fragmented by infrastructure or development, consistent with existing water rights and claims. Physical barriers or habitat alterations like

temperature changes or loss of stream flow do not exclude native fish or other aquatic species from their historic habitat.

Flooding is the primary disturbance. Streams and rivers maintain a natural hydrograph, or water flow over time, including periodic flooding, which promotes natural movement of water, sediment, nutrients, and woody debris. It creates a mix of stream substrates for fish habitat, including clean gravels for fish spawning and sites for germination and establishment of riparian vegetation.

Native fish and other native aquatic species are present, and habitat conditions are capable of supporting self-sustaining populations. Fish habitat is provided by overhanging banks where possible. Woody and herbaceous overstory and understory regulates stream temperatures.

Native fish and other native aquatic species are present within the 6th level HUC watersheds where they historically occurred. Federally listed native fish and other aquatic species are trending towards recovery. All native fish and other native aquatic species are stable or trending towards recovery and are being re-established in historic habitat where suitable conditions exist. Habitat and ecological conditions are capable of providing self-sustaining populations of native species. Fish habitat is provided by natural stream hydrographs and unaltered stream channels. Aquatic species habitat conditions provide the resiliency and redundancy necessary to maintain native fish and other aquatic species diversity. To maintain a raised water table, beavers are present and building dams where woody vegetation will support them. Dams, in turn, hold water year-round, supporting wetland vegetation and a higher diversity of water dependent and terrestrial plants and animals than surrounding areas.

Native species are free or minimally impacted by nonnative predation and diseases. Habitat and ecological conditions are capable of providing self-sustaining populations of native, riparian-dependent plant and animal species. Links between aquatic and upland components are maintained, providing access to food, water, cover, nesting areas, and protected pathways for aquatic and upland species. Native fish and other aquatic organisms have unobstructed passage upstream and downstream at all bridge, culvert, and diversion structures, unless there is a specific need to provide a passage barrier such as to physically separate native and non-native fish.

Related Plan Content for Streams

- See the following sections: Riparian Types, Springs

Wetlands and Reservoir/Lake

General Description and Background for Wetlands and Reservoir/Lake

This classification includes wetlands such as Mormon Lake and Stoneman Lake, or reservoir/lakes such as CC Craigen Reservoir, Knoll Lake, Upper Lake Mary and Lower Lake Mary.

On the Coconino NF, the term wetland means those areas that are inundated by water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands on the Coconino NF are generally disconnected from groundwater and perched above regional groundwater tables, and thus they are completely

reliant on precipitation for water input. Therefore, standing water and vegetation in wetlands can fluctuate wildly from basically non-existent in dry periods to highly productive wetlands in wet periods. Other key processes include the development and presence of hydric soils, decomposition, and nutrient cycling, as well as the geomorphic setting. The combination of these processes result in unique vegetative components. All of these processes combined result in a functioning wetland.

Natural disturbances are drought and flooding. Disturbance mechanisms controlled by management activities are grazing by livestock, stock tank construction, roads, and off road vehicle and other recreation use. Indirect disturbance mechanisms include increasing tree canopy cover that reduces ground cover in the upland soils and that results in erosion and sedimentation of wetlands. Fire is an infrequent disturbance, entering from adjacent vegetation types during drought conditions.

Wetland types differ from each other by water permanency, wetland vegetation, and size. These types are semi-permanent, seasonal, temporary or ephemeral wetlands, and reservoirs.

Table XX. Flooding Conditions by Wetland Type

Wetland Type	Flooding Regime	Plant Species Occupying Deepest Zone	Flooding Frequency
Reservoir/lakes, open water	Permanent water	submergent vegetation; bare soil	every year
Semi-permanent	6-12 months	Hardstem bulrush, Cattail; submerged aquatics	>7 of 10 years
Seasonal	3-6 months	Manna grass, spikerush, sedges.	<7 of 10 years
Temporary	1-2 months	Alpine timothy, Foxtail barley	3 of 10 years
Ephemeral	2-6 weeks	Bare soil, dock, western wheat grass, deergrass	3-10 years

Wetlands provide water storage, wildlife habitat, recreation, and fisheries, livestock watering.

On the Coconino NF, wetlands primarily occur at elevations ranging from 6,200 to 7,200 feet and cover about 10,000 acres. Most of them are on Anderson Mesa which is on the east central side of the Forest. They range in size from Mormon Lake at about 5,500 acres to less than 10 acres in size. XX percent of the plants known to be used by tribes that traditionally use the Forest occur here.

Desired Conditions for Wetlands and Reservoirs

Within the capability of individual wetland types and consistent with the hydrologic cycle, wetland vegetation has diverse age classes, a diverse composition of native species, and includes species that indicate maintenance of riparian soil moisture characteristics (i.e., plants that occupy deep zones in table above). This provides abundant food, cover, nesting, and spawning habitat.

Aquatic and riparian habitats are free of or minimally impacted by invasive exotic plant and animal species. Desirable non-native species, where they exist, are not having negative impacts on native species.

Wetland types provide habitats that are consistent with their flood regime and flood potential.

All wetlands except reservoirs are maintaining or trending towards properly functioning condition, at a minimum.

Soil is in satisfactory condition on most acres. Localized areas may have unsatisfactory or impaired conditions where there are exceptions such as access lanes for livestock and high wildlife use.

Soil function is sustained (i.e., ability to infiltrate water, recycle nutrients, and resist erosion).

Wetlands are resilient to changing climate conditions.

Wetlands and reservoirs are managed consistent with designated beneficial uses associated with existing claimed or certified water rights³.

Water quality is maintained or improved so it fully supports identified beneficial designated special uses by Arizona Department of Environmental Quality or State water quality standards.

Plants known to be used by tribes that traditionally use the Forest are thriving.

Objectives for Wetlands and Reservoirs

Wetlands are trending towards proper functioning condition (or soil condition is being sustained and trending towards or functioning properly and normally) in between XX to XX percent (XX wetlands) of the number of wetlands identified as functional-at-risk within 10 years following plan approval. Soils are trending towards satisfactory.

Guidelines for Wetlands and Reservoirs

Where native frogs and toads occur, established protocols (currently the Arizona Game and Fish Department protocol) should be followed to prevent the introduction and spread of a chytrid fungus (*Batrachochytrium dendrobatidis*) that kills amphibians.

Limited and localized soil compaction and trampling of vegetation is an acceptable effect of wildlife and human uses, including permitted livestock use; however, the scale and magnitude of these uses should not be such that permanent damage to perennial plants occurs (e.g. loss of plants species expected to be there,).

Recommendations in the Arizona Department of Environmental Quality's Total Maximum Daily Load (TMDL) plan should be considered and followed for Long Lake, Soldier Lake, Soldier Annex, Upper Lake Mary and Lower Lake Mary.

Management Approaches for Wetlands and Reservoirs

Collaborate with the Arizona Game and Fish Department and U.S. Fish and Wildlife Service on the management of sport and native fishes.

³ Certified water rights are legally recognized water rights that document how much water can be used, for what beneficial use and by whom. Claimed water rights are water right claims for use recognized by the Arizona Department of Water Resources pending adjudication by the court that will decree how much water can be used, for what beneficial use, and by whom.

Related Plan Content for Wetlands and Reservoirs

- See the following sections: Riparian Types, Springs, Streams, Watershed Management, Water Quantity and Water Quality

Springs

General Description and Background for Springs

There are multiple types of springs within the Coconino NF that vary based on landform and geology. Examples include seeps and hanging gardens. Some springs have unique chemistry that depend on the underlying geology, such as the springs that feed Fossil Creek—producing the unique turquoise color and resulting in travertine formations.

Many springs are used as water sources for domestic use, livestock, or wildlife use. Springs and wetlands are centers of biological diversity. Springs provide habitat or biological refugia for some species, particularly narrow endemics.

Springs are also important to tribes who have traditionally used lands within Coconino NF.

Desired Conditions for Springs

Springs and associated streams and wetlands have the necessary soil, water, and vegetation attributes to be healthy and functioning at or near potential. Water flow patterns, recharge rates, and geochemistry are similar to historic levels and persist over time.

Water quality and quantity maintain native aquatic and riparian habitat and water for wildlife and designated beneficial uses, consistent with water rights and site capability.

Water rights are maintained or procured to protect in situ (on site) water quantity necessary for riparian vegetation needs, fish and wildlife, domestic, agricultural, and livestock grazing use.

Native vegetation around springs exhibit diverse age classes, diverse composition of native species, and include species that indicate maintenance of riparian soil moisture characteristics (e.g., sedges, rushes, willows and other riparian vegetation), consistent with the type of spring. Vegetation association with springs is variable depending on spring type and can include aquatic plants (e.g., diatoms and algae), submergent and floating vegetation, emergent vegetation, grasses, forbs, sedges, shrubs and deciduous trees.

Plant cover protects the banks, edges, and shorelines of springs. Plant distribution and occurrence are resilient to natural disturbances.

Soil condition is in satisfactory condition on most acres with only minor components in unsatisfactory or impaired conditions. Soil function (i.e., the ability of soil to infiltrate water, recycle nutrients, and resist erosion) is sustained.

Spring riparian zones are capable of filtering sediment, capturing and/or transporting bedload, improving or maintaining water quality and providing ground water recharge within their natural potential.

Springs are resilient to natural disturbances and changing climate conditions and are functioning across the landscape within their type and capability. They are in properly functioning condition as determined by on-site assessment by Forest interdisciplinary teams.

Stream and spring ecosystems are not fragmented by infrastructure or development, consistent with existing water rights and claims. Springs are undeveloped and unaltered by man-made structures such as head boxes, cisterns, and pipelines, consistent with existing water rights and claims.

The physical and biological components provide habitat for a diverse community of plant and wildlife species including cover, forage, available water, microclimate, and nesting/breeding habitat. Riparian dependent plant and animal (including invertebrates) species are abundant and diverse consistent with site capability and water rights. Aquatic and riparian habitats and native species are free of or minimally impacted by invasive exotic plant and animal species.

Guidelines for Springs

Where native frogs and toads occur, established protocols (currently the Arizona Game and Fish Department protocol) should be followed to prevent the introduction and spread of a chytrid fungus (*Batrachochytrium dendrobatidis*) that kills amphibians.

Access to springs should be limited to trails or entry points that minimize erosion, trampling, compaction, and inadvertent introduction of non-native and undesirable plants, animals, and disease.

Fences constructed around springs should not cause harm to wildlife.

Structures that divert or alter spring flows should be minimized and/or modified to allow some flow from the spring's source and still maintain established water rights.

Open vegetative conditions in the watersheds surrounding springs should be maintained where feasible to raise the water table.

Management Approaches for Springs

Continue working with partners and stakeholders, including tribes, to inventory, classify, and prioritize springs for restoration. Include consideration of rare and endemic species when evaluating springs for restoration.

Work with partners and stakeholders to develop strategies for restoration of upland watersheds to improve spring flows.

Secure water rights for springs where there are no existing water rights or claims.

Related Plan Content for Springs

- See the following sections: Riparian Types, Vegetation,

Biophysical Features

Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes

General Description and Background for Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes

Biophysical features are geological features such as cliffs, talus slopes (rock slides) and caves (which includes, sinkholes, lava tubes, and fissures (large cracks)). Caves include any naturally occurring void, cavity, recess or system of interconnected passages beneath the surface of the earth or within a cliff or ledge and which is large enough to permit a person to enter, whether the entrance is excavated or naturally formed. This definition includes any natural pit, sinkhole, or other opening which is an extension of a cave entrance or which is an integral part of the cave.

Cave resources include any material or substance occurring naturally in caves such as animal life, plant life, paleontological deposits, sediments, minerals, cave formations and cave relief features. Most cave resources are not replaceable and not renewable.

In some instances, cave resources are threatened due to improper use, high recreation use, vandalism, improper disposal of human waste, activities and uses that alter temperature, humidity and moisture regimes, and urban spread. The Forest contains [significant](#)⁴ solution and volcanic cave resources including Lava River Cave, a designated recreational cave. Caves often contain archaeological materials and are often of traditional importance to various Indian groups. Some caves on or near the Forest are known as traditional cultural places, identified as the abodes of deities or forces of nature where ceremonial offerings are still made. Proper temperature and humidity levels are critical to the suitability of caves for bat roosting. Bats are particularly sensitive to disturbance when they are raising their young or in winter roosts. An emerging threat for some bats species is a fatal fungal disease called White-nose syndrome which may be spread by humans.

Cliffs provide habitat for mammals and birds, such as Mexican spotted owls, and peregrine falcons; roosting habitat for bats; and habitat for rare plants such as Cliff fleabane. Cliffs offer challenges for rock climbers. Several popular rock climbing areas on the Forest are nationally and internationally known.

Talus slopes provide habitat for rare plants such as the San Francisco Peaks groundsel and for talus snails, which are a type of land snail.

Desired Conditions for Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes

Caves provide habitat for species that require specialized conditions for roosting and overwintering, such as bats. In this revised Plan, the term cave also includes sinkholes, fissures, and lava tubes. Caves maintain moisture and temperature levels consistent with historic conditions. Archaeological, geological, and biological features of caves are not disturbed by visitors. Cave formations and relief features continue to develop or erode under natural conditions. Caves known to be important for species of conservation concern are intact or

⁴ As defined by the National Cave Resources Management and Protection Act. See Glossary for definition.

provide adequate habitat for these species. Water flowing into, from, or within the cave system is not altered or diverted in its flow, contains normally fluctuating background levels of sediment, organic matter and dissolved minerals, and is not polluted. Bat diseases occur within natural levels. Some caves provide a range of recreational and educational opportunities.

Cliffs and rock outcrops continue to support nesting, roosting and feeding habitats of birds of prey, desert bighorn, bats, and other species. They provide habitat for rare plants such as Cliff fleabane and Senator Mine alumroot. Rock climbing and related recreational activities do not diminish the quantity or quality of specialized vegetation, such as mosses, lichens, and rare plants such as Cliff fleabanes. nor do these activities disrupt life processes of rare or threatened species.

Talus slopes are natural, undisturbed features that provide habitat for lizards, snakes, land snails, and listed plants. They maintain near-historic levels of moisture, and are free from excessive sedimentation. In areas where there are species of conservation concern, there is a near-historic level of high-quality rocky habitat.

Standards for Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes

Manage caves that have been designated as ‘significant’ by the Forest Supervisor

to perpetuate those features, characteristics, values, or opportunities for which they were designated.

Do not use caves for dumping.

Guidelines for Caves, Cliffs, Sinkholes, Lave Tubes, Fissures, and Talus Slopes

Moisture levels should be maintained in talus slopes that contain talus snails to maintain their habitat.

Bat maternity roosts and hibernacula (where bats hibernate) should not be disturbed.

Active bald eagle nests and peregrine falcon nests should not be disturbed.

Policies should be implemented to prevent the introduction or spread of diseases in caves.

Environments in caves, cliffs, and talus slopes should not be altered, unless it can be shown that there would be no deleterious effects to the biophysical feature’s significance or to the plants and animals that rely on those features.

Heavy machinery, blasting, controlled source seismic surveys requiring explosives or other disruptive techniques should not be conducted over, or close enough to, known biophysical features to damage the feature.

Mineral extraction activities should be avoided within a ¼ mile or other suitable buffer from biophysical features with high resource values or identified as “significant.” Buffers should consider infeasible drainages and surface areas immediately over cave passages.

If previously undiscovered caves are encountered above the zone of saturation for the regional water aquifer during drilling operations, precautions should be taken to protect the cave, including sealing the casing above and below the cave to prevent air flow and water leakage.

The list of “significant” caves on the Forest should be updated periodically.

When closing caves to public entry, wildlife-friendly gates that meet Bat Conservation International (BCI) recommendations will be installed where these species are present unless public safety concerns warrant closure by a different method.

Management Approaches for Caves, Cliffs, Sinkholes, Lava Tubes, Fissures, and Talus Slopes

Foster cooperation and exchange of information between governmental agencies and those who utilize biophysical features for scientific, educational, cultural, or recreational purposes are fostered.

Encourage partnerships with caving organizations, scientists and outdoor recreationists to secure, preserve and protect Forest biophysical features and their resources.. Enlist partners to help educate the public about the unique ecological and aesthetic value of geophysical features.

Consult with State and Federal agencies to both manage and monitor bat roosts to determine population dynamics at least once every three years.

Monitor significant caves or other biophysical features to determine visitor impacts and the conditions of key resources To protect long-term ecology of the feature or resource..

Foster collaboration with the U.S. Fish and Wildlife Service, Bat Conservation International and the Arizona Game and Fish Department and other stakeholders to address conservation, interpretation and education management for bat species.

Paleontological Resources

General Description and Background for Paleontological Resources

Paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth’s crust, that are of paleontological interest and that provide information about the history of life on earth.

Desired Conditions for Paleontological Resources

Using scientific principles and expertise, Forest paleontological resources are retained, generally with little or no negative impact from management activities. The scientific value of paleontological sites is preserved and sites are generally free from adverse impacts. Sites retain integrity and stability , especially on sites susceptible to imminent risks or threats, or where the values are rare or unique. Visitor impacts to sites are minimal, and significance and integrity are maintained through conservation and preservation efforts. Vandalism, theft, and human-caused damage to paleontological resources are rare. Vertebrate fossils (commonly bones, bone fragments, teeth and/or tracks) remain on the Forest, unless collected by permit. Allow for the casual collecting of reasonable amounts of common invertebrate and plant paleontological resources for non-commercial personal use and with negligible surface disturbance. Paleontological resources and copies of associated records are preserved for the public in an approved repository, to be made available for scientific research and public education.

Guidelines for Paleontological Resources

Known locations of key paleontological resources (Classes 3, 4, and 5 of the Fossil Potential Classification⁵) should be protected.

Disturbance to paleontological resources should not occur from fossil collecting activities in wilderness, botanical or geological special areas, and research natural areas, consistent with the intent for which those areas were identified and/or designated.

Locality information of paleontological resources should be protected to preserve cultural integrity and value. Specific locality data should not be released by the permittee or the repository without written permission from ??.

Management Approaches for Paleontological Resources

Emphasize interagency coordination and collaborative efforts, where possible, with the scientific community, non-Federal partners, and the general public.

Prior to ground-disturbing activities, conduct paleontological surveys in areas where there is high potential to encounter these resources. If paleontological resources are discovered during ground disturbing activities, the Forest will facilitate evaluation of the discovery and development of appropriate mitigation measures.

Develop a prioritized list of localities that need stabilization activities in order to be preserved. Monitoring of localities is prioritized in high visitation areas such as roads, campgrounds and trails.

Retain records at Forest Services offices when they need to be accessed regularly for research purposes. Maintain electronic records, including an index of documents of historic research value.

Work with partners such as the Museum of Northern Arizona and Northern Arizona University to protect and monitor localities.

Promote educational programs, interpretive presentations, or publications to increase public awareness of Forest paleontological resources and their significance.

Soils

Desired conditions for Soils

Soil productivity and function is sustained and functions normally and properly so water infiltrates and disperses properly, withstands accelerated erosion, and recycles nutrients. Herbaceous vegetative cover is maintained at levels that contribute to suitable hydrologic function, soil stability, and nutrient cycling. Compaction and erosion is minimized due to a diversity of grass and forb species and presence of plant litter and grass, forb, shrub and tree basal area surface cover.

Biological soil crusts⁶ are present and functioning on coarse textured and sandy soils.

⁵ Definition for Fossil Potential Classification Classes 3, 4, and 5

Guidelines for Soil Resources

Soil productivity and functions including the ability of the soil to resist erosion, infiltrate water and recycle nutrients should be sustained so terrestrial and riparian ecosystems are more resilient and better adapted to climate change.

The Forest should implement and monitor best management practices (BMPs) for all ground disturbance activities in accordance with the Intergovernmental Agreement between the Arizona Department of Environmental Quality and USDA SW Region to control and manage nonpoint source pollution.

The Forest should implement resource improvement projects that are beneficial for maintaining and improving soil condition and productivity, water quality and quantity. Priority should be given to activities with the least ground disturbance.

Consider using the published Terrestrial Ecosystem Survey (TES) for broad resource and forestwide assessments, land management and project planning at Regional, Forest and District levels. Use TES information as the basis for determining project goals & objectives and desired ecological conditions and predicting effects and impacts of the different management prescriptions and activities upon each terrestrial ecosystem. Use TES information for the initial selection of areas identified for implementation of proposed projects.

Consider conducting on-site soil investigations and refine mapping for soil disturbing projects which require site specific, precise, highly detailed soil information which is beyond the scope of the Level 3 TES . Analyze or collect site specific TES information as needed to accurately determine limitations, suitabilities and productivity potentials of the different terrestrial ecosystems that occur.

Disturbance should be minimized in areas where the percentage of biological soil crusts exceeds 50 percent.

Objectives for Soil Resources

Maintain or improve all soils currently in satisfactory soil conditions in satisfactory condition within 10 years following plan approval.

Impaired and unsatisfactory soils are treated and trending towards satisfactory condition in high priority, watersheds (identified in the watershed action plan) in 5th or 6th level HUC watersheds within 10 years following plan approval.

Other impaired and unsatisfactory soils that are not identified as high priority watersheds are trending towards satisfactory soil condition where treated within 10 years following plan approval.

⁶ Crusts of soil particles formed by living organisms (algae, mosses, lichens) in arid areas. They hold soil in place, help retain moisture, and improve soil nutrients by fixing atmospheric nitrogen.

Wildlife, Fish, and Botanical Resources

Desired Conditions for Wildlife, Fish, and Botanical Resources

Ecological conditions provide habitat for federally-listed and other special status species. Habitat conditions contribute to the survival and recovery of listed species, contribute to the de-listing of species under the Endangered Species Act, preclude the need for listing new species, and improve conditions for Forest Service Southwestern Region Sensitive Species.

Follow existing recovery plans for federally listed species.

Genetic diversity exists within native plant and animal populations, thus assisting species to adapt to changing environmental conditions.

Improved habitats for Proposed or Candidate species help preclude species listings as Threatened or Endangered under the Endangered Species Act.

Wildlife and Fish

Wildlife and fish are able to move freely across the Forest, or within the stream course (for aquatic or semi-aquatic species), and across the Forest boundaries to access adjoining habitat, disperse, migrate, in order maintain genetic diversity, and meet their needs within the capability of Forest resources.

Direction for species listed as threatened and endangered species takes precedence over direction for species not listed by U.S. Fish and Wildlife Service.

Botanical Resources

Collection of those plant species recognized as rare, limited in distribution, threatened, endangered or Southwestern Region sensitive during the plan revision process is discouraged (except for scientific and cultural purposes).

Forest recognizes and complies with regulations for State and federally listed species and considers these regulations before issuing collecting permits for special forest products or scientific research permits. Forest permits may be issued for these species if the requirements of the other entities are met.

Habitats throughout the Forest in general include the microclimate or smaller scale elements needed for rare plants within each PNVT. The structure and function of the PNVTs and associated microclimate or smaller scale elements such as special features, rock piles, specific soil types, and wet areas exist in adequate quantities to provide habitat and refugia for narrow endemics, species with restricted distributions, and Southwestern Region Sensitive species.

Standards for Wildlife, Fish, and Botanical Resources

Follow recovery plans for listed species.

Comply with species conservation agreements.

Plants

Collection of Southwestern Region Sensitive plants shall occur only for research or scientific purposes or in support of traditional cultural practices.

Storage of fuels and other toxicants shall be located away from known locations of Southwestern Region Sensitive plant and animal species.

When treating invasive exotic weeds to protect endangered, threatened, proposed, and candidate wildlife and plant species and their habitats, design features in Appendix B of FEIS for Integrated Treatment of Noxious or Invasive Weeds (2004) or more current direction must be followed.

Herbicides with Material Safety Data Sheet instructions against application where contact or runoff to water may occur shall not be used in riparian areas.

Guidelines for Wildlife, Fish, and Botanical Resources

All equipment should be cleaned, inspected, and dried before leaving any water body to remove plants, fish or animals so organisms are not transported among water bodies.

Minimal impact fire suppression techniques should be used in Mexican spotted owls protected activity centers (PACs).

Aircraft activity should not occur within 900 meters of bald eagle nesting areas to avoid disturbance to adult and newly fledged bald eagles.

To minimize restriction of antelope movement, fences should be located one eighth mile from roads if road right-of-way fencing is required.

Plants

When conditions are highly disturbed within the vicinity of occupied Southwestern Region Sensitive Plant Species habitat, vegetation should be re-established to avoid establishment of invasive exotic plant species.

Native, weed-free plant material should be selected to restore natural species composition and ecosystem function to the disturbed area.

Vegetation re-establishment may include seeding one mixture of species soon after disturbance, monitoring, and adding other species over time.

When available and not cost-prohibitive, seed and plants used for revegetation should originate from genetically local sources. Seed should be collected in accordance with seed zones or breeding zones. Consideration should be given to using long-term storage facilities for collected seeds such as the seed banks with the Colorado Plateau Native Plant Initiative.

In cases where plant collection permits are issued, collecting seeds or cuttings should be encouraged, while digging or physically removing whole plants should be discouraged.

For projects or activities that included application of insecticides, herbicides, fungicides, or rodenticides, potential adverse impacts on Southwestern Region Sensitive plants and animals, as well as plants and animals of cultural and ceremonial importance, should be minimized.

Conservation and recovery of plant species with high risks should be emphasized where quantity and quality of habitat needed to support them is a concern. Through discussions with Indian tribes who collect plants for traditional cultural and ceremonial purposes, growth and regeneration of culturally important plants should be encouraged during Forest restoration projects.

Introduction of invasive exotic species due to management activities should not occur and new populations as well as their spread should be detected and treated at an early stage. Applicable design features in Appendix B of the FEIS for integrated Treatment of Noxious or Invasive Weeds (2004) should be followed in treating invasive exotic plant species.

Measures to avoid weed establishment and spread should be included with proposed management actions near Southwestern Region Sensitive Plant species locations.

Where needed, project design should incorporate protective measures to provide for these species where they occur.

Disturbance to Western yellow-billed cuckoos (*Coccyzus americanus occidentalis*) during the breeding season should be reduced. Its habitat consists of riparian areas that have a multi-layered canopy of deciduous trees and mesquite bosques in the uplands. This species is a candidate for listing as threatened or endangered by the U.S. Fish and Wildlife Service.

Management Approaches for Wildlife, Fish, and Botanical Resources

Coordinate with Arizona Game and Fish Department regarding hunt recommendations to reduce soil disturbance and improve soil function particularly in montane meadows, wetlands, and riparian vegetation types.

Refer to the plan implementation guidebook for plants and plan implementation guidebook for invertebrates for project level guidance. These two guidebooks are intended to be living documents that are periodically updated with new information.

Coordinate with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service regarding threatened and endangered species, including re-introductions of listed species, such as Gila trout, into suitable habitat. Also, coordinate on the reintroduction and maintenance of native plant and wildlife species.

Coordinate with Arizona Game and Fish Department, U.S. Fish and Wildlife Service, sportsman groups, and other stakeholders about information and education regarding wildlife, fish, and botanical resources. .

Coordinate with Arizona Game and Fish Department, U.S. Fish and Wildlife Service, the scientific community and others stakeholders regarding research especially as it relates to gaps in our knowledge needed for management or to understand habitat requirements.

Maintain the native-fish-only status of Fossil Creek and streams free of non-natives through public education, signage, and law enforcement.

Related Plan Content for Wildlife, Fish, and Botanical Resources

- See the Following Section: Tribal Relations and Uses

Vegetation

All Vegetation Types

General Description and Background for All Vegetation Types

Scale

The ecological desired conditions for terrestrial ecosystems are grouped by potential natural vegetation types (PNVTs) and described at multiple, nested scales (definitions of each scale are found in the glossary under “scale”) and may only be achievable over a long time frame (several hundred years). Descriptions at various scales are developed to provide detail and guidance for the design of future projects and activities that help achieve the desired conditions over time. Descriptions under the landscape scale provide the “big picture” desired conditions for terrestrial resources across the larger land area. Descriptions at the mid-scale and fine scale provide further details necessary for guiding future site-specific projects and activities. A combination of fine scale units add up to the mid-scale and a combination of mid-scale units add up to the landscape scale.

The landscape scale is an assemblage of mid-scale units, typically composed of variable elevations, slopes, aspects, soils, plant associations, and disturbance processes. An area at this scale is comprised of multiple mid-scale units, most often 10 or more.

For our purposes, the mid-scale is a unit of 100 to 1,000 acres and is composed of assemblages of fine scale units which have similar biophysical conditions.

The fine scale is a 10 acre area or less at which finer scale items are described such as the distribution of individual trees (e.g., single, grouped, or aggregates of groups).

Desired Conditions for All Vegetation Types: Landscape Scale

Each vegetation type contains a mosaic of vegetative conditions, densities, and structures. This mosaic occurs at a variety of scales across landscapes and watersheds. The distribution of physical and biological conditions is appropriate to the natural disturbance regimes affecting the area.

Vegetative conditions are resilient to the frequency, extent, and severity of disturbances, such as fire in fire-adapted systems and flooding in riparian systems, and climate variability. Coconino NF landscapes are functioning ecosystems that retain all of their components, processes, and functions. Natural and human disturbances provide desired overall plant density, structure, species composition, coarse woody debris, and nutrient cycling. Desired disturbance regimes are restored where practical, including fire (table XX).

Table XX. Fire regime groups and descriptions⁷

⁷ A natural fire regime is the general classification of the role fire would play across the landscape in the absence of modern human mechanical intervention. These classifications include fire return interval and fire severity.

Fire regime	Fire return interval	Severity	Severity description
1	0-35 years	Low/mixed	Generally low severity fires replacing < 25percent of the dominant overstory vegetation; can include mixed severity fires that replace up to 75percent of the overstory
2	0-35 years	Replacement	High severity fires replacing > 75percent of the dominant overstory vegetation
3	35-200 years	Mixed/low	Generally mixed severity fires; can also include low severity fires
4	35-200 years	Replacement	High severity fires
5	200+	Replacement/any severity	Generally replacement severity; can include any severity type in this frequency range.

Native plant communities dominate the landscape while invasive exotic species are non-existent or in low abundance and do not occur at levels that disrupt ecological functioning. Establishment of invasive exotic plant species new to the Coconino NF is prevented. Existing invasive exotic plant species are prioritized for eradication, containment, or control.

Vegetative and stream connectivity provides for upland and aquatic species movements and genetic exchange consistent with landforms and topography.

Vegetation conditions allow for transition zones or ecotones between riparian areas, forests, woodlands, shrublands, and grasslands. Transition zones shift in time and space due to factors affecting site conditions (e.g. fire, climate).

Native insect and disease populations are generally at endemic levels with occasional outbreaks. A variety of vegetation structures usually restrict the scale of localized insect and disease outbreaks.

Vegetation provides sustainable amounts of products, such as wood fiber, or forage, for local and regional needs. Herbivory (the act of feeding on plants) aids in sustaining or improving native vegetation cover and composition. Livestock grazing and wood fiber harvest activities contribute to aspects of the social, economic, and cultural structure and stability of rural communities.

Ecosystem contributions (e.g., nutrient cycling, water infiltration, wildlife habitat, etc) are sustained as vegetation on the Forest adapts to a changing climate.

Plants known to be used by tribes that traditionally use the Forest are thriving.

Rare and culturally important plant species are valued. Their habitat is enhanced and protected.

Desired Conditions for All Vegetation Types: Mid-Scale

The composition, density, structure, and mosaic of vegetative conditions reduce the threat of uncharacteristic wildfire hazard to local communities and ecosystems.

Snags are present in adequate numbers to provide habitat features such as cavities and loose bark, etc.

Potentially suitable habitat for Southwestern Region Sensitive plant species helps retain functional stability of the species.

Desired Conditions for All Vegetation Types: Fine Scale

Endemic rare plant communities are intact and functioning.

Unique plant community habitats (e.g. limestone cliffs, margins of springs, Verde Valley Formation, basalt-lava flows/cinders, calcareous soil/alkaline clay, canyons/cliffs and ledges, granitic soils/Igneous rocks, and sandstone rocks/soils) are present to maintain well distributed populations of associated native plant species.

Native plants, including rare plant species, provide nectar, floral diversity, and pollen throughout the seasons that pollinator species are active. Desired habitat conditions promote pollinator success and survival.

Guidelines for All Vegetation Types

Forest and woodland vegetation within the wildland urban interface may be composed of conditions at the lower end of desired conditions for the respective vegetation type such as younger age classes, and the lower end of coarse woody debris and snags.

Management Approaches for All Vegetation Types

Foster partnerships with local research institutions to study topics of management interest.

Riparian Types

All Riparian Forest Types

Desired Conditions for All Riparian Forest Types

Riparian zones filter sediments and contaminants, build and stabilize banks, reduce the effects of flooding, store and release water, recharge the aquifer, support a diverse composition of riparian vegetation which regulates water temperature, and support a high diversity of native aquatic and riparian obligate fauna. Native riparian vegetation is diverse and provides the structure and composition to function within their natural potential and provide food and cover for wildlife.

Diverse native vegetative communities, comprised of deep-rooted and hydrophytic (water-loving) herbaceous vegetation, are present in sufficient quantity to filter sediments and provide clean water. These species include native aquatic plants, aquatic macrophytes, aquatic emergents, grasses and sedges, forbs, shrubs and deciduous trees. The diversity of riparian vegetation in all age classes provides for structural diversity important to fauna. Structural diversity includes

aquatic vegetation, leaf litter, ground cover and understory, mid-story, over-story, dead and live trees, and dead and down woody material. This woody material provides prey base habitat, aquatic nutrient cycling, and soil retention, consistent with public safety.

[Mesquite bosques](#) are open, park-like stands mesquite trees which are adjacent to cottonwood willow or mixed broadleaf riparian vegetation. The water table is high enough so that mesquite bosques persist on upland terraces. The combination of cottonwood willow riparian forest with mesquite bosques creates a unique vegetation community favored by bird species such as the yellow-billed cuckoo and Bell's vireo.

In bosques, a variety of age classes are present and old trees are prominent. The understory is comprised of native grasses and forbs that support the natural fire regime. Vegetative ground cover in mesquite bosques is comprised of about 15percent litter and 10percent plant basal area. Non-vegetative ground cover consists of sandy soils and rock fragments of gravel, cobble and rock outcrops.

Riparian areas also provide abiotic structure such as silt, sand, gravel, cobble, boulders, and bedrock; all of which are important for a variety of aquatic and terrestrial fauna. Multiple seral stages and age classes of native vegetation are represented. Enough seedlings and saplings are present to allow for adequate replacement and succession. The associated water table supports riparian vegetation and restricts non-riparian vegetation. Riparian vegetation prevents ash flows from entering perennial streams.

Soils are not compacted by management activities and are protected by leaf litter cover.

Soil function is sustained so it infiltrates and disperses water properly, withstands accelerated erosion, and cycles nutrients. Upland vegetation is maintained or improved to prevent excessive erosion of or sedimentation into downstream aquatic habitat.

Soil in wet and headwater meadows has a spongy moist nature, generally as a result of a shallow water table, and functions to filter water. These soils also store and release water over an extended period of time and release it so it is distributed through the associated meadows and downstream.

Flooding is the primary disturbance. Fire rarely burns through these vegetation types, and fire in the surrounding watersheds periodically provides slight increases in sediment, nutrients, and water that cause minimal channel modifications.

Objectives for All Riparian Forest Types

At least **XX** percent of non-functional and functional-at-risk riparian areas move towards satisfactory condition within 10 years following plan approval with a focus on priority 6th level HUC watersheds. Some examples of activities are road obliteration, improved grazing strategies, removal of dispersed campsites, and installation of elk exclosures.

Guidelines for All Riparian Types

In riparian areas, recreation activities, permitted uses, and management activities should occur with minimal impact to soil function and water quality.

A vegetated streamside management zone should be identified and maintained using guidance from the current plan or recent peer-reviewed publications. This zone generally follows the shape of the water course or riparian areas and consists of vegetation and vegetative litter. The purpose is to buffer against detrimental changes in the temperature regime of the water body, provide bank stability filter excessive sediments such as ash flows, and nutrients, and to provide shade for fisheries habitat. The intent is to minimize, not necessarily exclude, soil and vegetation disturbance from management activities in this zone. The ability of the stream management zone to trap and filter sediments is a function of the amount and type of material on the ground, and width and slope of zone. The table below is intended to be a general starting point for determining the width of the stream management zone, based on average cover conditions and erosion hazard⁸. Other considerations for the size and shape of a stream management zone include soil type⁹, orientation of stream or river to the sun, connection of stream to impaired waters, presence of threatened or endangered species, and condition of the riparian area.

Table XX. General starting point for width of stream management zones in riparian and non-riparian stream courses by erosion hazard

Erosion hazard	Width of zone in non-riparian stream courses	Width of zone in riparian stream courses
Severe	100 feet each side of streamcourse	120 feet each side of streamcourse
Moderate	70 feet each side of streamcourse	100 feet each side of streamcourse
Slight	35 feet each side of streamcourse	70 feet each side of streamcourse

Generally, riparian areas are not accessible to livestock. When they are accessible, livestock use is restricted to when vegetation is dormant. Livestock utilization should not exceed 20percent on woody vegetation (e.g., trees and shrubs such as cottonwood and willow). Within riparian areas, maintain an adequate height of herbaceous water-loving vegetation needed to protect stream banks.

Within the capability of the area, mesquite bosques should be contiguous and not fragmented by development and infrastructure.

To assure vegetative diversity, manage towards three or more riparian species where potential exists in a variety of age classes including seedling, sapling, mature, and overmature.

In order to achieve bank stability and soil and riparian function, maintain effective (80 percent of natural herbaceous levels) vegetative cover within floodplains, terraces, and riparian areas. This is determined by Terrestrial Ecosystem Survey or a Forest interdisciplinary team.

⁸ Erosion hazard is defined as the risk of erosion and sedimentation that is based on slope, soil type, and the amount and type of material on the ground that is able to trap eroded material.

⁹ Soil type or hydrologic soil group

Cottonwood Willow Riparian Forest

General Description and Background for Cottonwood Willow Riparian Forest

Cottonwood willow currently covers about 2,000 acres of the Forest. It is patchily distributed along the lower elevation (2,800 and 3,600 feet) and low gradient reaches of perennial streams including the Verde River, Oak Creek, West Clear Creek, Wet Beaver Creek, Dry Beaver Creek, and Fossil Creek as well as other perennial and intermittent streams and tributaries. Dominant vegetation includes Fremont cottonwood, willow, ash, box elder, alder and others. Various grasses and forbs are usually present. Riparian vegetation generally occurs along the stream channel.

Cottonwood willow is adjacent to the main communities of Cottonwood, Camp Verde, and Cornville, and other communities in the broader valley floodplains along the Verde and the confluences of the major tributaries. Much of this type along the Verde River, lower Oak Creek and lower Wet Beaver Creek is privately owned or managed by Arizona State Parks. Water diversions and increasing human development in the watersheds have affected quantity and seasonality of historical flood regimes.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Cottonwood Willow Riparian Forest

Associated higher stream terraces support a mix of riparian and upland vegetation, including mesquite and desert willow.

Soil productivity is inherently low on terraces and high on floodplains due to available soil and water. Floodplains tend to have higher surface litter and diversity of species, more protective ground cover, and greater vegetative productivity (biomass) than terraces. Consequently, floodplains have greater ability to resist erosion and recycle nutrients.

Flooding is the primary disturbance. Bends in the stream channel and low gradient help disperse stream energy. Fire is an infrequent disturbance within the system, but it is a disturbance from incursions from adjacent systems and is dependent on the fire regime in adjacent vegetation types.

Mixed Broadleaf Riparian Forest

General Description and Background for Mixed Broadleaf Riparian Forest

This riparian type covers about 2,560 acres of the Forest. Found between 3,600 and 5,800 feet in elevation, it is patchily distributed across the Forest and includes Sycamore Canyon, mid-elevation portions of West Clear Creek, Oak Creek, Beaver Creek and Fossil Creek, and associated tributaries. It consists of a vegetation mix of riparian woodlands and shrublands with various dominant species, depending on site specific characteristics. Vegetation can include Arizona sycamore, thin leaf alder, willow, Arizona cypress, conifers, box elder, narrow leaf or Fremont cottonwoods, velvet ash, Arizona walnut, and often contains oaks and conifers, including Arizona cypress, from adjacent uplands.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Mixed Broadleaf Riparian Forest

Soil productivity is inherently low on terraces and higher along floodplains. Generally, both have high amounts of protective litter and plant cover and are not compacted. Consequently, terraces and floodplains are able to resist erosion and recycle nutrients.

Flooding is the primary disturbance. Fire is an infrequent disturbance within the system, but it is a disturbance from incursions from adjacent systems and is dependent on the fire regime in adjacent vegetation types.

Montane Willow Riparian Forest

General Description and Background for Montane Willow Riparian Forest

Montane willow riparian is located mainly from 5,500 to 8,400 feet in elevation. It is scattered along perennial streams such as East Clear Creek and its tributaries, seasonally intermittent streams, wet meadows, and isolated springs at higher elevations. It covers about **XX** acres. Trees include Bebb's willow, narrowleaf cottonwood, velvet ash, cherry, box elder, Arizona walnut, and Arizona alder. Dominant shrubs include red osier dogwood, willows, and woods rose. The understory consists of a variety of grass and grass like species, including sedge, Baltic rush, spikerush, and deergrass. Outlying populations of this community type may have unique genetic components.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Montane Willow Riparian Forest

Soils have high amounts of litter and plant cover, and a spongy moist surface in terraces and wet meadows. Soil productivity is moderate to high on terraces and higher along floodplains. Generally, both have high amounts of protective litter and plant cover and are not compacted. Consequently, terraces and floodplains are able to resist erosion and recycle nutrients. Fire is an infrequent disturbance within the system, but is a disturbance from incursions originating in adjacent systems and is dependent on the fire regime in adjacent vegetation types.

Desert Communities

General Description and Background for Desert Communities

Desert communities (also known as desert scrub) are located on the Red Rock Ranger District and generally occur at elevations ranging from approximately **XX to XX** feet. They cover about **XX** percent of the Coconino NF, contain numerous roads and private land parcels, and adjoin the main communities of Cottonwood, Camp Verde, Cornville, and Page Springs. Desert communities are comprised of two vegetation sub-types that vary in composition and structure: creosote bush-dominated sites and crucifixion thorn-dominated sites.

Some soils in this community contain significant quantities of calcium carbonate and a pH of 8 or more is common. There is severe erosion hazard on slopes greater than 35percent. The hot arid climate and calcareous soils significantly limit potential for re-vegetation. This is not a fire-adapted community. It supports a unique community of endemic plants adapted to these calcium-rich soils. It also contains the Verde Valley Botanical Area.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Desert Communities: Landscape Scale

Predominant plant species are native shrubs, forbs, and grasses in various age classes. There is sparse vegetation cover over most of the area that includes native perennials and varying amounts of native annual species. Cover of these can be high after exceptionally wet winter or summer seasons, but is of short duration and do not lead to changes in the natural fire regime. There is successful regeneration and establishment of native endemic plant species.

In all subtypes, erosion occurs at natural rates. There is little sign of compaction or accelerated erosion. Arroyos are stabilizing and recovering. Soils are friable and biologically diverse so plants form beneficial relationships with soil microbes. Roots are covered with soil and there is little evidence of plants perched above the soil with exposed roots (pedestalling). Fires are rare with mean fire return intervals estimated between 75-200+ years (fire regime condition class 4).

Desired Conditions for Desert Communities: Mid-Scale

The table below shows differences in perennial plant canopy cover, basal area, litter and ground cover among the three subtypes.

Table XX. Comparison of vegetation characteristics between desert community subtypes

Sub-type	Canopy cover	Predominant species	Ground cover	Perennial plant basal area	Litter
Creosote bush	At 15percent for creosote bush, 25percent all shrubs	grass, shrubs	gravel, cobble	10 percent	10 percent
Crucifixion thorn	percent<10 to 15percent of Crucifixion thorn, 20 percent all shrubs	grass, shrubs	gravel, cobble, rock outcrops	10 percent	10 percent

Habitat for Arizona cliffrose (a federally endangered species) and endemic plants is connected and preserved. Population numbers for Arizona cliffrose remain **static or increase**. Habitat for Arizona cliffrose and other endemic plants remains suitable.

Desired Conditions for Desert Communities: Fine Scale

Biological soil crusts are present to improve nutrient cycling and stabilize soils, especially in sandier soils.

Guidelines for Desert Communities

Excessive¹⁰ ground disturbance should be avoided to limit accelerated erosion and to minimize bringing more calcareous soil to the surface. Bringing calcareous soil to the surface will limit soil plant nutrient availability.

Semi-Desert Grasslands

General Description and Background for Semi-Desert Grasslands

These low elevation semi-arid grasslands occur on the Red Rocks Ranger District and are bounded by Desert Communities at lower elevations and piñon-juniper evergreen shrub at higher elevations. They cover about 8 percent of the Coconino NF and contain numerous roads and private land parcels. They adjoin the main communities including Camp Verde, Cottonwood, and Cornville. Soils in this PNVT are generally not suited for intensive disturbance because they are shallow, clayey, have high amounts of surface rock, and have low bearing strength which is the inability to support a load without soil movement. Agaves provide food for birds, javelina and other wildlife.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Semi-Desert Grasslands: Landscape Scale

Semi-desert grassland communities are open and connected grasslands punctuated by groves of trees and shrubs. Predominant species are perennial native grasses. The moderate to dense native herbaceous cover includes annual and perennial desert grasses and forbs, succulent species, shrubs, and some herbaceous cover of annuals. Cool and warm season species are present at varying heights. Although the presence of annuals may be of short duration, they do not cause changes to the natural fire regime. Tree cover is less than 10 percent; shrub cover is less than 10 percent. Tree and shrub species include turbinella oak, catclaw mimosa, crucifixion thorn, Utah, redberry, and one seed juniper. All age classes are present. Plant basal area ranges from 5 to 20 percent and plant litter occupies 10 to 15 percent of the soil surface depending on soil type.

Herbaceous vegetative cover is maintained at levels that contribute to suitable hydrologic function, soil stability, and nutrient cycling. Compaction and erosion is minimized due to a diversity of grass and forb species and presence of plant litter. Diversity of grass and forb species is at or nearing potential. Plant basal area ranges from 5 to 20 percent and plant litter occupies 10 to 15 percent of the soil surface depending on soil type.

¹⁰ Excessive ground disturbance results in the extent of exposed soil greater than expected for the site; active erosion features with soil being carried off site in most areas, not just in localized patches; live plants and litter not protecting most of the area; obvious flow patterns and fan deposits; abundant deep rills; and deep gullies with sharp edges.

Arroyos are stabilizing and recovering. Suitable upland conditions of herbaceous cover, leaf litter, and uncompacted soils capable of infiltration reduce instances of overland flows during precipitation events. Improved infiltration reduces arroyos from forming and head cuts from forming in drainages.

Fire plays a natural role. Grasses or understory species carry fire and maintain the natural fire regime (greater than 75 percent overstory mortality or herbaceous top kill).

Desired Conditions for Semi-Desert Grasslands: Mid-Scale

Multiple seral stages of native vegetation are present.

Desired Conditions for Semi-Desert Grasslands: Fine Scale

In the Schoolhouse area, remnant populations of big sacaton grass are reproducing and are established in suitable soil types.

Biological soil crusts are present to improve nutrient cycling and stabilize soils, especially in sandier soils.

Objectives for Semi-Desert Grasslands

Allow or introduce **XX** acres of wildland fire over 10 years following plan approval to increase and maintain the area occupied by grasses and forbs while decreasing the area occupied by shrubs and trees.

Treat **XX** to **XX** acres to reduce the density of trees and shrubs and increase the grassland acres to move towards the desired condition of less than 10 percent canopy cover of trees and shrubs.

Guidelines for Semi-Desert Grasslands

Ground disturbing activities should occur when soils that have low bearing strength and high clay are dry to minimize soil compaction, displacement, and trafficability problems.

Interior Chaparral

General Description and Background for Interior Chaparral

The fire-dependent interior chaparral varies from widely scattered pockets within grasslands and woodlands to more extensive areas on steep slopes. Species composition and dominance varies across the broad range of soils and topography but are dominated by shrubs. Soil productivity is naturally low and most soils are inherently unstable due to the steep slopes.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Interior Chaparral: Landscape Scale

During young stages, chaparral contains a grass and forb component in the understory. The mid to late development stages are dense, nearly impenetrable thickets with considerable shrub litter (e.g., small stems, leaves) (about 35 to 45 percent of soil surface). Standing dead material may

accumulate in areas that have not burned for several decades. Greater than 70 percent of chaparral is middle to late development closed canopy with some openings of grasses and forbs. Canopy ranges from 40 percent at dry sites to 80 percent at wetter sites.

Chaparral is in a constant state of transition from young to older stages and back again, with fire being the major disturbance factor. Natural high severity fires (75+ percent mortality or top kill) occur with a frequency of once every 35 to 100 years. Long fire return intervals allow for re-establishment of seed bank and development of fuel loads and spatial continuity of fuels necessary for fire.

Although soil productivity is generally low and most soils are inherently unstable on steep slopes, there is sufficient vegetation and litter cover to protect soil from accelerated erosion.

Desired Conditions for Interior Chaparral: Mid-Scale

Fire hazard and severity is reduced in the Wildland Urban Interface (WUI) and human life and property is protected. Vegetation conditions within the wildland urban interface are composed of younger and more widely-spaced shrub patches and tree groups.

The frequency of disturbance (e.g., fire, vegetation treatments) within the WUI may be higher than the natural disturbance regime.

Desired Conditions for Interior Chaparral: Fine-Scale

There is 35 to 45 percent of total ground cover by litter and plant basal area and exhibit few signs of soil compaction or accelerated erosion. This indicates that soil function is being sustained and soil is functioning properly and normally.

Biological soil crusts are present to improve nutrient cycling and stabilize soils, especially in sandier soils.

Objectives for Interior Chaparral

Guidelines for Interior Chaparral

Fire treatments within the Interior Chaparral PNVT should provide diversity of burn intensity within burn units. At the landscape scale, burn unit locations should be rotated to provide varying seral stages and habitat diversity.

Management Approaches for Interior Chaparral

Emphasize coordination with local partners and stakeholders to reduce the risk of catastrophic fire in the wildland urban interface on Forest Service, and adjacent non-Forest Service, lands.

Piñon and Juniper

General Description and Background for Piñon and Juniper

The piñon-juniper (PJ) woodland vegetation community is collectively composed of:

- juniper grassland and piñon-juniper grassland

- piñon-juniper evergreen shrub,
- piñon-juniper woodland (also called persistent piñon-juniper)

These generally occur at elevations between approximately 4,500 and 7,500 feet. They are dominated by one or more species of piñon pine and/or juniper and can occur with a grass and forb dominated understory (PJ grassland), a shrub dominated understory (PJ evergreen shrub), or a sparse discontinuous understory of some grasses and/or shrubs (persistent PJ woodland). Two-needle, single-leaf, Mexican, and border piñon pine are common; as well as one-seed, Utah, redberry, Rocky Mountain, and alligator junipers, and a lesser abundance of oaks. Species composition and stand structure vary by location primarily due to precipitation, elevation, temperature, and soil type. In some locations, grassland soil types are interspersed with piñon-juniper soil types. Historically, persistent piñon-juniper did not develop an understory that could carry fire because they are generally located in rocky areas and on rocky outcrops.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for All Piñon and Juniper Types

A shifting mosaic of continuous canopy is interspersed with openings across the landscape. There is connectivity of openings between trees that provide for sufficient sighting distance to facilitate pronghorn movement. Large snags and old trees with dead limbs and tops are persistent and scattered across the landscape. The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances (e.g. insects, diseases, and fire), and climate variability.

Plant litter (e.g., leaves, needles, etc.) and coarse woody debris is present in sufficient quantity to resist accelerated soil erosion and promote nutrient cycling, water retention, and the microclimate conditions necessary for piñon seed germination. Large coarse woody debris is present.

There are sufficient “nurse trees” to provide microclimate condition in the understory that have improved nutrient and soil properties, higher soil moisture, and lower temperatures, and light levels which increase piñon seedling survival under harsh conditions.

There are opportunities for collecting forest products (e.g., firewood, piñon nuts, post and pole etc.) consistent with other desired conditions.

Pine stringers, noncontiguous narrow communities of predominantly ponderosa pine, extend below the normal elevation distribution of ponderosa pine, often into piñon and juniper, and they persist where they naturally occur.

Biological soil crusts are present to improve nutrient cycling and stabilize soils, especially in sandier soils.

Piñon Juniper Grasslands/Juniper Grasslands

Piñon-juniper grassland and juniper grassland are generally uneven aged and open in appearance. Trees occur as individuals and small groups and range from young to old. Basal area ranges from 10 to 30 basal area or square foot per acre. Scattered shrubs and a herbaceous understory relative to site capability, including native grasses, forbs and annuals, are present to support frequent surface fires and provide food and cover for wildlife. Shrubs, grasses, and vegetative ground

cover (e.g., forbs, litter, and coarse woody material) are present and sufficient to maintain soil stability and soil productivity. Snags and older trees with dead limbs are scattered across the landscape. Fires typically occur every 1 to 35 years with low-severity and patches of mixed severity (Fire Regime 1) favoring re-growth and germination of native grasses and forbs. Piñon Juniper Evergreen Shrub

Piñon-juniper evergreen shrub is a mix of trees and shrubs that occurs as a series of vegetation states that move from herbaceous-dominated to shrub-dominated to tree-dominated over time. Trees occur as individuals or in smaller groups ranging from young to old. Basal area ranges from 10 to 40 square foot per acre to maintain soil stability. Piñon trees are occasionally absent but one or more juniper species is always present. Arizona cypress and live oak are scattered across the landscape. Typically groups are even-aged in structure with all ages represented across the landscape for an overall uneven-aged grouped appearance. The understory is dominated by low to moderate density shrubs depending on successional stage. The shrub component consists of one or a mix of evergreen shrub, oak, manzanita, mountain mahogany, sumac and other shrub species, which are well-distributed. A variety of low to high growing native perennial and annual grasses and forbs are present in the interspaces and maintain soil stability and soil productivity. Fires are typically mixed severity (25-75 percent mortality or top kill with a moderate frequency—Fire Regime III) while some evergreen shrub types exhibit occasional high severity fires (greater than 75 percent mortality—Fire Regime IV).

Vegetation conditions within the wildland urban interface may be composed of younger and more widely-spaced shrub patches and tree groups so fires can be suppressed more easily when needed.

Piñon Juniper Woodland

Piñon-juniper woodland (persistent) is characterized by even-aged patches of piñons and junipers that at the landscape level form multi-aged woodlands. Very old trees (greater than 300 years old) are present. Old growth occurs as patches on the landscape as individual old trees and patches of old trees. Tree density is high and where interlocking crowns shade the ground over extensive areas, shrubs are sparse to moderate, and herbaceous cover is low and discontinuous. The composition, structure, and function of vegetative conditions are resilient to the frequency, extent and severity of disturbances (e.g. insects, diseases, and fire), and climate variability. Insects and disease occur at endemic levels. Fire as a disturbance is less frequent and variable due to differences in ground cover. The fires that do occur are mixed to high severity (Fire Regimes III, IV, and V).

Guidelines for All Piñon and Juniper Types

On grassland soil types, previous vegetation treatments (pushes) of piñon-juniper grasslands, juniper grasslands, or piñon-juniper evergreen shrub should continue to be treated to maintain seral grasslands.

On non-grassland soil types, pushes in piñon-juniper grasslands, juniper grasslands, or piñon-juniper evergreen shrub should trend towards desired condition for the particular woodland type.

Tree encroached grassland soil types (also called mollisol soils) within the piñon-juniper types should be restored to grassland desired conditions.

In areas where there is little understory and treatments are proposed, slash treatments (e.g., lop and scatter and mastication) should be used that improve herbaceous vegetation growth, soil and watershed condition, and soil productivity. The intent is to thin to encourage response by herbaceous vegetation and allow smaller debris to decompose in place on the ground.

If needed to support restoration and if available, seeding with native species appropriate for the ecological unit (or similar in elevation, soil type, and eco regions) should be used.

Objectives for All Piñon and Juniper Types

Treat between XX acres of piñon-juniper vegetation types within 10 years following plan approval to move towards desired conditions. Treatment priorities should move forest priority 6th level HUC watersheds towards satisfactory conditions.

Ponderosa Pine

General Description and Background for Ponderosa Pine

The ponderosa pine forest vegetation community generally occurs at elevations ranging from approximately 5,000 to 9,000 feet and covers about 44 percent of the Forest. It is adjacent to Flagstaff and numerous other communities. It is dominated by ponderosa pine and commonly includes other species such as oak, juniper, and piñon. More infrequently species such as aspen, Douglas-fir, white fir, and blue spruce may be present in small groups or individual trees. There typically is an understory of grasses and forbs and sometimes shrubs.

The ponderosa pine forest vegetation community includes two sub-types: ponderosa pine bunchgrass and ponderosa pine Gambel oak. The Gambel oak sub-type is particularly important to many wildlife species, including Mexican spotted owls. Higher species richness has been correlated with higher densities of Gambel oak. This sub-type provides important nesting and foraging habitat for wildlife. The desired conditions below apply to both sub-types. This community also contains unique features such as pine stringers. Pine stringers are noncontiguous, narrow communities of predominantly ponderosa pine that extend into the piñon-juniper woodland below the normal elevation distribution of ponderosa pine. They provide connectivity between two vegetation types as well as a unique microclimate in lower elevation environments.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Ponderosa Pine: Landscape Scale

At the landscape scale, the ponderosa pine forest vegetation community is a mosaic of tree species and forest conditions composed of trees from young to old. Old growth is well distributed in the landscape and occurs as groups of old trees mixed with groups of younger trees or occasionally as a group comprised mostly of old trees. Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably-sized openings of grass/forb/shrub vegetation associations similar to historic patterns. Size, shape, number of trees per group and number of groups per area are variable across the landscape. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Aspen is present as an early seral component of a diverse pine ecosystem and occurs in appropriate microsites such as northern aspects and canyons.

In the Gambel oak sub-type, all sizes, structure (shrub or tree forms depending on site capability), and all ages of oak trees are present. It is reproducing and maintaining its presence on suitable sites across the landscape. Large to moderate sized oak snags are scattered across the landscape, as are moderate to large live oak trees with dead limbs, hollow boles, and cavities. These provide shelter and nesting habitat for a variety of wildlife species, including owls and bats.

The ponderosa pine forest vegetation community is composed predominantly of vigorous trees, but declining trees in a variety of stages of decline are a component and provide snags; trees affected by top-kill, lightning, and fire-scars; and coarse woody debris (greater than 3 inch diameter); these are all well-distributed throughout the landscape. Ponderosa pine snags are typically 18 inches or greater at diameter at breast height (DBH) and average 1 to 2 snags per acre. This can vary in space and time. There are varying sizes greater than 18 inches at DBH. In the Gambel oak subtype, large oak snags (greater than 10 inches) are a well-distributed component.

Downed logs (greater than 12 inch diameter at mid-point and greater than 8 feet long) average 3 logs per acre within the forested area of the landscape. Coarse woody debris, including downed logs, is sufficient to maintain or improve long-term soil productivity, provide important wildlife habitat, and are generally well distributed and averages 3 to 10 tons per acre.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, dwarf-mistletoe or pathogens, diseases, drought, fire, and wind), including snags, downed logs, and old trees. Grasses, forbs, shrubs, leaves, and needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and native herbaceous vegetation provide protection from accelerated soil erosion; promote water infiltration, and nutrient cycling function in order to contribute to plant and animal diversity and to ecosystem function. Frequent, low severity fires (Fire Regime I) are characteristic in this type. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Desired Conditions for Ponderosa Pine: Mid-Scale

At the mid-scale the ponderosa pine forest vegetation community is characterized by variation in the size, density, and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Openings typically range from 10 percent in more productive forested sites to 70 percent in the less productive forested sites. Tree density within forested areas generally ranges from 20 to 80 square foot basal area per acre.

Understory species (e.g., grasses, forbs, and shrubs) diversity is consistent with site potential and provides for infiltration of water and reduction of accelerated erosion. The understory has a variety of heights of cool and warm season vegetation and produces seedheads and all age classes of vegetation for food and cover for wildlife. A mosaic of dense cover, high amounts of litter and bare ground, provide habitat for small mammals.

The mosaic of tree groups generally comprises an uneven-aged forest with all age classes present. Infrequently patches of even-aged forest structure are present. Disturbances sustain the overall age and structural distribution.

Fires burn primarily on the forest floor at low intensity and do not spread between tree groups as crown fire. Single tree torching and isolated group torching, however, is not uncommon, resulting in a mosaic across the landscape.

Forest conditions in goshawk post-fledging family areas (PFAs) are similar to general forest conditions except these forests contain 10 to 20 percent higher basal area in mid-aged to old tree groups than in goshawk foraging areas and the general forest. Goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively dense canopies.

In order to reduce fire intensity and resistance to control in the wildland urban interface (WUI), forest structure may be at the lower end of the range of desired conditions for levels of snags, logs, coarse woody debris, tree density, as well as groups of trees that are more widely spaced, or have fewer trees per group (but still within desired condition) than in the non-WUI areas.

Desired Conditions for Ponderosa Pine: Fine Scale

Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Openings surrounding tree groups are variably-shaped and comprised of a grass/forb/shrub mix. Some openings contain individual trees. Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Size of tree groups is typically less than 1 acre, and averages 0.5 acres. Groups at the mid-aged to old stages consist of approximately 2 to 40 trees per group.

Isolated infestations of dwarf mistletoe may occur, but the severity and amount of mortality varies among the infected trees. Witches brooms may form on infected trees, providing habitat for wildlife species.

Gambel oak acorns provide food for wildlife species.

Objectives for Ponderosa Pine

To move towards desired conditions in ponderosa pine communities: Thin **XX** to **XX** acres and prescribe burn **XX** to **XX** acres within 10 years following plan approval.

Guidelines for Ponderosa Pine

Snags and downed logs should be emphasized along edges of openings and within groups/clumps in PFAs to provide for prey habitat and roosts for tree-dwelling bats.

To provide for goshawk nesting, a minimum of 6 nest areas (known or replacement) should be located per territory. Goshawk nest and replacement nest areas should generally be located in drainages, at the base of slopes, and on northerly (NW to NE) aspects. Nest areas should generally be 25 to 30 acres in size. In order to provide habitat while young goshawks are maturing, goshawk PFAs of approximately 420 acres in size should be designated surrounding the nest sites.

In goshawk foraging areas and PFAs, groups of 3 to 5 reserve trees should be retained within management-created openings greater than 1 acre in ponderosa pine and dry mixed conifer, and 6 reserve trees should be retained within management-created openings greater than 0.5 acre in wet mixed conifer and spruce-fir, except where the strong potential for wind-throw prevents the possibility of viable reserve trees, or insect and/or disease prevent the eventual development of regeneration into large trees.

Human presence should be minimized in occupied goshawk nest areas during nesting season of March 1 through September 30.

Ponderosa pine site treatment timing and residual green slash accumulations should be managed to minimize opportunities for *Ips* beetle populations to increase.

Because the intent of treatments in the WUI are at least partially to reduce fire intensity and resistance to control, forest structure in the WUI may have lesser levels of snags, logs, coarse woody debris, lower tree densities, as well as groups of trees that are more widely spaced, or have fewer trees per group (but still within desired condition) than in the non-WUI areas. Crown base height will be higher.

Slash piles could be retained across the landscape for several years, rather than immediate burning to increase small mammal occupancy in areas where logs are deficient and to provide nesting habitat for turkeys. This should be consistent with scenic integrity objectives and balanced with potential threats from *Ips* beetles.

Dry Mixed Conifer

General Description and Background for Dry Mixed Conifer

Mixed conifer with frequent fire, or dry mixed conifer, covers approximately 79,060 acres on Coconino NF (along with mixed conifer with infrequent fire). This forest type occurs at elevations above ponderosa pine between 5,500 and 9,500 feet on mountain slopes and may also occur in canyons and north facing slopes. These conifer forests are dominated by mainly shade intolerant trees such as: ponderosa pine, southwestern white pine, limber pine, quaking aspen, and Gambel oak, with a lesser presence of New Mexican locust and big toothed maple as well as shade tolerant species such as white fir and blue spruce. Moderately shade tolerant species such as Douglas-fir are common. Aspen may occur as individual trees or small groups.

This forest type typically occurs with an understory of graminoids, forbs, and shrubs. The understory is more similar to ponderosa pine, and it generally has more sedges, mosses, and liverworts. Big toothed maple only occurs on the Mogollon Rim Ranger District.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Direction regarding Mexican spotted owl (MSO) habitat in this vegetation community is contained in the MSO Recovery Plan.

Desired Conditions for Dry Mixed Conifer: Landscape Scale

At the landscape scale, the dry mixed conifer vegetation community is a mosaic of forest conditions composed of structural stages ranging from young to old trees. Old growth is well-distributed in the landscape and occurs as groups of old trees, often mixed with groups of younger trees or as individual patches. Forest appearance is variable but generally uneven-aged and open; occasional patches of even-aged structure are present. The forest arrangement is in small clumps and groups of trees interspersed within variably-sized openings consisting of graminoid, forb, and shrub associations similar to historic patterns. Openings typically range from 10 percent in more productive forested sites to 50 percent in the less productive forested sites. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. Where they naturally occur, groups and patches and all structural stages of oak are present. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

The dry mixed conifer forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (greater than 3 inch diameter), all well-distributed throughout the landscape. A variety of snag species and coarse woody debris are well distributed throughout the landscape. Snags are typically 18 inches or greater at DBH and average 3 per acre. Downed logs (greater than 12 inch diameter at mid-point and greater than 8 feet long) average 3 per acre within the forested area of the landscape. Coarse woody debris (greater than 3 inch diameter), including downed logs, ranges from 5 to 15 tons per acre to maintain long-term soil productivity.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, severity of disturbances, and to climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, and wind), including snags, downed logs, and old trees. Graminoids, forbs, shrubs, needle cast (fine fuels), and small trees maintain the natural fire regime.

Organic ground cover and native herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Frequent, low severity fires (Fire Regime I) are characteristic. Natural and human caused disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Desired Conditions for Dry Mixed Conifer: Mid-Scale

At the mid-scale, the dry mixed conifer forest vegetation community is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive forested sites contain more trees per group and more groups per area. Openings typically range from 10 percent in more productive sites to 50 percent in the less productive sites. Tree density within forested areas generally ranges from 30 to 100 square foot basal area per acre. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

The mosaic of tree groups generally comprises an uneven-aged forest with all age classes and structural stages. Occasionally small patches (generally less than 50 acres) of even-aged forest structure are present. Disturbances sustain the overall age and structural distribution.

Frequent low severity fires (generally less than 25 percent mortality or topkill) occurring every 1 to 35 years are characteristic of this forest, including throughout the range of Mexican spotted owls and northern goshawks. Fires burn primarily on the forest floor and do not spread between tree groups as crown fire. Grasses, forbs, shrubs, and needle cast (fine fuels) maintain the natural fire regime with a greater proportion of the ground cover as grasses and forbs as opposed to needle cast.

Forest structure in the wildland urban interface (WUI) is similar to conditions described above or may be composed of smaller and more widely spaced groups of trees.

Basal area per mid-aged to old tree group in northern goshawk PFAs is 10 to 20 percent higher than northern goshawk foraging areas and the general forest. Goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively dense canopies consistent with current technical guides for northern goshawk in the southwestern U.S.

Where they naturally occur, all age classes of aspen and maple are present in groups or patches and are regenerating and vigorous. A diverse understory comprised of native herbaceous and shrub species is has a variety of seral and age classes and is vigorous and regenerating.

In order to reduce fire intensity and resistance to control in the WUI, forest structure may be at the lower end of the range of desired conditions for levels of snags, logs, coarse woody debris, tree density, as well as groups of trees that are more widely spaced, or have fewer trees per group (but still within desired condition) than in the non-WUI areas.

Desired Conditions for Dry Mixed Conifer: Fine Scale

Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Openings surrounding tree groups are variably-shaped and comprised of a mix of graminoids, forbs and shrubs. Some openings contain individual trees or snags. These provide habitat for rare species such as Colorado blue columbine, Rusby milkvetch, and timberland blue-eye grass.

Trees within groups are of similar or variable ages and one or more species. Size of tree groups typically is less than 1 acre. Groups at the mid-age to old stages consist of approximately 2 to 50 trees per group.

Mistletoe is present in isolated pockets, but the degree of severity and amount of mortality varies among the parasitized trees. Witches brooms may form on infected trees, providing habitat for wildlife species.

Openings and meadows are well distributed throughout the PNV. These provide habitat for rare species such as Colorado blue columbine (*Aquilegia caerulea* var. *pinetorum*), Rusby milkvetch (*Astragalus rusbyi*) and timberland blue-eye grass (*Sisyrinchium longipes*). These openings are maintained by natural processes or management activities and exist within the PNV in quantities and qualities adequate enough to allow for the persistence of these species as members of the native plant community.

Fine scale features such as rock piles and wet areas, which are necessary to support these rare plant species, are well distributed and maintained within the capacity of the PNV.

Guidelines for Dry Mixed Conifer

A minimum of 3 nest areas and 3 replacement nest areas should be located per territory. Goshawk nest and replacement nest areas should generally be located in drainages, at the base of slopes, and on northerly (NW to NE) aspects. Nest areas should generally be 25 to 30 acres in size.

Goshawk Post-fledging Family Areas (PFAs) of approximately 420 acres in size should be designated surrounding the nest sites.

In goshawk foraging areas and PFAs, groups of 3 to 5 reserve trees should be retained within management-created openings greater than 1 acre in ponderosa pine and dry mixed conifer, and 6 reserve trees should be retained within management-created openings greater than 0.5 acre in wet mixed conifer and spruce-fir, except where the strong potential for wind-throw prevents the possibility of viable reserve trees, or insect and/or disease prevent the eventual development of regeneration into large trees.

Human presence should be minimized in occupied goshawk nest areas during nesting season which is typically March 1 through September 30.

Primary caches (i.e., seed storage sites) for red squirrels should be protected from loss from due to management activities.

Wet Mixed Conifer

General Description and Background for Wet Mixed Conifer

Mixed conifer with infrequent fire, or wet mixed conifer, covers approximately 79,060 acres on Coconino NF (acreage combined with mixed conifer with frequent fire). This forest type occurs at elevations ranging from approximately 5,500 to 10,000 feet **make Coconino NF specific** on mountain slopes such as the San Francisco Peaks and may also occur in canyons and north-facing slopes at lower elevations. Tree species composition varies depending on seral stage, elevation, and moisture availability. It can be composed of early and mid-seral species such as aspen, Douglas fir, New Mexico locust, southwestern white pine and limber pine, and late seral species such as maple, white fir and blue spruce. Ponderosa pine may be present in minor proportions. The absence of Engelmann spruce and/or corkbark fir distinguishes wet mixed conifer from the spruce-fir forest. Aspen may occur as individual trees or small groups.

Disturbances typically occur at two temporal and spatial scales; large scale infrequent disturbances (mostly fire) and small scale frequent disturbances (fire, insect, disease, wind).

This forest has an understory of a wide variety of shrubs grasses, and forbs depending on soil type, aspect, elevation, disturbance, and other factors. It generally has more sedges, mosses, and liverworts than mixed conifer with frequent fire (also called dry mixed conifer). Lichens may occur on the Douglas fir. Vegetation tends to flower more in the spring and compositionally be more similar to vegetation in adjoining spruce-fir type or in canyons. It has more leaf litter than dry mixed conifer because there are more deciduous species. Mixed conifer understory in canyons is older geologically, because the canyons are older than mountains on the Forest. Consequently, mixed conifer vegetation in canyons provides additional biological and genetic diversity.

XX percent of the plants known to be used by tribes that traditionally use the forest occur in this ecosystem.

Direction regarding Mexican spotted owl habitat (MSO) in this vegetation community is contained in the MSO Recovery Plan.

Desired Conditions for Wet Mixed Conifer: Landscape Scale

At the landscape scale, this forest type is a mosaic of structural and seral stages ranging from young trees through old. The landscape arrangement is an assemblage of variably-sized and aged groups and patches of trees and other vegetation associations similar to historic patterns. Tree groups and patches are comprised of variable species composition depending on forest seral stages. An approximate balance of seral stages is present across the landscape, each seral stage characterized by distinct dominant species composition and biophysical conditions. Old growth is well-distributed in the landscape. Canopies are generally more closed than in dry mixed conifer. An understory consisting of native graminoids, forbs, and/or shrubs is present.

The wet mixed conifer community is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris all well-distributed throughout the landscape. Number of snags and the amount of downed logs (greater than 12 inch diameter at mid-point and greater than 8 feet long) and coarse woody debris (greater than 3 inch diameter) vary by seral stage.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, and severity of disturbances and climate variability. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, wind, and fire), including snags, downed logs, and old trees. Mixed severity fire (Fire Regime III) is characteristic. High severity fires (Fire Regimes IV and V) rarely occur. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function.

Mosses and lichens are prevalent and function for recycling soil nutrients and for filtering air. These require moisture for part of their life cycle.

Desired Conditions for Wet Mixed Conifer: Mid-Scale

At the mid-scale, the size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are frequently in the hundreds of acres, with rare disturbances in the thousands of acres. Groups and patches of tens of acres or less are relatively common. A mosaic of groups and patches of trees, primarily even-aged, but variable in size, species composition, and age is present. Grass, forb, shrub openings created by disturbance, may comprise 10 to 100 percent of the mid-scale area, depending on the disturbances and on amount of time since disturbance. Aspen is occasionally present in large patches.

Tree density ranges from 20 to 180 square foot basal area per acre depending upon time since disturbance and seral stages of groups and patches. Snags 18 inches or greater at DBH average

from 1 to 5 snags per acre, with the lower range of snags of this size associated with early seral stages and the upper range associated with late seral stages. Snag density in general (greater than 8 inches DBH) averages 20 per acre. Coarse woody debris, including downed logs, vary by seral stage, with averages ranging from 5 to 20 tons per acre for early-seral stages; 20 to 40 tons per acre for mid-seral stages; and 80 tons per acre or greater for late-seral stages.

Quaking aspen exists as a mosaic within the PNVT, providing habitat for those organisms dependent on it. Organisms present in aspen groves include native plant species such as the Colorado blue columbine and Rusby milkvetch, native animals such as woodpeckers, and a variety of fungi and microorganisms.

Mixed (Fire Regime III) and high (Fire Regime IV) severity fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. High severity fires generally do not exceed 1000 acre patches of mortality. Other smaller disturbances occur more frequently.

Forests in the wildland urban interface (WUI) are dominated by early-seral fire-adapted species growing in an overall more open condition than the general forest. These conditions result in fires that burn primarily on the forest floor and rarely spread as crown fire.

Basal area per mid-aged to old tree group in northern goshawk PFAs is 10 to 20 percent higher than northern goshawk foraging areas and the general forest. Nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively dense canopies.

Where they naturally occur, all age classes of aspen and maple are present in groups or patches and are regenerating and vigorous. A diverse understory comprised of native herbaceous and shrub species has a variety of seral and age classes and is vigorous and regenerating.

Desired Conditions for Wet Mixed Conifer: Fine Scale

In mid-aged and older forests, trees are typically variably-spaced with crowns interlocking (grouped and clumped trees) or nearly interlocking. Trees within groups can be of similar or variable species and ages. Small openings (gaps) are present as a result of disturbances.

Openings that support grasses, forbs, and shrubs are periodically created by disturbance to provide habitat for such species as Rusby milkvetch.

Natural openings and meadows are well distributed throughout the PNVT. These provide habitat for rare species such as Colorado blue columbine, Rusby milkvetch, Oregon willow herb and timberland blue-eye grass. These openings are maintained by natural processes and exist within the PNVT in quantities and qualities adequate enough to allow for the persistence of these species as members of the native plant community. Fine scale features such as rock piles and wet areas which are necessary to support these rare plant species, are well distributed within the capacity of the PNVT.

Guidelines

Primary caches (i.e., seed storage sites) for red squirrels should be protected from loss from due to management activities.

Montane/Subalpine and Great Basin Grasslands

General Description and Background for Montane/Subalpine and Great Basin Grasslands

Laying in a patchwork across the Colorado Plateau, the grasslands are meadows varying in size from just a few acres to well over 1,000 acres. A wide variety of species of grasses and forbs characterize the vegetation which varies according to soil type, soil moisture, and temperature.

Grasslands provide vegetative diversity needed by wildlife. They provide breathtaking views and are themselves a highly attractive visual resource.

Prairie dogs are present in a variety of locations. Where they exist, they are a key component in their environment because their burrows provide shelter, and they are prey for a variety of birds and animals.

Grasslands are susceptible to channel erosion and subsequent dropping of the water table, as well as lack of fire as a natural disturbance in some soil types that, in turn, encourages the growth of trees and shrubs.

Subalpine Grasslands

Subalpine grasslands occur at elevations ranging from 8,000 to 11,000 feet on warmer drier aspects than adjacent soil units that support mixed conifer. A typical location is on the San Francisco Peaks. These productive communities often harbor several plant associations with varying dominant grasses and herbaceous species. Such dominant species may include pine dropseed (*Blepharoneuron tricholepis*), nodding brome (*Bromus anomalus*), various sedges (*Carex spp.*), Arizona fescue (*Festuca arizonica*), mountain junegrass (*Koeleria pyramidata*), mountain muhly (*Muhlenbergia montana*), muttongrass (*Poa fendleriana*), and squirreltail (*Sitanion hystrix*). Trees may occur in trace amounts within these grasslands, and along their periphery. Shrubs may also be present. These meadows are seasonally wet and closely tied to snowmelt. They are maintained by fire.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Montane Grasslands

Montane grasslands generally occur at elevations between 6,550 and 8,000 feet. Typical locations include Kendrick Park, Antelope Park, and Mule Park. They are more productive than Great Basin and semi-desert grasslands. Species include, but are not limited to: muttongrass, mountain muhly, spike muhly, Arizona fescue, blue grama, red three-awn, squirreltail, yarrow, and pine dropseed. Non-native Kentucky bluegrass is present. Trees occur along the periphery of montane grasslands. Vegetation in some of the montane grassland soil types are maintained by fire. They are also influenced by weather. Tree canopy is increasing in some areas.

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Great Basin Grasslands

Great Basin grasslands occur at elevation (insert range) and are more arid than montane or subalpine grasslands. Typical locations are Anderson Mesa and near Wupatki National Monument. They consist mostly of grasses with smaller amounts of forbs and shrubs. Trees can be present in trace amounts depending on soil type; however, tree canopy is increasing in some areas, especially in the northeast part of the Forest around Wupatki National Monument. Species include but are not limited to: western wheatgrass (*Pascopyrum smithii*), black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), galleta grass (*Hilaria jamesii*), hairy grama (*Bouteloua hirsuta*), spike muhly (*Muhlenbergia wrightii*), needle and thread grass (*Hesperostipa comata*). Trees may include sparse one-seeded juniper (*Juniperus monosperma*), alligator juniper (*Juniperus deppeana*), red berry juniper (*Juniperus coahuilensis*), Utah juniper (*Juniperus osteosperma*) and Colorado piñon pine (*Pinus edulis*). Natural disturbances are: weather, natural soil movement (e.g., natural shrink-swell and seasonal surface cracking), and fire (one soil type in this grassland is adapted to fire).

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Montane/Subalpine and Great Basin Grasslands: Landscape Scale

The composition (i.e., mix of species), structure (i.e., form and shape of the species of the composition on the landscape), and distribution (i.e., where it occurs on the landscape) of native vegetation reflects a mix of early, mid, and late seral stages. Early seral stages will typically contain more forbs, and as stages get older, they are dominated by more grasses and fewer forbs. Vegetation height, density, and cover support the historic fire return interval, where fire played a role, while providing food and cover for wildlife species, including pronghorn. Historic fire is thought to be low intensity fire with a 1 to 35 year fire return interval and is generally dependent on the fire regime in adjoining vegetation types.

Tree and shrub canopy cover are each less than 10 percent. There are inclusions and variability within the landscape as well as ecotones on the fringes. There is regeneration, seed head production, and balance of grasses and forb species, including warm and cool season species in most years and within the capability of soil type.

Leafy spurge, an invasive exotic noxious weed, is not present on the landscape. If it is present, it does not compete with rare plant species such as Arizona sneezeweed (*Helenium arizonicum*) and Apache beardtongue (*Penstemon oliganthus*).

Organic ground cover and herbaceous vegetation provide protection from accelerated erosion and promote water infiltration and nutrient cycling function. Soil function is sustained. Soil has the ability to infiltrate water, resist erosion, and recycle nutrients to maintain long-term soil productivity. Soil surface structure is granular or well aggregated to promote water infiltration and reduce runoff.

Grasslands are connected based on the distribution of mollisol soils and not fragmented.

Natural surface drainages and subsurface flow patterns are not altered by man-made or ungulate disturbance, and they are maintained to assure water flow into connected waterbodies or streams returns water quantity expected from an unaltered condition.

Desired Conditions for Montane/Subalpine and Great Basin Grasslands: Mid-Scale

The table below shows desired ranges of how canopy cover of grass and forbs and plant basal area and litter cover vary among grassland types.

Table XX.

Grassland type	Canopy cover grasses & forbs¹¹	Plant basal area and herbaceous litter
Subalpine	> 80 percent	> 90 percent
Montane	65-80 percent	40-90 percent
Great Basin	20-50 percent	25-45 percent

Desired Conditions for Montane/Subalpine and Great Basin Grasslands: Fine Scale

Fine scale features such as rock piles and wet areas, which are necessary to support rare plant species such as grassy slope sedge (*Carex oreocharis*), Arizona sneezeweed (*Helenium arizonicum*), are well distributed and maintained within montane grasslands.

Within site capability, a mosaic of vegetation density exists across the landscape ranging from densely vegetated areas that provide cover for ground nesting birds and pronghorn fawns to bare areas that result from natural activities such as freeze thaw action or prairie dog burrowing.

Guidelines for Montane/Subalpine and Great Basin Grasslands

There should be 90 percent potential ground cover to prevent erosion and gully formation.

Minimize disturbance from management activities in key pronghorn fawning areas during fawning season (June 2 to July 15?).

Natural and constructed waters within ¼ mile of fawning habitat should be maintained and available to pronghorn during the fawning season.

New stock tanks and wildlife waters should be placed in locations that reduce concentrations of grazing animals and subsequent vegetation and soil effects in open areas.

Management Approaches for Montane/Subalpine and Great Basin Grasslands

Provide media and public information focused on the unique properties of meadows and appropriate activities within meadows.

Collaborate with partners and stakeholders on grassland restoration, grassland connectivity, and education.

¹¹ Depends on Terrestrial Ecosystem Unit or soil type

Coordinate with Arizona Game and Fish Department on objectives for wildlife conservation, education, and habitat restoration and improvements particularly regarding pronghorn and prairie dogs.

Spruce Fir Forest

General Description and Background for Spruce Fir Forest

The spruce-fir forest vegetation community generally occurs at elevations ranging from approximately 9,500 to 11,500 feet. It is often dominated by Engelmann spruce but contains other species depending on elevation. The understory commonly includes currants, maples, honeysuckle, common juniper, huckleberry, alpine clover, and sedges. Spruce-fir forests occur within the Kachina Peaks Wilderness and are among the coldest, wettest, and highest elevation sites on the Coconino NF. This forest vegetation community can be subdivided into lower elevation (spruce-fir mix) and upper elevation (subalpine spruce-fir) sub-types with differing fire regimes and sub-dominant species composition. The lower spruce-fir sub-type typically occurs between 9,500 and 10,500 feet in elevation, while the upper spruce-fir sub-type typically occurs between 10,500 and about 11,500 feet in elevation and is bounded by the alpine tundra vegetation above 11,500 feet.

The lower elevation spruce-fir sub-type resembles mixed conifer (with infrequent fire) except with a different composition of tree species, due to colder and wetter conditions, and it is a transition zone between wet mixed conifer and the upper elevation spruce-fir forest sub-type. In the lower sub-type, the common tree species are aspen, Douglas-fir, white fir, and Southwestern white/limber pine. The climax forest is dominated by Engelmann spruce, white fir and occasionally blue spruce. Subdominant species may include corkbark/subalpine fir, white fir, and bristlecone pine. In the upper sub-type, the dominant tree species are Engelmann spruce and corkbark fir (subalpine fir). Patches of aspen are occasionally present but are usually absent. Disturbances in these types typically occur at two temporal and spatial scales; large-scale infrequent disturbances (mostly fire) and small-scale frequent disturbances (fire, insect, disease, wind).

XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Spruce Fir Forest: Landscape Scale

The spruce-fir forest is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, avalanches, and wind), including old trees, downed logs, and snags.

The spruce-fir forest vegetation community is a mosaic of structural and seral stages ranging from young trees through old and is composed of multiple species. The landscape arrangement is an assemblage of variably-sized and aged groups and patches of trees and other vegetation similar to historic patterns. “Old growth” is well-distributed in the landscape. Tree canopies are generally more closed than in mixed conifer. An understory consisting of native grass, forbs, and/or shrubs is present.

The spruce-fir forest vegetation community is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags, top-killed, lightning- and fire-

scarred trees, and coarse woody debris, all well-distributed throughout the landscape. The number of snags and amount of downed logs (greater than 12 inch diameter at mid-point and greater than 8 feet long) and coarse woody debris (greater than 3 inch diameter) vary by seral stage.

The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, and severity of disturbances and climate variability. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, diseases, fire, avalanches, and wind), including old trees, downed logs, and snags. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. In the lower spruce-fir sub-type, mixed severity fires (Fire Regime III) infrequently occur. In the upper spruce-fir type, high severity fires (Fire Regime IV and V) occur very infrequently. Natural and human-caused disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

The tundra and upper mixed conifer and spruce-fir slopes within the Kachina Peaks Wilderness are closed to grazing and are not part of any grazing allotment.

Desired Conditions for Spruce Fir Forest: Mid-Scale

At the mid-scale, the size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are mostly in the hundreds of acres, with rare disturbances in the thousands of acres. There may be frequent small disturbances resulting in groups and patches of tens of acres or less. A mosaic of groups and patches of trees, primarily even-aged, that are variable in size, species composition, and age is present. Grass, forb, and shrub openings created by disturbance may comprise 10 to 100 percent of the mid-scale area following major disturbance and depending on time since disturbance. Aspen is occasionally present in large patches.

Tree density ranges from 20 to 250 square foot basal area per acre, depending upon disturbance and seral stages of the groups and patches. Snags 18 inches or greater at DBH range from 1 to 3 snags per acre, with the lower range of snags this size associated with early seral stages and the upper range associated with late seral stages. Snags density in general (greater than 8 inches DBH) averages 20 per acre with a range of 13 to 30. Coarse woody debris, including downed logs, averages vary by seral stage, ranging from 5 to 20 tons per acre for early-seral stages; 20 to 40 tons per acre for mid-seral stages; and 80 tons per acre or greater for late-seral stages.

Quaking aspen exists as a mosaic within the PNVT, providing habitat for those organisms dependent on it. Organisms present in aspen groves include native plant species such as the Colorado blue columbine and Rusby milkvetch native animals such as woodpeckers, and a variety of fungi and microorganisms.

Mixed (Fire Regime III) and high (Fire Regimes IV and V) severity fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. Localized, accelerated soil erosion occurs following high severity fires but not to the extent it risks long-term impairment to connected waters downstream or causes loss of soil productivity over major portions of the 5th or 6th level HUC watershed.

The wildland urban interface (WUI) is comprised primarily of grass/forb/shrub vegetation. Structures in the WUI are surrounded by grassy openings with very few or no trees. These conditions result in ground fires.

Forest conditions in goshawk post-fledging family areas (PFAs) are similar to general forest conditions except PFAs contain 10 to 20 percent greater tree density (basal area) than goshawk foraging areas and the general forest. Nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively dense canopies.

Soil and vegetation disturbance from management activities occur in confined, localized areas where impacts to long-term soil and vegetative condition are minimal.

Desired Conditions for Spruce Fir Forest: Fine Scale

Mid-aged to old trees grow tightly together with interlocking crowns. Trees are generally of the same height and age in early group/patch development but may be multilayered in late development. Small openings (gaps) are present as a result of disturbances. Invasive exotic species are absent or present at minimum levels.

Natural openings and meadows are well distributed throughout the PNVT. These provide habitat for rare species such as Colorado blue columbine, graceful buttercup, spider saxifrage, and timberland blue-eye grass. Openings are maintained by natural processes and exist within the PNVT in quantities and qualities adequate enough to allow for the persistence of these species as members of the native plant community. Fine scale features such as rock piles and wet areas, which are necessary to support these rare plant species, are well distributed within the PNVT.

Guidelines for Spruce Fir Forest

Soil and vegetation disturbance from management activities should occur in confined, localized areas where impacts to soil condition and vegetation is minimized to maintain long-term soil productivity and continue moving the majority of the 6th level HUC watershed towards a functioning Class 1 watershed.

Alpine Tundra

General Description and Background for Alpine Tundra

On the Coconino NF, about 941 acres of alpine tundra occur in the Kachina Peaks Wilderness, beginning around 10,600 feet elevation continuing to the top of Humphrey's Peak, the highest point in Arizona. This is the only alpine tundra and area of bristlecone pine, on Forest Service land in Arizona and is one of the southernmost extents of alpine tundra in the Continental United States.

Alpine tundra consists of three main habitat associations: boulder fields, talus slopes, and meadows. Krummholz (areas of dwarfed, wind twisted trees) occurs near tree line where trees transition to alpine tundra vegetation. It is typically barren with sparse vegetation including grasses, forbs, lichens and low shrubs. It supports a federally threatened plant, San Francisco Peaks groundsel (*Packera franciscanus*) that is only found here, as well as other endemic species.

Vegetation is controlled by presence of soil, wind, snow accumulation, slope, and aspect. Episodic weather related factors are the major natural disturbance processes and include extreme temperatures, solar radiation, winds, avalanches, and moisture. Wildland fires and invasive exotic or noxious weeds have had little to no effect on this habitat however off-trail recreation can trample plants and damage habitat.

Major human disturbances are developed recreation from the adjacent ski area and year-round dispersed recreation, mainly outside of winter. There is a popular trail leading to Mount Humphrey's peak.

The alpine tundra vegetation zone is probably the most significant cultural area on the Coconino National Forest. It contains shrines that are the focal points of prayers for many tribes in the Southwest. XX percent of the plants known to be used by tribes that traditionally use the Forest occur in this ecosystem.

Desired Conditions for Alpine Tundra

The ecosystem diversity of alpine tundra is maintained. It maintains the ecological attributes and processes that allow it to provide watershed values, habitat for native biota, panoramic vistas, and/or solitude. The mountain maintains attributes that provide historic and cultural values. It displays a diverse composition of native species and vegetation communities (including boulder fields, talus slopes, and meadows). Invasive exotic species are absent. Recreation use, ecological attributes, and tribal values maintain the uniqueness of the vegetation.

The alpine ecosystem provides habitat for San Francisco Peaks groundsel; is able to support and sustain rare or endemic species and continues to be resilient to natural and human-caused impacts.

Standards for Alpine Tundra

Recreation activities including new route construction shall avoid important habitat for the San Francisco Peaks groundsel and result in few additional areas of disturbance to its habitat.

Invasive Exotic Species Management

Community Forest Interface

Fire Management

General Description and Background for Fire Management

Wildland fire is any non-structure fire that occurs in the wildlands. That includes either unplanned human fires, naturally caused fires, or prescribed fires (planned ignitions).

Most of the vegetation on the Forest is adapted to recurrent wildland fires started by lightning from spring and summer thunderstorms. Frequent, low-intensity fire plays a vital a role in maintaining ecosystem health. Fire, both prescribed and wildfire, if properly managed, is a tool for restoring the forest's fire-adapted ecosystems.

Desired Conditions for Fire Management

Wildland fires move ecosystems toward their desired conditions and burn within the range of intensity and frequency of the historic fire regime of the vegetation communities affected. Uncharacteristic high severity fires rarely occur and do not burn at the landscape scale, except where this is part of the historical fire regime.

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

Wildland fires in the Wildland-urban interface (WUI) are low intensity surface fires. Residents living within and adjacent to the Forest are knowledgeable about wildfire protection of their homes and property, including providing for defensible space. Wildland fires in the WUI do not result in the loss of life, property or ecosystem function.

People understand that wildland fire is a necessary natural disturbance process integral to the sustainability of the Forest's fire adapted vegetation communities.

Wildfires are safely managed across most of the landscape for the resource benefits they provide.

Standards for Fire Management

Public and firefighter safety are the highest priority in managing fire.

Guidelines for Fire Management

Areas around private land and development should be a high priority for fuels reduction and maintenance.

Management Approaches for Fire Management

Where possible, manage wildland fires for multiple resource management objectives.

Integrate fire with other management tools to treat and restore fire adapted ecosystems.

Coordinate with other jurisdictions such as communities, service providers (infrastructure), and county, federal, tribal, state and local entities regarding prevention, preparedness, planned activities and responses to wildland fires. Notify the above regarding the upcoming and, ongoing fire season and any prescribed fire activity.

Work with homeowner associations and homeowners in the Neighborwoods Management Areas to plan and implement measures to reduce wildfire threats to life and property such as:

- Providing reasonable road ingress and egress for emergency evacuation of personnel.
- Providing reasonable road access suitable for use by fire engines including places to turn engines around.

Access for initial attack and suppression activities should be provided in order to reduce response times and address public and firefighter safety.

Encourage the development and implementation of Community Wildfire Protection Plans to promote public safety and to reduce the risk of wildfire on non-Forest Service lands.

Heritage Resources

General Description for Heritage Resources

The Coconino NF has some of the highest archaeological site densities in the Southwest that represent 13 prehistoric and historic cultural traditions, but only about 30 percent of the Forest has been archaeological inventoried. About 10,000 sites have been recorded by those surveys. Of the approximately 10,000 archaeological sites recorded on the Forest when this plan was approved, about 2,700 have been determined to meet the criteria of eligibility for the National Register of Historic Place, meaning they: are considered significant because they are associated with important events or important people, are an outstanding example of a type of site or architecture, or have the potential to contribute important information to history or prehistory.

Four hundred and sixty-two sites have been determined ineligible for the National Register. For those sites that are of particular significance, they are formally nominated to be listed on the National Register, either as individual sites, a district, or as one of a number of significant examples of a class of sites. One hundred and fifty-nine sites have been listed on the National Register, either individually or as part of six National Register Districts.

The highest honor that can be paid to a site is to be considered a National Historic Landmark. These must be approved by an Act of Congress. There are two National Historic Landmarks within the Coconino NF that contain ten additional sites: the C. Hart Merriam Base Camp and Winona Village. Merriam's significant Life Zones concept was conceived in 1889 while he studied the different vegetation zones on the San Francisco Peaks. Winona Village is a complex of sites that were partially excavated in the 1930's and were the basis for many of the archaeological concepts for the prehistory of the Flagstaff area..

Several tribes, particularly the Hopi and Zuni, recognize many of the sites on the Forest as ancestral villages, where many of the ceremonies and traditions of their cultures originated. Pilgrimages to some of these sites are still made, with offerings of prayers and other items.

The recreational, educational, cultural, and scientific values of the archaeological sites on the Forest have been recognized as a recreational and scientific niche that the Forest can provide to the public. Promoting and developing that niche, while respecting those cultural and scientific values through research and conservation, is a goal of the heritage program of the Coconino NF.

Heritage Site Conservation and Evaluation

Desired Conditions for Heritage Site Conservation and Evaluation

Historic and prehistoric sites, including known American Indian sacred places and traditional cultural properties, are preserved and protected for their cultural importance and are generally free from adverse impacts or minimized through consultation with those tribes who are descendants of the prehistoric people or who have occupied the area in historic times.. Site

integrity and stability is protected and maintained on sites that are susceptible to imminent risks or threats, or where the values are rare or unique. All of the priority heritage assets are stable and their significant values are protected. Vandalism, looting, theft and human caused damage to heritage resources are rare. Site significance and integrity are maintained through conservation and preservation efforts and receive minimal impact from visitors. Cultural and scientific values are continually enhanced through research and partnerships with tribes, universities, and museums. Through interpretation and public involvement in archaeological activities, appreciation and respect of cultural values and a sense of stewardship for our common heritage is increased.

Objectives for Heritage Site Conservation and Evaluation

Complete analysis of XX “property classes” every XX to XX years to determine their rarity or ubiquity, significance, and information gaps about them that will lead to better understanding of those site classes and more cost-effective project clearances.

Nominate XX to XX sites for inclusion on the National Register of Historic Places within 10 years of plan approval.

Management Approaches for Heritage Site Conservation and Evaluation

Develop a prioritized list of sites that need stabilization or documentation in order to be preserved to maintain their information potential and significant values. Focus on sites at risk from threats from vandals, natural conditions, and structural stability. Monitoring of sites is prioritized in high visitation areas such as near roads, campgrounds, and trails. Also prioritize sites for their ability to contribute to significant research issues at local, national, and international levels.

Work with partners such as the Arizona Site Stewards program, the Arizona Archaeological Society, and the Museum of Northern Arizona to study, protect and monitor sites.

Cultural and biological resources in the vicinity of Hartwell Canyon are protected through partnerships and collaboration with organizations, such as The Nature Conservancy and The Archaeological Conservancy.

Achieve a balance between National Historic Preservation Act (NHPA) Section 106 activities (ensuring projects are in compliance with legal requirements to evaluate and protect archaeological sites) and NHPA Section 110 activities (actions focused on the cultural resources themselves). Studying, documenting, and preserving sites as well as conducting a program of “public archaeology” to educate people about heritage through site interpretation and hands-on involvement in the archaeological process.)

Within three years of plan approval, divide the Forest into archaeological study units (geographic areas that are meaningful units of analysis with which to examine and interpret the prehistory of that area) and identify historic property classes (types of sites such as field houses, flaked stone scatters, small pueblos, large pueblos, pit house clusters, and rock art that have cohesiveness and can be studied as individual classes and can be compared between archaeological study units). In property class surveys, give priority for identification and documentation to certain site types, such as wooden structures and rock art that may be more sensitive to impacts due to fire activities and wildland fire.

Related Plan Content for Heritage Site Conservation and Evaluation

- See the following sections: Facilities

Heritage Collections

Desired Conditions for Heritage Collections

Primary archaeological site and survey records that are maintained and updated on the Forest. Associated records (36 CFR 79.4) may be shared and maintained at institutions that meet professional standards (e.g. 36 CFR 79, American Museums Association) and have research interests on the Coconino NF. Archaeological collections and associated records are maintained and stored in facilities that meet professional standards. Collections and associated records are curated at museums, organizations, and other institutions that meet professional standards for the purpose of scientific research, public education, and interpretation.

Management Approaches for Heritage Collections

Develop agreements with Forest Service approved repositories to curate records and artifacts. Periodically inspect collections and repository facilities to ensure they continue to meet professional standards. Projects resulting in the collection of artifacts should address funding for curation of those artifacts .

Records will be retained at Forest Services offices when they need to be accessed regularly for management and research purposes. Maintain electronic records, including an index of primary documents of historic research value.

Heritage Enhancement and Interpretation

Desired Conditions for Heritage Enhancement and Interpretation

Heritage resources provide educational opportunities that connect people, past and present, to the land and its history. Through positive heritage experiences provided by interpretive sites, historic standing structures, and other materials, the public develops an appreciation for the region's history and develops an awareness of preservation efforts. In some cases, historic routes (e.g., railroad grades, General Crook Road, Beale Road) are used for recreation trails with proper interpretation. Heritage-based recreation opportunities are connected, where practical with other recreation opportunities, such as trails.

Public enjoyment is enhanced by opportunities to visit interpreted heritage resource sites. Archaeological site etiquette information is readily available to national forest visitors. Interpretation of the human history of the Coconino NF promotes greater public understanding of the communities that have depended on this landscape for their livelihood, recreation, and spiritual well-being and provides connections between prehistoric, historic, and modern people.

Opportunities exist for volunteers to participate in heritage resource conservation activities such as research site stabilization, conservation, and interpretation. Cooperation with local museums, schools, organizations, and other governmental agencies provide for heritage tourism that enhances the overall experience of visitors to the Forest, results in preservation and protection of those resources, and is consistent with tribal interests and desires.

Heritage programs, interpretive presentations, or publications are available to provide the public with opportunities to learn about, understand and experience the Coconino NF's prehistory and history.

Objectives for Enhancement and Interpretation

Update the Cultural Resources Overview and tie it to the existing class of properties within **XX** years of the plan approval.

Guidelines for Enhancement and Interpretation

Commercial use of heritage-based interpretive sites should be limited to activities that enhance the public's understanding of the resource, protect and preserve the resource, and are consistent with tribal interests.

Management Approach for Enhancement and Interpretation

Partnerships are encouraged with American Indians, commercial ventures, volunteers, and universities for documenting, preserving, interpreting, and managing sites, and to evaluate and develop creative management opportunities.

Tribal Relations and Uses

General Description and Background for Tribal Relations and Uses

The Forest Service and federally recognized American Indian tribes have a special and unique government-to-government relationship of one sovereign nation to another, based on the U.S. Constitution, statutes, and court decisions. The Coconino NF is about six miles from the Navajo Nation reservation boundary and adjacent to the Yavapai Apache near Camp Verde. The Forest regularly consults with 13 tribes. American Indian tribes have lived on the land that is now the Coconino NF for centuries. Some consider the prehistoric sites to be the homes of their ancestors. Other tribes recognize some sites and places to be of historical, cultural, and religious significance.

Desired Conditions for Tribal Relations and Uses

Tribes have access to areas that provide them an opportunity to practice traditional activities, such as plant gathering, and ceremonial activities that are essential in maintaining their cultural identity and the continuity of their culture with reasonable limitations, consistent with public safety and multiple uses by other Forest users. Forest products used by American Indian nations, tribes, and communities with ancestral or historic ties to the Coconino NF continue to be available for traditional practices. Collection of culturally important plants by American Indian tribes does not negatively affect the existence and distribution of the species on the Forest.

Management Approaches for Tribal Relations and Uses

Work with the Kaibab National Forest to consult with tribes to develop a consistent tribal fuelwood program for both adjacent Forests.

Partner with American Indian Tribes and the Forest Service are partners in management of cultural sites. Cultural resources are preserved and interpreted for the enjoyment of all visitors.

Meet with American Indian tribes to better understand their needs and viewpoints. The Forest develops a better relationship and recognition of American Indian tribal needs and viewpoints. Consider developing agreements, such as the Coconino and Kaibab National Forests Memoranda of Agreements with the Hopi Tribe, may be developed with other tribes for the purpose of detailing the Forests' government-to-government relationship with the tribe or for managing recurring activities such as native plant gathering.

Consult Indian tribes during plant, fish (water), and botanical to determine if there are any impacts to traditional cultural values or opportunities to improve plant and animal populations of traditional cultural importance.

Infrastructure

Facilities

General Description for Facilities

In progress

Desired Conditions for Facilities

Recreation sites, administrative buildings, dams, and other infrastructure, operate as intended and provide a safe environment for people, while minimizing negative impacts to natural resources. Energy efficient and economical facilities are placed where they can be effectively used while making sustainable use of natural resources.

Forest facilities that are eligible for the National Register of Historic Places continue to be available for Forest administration, public recreation and interpretation, tribal events and other uses, as appropriate. These sites retain their importance in American history through historic preservation and adaptive re-use and continue to contribute to the historical significance of the community.

Objectives for Facilities

Guidelines

The Forest Service's Built Environment Image Guide (BEIG) or subsequent guides for facility design should be used for public and private facilities across the Forest in order to provide for consistency in design of facilities.

Management Approach

Design narratives provide criteria to determine the appropriate location, capacity, and type of facility required to meet user needs in the context of the Forest setting.

Roads

General Description for Roads

The Coconino NF has a substantial number of roads with a particularly dense road network in the northwest and southeast areas. Two major interstates meet near the center of the Coconino NF (Interstate 17 and Interstate 40). Most of the major roadways follow a north-south orientation, the lone exception being Interstate 40, which is oriented east-west.

Desired Conditions for Roads

A sustainable, and economical transportation system (roads) exists at a level commensurate with use and need and balances desire for public access with potential for ecological impacts. A system of sustainable, well-maintained, and marked roads and trails provides diverse opportunities to safely explore the Forest and minimizes impact to rare plants, fisheries, and wildlife habitat and movement. Bridges and culverts allow for safe aquatic passage. Travel restrictions are clearly understood by Forest visitors. Roads to private property provide reasonable access but do not necessarily provide for comfort or all-weather access. Roads that are under easement or special use permit are maintained to Forest Service standards by the permittee or easement holder.

Unneeded roads are closed and rehabilitated to reduce human disturbance to wildlife and to reduce soil erosion. Some closed roads have been converted to non-motorized trails for recreational use by hikers, mountain bikers, and horseback riders.

Deadman Wash provides large tracts of un-roaded landscape for disturbance-sensitive species and remote recreation experiences.

Guidelines for Roads

Frequent and low-intensity maintenance should be used on roads that are in areas that may impact wildlife, areas with sensitive soils, and roads that affect water resources to prevent the need for larger scale reconstruction and the associated disturbance.

Roads open on the Motor Vehicle Use Map should be signed.

Bridges and culverts should comply with current guidelines regarding wildlife use of bridges and culverts, such as the AZGFD Bridge and Culvert Guidelines.

Management Approaches for Roads

Consider wildlife habitat needs should be considered early in the transportation and development planning process.

Work closely with the AZGFD, the Arizona Wildlife Linkages Working Group and ADOT to identify potential barriers to wildlife movement, and to mediate such threats during new projects by designing effective wildlife crossings and travel mitigation areas.

Encourage private land owners who use Forest roads to take maintenance responsibility for roads that serve primarily private uses.

Collaboration efforts with local and regional governments and transportation agencies to meet

future local and regional transportation needs, as well as NF objectives and plans, such as the design and location of roadway improvements and routes and alternative modes of transportation.

Lands

Land Adjustments

General Description for Land Adjustments

Land adjustments are the real estate transactions on the Forest including sales, purchases, exchanges, conveyance, and rights-of-way. Land exchange and land purchase have been, and will continue to be, the means by which the Coconino NF acquires key wildland resources and open space areas.

Desired Conditions for Land Adjustments

The Coconino NF has a mostly contiguous land base that provides for biologically diverse public lands with minimal impacts from adjacent land uses. Most of the Forest has a natural-appearing landscape that has not lost its wildland character. Open-space values including those related to naturally appearing landscapes, wildlife habitat, recreational opportunity, riparian/wetland character and community needs are retained.

Priority parcels in the Sedona/Oak Creek Management Area¹² are acquired from willing sellers, through methods other than land exchanges, when possible.

Rights of Way

Easement rights of way help provide adequate access to the Forest. Appropriate trail access through private lands is identified and managed or acquired through the private land development process, in cooperation with local governments. Reasonable access is provided to private inholdings.

Standards for Land Adjustments

Land exchanges that dispose of national forest land in the Sedona/Oak Creek Management Area will occur only if they result in acquisition of national forest lands in the Sedona/Oak Creek Management Area.

Land exchanges that dispose of national forest land in The Dells area will occur only if they result in acquisition of high-priority private parcels elsewhere in the Sedona/Oak Creek Management Area. High priority private parcels total approximately 95 acres (see map XX). High-priority land acquisition parcels include: Lincoln Canyon (25 acres) and Hancock Ranch (70.3) acres.

Base-for-exchange lands are national forest lands located at:

¹² Priority parcels are those listed in the standards and guidelines.

- Chapel of the Holy Cross area (approximately 11 acres, Sedona Neighborwoods Management Area), Slide Rock area (approximately 13 acres, Oak Creek Management Area), Village of Oak Creek Golf Course area (approximately 5 acres, Sedona Neighborwoods Management Area) and The Dells area (up to 300 acres, Sedona-Oak Creek and House Mountain-Lowlands Management Areas).
- In the Walnut Canyon Management Area, national forest jurisdiction will be maintained for all lands in the Walnut Canyon Management Area. No land exchanges will occur unless the purpose is to acquire land within this Management Area through exchange of national forest lands elsewhere.

Guidelines for Land Adjustments

Lands that the Forest considers for acquisition have one or more of the following qualities:

- Contains habitat for threatened or endangered species and sensitive species
- Contributes to the continuity of wildlife habitat
- Contains or influences wetlands, riparian areas, or other water-related features
- Contains important cultural resources
- Provide needed access, protect public lands from fire or encroachment, or prevent damage to resources
- Contributes to areas of high scenic integrity
- Improves the ability to manage a designated special area.
- Contains significant sites with cultural, scientific, or recreational values.

Lands that the Forest is willing to exchange or sell have one or more of the following qualities:

- Isolated from other NFS lands
- Without unique cultural or ecological resources
- Managed for a single commercial or other special use, for which it is being exchanged or sold
- Has lost its wildland characteristics
- Lands needed to meet the needs of communities and the public, such as land for a water treatment plant.

Priority parcels in the Sedona/Oak Creek Management Area¹³ should be acquired from willing sellers, through methods other than land exchanges, when possible.

National Forest parcels less than or equal to 10 acres in size in the Sedona/Oak Creek Management Area could be disposed of under the Small Tracts Act, Townsite Act or General Exchange Act to resolve encroachment issues or provide lands needed for public purposes.

¹³ Priority parcels are those listed in the standards and guidelines.

Base-for-exchange lands at the Chapel of the Holy Cross area is intended for church acquisition only; base-for-exchange at Village of Oak Creek Golf Course is intended for golf course acquisition.

Slide Rock base-for-exchange land should be available for acquisition by Slide Rock State Park to better facilitate management of the creek and the park.

Rights of Way

When responding to requests for new access permits or easements, easements should be granted in reciprocity, if appropriate, to ensure administrative and public access to the Forest.

Management Approaches for Land Adjustments

Consult with the local governments about land adjustment proposals the Forest plans to take forward into NEPA. Public input on land exchange begins at the time a site-specific land exchange is proposed.

If acquisition cannot occur, collaborate with private land owners and county governments in the land development process to protect unique resources such as scenery, adjacent Wilderness, archaeological values and threatened and endangered species habitat. Encourage local governments or agencies, private landowners and/or other appropriate entities (e.g. Nature Conservancy, Trust for Public Land, Archeological Conservancy, local land trust) to protect the resources and character of National Forest through methods such as conservation easements, land trust management, deed restrictions, or public acquisition of adjacent, high priority parcels.

Work with land owners and local and regional governments to raise awareness of the roles, values and contributions of NFS lands within the broader landscape. This would include evaluation of existing assessments to understand the condition and trends of natural resources across the region, social/economic indicators in the relevant landscapes, and the management intentions of neighboring landowners. Provide advice to local governments on the possible impacts of new developments on natural resources and open space (especially when they are adjacent to the Forest), participate in community forums concerning open space issues, continue linking city and county trails to Forest Service trails, share public outreach and education tools, and share information about future plans.

Rights of Way

Work with local and regional governments and road agencies to develop transportation solutions that reduce traffic and vehicle impacts on national forest lands.

Range and Livestock Grazing

General Description for Range and Livestock Grazing

Livestock grazing has occurred on the Coconino NF since it was established. This use has changed dramatically since the 1940's. During World War II and in the years following, there was substantially more livestock permitted to graze on the Forest than there are today, as well as there were many more ranchers with permits on the Forest.

Desired Conditions for Range and Livestock Grazing

Range lands provide large areas of unfragmented open space. These open spaces sustain biological diversity and ecological processes and help to preserve the rural landscape and cultural heritage of central and northern Arizona.

Domestic livestock grazing maintains the desired composition and structure of plant communities. Rangeland ecosystems are diverse, resilient, and functioning within a healthy, sustainable landscape. Grasses and forbs provide adequate forage for wildlife and permitted livestock consistent with other desired conditions. Areas that are grazed have stable soils, functional hydrology and biotic integrity.

Livestock waters allow for safe access by wildlife. Troughs and uncovered storage tanks are designed or modified to avoid wildlife injuries.

Standards for Range and Livestock Grazing

Water developments shall incorporate escape devices to prevent animal entrapments.

Guidelines for Range and Livestock Grazing

The placement of salt, minerals, and/or other supplements for the purposes of livestock management should be located further than $\frac{1}{4}$ mile from riparian areas or seasonally present water that is not overland flow to protect riparian area function.

New water developments, corrals, and other handling or loading facilities should be located away from known locations of Southwestern Region Sensitive Plant species unless it can be demonstrated these facilities do not adversely affect occupied sensitive plant habitat.

Livestock salting should be located away from known locations of Southwestern Region Sensitive Plant species so plants are not affected by associated trampling and archaeological sites.

Burned or mechanically treated areas should be given sufficient rest, especially during the growing season, to ensure plant recovery and vigor and to ensure that perennial plants would not be permanently damaged by grazing. The range management definition for this condition is range readiness. Range readiness is achieved and plants are ready for grazing when characteristics such as the following are present on a majority of the perennial plants within the treated area: seed heads or flowers, multiple leaves or branches, and/or a root system that does not allow them to be easily pulled from the ground. These characteristics provide evidence of plant recovery, vigor, and reproductive ability.

Nonstructural and structural (fences, troughs, pipelines) range improvements should be used and/or located in a way that does not conflict with riparian functions and archaeological sites or should be relocated or modified when found incompatible.

Intensity, timing, duration, distribution, and frequency of livestock grazing should provide for growth, reproduction, and retention of adequate residual cover of desired plant species.

Fences are constructed to specifications identified in the interagency fence standard book¹⁴. Project specific wildlife concerns may require modifying the standard specifications on new or existing fences. Construction of additional fences should be minimal. Maintenance of fences should occur as needed and be prioritized in threatened, endangered, and sensitive species habitat. Fences that are no longer needed should be removed.

Cattleguards should be placed where problem gates exist to help achieve desired plant composition and structure.

Establishment of forage reserves should be considered to improve flexibility and balance between restoring fire adapted ecosystems and range management.

Management Approaches for Range and Livestock Grazing

Collaborate with permittees, tribes, educational institutions, other agencies and stakeholders, in achieving and maintaining desired conditions.

Regularly review active Allotment Management Plans.

Leave gates in waterlot fencing open to wildlife except when controlling livestock distribution.

Livestock Grazing Suitability

Suitability is the appropriateness of applying certain resource management practices to a particular area of land in consideration of the relevant social, economic, and ecological factors. The identification of lands suitable for livestock grazing is not a decision to authorize livestock grazing; the final decision to authorize livestock grazing would be made at the project (allotment) level.

Table XX. Grazing Suitability, areas that are not suitable Coconino National Forest

Table under development		

Livestock Grazing Capability

Capability is the potential of an area of land to produce resources and supply goods and services. Capable lands are generally the sum of lands classified as full or potential grazing capability for domestic livestock and generally exclude areas classified as no capability. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology. Livestock grazing capability is determined at the allotment (project) level following Southwestern Region protocol that may be current at the time.

¹⁴ Fences. USDI BLM and USDA Forest Service, July 1988, or more current standards.

Energy and Minerals

General Description for Energy and Minerals

There are low levels of mineral development currently on the Coconino NF, but the Forest has some potential for geothermal development (a leaseable mineral) on the northern part of the Forest and for mineral materials such as pumice, cinder pits, and gravel. (Definitions for locatable and leaseable minerals and mineral materials are in the glossary.)

Desired Conditions for Energy and Minerals

Opportunities for environmentally sound minerals development are available. Important wildlife habitats, visually sensitive areas, archeological sites and areas with large capital investments are protected through surface occupancy restrictions imposed on mineral activities. Adverse surface resource impacts are minimized through the appropriate administration of mineral laws and regulations. Past and present mine facilities are sufficiently reclaimed to provide for public safety and minimize impacts to cultural and natural resources. Mineral materials are provided to State, county, and city agencies, where feasible, available, and consistent with other resource values. Mineral material removal does not occur where needed for forest purposes.

Guidelines for Energy and Minerals

The Forest should recommend to the Department of Interior existing mineral withdrawals for retentions, revocations and modifications.

The following areas that should be considered for withdrawal for locatable minerals include:

- Properties with a substantial FS investment in facilities such as administrative sites and campgrounds.
- Traditional Cultural Properties where historic preservation laws alone do not adequately protect the cultural resource.
- Areas of very high archaeological site density and significance
- Oak Creek Canyon
- Established Research Natural Areas not located in Wilderness
- Geological and Botanical Areas

Maintain existing mineral withdrawal¹⁵ on the San Francisco/Mount Elden Recreation Area.

The following areas should be considered for No Surface Occupancy or No Leasing for leaseable minerals in:

- Designated and Eligible Wild and Scenic Rivers
- Research Natural Areas not located in wilderness.
- The Foreground of State and National Scenic byways and National Trails

¹⁵ Expires in year 2020.

- Areas of Very High Scenic Integrity
- San Francisco Peaks/Mount Elden Recreation Area Withdrawal
- Areas of very high archaeological site density and significance

Minerals materials operations should be limited in Oak Creek Canyon MA, although some activities may be appropriate for ADOT and Forest Service administration needs if they are minor and consistent with area desired condition and standards and guidelines.

Mitigation measures should be used for threatened, endangered and sensitive species to avoid impacts to populations due to mineral exploration or extraction activity, where feasible and consistent with mining laws and regulation. Management Approaches for Energy and Minerals

For congressionally designated areas that are not specifically withdrawn by the legislation establishing them, consider withdrawal from locatable minerals entry and operations.

Projects requiring mineral materials will consider environmental and resource concerns, multiple-use objectives, economic costs and savings. Project-level environmental analysis will consider potential environmental effects of new and existing sources.

Best Management Practices and stipulations from the Geothermal Leasing Programmatic EIS (DOI- BLM Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States published in 2008) may be incorporated into future leases as appropriate to the location.

To achieve the desired conditions for forest products, use operating plans and bonds for rehabilitation to protect and restore surface resources.

Projects requiring mineral materials will consider environmental and resource concerns, multiple-use objectives, economic costs and savings opportunities.

Recreation

General Description for Recreation

Coconino NF provides public access to central Arizona settings that accommodate a wide range of opportunities for outdoor, nature-based recreation. Interstates 40 and 17 connect the Coconino NF with several urban populations including Phoenix, Tucson, Flagstaff, Las Vegas, and Albuquerque. Smaller rural towns and communities utilize parts of the Coconino NF as local recreation areas and tourism attractions. Scenic rivers, creeks and lakes create unique mountain settings for water-based activities such as fishing, swimming and motor boating. Several rivers have sections of whitewater for kayaking, canoeing and rafting. Remote backcountry areas of the Forest accommodate dispersed recreation activities like backpacking, mountain biking, horseback riding, and hunting.

Developed Recreation

General Description for Developed Recreation

Developed facilities are sites where the Forest Service provides multiple amenities for the purpose of visitor comfort and convenience

Desired Conditions for Developed Recreation

Developed recreation facilities such as campgrounds and picnic areas are clean, energy efficient, and maintained to standard. Most meet current accessibility guidelines. Developed sites blend with the natural setting, and uses at these areas do not cause damage to ecologically or culturally sensitive areas. Potable water is provided in high-use areas. Developed recreation opportunities are available for both families and groups, with a multitude of recreation experience types.

Developed camping facilities provide a level of amenities appropriate for their Recreation Opportunity Spectrum (ROS) setting (see map XX), while providing climatic relief and escape from urban life. Developed campgrounds are located outside of floodplains and away from areas prone to flash flooding. Most campgrounds are part of a centralized strategy which consolidates developed recreation opportunities and protects resources. Trails in developed sites connect users to a variety of dispersed recreation opportunities.

Developed sites near riparian areas are predominantly day use. Amenities in sites adjacent to water protect water quality and prevent vegetation damage and soil erosion and compaction from fishing, boating, swimming, and other activities. Invasive exotic weeds and aquatic organisms are not established or transported. There is little human litter as a result of effective enforcement, patrols, and use of refuse and recycling facilities

Group sites in a variety of settings are provided across the Forest. Sites may vary in capacity including providing space for groups of more than 75 people¹⁶. These sites offer users a place to gather near towns and communities and provide adequate sanitation and amenities. Group sites may be co-located with developed campgrounds or day use facilities, such as Elden Pueblo. These sites are strategically located to protect resources and minimize the need for large group gatherings in the dispersed recreation areas.

Information facilities are open to the public on busy days and provide places where visitors can find information and learn about natural and cultural resources on the Coconino NF. They are located in strategic locations to best serve the public.

Where there are high levels of visitor use, most national forest visitor activities occur at developed sites and on trails designed for high levels of use. High levels of developed recreation use occurring along Upper and Lower Lake Mary and in Oak Creek Canyon are accommodated by facilities which balance resources protection with recreation demand. Recreation sites within these corridors also emphasize safety and minimize user conflict along highways. Designated parking spots are provided along these highways to prevent resource damage and erosion into nearby waterbodies. The site-specific combination of recreation facilities, services, public information and enforcement minimize wildlife access to human food and trash.

¹⁶ Groups of 75 people or more must apply for a special use permit under the Forest Service's non-commercial group regulations.

Objectives for Developed Recreation

Reduce the backlog of recreation deferred maintenance by **XX** percent within **XX** years of plan approval.

Guidelines for Developed Recreation

Use of native plant species should be emphasized during planning activities (design of new or improvements of existing sites). Invasive exotics should be removed or treated on existing sites before they become widespread within recreational sites.

The USFS's Built Environment Image Guide (BEIG) or subsequent guides for facility design should be used for public and private facilities across the Forest in order to provide for consistency in design of recreation facilities.

Snowplay areas should be managed to industry standards.

Management Approaches for Developed Recreation

Patrol areas regularly for such things as public safety, facility/resource protection, and fee compliance checks. Site operation or closure is determined by volume of use by season. Sites are operated to the current standards, such as those outlined in the Forest Service publication "Cleaning Recreation Sites"

Facilities and infrastructure are maintained and replaced as needed using a sustainable mix of federal and other funds and partners. Through a facilities master planning process and appropriate NEPA, some facilities may be closed or decommissioned as the public's needs change.

Design narratives provide criteria to determine the appropriate location, capacity, and type of facility required to meet user needs in the context of the forest setting.

Fee areas and concessionaires may be used, as appropriate, to maintain and manage developed facilities, particularly in high-use areas. **Ensure that FS rules are enforced consistently through contract administration.**

Area-specific Built Environment Image Guides may be developed to manage specific design issues associated with special areas or unusual circumstances.

Consider mitigation of heavy recreation congestion along Highway 180 with future development of developed recreation facilities, particularly for winter recreation, along the Highway 89 corridor (and/or other locations).

Adaptively manage recreation facilities and opportunities as needed to shift limited resources to those opportunities.

Dispersed Recreation

General Description for Dispersed Recreation

Dispersed recreation is activities that take place outside of developed camping or concessionaire-operated facilities. This may include dispersed camping in designated sites or corridors that lack

substantial improvements. The growing array of dispersed recreation uses points out the need to supply an adequate spectrum of recreation settings and opportunities. Particularly critical is providing future trail systems that accommodate many types of uses, while reducing user conflicts. If current management direction continues, overuse will eventually occur in more areas. Illegal uses will also continue to escalate as demand outgrows the supply of designated trails and roads, especially for OHV, mountain bike, and horse use. The Forest recognizes and understands that recreation activities are fluid and change over time, with new users being attracted to varying opportunities. The Forest may recognize new activities that occur on Forest lands, while upholding the responsibility to protect the natural environment and the multiple use rights of other visitors.

By the time the plan is in place the Forest expects to have published its first Motor Vehicle Use Map (MVUM) under the 2005 Travel Management Rule (TMR). The part of the plan pertaining to motorized use directs future iterations of the MVUM and TMR decisions.

Desired Conditions for Dispersed Recreation

The diverse landscapes of the Coconino NF offer a variety of settings for a broad range of recreational opportunities in all seasons and a place for visitors to escape into natural, wild places. Landscapes range from primitive settings that provide opportunities for solitude, to more developed, rustic settings that provide opportunities for social interaction and greater human comforts, such as sources of drinking water, trash disposal, and boat docks at lakes. Recreation opportunities exist for people with a variety of abilities. Although development and population in the region continue to grow and new forms of recreation emerge, recreation settings on the Coconino NF are stable, retaining their natural character, and loss of remote, undeveloped settings does not occur. Recreation activities are balanced with the ability of the land to support them, and create minimal user conflicts. The Coconino NF fulfills a unique and vital role as a place of learning and caring about the environment.

Growing demand for recreation is balanced with other Forest desired conditions, unless increasing capacity results in unacceptable negative effects on natural resources. Managed recreation use stays within this capacity with the exception of holiday weekend use levels that may exceed capacity on a short-term basis but resources can recover from short-term increases in use. Recreation on the Coconino NF enhances the quality of life for residents and provides tourist destinations, which contribute to local economies. Dispersed recreation activities on the Coconino NF include driving, hiking, wildlife viewing, hunting, fishing, horseback riding, camping, and hunting, among others. Activities such as mountain-biking, geo-caching, and rock climbing do not significantly detract from the natural character of the Forest, impact resources such as aesthetics, soils, vegetation, and wildlife, or contribute to user conflicts. Non-recreation activities that take place have minimal effect on recreation activities. For example, thinning projects do not result in slash piles that block trails, and projects that temporarily impact trails are followed up with trail restoration.

Motorized Recreation

Motor vehicle use is a legitimate use of National Forest System lands. Motorized vehicle use occurs as identified on the Motor Vehicle Use Map (MVUM), except as authorized by permit or for administrative uses. A motorized trail system provides a variety of trail widths and levels of challenge for a diversity of users. This system offers opportunities to enjoy scenery, wildlife viewing, a variety of terrain and conditions, and dispersed camping. Multi-use trails are more

common than those available for only one class of vehicle and may interconnect with roads to make loops. Motorized routes are easily identified on the ground and on the Motor Vehicle Use Map. Single-track trails emphasize solitude from other types of motorized vehicles, to the extent practical, and challenge. Motorized trail opportunities provide long distance connections between motorized recreation hubs.

The boundaries of the Cinder Hills Off-Highway Vehicle (OHV) Area are clearly delineated and prevent off-road driving outside of the designated area. Intrusion on the Sunset Crater National Monument is eliminated. Clear signing and information are provided to off highway vehicle drivers to make clear distinction between driving rules in the Cinder Hills OHV area and rules that apply to the cinder cones outside of the OHV area. Connectors provide access to the motorized trails within this area from a number of nearby access points and adjacent motorized trails.

Adequate signing is provided to advise publics of motorized restrictions. Information kiosks are located at main entryways onto the Forest with pertinent OHV recreation information. Information is provided for OHV recreationists and trail users, including maps and signs that provide road and trail information and explain national forest regulation for such activities as OHV travel and camping and trail opportunities. Orientation information and interpretation is provided at sites that receive high levels of visitation.

Resource damage from unauthorized motorized trails is minimal and existing user-created roads and trails are rehabilitated to prevent future access by the public and to mitigate long-term soil and water impacts. Motorized trails are located with minimal impact to sensitive resources such as cultural sites, highly erodible soils, water, and wildlife and botanical resources. Poorly located trails are redesigned or relocated.

Interpretation and Education

Forest Service communication and interpretive messages show respect for the diverse backgrounds and needs of visitors. The Forest Service communicates accurately and conveys a land ethic to visitors. Visitors are well-informed and supportive of a sustainable land ethic; not only do they understand how to reduce their impacts on ecosystems, but actively help support the Coconino NF's efforts to protect natural resources and wilderness values. Low impact recreation principles are promoted and widely practiced by the visiting public. There is little human litter as a result of effective enforcement, patrols and use of refuse and recycling facilities. Through a variety of interpretive efforts, people learn about geology, riparian communities, and biodiversity and will be motivated to practice careful stewardship.

Information kiosks minimize visual clutter by concentrating messages and eliminating the need for multiple signs. CNF information boards provide regional recreation maps and information, site-specific interpretation, trip preparedness, ethics, and seasonal information or closures.

Interpretation and communication results in residents adjacent to national forest lands understanding the natural environment and are partners in managing the neighboring forest lands for public use and resource protection.

The national forest educational mission underlies all resources, including vegetation management, rare communities, fire, wildlife/fisheries and heritage resources. Through an increased effort to

provide learning-based recreation, the Coconino NF provides strong local and regional support as sustainable nature-based tourism continues to grow into the 21st century.

Camping

Forestwide dispersed recreation sites have an appropriate-sized footprint, and evidence of human waste and litter and resource damage is minimal. Where resource damage has occurred in high traffic locations, sites are rehabilitated to discourage expansion of the impacts.

Dispersed camping with recreational vehicles and campers occurs in designated motorized camping corridors or designated spur roads as shown on the Motor Vehicle Use Map (MVUM). There is a range of choices available for dispersed camping. Most motorized dispersed camping areas are not overcrowded, and their naturalness is maintained. In both nonmotorized and motorized dispersed camping areas, trees are intact, and soil erosion, impacts to understory vegetation, and evidence of human waste is minimal. Invasive exotic plants and animals are not introduced or spread by activities.

Trails and Trailheads

A system of well-marked and well-maintained trails provides opportunities for visitors to explore the Forest. Access roads to trailheads are open and maintained, and trailheads provide adequate parking and vehicle turnaround space. Trailheads minimize conflict with private land and avoid impacts to ecological and cultural resources. Trails provide access to scenic and wildlife viewing opportunities. Damage to resources from trailheads and trails is minimal and within the ability of the Forest to mitigate or restore. Trail level of development is appropriate to the site conditions and ROS setting. Trail use remains on the established tread, especially in high-traffic or sensitive areas such as the Verde Valley Botanical Area (see map XX for Special Areas).

Meadows and riparian areas are visually appealing and free from evidence of physical, mechanical, or vegetative damage due to recreation and other forest activities. Physical impacts to meadows and riparian areas are confined to specified road crossings, trail crossings, and access points. These structures are designed to minimize damage to meadows and riparian areas. Access to springs is limited to trails or entry points that minimize erosion, trampling, compaction and inadvertent introduction of invasive exotic plants, animals and disease and allow for wildlife access to the spring.

Historic trails, such as Beale Wagon Road, Chavez Road, and logging railroad grades, are preserved and adapted for contemporary use, where appropriate and feasible. Unplanned social trails are rare and off-trail non-motorized use is discouraged in ecologically-sensitive or high traffic areas. National Forest System trails adjacent to urban areas sometimes connect to urban trail systems to expand recreation opportunity. Trails in areas with resource concerns such as sensitive soils that may result in accelerated erosion and loss of soil productivity, rare plant or riparian impacts, or where high user conflicts occur, are prioritized for closure, rehabilitation, and mitigation. Markers on winter sport trails are visible in winter. Mountain biking occurs on multi-use trails which provide adequate opportunities for a different levels of skills and a variety of settings. Recreation uses, including some mountain biking trails that provide a high level of challenge, are located where their impact to soil and vegetation resources is minimized.

Trailheads are easily accessible and do not interrupt the traffic flow along main roads. Infrastructure at trailheads is durable, sustainable, and appropriate for the setting. Boundaries of trailhead parking areas are clearly defined to prevent parking outside of the trailhead. Trailhead

interpretive information is appropriate for the uses of the trail and provides information on low impact trail use. The level of development at trailheads is appropriate for the ROS setting¹⁷. Trailheads that are needed for multi-season recreation access are designed to accommodate snow removal. Ample access to year-round recreation activities areas is available. Trailheads intended to accommodate horse trailers are wide enough for vehicles with trailers to turn around and have a firm, stable surface to prevent resource damage in wet conditions.

Recreation programs, infrastructure and services are useable by all people to the greatest extent possible without separate or segregated access for people with disabilities. Information on what conditions recreation visitors will encounter on trails is well-advertised at the trailhead. Trails and facilities incorporate principles of universal design.

Water-based Recreation

Recreation opportunities at waterways and lakes emphasize day-use, nature-based activities such as hiking, picnicking, wildlife viewing, photography, boating, swimming, fishing and interpretation. These activities in and near riparian areas do not contribute to bank erosion, trash, water quality, or sanitation issues. Camping is discouraged, where recreation activities have damaged riparian, shoreline, or aquatic resources. Dispersed camping is provided near but not within 200 feet of riparian, shoreline, or aquatic resources (per Leave No Trace principles) of these areas to provide fishing/camping opportunities. Angling opportunities are available at remote sites, with a semi-primitive or primitive character and in a natural setting.

Snow-based Recreation

Snowplay activities occur where conflict between motorized and non-motorized activities is mitigated through signing and design considerations. Dispersed downhill snowplay activities, such as sledding, are discouraged within a quarter mile of paved roads and along the Interstate 17 corridor unless the site-specific conditions, such as the slope of hill in the direction away from the road, do not pose a serious hazard.

Hunting

The Coconino NF provides for a diverse range of hunting opportunities. Blinds, stands, cameras and other structures brought in by the public are temporary and portable and do not have long-term effects on vegetation and wildlife. Quiet areas¹⁸ provide opportunities for non-motorized hunting experiences with minimal disturbance of wildlife.

Objectives for Dispersed Recreation

Within **XX** years of plan approval, develop a system of designated bike trails, equestrian trails, and motorized trails to adequately provide for these user groups and reducing conflicts between user groups.

¹⁷ For example, an area that is providing access into a SPNM or Primitive setting uses natural materials for the parking area and has signing that is minimal but provides adequate information for the recreation experience. Trailheads in more developed settings may have constructed fencing, gravel or pavement and other developed features more consistent with developed campgrounds and picnic areas as appropriate under the ROS objectives for that level.

¹⁸ Quiet areas are areas designated by the Forest Service and AZ Game and Fish Department jointly, that are closed to motor vehicle traffic seasonally to provide for a non motorized hunting experience. These area have existed since the pervious plan was instated. (See Standards for closure periods)

Develop an Interpretive Services Master Plan with 10 years of plan approval.

Naturalize XX to XX miles of unauthorized routes every XX years until evidence of these routes is minimized forestwide.

Designate XX additional systems of motorized trails on the Coconino NF within 10 years of plan approval.

Standards for Dispersed Recreation

Prohibit motor vehicle use beyond the designated system of roads, trails, and areas, as defined on Motor Vehicle Use Maps (MVUMs), except for those uses authorized by law, permits, and orders in connection with resource management and public safety.

Motorized vehicle use shall be restricted in the following areas¹⁹ during the specified seasons of the year²⁰:

- Nordic Ski Center Seasonal Closure – closed to motor vehicle use from December 1 to March 31.
- Wing Mountain Cross Country Ski Area Seasonal Closure – closed to motor vehicle use from December 1 to March 31.
- Pine Grove Seasonal Closure – closed to motor vehicle use from August 15 to December 31. Roads within the area are closed, but the roads along the perimeter are open to motorized travel. The purpose of the closure is to provide opportunities for recreation in areas undisturbed by vehicles.
- Rattlesnake Seasonal Closure – closed to motor vehicle use from August 15 to December 31. Roads within the area are closed, but the roads along the perimeter are open to motorized travel. The purpose of the closure is to provide opportunities for recreation in areas undisturbed by vehicles.
- Woods Seasonal Closure – closed to motor vehicle use from December 15 to April 1. Roads within the area are closed, but the roads along the perimeter is open to motorized travel. Schnebly Hill Road and Forest Road 153 are not affected by this closure. The purpose of the closure is to minimize disturbance to big game winter habitat.
- Cottonwood Basin Seasonal Closure – closed to motor vehicle use from December 1 to June 15. The purpose of the closure is to provide for wildlife habitat.]

Guidelines for Dispersed Recreation

Motorized vehicles should not be permitted to cross riparian areas, streams, and rivers and adjacent filter strips except at hardened crossings, bridges, or crossing with existing culverts.

Trails should be built, rerouted, or maintained utilizing current best practices to promote tread stability and desired user experience.

¹⁹ These seasonal closures were carried forward from the 1986 plan (revised May 1991), and they are identified on map XX in appendix XX.

²⁰ These closures should be reflects on the MVUM and in associated closure orders.

New designated motorized dispersed camping access routes should be located away from floodplains and environmentally sensitive areas.

Interpretation should follow the themes established in a Forest Interpretive Strategy with district priorities for implementation.

Where necessary, national forest visitor activities should be restricted from soil and plant restoration sites.

Dispersed sites should be closed, rehabilitated, or otherwise mitigated when:

- campsite condition reaches Frissell class 4 (heavy) or 5 (severe),
- site occupancy exceeds the adopted scenery management objective,
- there are social use conflicts, or
- unacceptable environmental damage is occurring.

Where forage is limited, require overnight campers with recreational livestock to carry cubed, pelleted, or rolled feed. Feeds shall be free of viable noxious-weed seeds.

Management Approaches for Dispersed Recreation

Establish long-term partnerships with motorized recreation organizations to help the Forest establish, construct, and maintain motorized trails and foster a low-impact conservation ethic.

Develop a management plan for the Cinder Hills OHV Areas. Within the Cinder Hills OHV area, work with and establish interpretive messages and programs with the adjacent national monument and volunteers from OHV users, including improved signing, information kiosks, and interpretive message. Provide signing and information aimed at the following objectives: to prevent lost riders, to show opportunities of where to ride, and to identify dangerous and/or closed areas.

Work with partners such as AZGFD, Arizona State Parks, and user groups to provide information and education to foster a low-impact land ethic among OHV riders.

When developing motorized trails consider their suitability as multiple user trails for non-motorized recreation.

Work with other Forests and AZGFD to adopt a noise emission standard for OHVs to manage noise impacts.

Work with the Great Western Trail Association and associated groups to maintain the long – distance trail opportunity it provides.

Develop and implement a motorcycle-trials recreation area within 5 years of plan approval in cooperation with trials groups. This area will provide for both individual riders and special-use permitted competitive events.

Provide leadership to coordinate recreation, visitor information, and trail planning among major recreation providers, such as the National Park Service, State Parks, the Arizona Game and Fish Department, concessionaires, chambers of commerce, city and county governments, volunteers and non-profits.

Update the Memorandum of Understanding (MOU) between the National Park Service and the Coconino National Forest. The MOU sets up: 1) how the agencies communicate when management concerns arise and 2) what criteria will be used to make decisions together. For the Flagstaff area national monuments, some considerations should be included for: American Indian access for traditional uses, law enforcement cooperation, personal use plant gathering, outfitter/guide parameters, commercial filming parameters, boundary management, fire management, location and management of NPS facilities on Coconino NF lands, National Historic Preservations Act (Section 106), National Environmental Policy Act and Endangered Species Act compliance coordination, shared services for monitoring, and cooperative efforts in managing interpretation and visitor services.

Consider single use trails (as opposed to multi-user trail designs) to accommodate varying user experiences where trail design features cannot be provided to mitigate user conflicts or provide for a sustainable recreation setting. Lands and Recreation staffs provide input to the design requirement of new developments (especially when they are adjacent to National Forest), share public outreach and education tools, and share information about future plans.

Include discussions and input from county trails coordinators and local groups, as well as local citizens when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both. Coordinate trailhead parking with future development on adjacent lands so as to be proactive in designing trails and trailheads to maintain access to public lands and protect resources.

Cooperate with local governments to provide for snow removal and safe conditions for travel to and from winter outdoor activities.

Coordinate with the Arizona Game and Fish Department and other stakeholders to provide a network of wildlife viewing opportunities.

Adopt design standards and best management practices for emerging recreation activities as they become available. Adopting management policies for new forms of recreation may be considered as time allows and in accordance with the desired interest these new forms attract in relation to other known recreation uses

For trail-system analyses and decisions, include consideration of universal design for all new construction or rehabilitation proposals.

Provide visitor information and guidelines to members of the public inquiring about dispersed recreation opportunities. Coordinate with city, county, and State law enforcement agencies to assist with the enforcement of Federal laws at known Forest dispersed recreation areas on holiday weekends.

Scenic Resources

All Scenic Resources

General Description for All Scenic Resources

The Forest is divided into a three levels of desired Scenic Integrity: Very High, High, and Moderate. These levels set objectives for the amount of variation from the desired landscape

character that is permissible within the scenic integrity level, according to Agriculture Handbook Number 701 Landscape Aesthetics: A Handbook for Scenery Management. Some areas of the Forest may require restoration in order to move toward the conditions described in the desired landscape character.

Desired Conditions for All Scenic Resources

The scenic values of the Coconino NF are conserved and enhanced. Vegetation treatments contribute to the scenic integrity of the valued landscape character (see character zones), especially in highly sensitive areas. Visitors see that the Forest is being actively managed through visual cues, such as seeding fuel breaks with native wildflowers, grasses, and forbs and thinning trees to frame views from trails. Slash and root wads along Concern Level 1 and 2 travel routes are arranged to minimize their visual disturbance in the Immediate Foreground (300 feet). Slash piles are not evident once they are burned or scattered. Openings and stand boundaries are naturally shaped and are oriented to contours and existing vegetation patterns to blend with existing landscape characteristics, except where other natural resource concerns require minimal treatment along powerline corridors. Constructed features, facilities, and management activities closely follow the form, line, color, texture, and pattern common to the valued landscape character to remain visually subordinate to the surrounding landscape. Long-term soil and plant productivity, properly functioning ecosystems and clean water are considered important components of scenic quality. Gravel pits, borrow areas, open pit mines, and restored gullies are not seen in the area of visually sensitive travelways and viewing points to the extent possible. Cultural and historic features are recognized for their inherent scenic values. Native plant rehabilitation is carried out in disturbed areas to speed scenic quality recovery. Natural land forms and vegetation are used, to the extent possible, to screen facilities from important viewing locations such as scenic trails and byways.

Guidelines for All Scenic Resources

Management activities that are inconsistent with the scenic integrity objective and whose effects last more than 5 years should not occur unless a decision is made to change the scenic integrity objective.

In areas with Very High and High Scenic Integrity Objectives, only minimal²¹ alterations²² from the landscape character goals described in the desired conditions should be allowed in the long-term.

In areas with Moderate Scenic Integrity Objectives, only slight alterations should be allowed, which ensure that deviations remain visually subordinate to the landscape character in the long-term.

²¹ Descriptions of the terms “minimal”, “slight” and “moderate” can be found in Agricultural Handbook Number 701: Landscape Aesthetics. In general, “minimal” means deviations are not evident because they closely follow the form, line, color texture and pattern common to the landscape character, “slight” means that noticeable deviations are subordinate to the landscape character being viewed, and “moderate” means deviations may begin to dominate the landscape but borrow from the characteristics of the valued landscape character.

²² Alterations are long-term alterations to the landscape and not intended to restrict short-term impacts to scenery from construction, fire management, drilling rigs or other short-term activities.

In areas of High Scenic Integrity, new infrastructure should, when safety and logistical constraints allow:

- Use of natural contours to minimize the appearance of structures;
- Use of neutral, non-reflective colors to blend structures into their surroundings;
- Make use of existing infrastructure to camouflage new structures that are not part of the valued landscape

Where using rocks from the surrounding landscape is not desirable or feasible, fencing should use rough-hewn stacked timbers in highly visible areas within the Ponderosa Pine and Anderson Mesa Landscape Character Zones, except where barbed wire is needed for range, wildlife, or other specific management.

Visually attractive trees and understory shrubs²³ should be favored when leaving vegetation in the Foreground (1/2 mile or less)²⁴ of Concern Level 1 and 2 travel routes.

Stems should be flush cut if possible and at a maximum cut to within 6 inches of the ground in the Immediate Foreground (300 feet or less)²⁵ of Concern Level 1 travel routes.

When possible, new log landings, roads, and designated skid trails should be located out of view to avoid observation of bare mineral soil from Concern Level 1 and 2 travel routes.

Straight lines and geometric shapes should be avoided at the edges of openings and stand boundaries.

Where fire management activities occur, brown needles and other evidence of fire activities should be permissible for up to 3 years after burning in areas of High Scenic Integrity and 5 year in Moderate Scenic Integrity.

Management Approach for All Scenic Resources

A decision to change the scenic integrity objectives will be documented in a project-level NEPA decision document and in the Plan Desired Scenic Integrity Objective map.

Priorities for rehabilitation of sites and facilities that do not meet scenic integrity objectives may consider the following:

- relative importance of the area and the amount of deviation from the scenic condition objectives; "foreground" of high public-use areas has highest priority
- length of time it will take natural processes to reduce the visual impacts so that they meet the scenic condition objective
- length of time it will take rehabilitation measures to meet the scenic condition objectives
- benefits to other resource-management objectives to accomplish rehabilitation.

²³ Visually attractive trees are those that are pointed out for particular scenic value in the landscape character zone desired conditions.

²⁴ The Foreground may be less than 1/2 mile as determined by site-specific visibility modeling.

²⁵ The Immediate Foreground may be less than 300 feet as determined by site-specific visibility modeling.

The Forest Service may cooperate with other entities, such as AZDOT, local governments, and commercial and private entities to protect scenic integrity on and adjacent to the national forest.

Special Uses

Land Special Uses

General Description for Land Special Uses

Special uses permits authorize a large variety of activities on the national forest. Land special uses are not related to recreation and may include activities such as utility lines, road use, communication sites, research, and wind energy development.

Desired Conditions for Land Special Uses

Infrastructure on national forest lands associated with private land needs (e.g., utilities, waterlines, roads and bridges) meets scenic goals, particularly as viewed from the highways, concern level 1 travelways, and recreation sites. New utility construction and reconstruction of existing utility lines uses existing rights-of-ways to the extent practical to provide utility access and services to private land and communities. Utility lines, such as pipelines, power lines, fiber optic lines, and telephone lines are buried unless there are overriding environmental or technical concerns that would prevent burial. The location of new, large linear infrastructure such as power lines has minimal effects to wildlife and minimizes habitat fragmentation.

Existing communication sites and utility corridors are used to their maximum capacity with compatible utilities where additions are environmentally and visually acceptable before considering new routes and sites. New corridors will avoid research natural areas, geological and botanical areas, and environmental study areas. New communication sites are rare and occur only when a broad public need is demonstrated. Powerlines and towers are built (construction or reconstruction) to specifications compatible with raptor use.

Information about the screening process for special use permits is available and understandable to the public.

The Forest supports alternative energy production and facilitates its development while mitigating impacts to resources and public values. Alternative energy developments, such as wind energy, are designed to minimize impacts to other uses and resources, in particular wildlife and scenic integrity.

Commercial filming using aircraft is limited in all management areas except the House Mountain-Lowlands Management Area

Research permitted on the national forest is focused on improving the general scientific understanding of natural and social systems. Research projects conducted under special use permits: helps realize and understand the scientific potential of the abundant cultural and natural resources found on the Coconino National Forest

- are clearly related to the mission of the Forest Service
- do not interfere with recreation opportunities for the general public

- do not introduce new invasive exotic plants or animals
- do not negatively impact long-term vegetation structure and composition or vegetation management objectives for the vegetation type.
- provide needed data for future forest management
- are co-located with other research activities, when possible
- expand the knowledge of rare species on the Forest

Guidelines for Lands Special Uses

Utility rights-of-ways should be located and maintained to conform with natural-appearing patterns of native vegetation to the extent possible.

New overhead utility lines and support towers should be located to minimize adverse environmental and scenic impacts and screened, where possible.

Structures, such as communication sites, should have finishes that reduce contrast with the desired landscape character.

Expansion of existing communication sites and utility corridors with equipment of a comparable scale should be allowed before creating new sites or corridors.

Where environmental or technical concerns prevent the burial of utility lines, scenic integrity objectives should be maintained to the extent feasible.

Aircraft activities related to commercial filming should be restricted to protect threatened, endangered, and sensitive species from noise disturbance.

Special use permits for diversion ditches across NFS lands should be maintained in a way that minimizes disturbance of vegetation and hydrological conditions.

Commercial filming at cultural sites should generally be prohibited.

Management Approaches for Land Special Uses

Work to ensure that all communication sites have a Communication Site Plan in place.

Look at Landscape Character Zone desired conditions, when considering whether or not a permit would be consistent with the scenic integrity objectives. For instance, astronomical facilities in the Ponderosa Pine and Anderson Mesa LCZ's.

Coordinate with the research community to identify and manage long-term research locations.

Recreation Special Uses

General Description for Recreation Special Uses

Special use permits authorize services that support the Forest Service mission and meet the needs of the public. These permits are a partnership between the Forest Service and private businesses

and individuals to provide services and facilities, such as outfitter-guide services, skiing, and special events.

Desired Conditions for Recreation Special Uses

Special use activities blend into the landscape and do not draw attention to the activity or equipment. Commercial tours are focused on main roadways and vistas as well as selected recreation locations. They support the Forest Service mission by providing high-quality outdoor recreational and educational and interpretive opportunities. If the need can be demonstrated, commercial tours are allowed to provide opportunities for scenic viewing, natural history education, wildlife viewing, and other activities that are compatible with resource protection, user experiences, and Forest direction.

Commercial and recreational activities occur during times and in locations that are consistent with the needs of national forest users and area residents. These activities are consistent with other direction for the location including ROS objectives, resource protection and community goals. Commercial use travel is limited to roads and trails on the Motor Vehicle Use Map, or to sites designated in an operating plan for such use. Exceptions include activities that require very limited access over a short period of time, such as hot air balloon retrieval and similar activities, where this access is specified in the permit. Livestock used in special use activities does not negatively impact areas where forage is limited.

Outfitter/guide permits or permit use does not cause a significant change for the ROS social or managerial setting, such as allowing airboats or seaplanes on the lakes that are at a less developed ROS setting. Generally, motor vehicle use for outfitter-guide activities occurs on roads and trails displayed on the Motor Vehicle Use Map. Commercial uses are encouraged to use non-National Forest System lands for their activities when their proposed use is not consistent with national forest goals and can be accommodated on non-National Forest System lands.

Large group gatherings and recreation events are discouraged outside of areas that have already been analyzed for resource issues or suitably developed sites. These sites provide a range of opportunities from a natural, “outdoor” experience to commercial amenities for visitor comfort. Applicants are encouraged to use non-National Forest System land for staging when possible. Pre-approved sites are generally areas that are compatible with use by the general public and are identified based on their ability to support large group activities with minimal resource impacts. They do not have long-term evidence of erosion or invasive exotic species as a result of special use activities. In general, events occur where they will disrupt the general public’s use of the land.

Recreation residences and commercial facilities on the Forest meet State and county health and safety standards. Their footprints are stable with some exceptions to accommodate improvements that address health safety and environmental issues. Organization camps managed under special use permits are focused on natural resource values, conservation education, and emphasize non-motorized recreation opportunities.

Objectives for Recreation Special Uses

Replace through permit administration all outhouses (outbuildings with one or more seats and a pit serving as a toilet) at recreation residences within **XX** years of plan approval with facilities that meet sanitation requirements.

Identify and approve XX sites for recreation events and large group gatherings within XX years of plan approval.

Standards for Recreation Special Uses

Prohibit motorized aircraft landings and takeoffs associated with outfitter-guide activities on National Forest System lands and waters, except for emergencies and rare administrative support activities.

Require permit holders to rehabilitate non-NFS trails and other sites created by activities authorized under special use permits.

Guidelines for Recreation Special Uses

Outfitter-guide motor vehicle use and camping activities should be excluded from areas with a high density of archeological sites, sensitive wildlife areas, including riparian areas or areas with sensitive or rare plants, and adjacent to urban areas.

Special use permits should not be given for activities proposed to occur within 200 feet of perennial streams, springs, or sensitive waters. Exceptions will be for hardened or slickrock sites, for activities in support of approved research, to improve safety, or to provide for site rehabilitation.

Commercial tours at high interest archeological sites such as Honanki, should be consistent with site protection and visitor experience objectives.

Air tour companies and rock climbing activities should not disturb occupied eyries between March 1 to August 31, to protect the area during the peregrine falcon breeding season and to protect other raptor species.

Outfitter/guide activities or group activities should not generally occur in Deadman Wash, Dry Lake Hills, Walnut Canyon from Fisher Point east, and Pumphouse Wash.

Special use events should occur on the Snowbowl Road infrequently and should not interfere with use of the area by the general public or permittees near the Snowbowl Ski area.

Where forage is limited, require overnight campers with recreational livestock to carry cubed, pelleted, or rolled feed. Feeds shall be free of viable noxious-weed seeds.

Sites pre-approved for special use activities should be rated/designed to accommodate a specific number of people.

Management Approaches for Recreation Special Uses

Priority is given to permit applications received in response to a prospectus issues by the Forest Service. Unsolicited proposals will be evaluated on a case-by-case basis as workload allows.

Before permitting outfitter/guides adjacent to national monuments, contact the National Park Service for coordination. Outfitter guiding might also help meet the mission of the National Park Service in the national monuments or on adjacent national forest lands. Work cooperatively with NPS for special uses requests that occur on both Forest Service and NPS lands.

Coordinate wildlife viewing permits with the Arizona Game and Fish Department.

Forest Products

General Description for Forest Products

National forest lands were reserved with the intent of providing goods and services to satisfy public needs over the long-term. Among these goods is the production of a sustainable supply of forest products. The focus of the Forest Service has broadened over time, and the desired conditions for this plan are focused on outcomes rather than outputs.

Forest products fall into three categories: timber, special forest products, and forest botanical products.

Timber products include, but are not limited to, firewood, wood pellets for home and industrial heating, structural panels, animal bedding, wood molding, pallets, structural lumber, posts and poles, sawtimber, pulpwood, non-sawlog materials removed in log form, cull logs, small roundwood, house logs, and biomass to electricity. Timber products can be measured in cubic or board feet of solid wood.

Special forest products include, but are not limited to, bark, berries, boughs, bryophytes, bulbs, burls, cactus, Christmas trees, cones, ferns, firewood, forbs, fungi (to include mushrooms), grasses, mosses, nuts (to include piñon nuts), pine straw, roots, sedges, seeds, transplants, tree sap, wildflowers, fence material, mine props, posts and poles, shingle and shake bolts, and rails. Special forest products do not include minerals, animals, animal parts, insects, worms, soil, and water.

Forest botanical products are naturally occurring special forest products, including, but not limited to, bark, berries, boughs, bryophytes, bulbs, burls, cactus, cones, ferns, fungi (to include mushrooms), forbs, grasses, mosses, nuts (to include piñon nuts), pine straw, roots, sedges, seeds, shrubs, transplants, tree sap, and wildflowers. Forest botanical products are not rocks, minerals, animals, animal parts, insects, worms, soil, or water.

Special forest products and forest botanical products do not have a common standard conversion to cubic or board feet of solid wood.

Desired Conditions for Forest Products

The Forest provides a sustainable supply of forest products within the capacity of the land to produce these goods and within applicable laws and regulations.

Silvicultural treatments reflect natural disturbance regimes and contribute to ecosystem sustainability. On forested lands suitable for thinning, timber management activities are designed to integrate considerations for socio-economic values, water quality, soils, wildlife habitat, recreation opportunities, visual quality, and other values, while providing opportunity for a sustainable and appropriately scaled industry.

Timber products are available to businesses and individuals in a manner that is consistent with other desired conditions and that is on a sustainable basis within the capacity of the land. Timber

products are available to local American Indian tribes for subsistence and traditional purposes, such as kiva beams.

Forest botanical products remain on the Forest unless collection is authorized by permit and occurs in a manner that ensures the products collected persist on the Forest.

Traditional tribal uses for forest botanical products, such as the collection of medicinal plants, wild plant foods, basketry materials, and fire wood, are facilitated. Boughs and herbaceous plant parts used for American Indian traditional and ceremonial purposes are available under conditions and procedures that minimize restrictions, and are consistent with laws, regulations, and agreements with tribes.

Management Approaches for Forest Products

When forest products are available as a result of forest management activities, work with agencies, private organizations, and individuals to promote forest product use.

Encourage use of forest products in lieu of onsite burning or chipping.

Ensure the continued sustainability of special forest products through observation of commercial sales and personal-use permit harvest levels.

Recognize the rights of members of tribes whose aboriginal territories include the land now administered by the Coconino NF to collect forest materials for traditional, ceremonial, and subsistence purposes.

Collaborate with tribal governments through nation-to-nation agreements, annual project consultations, formal and informal meetings, and other methods on the management of species important to maintaining the social and cultural well-being of tribes.

Provide training to Forest employees about the trust responsibilities Federal agencies have for tribes, and the specific ways in which the Coconino NF honors and implements those responsibilities.

Encourage tribal members to engage in traditional activities relating to forest botanical products, such as the collection of medicinal plants, wild plant foods, basketry materials, and fuel wood for traditional and cultural purposes..

Chapter 3. Management Areas

Introduction to Management Areas

Management areas are areas that have similar management intent and a common management strategy that are more specific than forestwide guidance provided in Chapter 2. This direction does not substitute for or repeat forestwide direction, but rather provides additional direction for the applicable area. In the event that a plan decision in this section and the forestwide component in another section conflict, the more restrictive plan decision generally prevails. A project or activity-level evaluation, however, may be required to resolve the conflict; generally, however, the more restrictive plan decision prevails.

Some management areas are special areas that have been designated by Congress or an office of the Executive Branch. They are managed to protect the special features or character for which they were designated and must be managed in accordance with relevant law, regulation, and policy and any area-specific management plan, such as the Verde River Comprehensive River Management Plan.

Because of the complication of carrying forward direction from the previous forest plan there are two management areas that overlay the Sedona-Oak Creek Management Area (MA). The Oak Creek Canyon and House Mountain-Lowlands MAs are both subject to direction for the Sedona-Oak Creek MA and have unique direction that applies only to these overlay areas. In addition, there are several guidelines in the Sedona-Oak Creek MA to which the House Mountain-Lowlands MA is an exception.

Scenery desired conditions (desired landscape character) for wilderness and wild and scenic rivers is described in the MA direction. For other management areas, see the Landscape Character Zones for this direction.

Management area categories have been identified and are listed in the table below. Several of the management areas are designated special areas, such as wilderness. These are places that have been designated by statute or through past administrative process because of their unique or special characteristics. In addition, there are two categories of preliminary administrative recommendations that occur as separate management areas (recommended research natural areas and recommended wilderness). Those areas recommended for designation are managed to protect their special characteristics until a decision on the designation is made.

Designated Special Areas

All Designated Wilderness Areas

General Description for All Designated Wilderness Areas

There are 10 existing wilderness areas on the Coconino National Forest. This plan provides direction for 8 of them. Direction for the Kendrick and Mazatzal Wilderness areas is provided in the Kaibab and Tonto National Forests' plans, respectively. The Coconino NF's plan contains direction for the Sycamore Wilderness which also lies within the Prescott and Kaibab National Forests.

Note for public review: The Coconino National Forest will be creating a draft of Wilderness Opportunity Spectrum for the Draft Plan and EIS. If you would like to comment on how the settings below apply to an existing wilderness area that you are familiar with, please send those to the Plan Revision Team during this comment period:

- **Pristine-** The area is characterized as an extensive, unmodified, natural environment. Natural processes and conditions have not been measurably affected by the actions of users. The area will be managed as free as possible from the influences of human activity. Terrain and vegetation allow extensive and challenging cross-country travel.
- **Primitive -** The area is characterized by an essentially unmodified, natural environment. Concentrations of Visitors are low and evidence of human use is minimal. The area has high opportunity for isolation, solitude, exploration, risk, and challenge.
- **Semi-primitive –** The area is characterized by a predominantly unmodified environment of at least moderate size. System trails and campsites are present and there is evidence of other uses. A minimum of on-site controls and restrictions are implemented to protect physical, biological, and social resources. Some facilities may be present to reduce visitor impact.
- **Transition -** The area is characterized by a predominantly unmodified environment; however, the concentrations of visitors may be moderate to high at various times. The area is characterized as having a large number of day users who are often mixed with overnight and long-distance travelers on trails near trailheads and wilderness boundaries.

Desired Conditions for All Designated Wilderness Areas

Wilderness and recommended wilderness areas provide their full range of social and ecological benefits.

Wilderness Recreation

Trail and trailhead development emphasizes wilderness recreation and watershed condition while maintaining wilderness resource values. Key wilderness trailheads provide sanitation, orientation, and interpretation to wilderness visitors. Directional guidance and information on minimum impact and archaeological site etiquette is provided at wilderness access points. Loop hikes are expanded in wilderness to encourage low-impact day use, where possible. Wilderness-dependent recreation opportunities such as backpacking, horse packing and hunter guiding are ongoing where these activities are consistent with resource and opportunity setting objectives.

New structural improvements necessary for proper management and/or protection of the wilderness resource are rare. High-traffic roadside facilities that provide a gateway to wilderness areas or vistas of wilderness inform and educate visitors about wilderness.

Permanent damage to the resource is limited by distributing visitor use in wilderness by permit system or other methods where such damage is evident. Existing signs and facilities are maintained where public safety and resource protection require it.

Places within existing wilderness that have inconsistencies with the wildernesses primitive character, such as at Bell Rock, West Fork, Boynton Canyon, Kachina Peaks and some places near private land retain wilderness values to the extent possible. Infrastructure in these places are more developed and signs and carrins may be more frequent than normally associated with wilderness management in order to protect visitor experience and resources. In areas where the desired condition is a Pristine or Primitive wilderness opportunity, these types of developments do not exist.

Special use permits issued in wilderness provided for activities that facilitate the protection of wilderness character. These permitted activities do not interfere with the challenging and self-reliant recreation of other wilderness visitors and do not cause widespread impacts to wilderness character.

Wilderness Education

Educational material and information is provided at all wilderness trailhead access points including information about the variety of trails and experiences available in nearby wilderness areas and information about personal safety, leave-no-trace etiquette, and pertinent regulations. Educational materials encourage widespread understanding of the philosophy of wilderness and support for its natural and social benefits. They also provide information to help users be prepared with appropriate equipment and information. Visitors learn about sensitive ecological features, know their responsibility, and act in a way that protects ecological systems.

Ecological Management of Wilderness Areas

Ecosystems within wilderness are functioning within their historic range of variability. Ecological conditions trend towards the desired conditions for the respective vegetation types within each wilderness. Disturbances, including fire and flooding, are able to play their natural role in vegetative succession, while accounting for public health and safety concerns. (See the appropriate Vegetation Types and Forestwide Ecological Direction for more information). Ecological conditions trend towards the desired conditions for the respective ecological resource within each wilderness. Invasive exotic plants and animals do not occur at levels that disrupt ecological functioning. Plants used for traditional medicine and cultural purposes thrive here.

Objectives for All Designated Wilderness Areas

Rehabilitate to natural conditions at least **XX** damaged wilderness campsite(s) every **XX** years.

Standards for All Designated Wilderness Areas

In wilderness, group size limit is 12 persons and livestock (combined) per group.

Generally, do not permit commercial activity in wilderness areas, unless the activity is wilderness-dependent and the activity cannot be conducted/replicated outside of wilderness. This would include activities by organizational groups and/or training classes.

Guidelines for All Designated Wilderness Areas

Large group activities (75 or more people), such as races and social gatherings, should not occur in wilderness unless they are specifically for the purpose of wilderness-based education and are designed to protect wilderness resources.

Signing in wilderness should be limited to those that are essential for resource protection and user safety.

Signing and parking for wilderness access should concentrate parking in designated locations. Casual wilderness use resulting from roadside parking along the highway should be discouraged. Damaged parking sites should be restored using erosion control and revegetation.

Management Approaches for All Designated Wilderness Areas

Implement corrective measures such as a wilderness permit system if overuse causes unacceptable resource damage. Overuse can be determined from: Limits of Acceptable Change (LAC) studies, range analyses, Code-a-site inventories, and professional judgment. The Kachina Peaks, Red Rock-Secret Mountain, Wet Beaver, West Clear Creek, and Sycamore Canyon Wilderness areas are closely monitored to determine whether or not corrective measures are needed.

Discourage bicycles in wilderness through such methods as ranger patrols, placement of bike racks near wilderness boundaries or portals, "wilderness ahead" signs located outside of the wilderness, improved trail design, and expanded trail opportunities outside of the wilderness.

Provide regular wilderness ranger patrol in wilderness areas to the degree necessary to meet the standards for each area. If funding is limited, use volunteers to accomplish as much of this work as possible via the Wilderness Information Specialist (WIS) program. Standard level trail maintenance is defined in the implementation schedules for each wilderness.

Expand partnerships such as the resort Wilderness Ranger Program to increase awareness of wilderness values and etiquette. Increase residents' awareness of the wilderness near them by providing them with information about wilderness. Use volunteers as much as possible, particularly during peak season to patrol, pick up litter, break up fire rings, restore damaged sites, contact the public, and maintain trail condition logs.

Coordinate law enforcement activities with wilderness managers to ensure that any evidence of illegal activities that negatively impacts wilderness character is removed.

Develop wilderness management direction that establishes Limits of Acceptable Change (LAC) for all wilderness areas.

Management plans may be developed and implemented for all wilderness areas on the Forest.

Fossil Springs Wilderness

General Description for Fossil Springs Wilderness

Sixty miles south of Flagstaff, the Fossil Springs Wilderness encompasses a steep, wide canyon approximately 1,600 feet down at the edge of the Colorado Plateau. Generally, the vegetation types are piñon-juniper evergreen shrub, riparian, and ponderosa pine; however, there are inclusions of other types due to the topographic and ecological complexity of the area. This wilderness is one of the most diverse areas in the State likely due to the range of plant communities compressed into a small area that ranges from very wet to very dry. The creek is situated in a region dominated by Quaternary basalt laid down over the Supai Formation. The

springs are located on the southern side of the Wilderness, but are not within the Wilderness. The stream is subject to chemical mineral deposits called travertine. These deposits along with the unique stream chemistry interact with the riparian vegetation and other geological features to produce an unusual environment that is only one of two in Arizona. (See the direction for the Fossil Springs Botanical Area and Wild and Scenic River for more discussion of the springs.) Fossil Creek has a Wild and a Recreational River Segment within the wilderness. (See the direction for Wild and Scenic Rivers and the Corridor Management Plan for more information.)

Fossil Creek is a very important place for the Apache. There are many stories and traditions about the canyon and the role it has played through time as a sanctuary for the Apache people. In the 1870's, most Apache were forcibly relocated to the San Carlos Reservation, although some families managed to hide out and survive in the canyon. With the need for labor to construct the Childs-Irving hydroelectric power plant system, Apache returned to the canyon to help build that historic project and maintain it for over 40 years until they were forced to leave and relocate in the Yavapai-Apache reservations by Camp Verde, Middle Verde, and Clarkdale.

The desired conditions for this area are in addition to those described for the Verde Valley Landscape Character Zone.

Desired Conditions for Fossil Springs Wilderness

The area retains its integrity as an outstandingly clean, pristine site. It has primitive hiking trails and is a good place to find solitude. There are recreation opportunities for big and small game hunters, wildlife viewing, hikers, backpackers, fishermen, swimmers and kayakers.

The steep canyon topography has terraces which provide for a greater diversity of plants and habitat conditions. The vegetation types for this wilderness include piñon-juniper evergreen shrub, mixed broadleaf deciduous riparian and ponderosa pine (see Vegetation Type Desired Conditions for more information). Within these vegetation types there are numerous and diverse inclusions of communities of plants such as mesquite, catclaw acacia, crucifixion thorn, cacti, ash, walnut, alder, cottonwood, sycamore, hackberry, willow, chokecherry, boxelder, piñon pine, several juniper species, with ponderosa pine dominating the higher plateaus with numerous annual and perennial woody and non woody plants. A variety of age classes of riparian trees are present, successfully regenerating, and some trees are very large (exceeding 30 inches in diameter). Native shrubby and herbaceous vegetation is also successfully regenerating and provide food and cover for wildlife consistent with the capacity of the area. This vegetative diversity creates many wildlife niches for deer, javelina, and large number of bird species. Occupied black hawk nesting sites are protected from disturbance during the breeding season.

Fossil Creek is an important isolated refuge for black hawks, lowland leopard frogs, native fish and macro-invertebrates. Non-native fish or other non-native aquatic species are not present in the channel or in livestock developments within the Fossil Creek-Verde River 5th level HUC.

Hydrologic and geologic features of the stream are preserved, especially the travertine system. Water quality is outstanding and the river to at times appears blue because of the water chemistry. Turbidity is low except during flood events, and E. coli levels are low. The exposure above the springs of a scarp of the Colorado Plateau, eroded on Late Paleozoic sedimentary rocks and now buried under extensive Tertiary basalt lava flows, is preserved in pristine geological condition. In the uplands, the landscape is dry and open with a very rocky texture and semi-arid vegetation.

The Mail Trail, once used for horseback mail deliver, and the Flume Trail tie to the history of hydropower and industry in the vicinity. Fossil Creek is notable for its high archaeological site density and diversity in a unique microcosm in the Mogollon Rim. It is also one of the more important locales of historic and modern Apache occupation. Its various site types that occur in the different environmental zones in and around the Creek reflect specialized subsistence and settlement strategies to maximize the specific resources of those zones. In this respect, there is also similarity in the ways the prehistoric Sinagua and historic Apache utilized this environment. Habitations and riparian-oriented agriculture were the main uses of the canyon bottom and virtually every flat location along the creek shows evidence of habitation by both Sinagua and Apache. The hill slopes along the creek were areas extensively utilized for the collecting and gathering of wild plant foods such as yucca, agave, and prickly pear, cooked in large communal roasting pits. Small pockets of soil that collected in hillsides formed small areas in which corn could be grown, as evidenced by numerous small prehistoric field houses as well as remains of Apache houses in their vicinity.

Kachina Peaks Wilderness

General Description for Kachina Peaks Wilderness

Located just north of Flagstaff, the Kachina Peaks Wilderness is part of a large, heavily vegetated composite volcano 7,400 to 12,633 feet high, including Humphreys Peak, the highest point in Arizona. The San Francisco Peaks exhibits a rich diversity of past geologic events such as lava flows, volcanic eruptions, glaciation, and erosion. The San Francisco Peaks are an outstanding example of past volcanic activity and preserves the best example of Ice Age glaciation in Arizona in lateral and medial moraines and former streambeds.

The only alpine tundra vegetation in Arizona is found on the San Francisco Peaks. This area is less than 1,000 acres and contains a threatened plant, *Packera franciscanus*, (San Francisco Peaks groundsel) as well as other endemic species. Wildlife species include mule deer, elk, turkey, black bear, coyote, mountain lion, red squirrel, and Clark's nutcracker. The San Francisco Peaks contain virgin spruce-fir forest and the only area of bristlecone pine on the Coconino NF. The San Francisco Peaks are sacred to a number of southwestern tribes, most notably the Hopi and Navajo, but also the Yavapai, Walapai, Havasupai, Apache, Zuni, and Acoma (See San Francisco Peaks Landscape Character Zone).

This wilderness contains the San Francisco Peaks Research Natural Area, which provides a control or reference for an alpine tundra ecosystem at the southern extend of this ecosystems range.

For Scenery Desired Conditions, see the San Francisco Peaks Landscape Character Zone.

Desired Conditions for Kachina Peaks Wilderness

There is a diverse composition of wildlife species and native vegetation. In this high elevation wilderness, there are alpine tundra, mixed conifer with aspen, and spruce-fir forests with subalpine grasslands and ponderosa pine interspersed (see Vegetation Type Desired Conditions for more information). The ecosystem diversity of the wilderness and ecological attributes and processes that allows it to provide watershed values, habitat for native biota, panoramic vistas,

and/or solitude are maintained. Recreation use, ecological attributes, and tribal values maintain the uniqueness of the vegetation.

The alpine ecosystem provides habitat for San Francisco Peaks groundsel, is able to support and sustain rare or endemic species, and continues to be resilient to natural and human-caused impacts.

Several roads, jeep trails, and hiking/equestrian trails provide access to the wilderness boundary. Recreational opportunities include day hiking, backpacking, cross-country skiing, snowshoeing, winter camping, snow and ice climbing, small and big game hunting, bird watching, and leaf watching (fall). The top of the Kachina Peaks Wilderness provides outstanding views of the Painted Desert, the North Rim of Grand Canyon, and Sunset Crater. Trails to the top of Peaks within the wilderness are higher traffic than is typical of more remote wilderness. These trails have a stable narrow width and discourage traveling off-trail. Particularly in areas of alpine tundra vegetation, off-trail travel does not occur. The mountain maintains attributes that provide historic and cultural values, such as shrines.

Standards for Kachina Peaks Wilderness

Off-trail travel is prohibited except when there is enough snowpack to protect underlying vegetation, particularly in the alpine tundra vegetation type.

Munds Mountain Wilderness

General Description for Munds Mountain Wilderness

Elevations in the Munds Mountain Wilderness range from 3,600 to 6,800 feet. Located east of Sedona, the area is characterized by the moderate to steep slopes of the Mogollon Rim. Rattlesnake, Woods, and Upper Jacks Canyon are the major drainages. Munds Mountain, Lee Mountain, and Horse Mesa are the areas of highest elevation.

Munds and Lee Mountains are unique geologic areas of the Mogollon Rim. There are extensive outcroppings of Coconino and Supai sandstone on the cliff faces of Munds and Lee Mountains and ramp basalt flows.

The desired conditions for this area are in addition to those described for the Red Rock and Ponderosa Pine Landscape Character Zones.

Desired Conditions for Munds Mountain Wilderness

A great diversity of vegetation and wildlife species and outstanding riparian habitat characterize this wilderness. Depending upon slope and aspect, several vegetation communities are found, including ponderosa pine, piñon-juniper evergreen shrub, interior chaparral, and mixed broadleaf deciduous riparian. There is a small portion of semi-desert grasslands. Riparian vegetation and perennial water sources are found in the major drainages (see Vegetation Type Desired Conditions for more information). Arizona cypress communities are preserved.

The deep drainages and rugged nature of the terrain offer many opportunities for primitive and unconfined activities including hiking, backpacking, horseback riding, swimming, rock climbing, bird watching, and hunting. The terrain provides many challenging recreation opportunities in

areas with few trails. Due to the striking beauty of the red cliffs and riparian habitat, the wilderness also offers outstanding opportunities for photography and painting. In order to identify trail locations, cairns (trail markers made of stacked rocks) may be found along trails. At Bell Rock, visitors have an awareness of, and sensitivity to, the Munds Mountain Wilderness.

Prehistoric sites occur in many different locales within the wilderness and reflect hunting activities as early as 9,000 years ago, as well as agricultural settlements by the Sinagua 900 years ago. Although there are no interpreted sites in the wilderness, it contains a great variety of Sinagua site types, including small field houses, substantial habitation pueblos, so-called “forts”, field systems, and petroglyphs. Later activity by Yavapai and Apache are also present in rock shelters and caves as well as sites in the open. Many reflect long-term harvesting and cooking of agave in communal roasting pits. The historic Chaves Road skirts the south edge of the wilderness and provides a taste of what it was like to travel across this rugged area during pioneer times.

Red Rock Secret Mountain Wilderness

General Description for Red Rock Secret Mountain Wilderness

Located twenty miles south of Flagstaff, the Red Rock-Secret Mountain Wilderness includes spectacular red, tan, and buff cliffs that mark the edge of the Colorado Plateau. The country plunges as much as 2,500 feet into canyons that drain into Oak Creek and the Verde River. Secret Mountain and Wilson Mountain are high mesas jutting out into the lower country. Several lava flows cap the high rims of Tertiary, Triassic, Permian, Pennsylvanian, and Mississippian exposures. The area includes the dramatic backdrops and scenic cliffs that make Sedona a popular tourist spot.

This is an area of great climatic variation. The high rims are cool and moist most of the year, except for May and June. The south end of the wilderness, near Sedona, has a much warmer climate. Mid-winter temperatures average above freezing. The West Fork of Oak Creek Research Natural Area (RNA), a diverse vegetation community, is in the wilderness. (See the West Fork of Oak Creek RNA direction for more information.)

The Red Rock Secret Mountain Wilderness was most heavily occupied in prehistoric times by the Southern Sinagua during the A.D. 1150 to 1300 period. Cliff dwellings are the most notable site types, forming single family homes as well as storage facilities for crops grown on the mesa tops and canyon bottoms. The most impressive sites are on the edge of the wilderness, the cliff dwellings of Honanki and Palatki, both of which have outstanding examples of prehistoric pictographs that span the entire range of human occupation of the Verde Valley. Both sites are developed for public visitation.

The desired conditions for this area are in addition to those described for the Red Rock and Ponderosa Pine Landscape Character Zones.

Desired Conditions for Red Rock Secret Mountain Wilderness

There are seven major plant communities: ponderosa pine, mixed conifer, interior chaparral, piñon-juniper evergreen shrub, riparian, and semi-desert grassland (see Vegetation Type Desired Conditions for more information). Arizona cypress communities are preserved. The wide variety of vegetative types provide habitat for equally diverse wildlife populations.

Native fish populations in the West Fork of Oak Creek persist and are minimally affected by invasive exotic aquatic species. Cliffs that are occupied peregrine falcon habitat are undisturbed. Invasive exotic plants do not occur at levels that disrupt ecological functioning. Plants used for ethnobotanical²⁶ purposes thrive here.

Heritage sites remain unaltered. Spectacular red, tan, and buff cliffs that mark the edge of the Colorado Plateau are found throughout this wilderness. Steep forest canyons interspersed with red rock arches and formation provide outstanding opportunities for solitude farther into the area. Visitor encounters are higher at the eastern end of the West Fork of Oak Creek. Opportunities for primitive recreation are many. Primitive hiking is allowed, but overnight camping may be restricted because of the overlying research natural area and resource protection. The Wilson Mountain National Recreation Trail provides an outstanding scenic hike within the wilderness. In order to provide for safety, cairns may be found along trails.

Strawberry Crater Wilderness

General Description for Strawberry Crater Wilderness

Located 30 minutes north and east of Flagstaff, the Strawberry Crater Wilderness is gently rolling piñon-juniper, cinder terrain, and lava fields about 5,500 to 6,000 feet in elevation. Strawberry Crater is part of the San Francisco Peaks volcanic field, which contains some 600 craters and cones. Strawberry Crater itself is about 50,000 to 100,000 years old. In appearance it is quite different from the younger, rounded cinder cone nearby. The Crater was formed by slow moving basaltic andesite. The ridges of the central Crater show the distinct layering that occurred during eruption. The ridges are broken at right angles to the ground and to one another. The jagged features and deep rust color of Strawberry Crater make it unique among local cinder cones. The area contains the Southwestern Region Sensitive plant species *Penstemon clutei*.

Strawberry Crater Wilderness shows evidence of occupation by the northern Sinagua who probably took advantage of a unique geological setting that exists nowhere else in the territory they occupied in prehistoric times. Strawberry Crater is also an important place to the Hopi and Navajo.

Because of the relatively open terrain and easy access from major roads, motor vehicle intrusion into the wilderness is an issue.

The desired conditions for this area are in addition to those described for the Volcanic Woodlands Landscape Character Zones.

Desired Conditions for Strawberry Crater Wilderness

The Strawberry Crater Wilderness offers the visitor an opportunity to experience the sense of time and endless horizon presented by piñon-juniper zones. The area also contains transitional areas to the ponderosa pine and the Great Basin grasslands vegetation types (See Vegetation Type Desired Conditions for more information). Strawberry Crater Wilderness shows little evidence of human visitation and vegetation on its slopes is preserved. From the low cinder cones, there are high quality scenic views of the Painted Desert, the Hopi mesas, and the buttes of the Little Colorado River valley. On the horizon, the San Francisco Peaks and Sunset Crater, add another dimension

²⁶ Define ethnobotanical and should this be a forestwide condition?

to the view. The area is strewn with cinders and evidence of the prehistoric volcanic activity that formed the area. The lava field to the north is a sea of black in the piñon juniper landscape.

The area offers opportunities for day hiking, backpacking, and camping. The area provides ample opportunity for self-reliance and challenging navigation in a flat, densely vegetated area. Petrified bubbles of once boiling stone look as fresh as the sparse vegetation that struggles for a foothold on this rugged moonscape. There are a few game animals and small mammals throughout. Opportunities for solitude and for exploring interesting geological and archaeological features exist.

The construction of barriers and signing along the wilderness boundary prevent motor vehicle intrusion along the south and west boundaries of the wilderness. Educational materials about the sensitive soils and plants are provided to visitors.

West Clear Creek Wilderness

General Description for West Clear Creek Wilderness

Located 10 miles east of Camp Verde, West Clear Creek is one of the most rugged, remote canyons in northern Arizona. The canyon forms where Willow Valley and Clover Creek join near two access trails; the Maxwell Trail and the Tramway Trail. The canyon continues westward for approximately 27 miles, measured along the creek, ending near Bull Pen Ranch. The creek continues westward to join the Verde River south of Camp Verde. The canyon is very narrow for most of its length, with many side canyons.

West Clear Creek Canyon is the longest of the canyons cutting through the Mogollon Rim, the edge of the Colorado Plateau. The formations visible in the canyon area are, from bottom to top, Late Paleozoic sedimentary rocks (Supai, Coconino, Kaibab), Tertiary sediments, and Tertiary basalt lava flows.

The desired conditions for this area are in addition to those described for the Verde Valley and Ponderosa Pine Landscape Character Zones.

Desired Conditions for West Clear Creek Wilderness

Major vegetation types in this wilderness are piñon-juniper evergreen shrub and ponderosa pine. The riparian and semi-desert and montane grassland components add to the diversity of the canyon ecosystem (See Vegetation Types Desired Conditions for more information). The terrain is rugged and provides for a variety of wildlife habitat. Hanging gardens on the upper slopes are undisturbed (See Riparian Vegetation for further direction on springs and seeps). Heritage sites remain undisturbed.

The canyon does contain some evidence of human use but the apparent naturalness of the area is unaffected. In spite of the short distance from the northern to the southern boundary, the area offers outstanding opportunities for solitude and primitive recreation by virtue of the very steep canyon walls. Access from Bull Pen Ranch to Bald Hill is fairly easy, even for inexperienced hikers or for fishermen. There are short steep access trails that are unmaintained from the rim to the canyon bottom. In the main, narrow part of the canyon, there are no trails. Deep long pools make it necessary to wade or swim in many places when hiking from one end of the canyon to the other so that even the most seasoned hiker will find lots of challenge. The canyon is wild and

primitive. Interpretive materials associated with this wilderness advise that users need to plan trips carefully and self-reliance is emphasized.

Wet Beaver Wilderness

General Description for Wet Beaver Wilderness

Forty miles south of Flagstaff, the Wet Beaver Wilderness commences at its eastern border at the confluence of Brady and Jacks Canyons. Moving west, the boundary follows the canyon rim. In the lower reaches of the canyon, the boundary moves back slightly from the rim to include some of the adjacent plateau. The area ends where Wet Beaver Creek canyon opens towards the Verde Valley. Wet Beaver is a steep walled canyon cutting into the rim of the Colorado Plateau. Supai sandstone and shale form striking red cliffs along the lower canyon.

Like the West Clear Creek Wilderness, prehistoric sites occur in almost all types of topographic situations along Wet Beaver Creek and reflect an adaptation to the unique canyon environment. Petroglyphs can be seen along the Bell Trail that begins at the mouth of Wet Beaver Creek. Just outside the north edge of the wilderness is the ancient Palatkwabi Trail. It is likely that a side trail from it entered the Verde Valley and was a major trade connection between the southern Sinagua of the Verde Valley and the early Hopi pueblos along the Little Colorado River and the Hopi mesas.

The desired conditions for this area are in addition to those described for the Verde Valley and Ponderosa Pine Landscape Character Zones.

Desired Conditions for Wet Beaver Wilderness

The major vegetation type in this wilderness is piñon-juniper evergreen shrub, and the additional types of ponderosa pine, riparian and semi-desert grassland add to the diversity of the canyon ecosystem (See Vegetation Types Desired Conditions for more information). Wet Beaver Wilderness provides recreation opportunities for waterplay, wildlife-viewing, camping, and hiking while protecting the pristine riparian and aquatic resources. The perennial desert stream passes through a canyon of Supai sandstone, shale, and red rock. As visitors move eastward in the canyon, opportunities for solitude increase. Heritage sites remain undisturbed.

Sycamore Canyon Wilderness

General Description for Sycamore Canyon Wilderness

Sycamore Canyon Wilderness is on the Coconino, Kaibab, and Prescott National Forests. The direction in the Coconino NF Plan provides direction for this wilderness area on all three national forests.

The southern portion of the area is a series of broad mesas with gently sloping drainages tributary to the Verde River. Along the Verde River, there is extensive riparian habitat. The northern section is a series of foothills and canyons that rise to a 300-foot rim of rugged sandstone outcrops along Sycamore Canyon. Elevation ranges from 3,700 to 6,500 feet. These differences in elevation and aspect throughout the canyon result in a variety of contrasting ecological associations, set in spectacular "red rock" geologic formations.

Sycamore Canyon has long been noted for its cliff dwellings as well as tall tales of lost Spanish gold mines and Mexican treasure hunters ambushed by Apaches. Prehistoric textiles found in one site in the 1930's show that cotton was once grown in areas like Sycamore Canyon, and that the Sinagua produced some of the most sophisticated and complex weaving technologies in the Southwest. Finely-woven, highly decorated cotton textiles were undoubtedly one of the more important products the Sinagua traded to the northern pueblos along the Palatkwabi Trail.

The desired conditions for this area are in addition to those described for the Verde Valley, Red Rock and Ponderosa Pine Landscape Character Zones.

Desired Conditions for Sycamore Canyon Wilderness

The canyon walls represent a diversity of geological history such as red sandstone, white limestone, and brown lava. Vegetation in the canyon varies from mixed conifer with aspen, ponderosa pine, and montane and semi-desert grasslands in the upper reaches to interior chaparral, piñon-juniper evergreen shrub and woodland, semi-desert grasslands and desert communities in the lower portions. The stream course is a mixed-broadleaf deciduous riparian vegetative type (See Vegetation Type Desired Conditions for more information). Along Sycamore Creek, the sycamore component is maintained as a higher proportion of the species composition than is seen in other mixed broad leaf deciduous vegetation type. Visitors experience solitude and challenge in this diverse canyon and enjoy high quality views of red rock country. Heritage sites remain undisturbed. Sycamore Canyon Wilderness is a Class I Airshed (See Air quality section). Noxious weeds such as tamarisk are absent from the creek and associated springs.

Recommended Wilderness

General Description for Recommended Wilderness

The proposed action includes three recommended wilderness areas that if selected in the Final Plan would use the interim direction below while waiting for Congressional action. (See map **XX**).

Desired Conditions for Recommended Wilderness

The primitive and undeveloped characteristics of recommended wilderness are maintained or enhanced. Scenery and wilderness recreation opportunities are emphasized over developments and mechanized forms of recreation. Mechanized recreation within the area does not detract from wilderness values. Motorized vehicle use is reduced. Archaeological sites remain undisturbed.

Objectives

Develop and implement management plans for any newly designated wilderness areas by **XX** years after designation occurs.

Guidelines for Recommended Wilderness

Existing facilities should be maintained but not expanded pending action by Congress.

Recreation facilities should be designed and rehabilitated in accordance with the Minimum Requirement Decision Process criteria.

Use of motorized vehicles should be limited to administrative and permitted use.

Wild and Scenic Rivers

Verde Wild and Scenic River²⁷

General Description for the Verde Wild and Scenic River

The Verde Wild and Scenic River was designated by the Arizona Wilderness Act of 1984 (Public Law 98-406, on August 28, 1984). Beginning at the most southern point of the Forest, the confluence of the Verde River and Fossil Creek, the Wild and Scenic River stretches northward approximately 22 miles to a parcel of private land south of Camp Verde. The Wild and Scenic River designation applies to both sides of the river and generally totals one-half mile wide (one quarter mile on each side of the river). The area overlaps with a portion of the Mazatzal Wilderness.

The desired conditions for this area are in addition to those described for the Verde Landscape Character Zones.

Desired Conditions for the Verde Wild and Scenic River

The Verde River has outstandingly remarkable scenic values. The scenic qualities of landform, vegetation, and water within the Verde Wild and Scenic River (VWSR) are distinctive. Landform varies from steep, rocky canyons framing the river to plateaus dropping to wide flood plains, with the river as a central feature. Vegetation varies according to terrain, from broad mesquite bosques and cottonwood gallery forests to narrow bands of riparian willows, in contrast to the surrounding dry grassland and desert vegetation, including barrel cactus. Scenic qualities of the perennial Verde River change dramatically with the seasons and with changes in river flow. Dramatic fall color contrasts with summer greenery. Water flow changes from shallow, still pools and slow water, to high flow, seasonal rapids, and waterfalls. Recreationists view the river corridor from the high edges of plateaus and canyons, from within the floodplain, from the riverbank, and from the surface of the river itself. The VWSR area is visually sensitive due to the combination of high viewer expectations, generally long duration of view, and high amount of detail visible to the viewer. The river corridor is characterized in many locations by open, expansive vistas viewed from numerous locations.

The VWSR offers exceptional river-related recreation opportunities that emphasize non-motorized recreation. Recreation activities occur at appropriate locations and intensities such that ORVs are protected and enhanced. Recreation opportunities and activities are primarily nature based and offer outstanding opportunities for experiencing scenic beauty and the intrinsic cultural and natural resources associated with the river. The high demand for both camping and day use of the VWSR is balanced with the maintenance of outstanding opportunities for primitive recreation and solitude. Facilities and management emphasize recreation opportunities for individuals, families, and small groups. Both day use and camping recreation opportunities are offered, within a predominantly undeveloped river setting. Beasley Flat and Childs areas are managed for higher levels of visitation and to provide river access while meeting the demands of intensive day-use

²⁷ The section for the Verde Wild and Scenic River comes from the Comprehensive River Management Plan.

recreation activities in the river's floodplain. Recreation facility operation, maintenance, enforcement, and management presence are consistent with desired resource conditions for Outstandingly Remarkable Values (ORVs). Recreation user conflicts are minimal. Except for the developed areas of Childs and Beasley Flat, the VWSR is managed for a predominantly uncrowded setting. The character of recreation settings is identified and managed through the Recreation Opportunity Spectrum (ROS). Recreation use activities and capacities are established for commercial and non-commercial uses consistent with ORVs and ROS/WOS (Wilderness Opportunity Spectrum) classifications.

Visitors have opportunities for primitive recreation, solitude, physical and mental challenge and inspiration consistent with preservation of the wilderness resource. Natural processes operate freely.

Roads and trails provide access within the VWSR consistent with protection and enhancement of scenic, cultural/historic, wildlife, and fish outstandingly remarkable values, and protection of soil and water quality. The transportation system supports interpretation, recreation, and resource management activities.

The river exists in a free-flowing condition with a range of flows that provide optimum conditions for native fish and wildlife and scenic quality. Healthy and diverse stands of riparian vegetation thrive along the banks and flood plain, reflecting the potential of the river's habitats and maintaining the channel at a higher level of stability. Recovery of channel and habitat conditions following scouring floods is not hindered by management activities within the VWSR corridor. The river corridor provides important consumptive and non-consumptive wildlife use opportunities for visitors. The public is aware of these opportunities as well as species protection requirements. The public is aware of the importance of native fish and releases listed species when caught. Aquatic habitat is maintained in a condition with low substrate embeddedness, abundant aquatic food supply, and stable streambanks (See Riparian Vegetation Types for more desired conditions).

Standards for the Verde Wild and Scenic River

The remainder of the management standards are identified in the Verde Wild and Scenic River Comprehensive River Management Plan as "Standards and Guidelines"(CRMP, 2004). Included in the CRMP is unique direction for the Verde Wild and Scenic River along with other management direction that is duplicated elsewhere in the plan but was highlighted for the CRMP as a matter of emphasis. In addition, the CRMP has some site-specific direction not suitable for the plan, such as project-specific trail and road obliteration.

Management Approaches for the Verde Wild and Scenic River

Coordinate with the Arizona Department of Environmental Quality to monitor and achieve acceptable total maximum daily loads (TMDLs) for turbidity in the Verde River.

Fossil Creek Wild and Scenic River

Direction for the Fossil Creek Wild and Scenic River is being completed along with its Comprehensive River Management Plan (CRMP) under a separate decision. Depending on the order of the decisions, the CRMP will either amend the existing plan and be carried forward as is into the revised plan as-is or it will amend the revised plan.

National Trails and Scenic Byways

Arizona National Scenic Trail

General Description for Arizona National Scenic Trail

The Arizona National Scenic Trail is a scenic, non-motorized trail that stretches for approximately 807 miles through some of the most renowned mountains, canyon, deserts, and forests in the State of Arizona. It is the longest continuous land-based trail in the State and showcases a wide variety of scenic views for a multitude of outdoor enthusiasts, including hikers, equestrians, mountain bicyclists, cross-country skiers, nature enthusiasts, and other nonmotorized recreationists. The Arizona National Scenic Trail begins at the Coronado National Memorial near the border between the U.S. and Mexico, extends to the higher elevations of northern Arizona, and continues across the Coconino Plateau to the Grand Canyon²⁸.

Desired Conditions for Arizona National Scenic Trail

The Arizona National Scenic Trail provides opportunities for long-distance non-motorized recreation, such as hiking, equestrians and mountain biking. Roads and motorized trails are not present except at designated crossings. Development levels and levels of use will vary by location, but the Trail will emphasize a semi-primitive recreation experience in a predominantly natural or natural-appearing landscape. Where infrastructure and facilities impact the scenic integrity along the trail, mitigation is applied appropriately. Recreation does not negatively impact cultural and natural resources, or scenic integrity. Nearby developed sites, trailheads and recreation facilities, particularly drinking water sources, are signed to help long-distance travelers navigate.

Management Approaches for Arizona National Scenic Trail

Work with adjacent landowners and Arizona Trail Stewards to maintain the trail corridor and the condition and character of the surrounding landscape.

General Crook National Recreation Trail

General Description for General Crook National Recreation Trail

When American settlers first began homesteading in Arizona, the Army established outposts at Fort McDowell, Fort Verde, Camp Reno, Fort Apache, and Camp San Carlos. General George Crook, who was the head of the military department, established a supply route along the Mogollon Rim. This route became one of the first major roads in Arizona, and for decades was used as a supply and communications route, as well as a patrol route for monitoring the western Apache. Today, the original blazes can still be seen on the ponderosa pines lining the trail, as well as occasional traces of homesteads. The trail is multi-use and popular with equestrians and mountain bikers as well as hikers. The trail is 114 miles long, from Fort Verde to west of Cottonwood Wash²⁹.

²⁸ SB: 1304: Arizona National Scenic Trail Act.

²⁹ Source: <http://www.publiclands.org/explore/site.php?id=967>

The General Crook Trail has been designated as a National Recreation Trail and is being studied for nomination as a National Historic Trail. The trail, also known as the Crook Road, was developed along the Mogollon Rim as a way of quickly moving troops between Fort Whipple, Fort Verde, and Fort Apache during the Apache Wars period of the 1870's and 1880's. The road was engineered by General Crook, likely following earlier Indian trails. A "V" and a number indicating the miles from Fort Verde was cut into rocks or trees each mile along the road. Most of these are now gone, but the "V-13" still can be seen at 13 Mile Rock. White and yellow chevrons now mark the route of the National Recreation Trail, which generally follows the historic route. The Trail is eligible as a National Historic Trail pending completion of a approved Trail Study.

Desired Conditions for General Crook National Recreation Trail

The historic route and associated values are preserved. Foot and horse travel are the emphasized recreation activities on the Trail. Adequate signing is provided to advise publics of motorized restrictions. The needs of the disabled and those with limited mobility are considered in developing access facilities for the Trail. Recreational facilities for the Trail are related to significant interpretive and recreation points of interest on or adjacent to the Trail. Interpretation of the trail is consistent across landownership and Forest Service administrative boundaries.

Standards for General Crook National Recreation Trail

Protect General Crook National Recreation Trail chevrons and route markers and historic mile post markers.

Management Approaches General Crook National Recreation Trail

Manage the 138-mile trail General Crook Trail corridor on National Forest Land from Fort Whipple to Fort Apache and associated historic sites and side trails for potential Congressional designation as a National Historic Trail.

Develop one representative visual logo for the entire Trail with adjacent Forests and local entities.

Wilson Mountain National Recreation Trail

General Description for Wilson Mountain National Recreation Trail

This trail is a strenuous 5.6 miles to the top of Wilson Mountain. It provides some of the most panoramic views in the Oak Creek Canyon/Sedona area. There is no unique direction for this trail.

All Byways

Desired Conditions for All Byways

Along scenic byways visitors find occasional developed recreation sites that provide desired amenities (restrooms, picnic tables, etc.). These facilities are mostly in character with the National Forest System setting. Occasionally, visitors see small historic sites—these areas are positive scenic elements, providing a glimpse of times past.

Management Approach for All Byways

Work closely with ADOT and local communities to promote and improve services and interpretive opportunities on the byways.

Historic Route 66 All American Road

General Description for Historic Route 66 All American Road

Historic Route 66 All American Road—or Route 66—is known as “The Mother Road” as it heralded the development of the U.S. highway system. With its history starting with Indian trails across the country, it developed over the years into the first national highway linking Chicago and Los Angeles. Its route was pioneered along the 35th Parallel with the engineering explorations of Lt. Edward Fitzgerald Beale in 1857 to 1859. He later directed the construction of the Beale Road, which opened up the western frontier for settlers, ranchers, and the military. When the transcontinental railroad began in the 1880’s, its route followed the Beale Road and encouraged the growth of towns and the commercial development of the west. The main period of significance for Route 66 began with its construction in 1920 until 1944, when the Federal Highway Act was passed. “The Main Street of America,” as it came to be known, would be replaced in 1956 with the construction of Interstate 40.

Route 66 occupies a special place in American popular culture and history. It represents freedom, mobility, and adventure. No where is that more prevalent than the open lands of northern Arizona along Route 66. The Mother Road, Main Street USA, Get Your Kicks on Route 66 are all synonymous with the wonderful resource. Unfortunately, the actual conditions of the remaining route and its former attractions is less than desirable and is the driving force behind efforts of communities along the byway to save what remains (AZDOT 2005). There are short segments of the official byway crossing the Coconino NF and many parallel routes that were formerly part of the Mother Road.

Desired Conditions for Historic Route 66 All American Road

Arizona Historic Route 66 All-American Road is preserved and promoted in a manner that protects its intrinsic qualities; and enhances visitors' appreciation of the scenic, natural, recreational, cultural, historical, and archaeological resources of the corridor. The highway serves as a vital link between the communities along the route and provides a direct connection to the diverse historic and cultural visitor opportunities within northern Arizona.

Historic alignments of Route 66 are interpreted and their locations are made available to the public. Interpretation of these alignments emphasizes the history of highway development and the changing uses across the Forest that are associated with the time period that the alignment was part of Route 66.

Guidelines for Historic Route 66 All American Road

Signage and facilities on Route 66 should incorporate elements of historic roadside architecture, including but not limited to elements of the cultural landscape from nearby communities or historic Forest Service design.

Activities along the byway should be consistent with direction in the Arizona Historic Route 66 Corridor Management Plan to ensure consistency with other jurisdictions.

Management Approaches for Historic Route 66 All American Road

Partner with the Route 66 Scenic Byway Association to coordinate activities and design of byway facilities.

Red Rock All American Road

General Description for Red Rock All American Road

The 7.5-mile Red Rock All-American Road, from Milepost (MP) 302.5 to MP 310.0 on State Highway 179, is the gateway to the Red Rock Landscape Character Zone and the Sedona-Oak Creek Management Area. The major buttes and scenic attractions that characterize the area are visible along the road. The Forest Service manages the majority of the viewshed, with the exceptions of the Village of Oak Creek and Sedona.

Desired Conditions for Red Rock All American Road

The Red Rock All-American Road is preserved and promoted in a manner that protects its intrinsic qualities and enhances visitors' appreciation of the scenic, natural, recreational, cultural, historical, and archaeological resources of the corridor. Views of prominent red rock formations such as Bell Rock, Courthouse Rock, and Cathedral Rock are unobstructed from the byway. Scenic pull-outs are provided along the byway with safe vistas for photography and scenery viewing and provide facilities such as restrooms and interpretive signs. Travel routes along the byway accommodate bicycle and pedestrians safely and connect them to the urban trail system. Wildlife crossings reduce the risk of wildlife mortality. Alternative transportation is provided to increase the sustainability of tourism on the byway.

Guidelines for Red Rock All American Road

Activities along the byway should be consistent with direction in the Red Rock Scenic Road Corridor Management Plan to ensure consistency with other jurisdictions.

Experimental Forests

The Fort Valley and Long Valley Experimental Forests are managed by the Rocky Mountain Research Station (RMRS) not by the Coconino NF. Therefore, direction in this plan does not apply to these areas unless they are returned to the National Forest System by RMRS.

Research Natural Areas/Botanical and Geological Areas

General Description for Research Natural Areas/Botanical and Geological Areas

Research natural areas (RNAs) and botanical and geological areas are designated to ensure protection of specific biological and geological communities. Research natural areas are experimental controls for a particular vegetation type, and botanical and geological areas are designated for a special feature such as a rare plant or exemplary geological formation. There are four existing RNAs on the Coconino NF: Casner Canyon, G.A. Pearson, Oak Creek, and San

Francisco Peaks. The G.A. Pearson is within the Fort Valley Experimental Forest and therefore is not managed by this plan. Oak Creek and the San Francisco Peaks RNAs are within designated wilderness. The draft revised plan is proposing three new RNA's: West Clear Creek, Rocky Gulch, and an expansion of the San Francisco Peak RNA. West Clear Creek and the expansion of the San Francisco Peaks are within existing wilderness areas. Direction for RNAs (listed below) should be applied to both proposed and established RNAs.

There are four botanical areas, Verde Valley, Mogollon Rim, Fossil Springs and Fern Mountain, and one geological area, Red Mountain.

Desired Conditions for Research Natural Areas and Botanical and Geological Areas

Research Natural Areas

Research natural areas have excellent examples of the ecological features for which they were designated, with little evidence of human activity or disturbance. Casner Canyon RNA is managed to protect retains the ecological integrity of a pure stand of Arizona cypress along with Supai sandstone.

The San Francisco Peaks RNA is managed to retain the characteristics of the mixed conifer-alpine tundra transition zone with populations of bristlecone pine.

The Oak Creek RNA protects retains a diversity of vegetation within Oak Creek Canyon.

Rocky Gulch proposed RNA is managed to retain the ecological integrity of old-growth ponderosa pine. It is a control for research in the Beaver Creek Watershed. West Clear Creek proposed RNA retains the riparian communities in a steep canyon setting as well as hanging gardens and springs.

Visitor access and use occurs at environmentally acceptable levels to maintain the research values of the RNA. Dispersed recreation within RNA is discouraged. Special use permits within these areas are inappropriate unless they are related to research for which the area is designated.

Fire management mimics natural fire processes and is compatible with ongoing research.

Botanical Areas

Botanical areas priority desired condition is to protect the plants and plant communities for which they are designated. Plants and plant communities for which the area was designated within these areas are resilient and are not negatively impacted from human activities. Non-motorized recreation is allowed on a limited basis on designated trails to protect soil conditions and hydrologic flow. New trails are discouraged. Mogollon Rim Botanical Area preserves white fir/bigtooth maple community. It represents a unique vegetation type found in Arizona only at a few locations along the Mogollon Rim.

Verde Valley Botanical Area, preserves a unique, limestone-dependent desert community containing Arizona cliffrose (*Purshia subintegra*), which has been greatly reduced by human conversion of its habitat.

Fern Mountain Botanical Area preserves a high elevation riparian scrub community dominated by Bebb's willow.

Fossil Springs Botanical Area preserves a riparian deciduous forest associated with a large perennial spring and travertine geology.

Soil productivity and functions (including the ability of the soil to resist erosion, infiltrate water and, recycle nutrients) are sustained so botanical areas are more resilient and can better adapt to climate change.

Geological Areas

The Red Mountain Geological Area preserves a unique cinder cone whose internal structure is exposed within the San Francisco Peaks volcanic field. The cinder cone rises 1,000 feet above the surrounding landscape. It is unusual in having the shape of a "U," open to the west, and in lacking the symmetrical shape of most cinder cones. In addition, a large natural amphitheater cuts into the cone's northeast flank. Erosional pillars called "hoodoos" decorate the amphitheater, and many dark mineral crystals erode out of its walls (USGS 2007). These asymmetrical cinder cones, amphitheater, erosional pillars or hoodoos, and minerals for which the area was designated, are predominantly undisturbed by administrative or research and recreation activities. Non-motorized recreation within the area allows for access to view the unique geological formations. Cinder slopes are protected from human-caused erosion.

Objectives for Research Natural Areas and Botanical and Geological Areas

Prepare establishment reports for Rocky Gulch Research Natural Area, West Clear Creek Research Natural Area, and eastern expansion of the San Francisco Peaks Research Natural Areas with **XX** years of plan approval.

Maintain all trails within botanical areas every **XX to XX** years to prevent erosion and damage to the areas' hydrology.

Standards for Research Natural Areas and Botanical and Geological Areas

Prohibit overnight camping, and recreation fires should be prohibited in established RNAs.

Prohibit permitted commercial tours except in support of approved research in established RNAs

Guidelines for Research Natural Areas and Botanical and Geological Areas

Recreation should be excluded from RNAs and botanical and geological areas where these uses have a negative impact on the resource for which the area is designated.

Fire should be managed using minimal impact suppression tactics in RNAs and botanical and geological areas.

Non-commercial group size should be limited to 25 persons or fewer in Casner RNA and to 12 persons or fewer without a permit in the West Fork of Oak Creek.

Allotment Management Plans should have provisions to protect the uniqueness and/or ecological condition of the special areas.

Management Approaches for Research Natural Areas and Botanical and Geological Areas

None at this time.

Environmental Study Areas

General Description for Environmental Study Areas

Environmental Study Areas (ESAs) are locations on the Forest that are set aside from development for the purpose of environmental education. Each area has an official school curriculum associated with it and is associated with a specific school.

The Elden ESA is located at the base of Mount Elden, adjacent to the subdivisions of Shadow Mountain, Paradise Hills, Skyline Estates, and Swiss Manor, and adjacent to Buffalo Park. It originally was a bird sanctuary. In addition, the Mount Elden ESA is a popular daytime destination for hiking, dog-walking, mountain-biking, and horse riding. The El Paso natural gas pipeline crosses the area. Old Caves Crater ESA is located north of Silver Saddle Road, east of U.S. Highway 89, and adjacent to Doney Park communities. Griffith's Spring ESA is located south of Flagstaff on Highway 89A, adjacent to the Forest Highlands community and just south of Pine Dell.

Desired Conditions for Environmental Study Areas

Mount Elden ESA

Trails provide for popular hikes that are convenient and easy to use. The area is available for study, and recreation and is integral part of the Flagstaff Public School curriculum. There are many formal access points developed along the edge of subdivisions providing public access. This ESA strengthens the opportunities for partnerships between the school, the Forest Service, and the Arizona Game and Fish Department. A wintering deer herd provides an opportunity for wildlife viewing by the students.

Old Caves Crater ESA

This large volcanic cinder cone has diverse vegetation, provides scenic backdrops to surrounding residents, and contains archaeological sites and cultural values. Teachers at local schools have a curriculum for the area, and students can walk safely from the school to the site. There are trails in the area and high levels of non-motorized daytime dispersed recreation use.

Griffith's Spring ESA

Among a variety of uses, local teachers use the spring and its stream channel as an outdoor classroom. The area is accessible to visitors traveling Highway 89A who stop here for picnics and daytime walks and to nearby residents. There is a stream channel with riparian vegetation and aquatic species. A nearby wet meadow adds additional diversity.³⁰

³⁰ Reference: US Geological Survey. 2007. Fact Sheet 024-02 Red Mountain Volcano – A Spectacular and Unusual Cinder Cone in Northern Arizona. Available online at: <http://pubs.usgs.gov/fs/2002/fs024-02/> Accessed: 12/26/2010

Management Areas of Public Interest

Fort Valley/Mount Elden Management Area

General Description for Fort Valley/Mount Elden Management Area

The Fort Valley/Mount Elden Management Area is on the north side of Flagstaff and south of the San Francisco Peaks. It provides a wide variety of motorized and non-motorized recreation—experiences that can be easily accessed from city parks and the Flagstaff Urban Trail System.

The desired conditions for this area are in addition to those described for the San Francisco Peaks Landscape Character Zones.

Desired Conditions for Fort Valley/Mount Elden Management Area

Dispersed Recreation

The varied topography of Fort Valley/Mount Elden Management Area and the Dry Lake Hills Trail system offers a variety of trail experiences for hikers, mountain bikers, and equestrians. The Dry Lake Hills Trail system provides non-motorized recreation trail opportunities. The trail system is stable and does not increase significant in mileage over time. The base of Mount Elden is primarily used for non-motorized recreation in order to protect deer winter habitat and cultural sites and to provide for high levels of non-motorized recreation. Fort Valley provides a mix of motorized and non-motorized recreation opportunities. In the Fort Valley/Mount Elden Management Area, extensive signing, brochures, and patrols allows visitors to easily find trails and facilities. This area receives a great deal of day-use recreation, primarily due to the close proximity to Flagstaff. Throughout this area “hub” trailheads provide access to a variety of motorized and non-motorized trails to control access and provide interpretive materials to the most visitors possible.

Objectives for Fort Valley/Mount Elden Management Area

Dispersed Recreation

Develop a system of designated non-motorized dispersed camping sites in the Mount Elden/Dry Lake Hills area within XX years of plan approval.

Guidelines for Fort Valley/Mount Elden Management Area

Dispersed Recreation

Maintain the Waterline Road as a high traffic non-motorized recreation corridor.

Flagstaff Neighborwoods Management Area

General Description for Flagstaff Neighborwoods Management Area

The Flagstaff Neighborwoods was known as the Urban-Rural Interface under the previous plan. It is the area that surrounds Flagstaff and provide a great deal of recreation and access for the community.

For scenery desired conditions, see the Sedona and Flagstaff Neighborwoods Landscape Character Description.

Desired Conditions for Flagstaff Neighborwoods Management Area

Dispersed Recreation

Recreation opportunities near Flagstaff emphasize day and overnight-dispersed recreation opportunities with few developed facilities, except in established developed campgrounds. Elden Pueblo public program continues to provide one-on-one, hands-on, experiential archaeology for school children and the public in partnership with the Flagstaff School System, the Arizona Natural History Association, the Arizona Archaeological Society, and the Museum of Northern Arizona. Trails are accessed through strategic located access points with an interconnected trail system. The NFS trail system connects to the Flagstaff Urban Trail system to provide continuous access to urban recreation opportunities. Many trails in this area provide easy to moderate recreation opportunities with well-defined trails and clear signing for easy way-finding.

Along Woody Ridge, there are large tracts of unfragmented habitat and backcountry recreation opportunities. Remote characteristics are maintained as new residential development occurs on the west side of Flagstaff. Woody Ridge has semi-primitive non-motorized recreation opportunities that are compatible with walk-in hunting.

Motorized Recreation

Where, possible, pass-through corridors for vehicles, off-highway vehicles (OHVs) and motorcycles, lead to separate motorized trails or to secondary forest system roads.

Scenery

Natural landscape is highly valued by local residents and visitors. National Forest System lands provide the backdrop for the community's character while accommodating features that are more typical of an urban or rural setting. Infrastructure and developments that serve a broad public interest are sometimes evident but still subordinate to the landscape. Recreation developments contribute to the area's unique sense of place through use of native materials; mimicking line, form, color, and texture of the surrounding landscape; or use of identifiable Forest Service symbols and historic features.

Objectives for Flagstaff Neighborwoods Management Area

Dispersed Recreation

Create **XX** additional connections with the Flagstaff Urban Trail System, Flagstaff Loop Trail, and Coconino County trails within 10 years of plan approval.

Complete construction of Coconino NF portions of Flagstaff Loop Trail within **XX** years of plan approval.

Sedona/Oak Creek Management Area (Amendment 12 in the 1986 plan)

General Description for Sedona/Oak Creek Management Area

The Sedona/Oak Creek Management Area lies within Coconino and Yavapai Counties in Arizona. This management area encompasses all of red rock country, Oak Creek Canyon, and the

communities of Sedona and the Villages of Oak Creek. A variety of vegetation types can be found within the Sedona/Oak Creek Management Area, including riparian, grassland, forest, and desert vegetation types.

The red rocks for which this management area is named include a variety of monumental buttes, soaring multi-hued cliffs, fantastic towering spires, and rugged canyons. Unified by Oak Creek, the vital riparian link between the Mogollon Rim and the Verde Valley, the landscape is a museum of life, a living crossroads connecting people in time and space.

This management area has a long history of human habitation and a remarkable natural environment rich with plants and wildlife. Unique features within this management area include: Oak Creek Canyon; Red Rock Secret Mountain and Munds Mountain Wilderness areas; Palatki, Honanki, and V-V Heritage Sites; Crescent Moon Ranch Cabin; hundreds of miles of recreation trails; the Red Rock All-American Road and Sedona-Oak Creek Scenic Byway; and the Wilson Mountain National Recreation Trail.

The desired conditions for this area are in addition to those described for the Red Rock, Ponderosa Pine, and Verde Valley Landscape Character Zones.

Desired Conditions for Sedona/Oak Creek Management Area

Developed Recreation

Day-use activities are emphasized across the management area, with a few campgrounds in the Oak Creek Canyon area. Facilities serve large numbers of people at main vista/trail access points, while conserving the natural environment and providing views of outstanding scenery, in an atmosphere where the natural environment prevails and opportunities exist for quiet and contemplation.

Dispersed Recreation

A variety of self-directed, day-use activities which emphasize hiking, scenic viewing, and learning about the natural and cultural history of the Sedona/Oak Creek ecosystem are encouraged. National forest camping continues to be an important recreation experience. There is a range of nature-based recreation opportunities that provide a wide array of benefits by meeting people's needs and preferences while sustaining the Sedona/Oak Creek ecosystem. High-quality opportunities are provided and maintained for people to enjoy the red rock's many scenic and aesthetic qualities. Recreation opportunities are primarily nature based, and they exist for individuals, families, or small groups. There are opportunities for experiencing solitude, scenic beauty, and natural quiet. Both short and long visits are available.

Appropriate degrees of natural quiet are restored and maintained. Visitors have access to high-quality trail experiences. Recognize the strong demand for inspirational and contemplative benefits in the natural landscape and provide settings that contribute to these benefits. Some recreation sites receive high levels of visitation and meet the demands of day-use activities, emphasizing scenic viewing, hiking, and experiencing and learning about the natural environment and cultural resources. Most places provide an uncrowded setting. Roving and guided interpretive activities are available in areas of high visitor use. Interpretation enhances the short-duration day-use experience with emphasis on natural history.

Many trails in this area provide easy to moderate recreation opportunities with well-defined trails and clear signing for easy way-finding.

Most national forest visitor activities occur at developed sites and on trails designed for high levels of use. Recreation site fees are maintained at an affordable level for families to access recreation opportunities in the Sedona and Oak Creek Canyon areas. Unneeded non-system trails are discouraged. Trails that duplicate system trails or cause damage, such as erosion or plant loss are rehabilitated. Methods of creating and maintaining user-friendly trails include: providing well-defined trails that encourage people to stay on designated routes, providing orientation maps, designing trails that provide a reasonable degree of access, and having trail markers and defining trail edges. A network of primarily non-motorized trails provides diverse opportunities for hikers, OHV recreationists, mountain bikers and equestrians while helping protect fragile natural resources and community relationships. Non-motorized trails provide access to the landscape for the community, including people with disabilities.

In the Dry Creek Basin area, a variety of non-guided, day-use recreational activities, featuring high-quality hiking, mountain biking, equestrian use, scenic viewing, contemplation and opportunities to experience nature and solitude are available. Non-motorized trail opportunities are available, providing a variety of challenge levels with emphasis on moderate to difficult access levels as defined in ROS accessibility guidelines.

Outstanding interpretive opportunities increase understanding of and appreciation for the management area with emphasis on geology and natural history. Provide opportunities for contemplative reflection and scenic vistas, and provide access for older people and people with disabilities seeking opportunities for regenerative reflection.

Dispersed camping is limited to locations that protect resources, provide neighborhood security, and protect the national forest visitor's quality of experience.

Information directs visitors to places that can sustain visitor use.

Opportunities for wildlife viewing are available.

Although the ROS objectives at Palatki and Honanki are the same as those of the surrounding management area, the maximum desired number of encounters is three to four groups per hour because of the lower capacity of these sites to handle visitation without damage to cultural values.

A high level of interpretation and personal contact is provided at cultural interpretive sites. On-site personnel and interpretation provides opportunities for: interactive learning through protection, documentation, and restorative stabilization projects at archaeological sites; appropriate access to site etiquette information; appreciation of archaeological conservation, native cultures, and history; and visitor education about prehistoric and historic cultural sites' archaeology and historic resources that fully protects those resources. Full-time hosts are located at significant cultural interpretive sites.

Lands Special Uses

Facilities that provide access to or occur near the cliffs remain visually subordinate to the cliffs and to the surrounding landscape. Views of the cliffs from the travel corridors are enhanced or maintained through various means such as: limiting the use of intervening areas for parking,

camping and/or utilities, limiting motor vehicle traffic between access corridors and the cliffs, or acquisition of intervening private properties with emphasis on undeveloped parcels.

Motorized Recreation

A network of roads at various challenge levels is available for off-highway vehicle touring. Most motorized recreation opportunities are within the House Mountain-Lowlands Management Area and the Schnebly Rim Management Area, although opportunities may be available in other management areas. Recreation in Neighborwoods, Oak Creek Canyon, Transition, and Red Rock areas is largely non-motorized, except for Casner Powerline Road, Broken Arrow and Soldier Pass.

Allow four-wheel-drive use along the Casner Powerline access road through a special use permit system consistent with ROS goals for the Transition Management Area and adjacent Wilderness Management Area, wildlife objectives, soil protection, and where such use does not interfere with APS powerline access needs.

Road maintenance and road improvement activities are limited in order to conserve Semi-primitive Motorized ROS characteristics. Road maintenance is consistent with management area direction/ROS objectives.

Recreation Special Uses

New outfitter-guide permits are issued for activities that have demonstrated public need, promote transportation services or public safety, or substantially increase protection of cultural or natural resources.

Commercial tours emphasize opportunities to experience scenic beauty, natural quiet, and contemplative reflection. Activities that vary from this condition, such as motorized tours, do not impact the ability of other Forest users to have these experiences.

Recreation events emphasize nature-based activities and education. Proponents are encouraged to stage large events off-forest and hold only smaller group activities on the national forest lands.

Facilities

Facility design and location retains and enhances the visitor's sense of arrival at a special place.

Roads

Opportunities are provided for motorists to stop along main roads to view the spectacular scenery and experience the red rock country. Visitors see a landscape characterized by uncluttered panoramic vistas of scenic features. The sight of other roads is rare to the traveler.

Road densities, conditions, and locations within the Oak Creek watershed reduce impacts on the floodplain, peak flows, and sediment routing.

Some forest roads are in a rough condition that keeps the challenging and narrow character of the roadway but allows access by the careful driver in a standard low clearance vehicle.

Schnebly Hill Road maintains its semi-primitive character with an unpaved surface to promote slow to moderate vehicle speeds and the desired recreation character. Minimum standards for

Schnebly Hill Road's width, horizontal and vertical alignment, vegetation clearing, ditch definition, and surfacing are maintained. Improvements to Schnebly Hill Road as an alternative commuter route between Interstate 17 and Sedona are discouraged in order to maintain a more primitive roadway and recreational experience. The character of development and use remains low-key, unhurried, and rustic; vehicle traffic speed is consistent with this character.

Ecological

The biological, physical, and human elements of the landscape sustain ecological processes, functions, and structures within a natural range of variability and conditions appropriate to the Sedona/Oak Creek ecosystem. Natural ecosystem disturbance patterns are conserved or restored consistent with human health and safety.

Objectives for Sedona/Oak Creek Management Area

Dispersed Recreation

Develop Schnebly Hill Vista as a viewpoint, interpretive site, and possibly a trailhead within 10 years of plan approval

Standards for Sedona/Oak Creek Management Area

Lands Special Uses

Prohibit plant collection for commercial activities within the Sedona-Oak Creek Management Area outside of the House Mountain-Lowlands Management Area, except for the legitimate purposes of federally-recognized tribes.

Motorized Recreation

Allow four-wheel-drive use along the Casner Powerline access road through a special use permit system consistent with ROS goals for the Transition Management Area and adjacent Wilderness Management Area, wildlife objectives, soil protection, and where such use does not interfere with APS powerline access needs.

Recreation Special Uses

Do not permit commercial tours on the Casner Powerline Road.

Do not permit new outfitter/guide permits in areas that are at or approaching capacity.

Guidelines for Sedona/Oak Creek Management Area

Dispersed Recreation

Sensitive plant populations should be protected by placing trails and trailheads out of sight of sensitive plants, such as Verde Valley sage and Delmaters agave.

Motorized Recreation

A consistent design style should be used for interpretive and information signs and kiosks but also allow for individual site distinctiveness.

Vehicle crossings of Dry Creek should be prohibited unless appropriate water quality protection measures can be implemented.

Vehicular access to Oak Creek should be restricted by measures such as vehicle barriers.

Roads should be maintained at the lowest standard possible consistent with safety and the desired recreation experience.

Recreation Special Uses

Any statewide special use permits for the Sedona/Oak Creek Area should be issued by the Red Rock Ranger District. This will ensure compatibility with plan direction and appropriateness of the activity for the sensitive Sedona/Oak Creek Area.

Lands Special Uses

Commercial filming using aircraft should not be allowed in the Sedona-Oak Creek MA except within the House Mountain-Lowlands MA.

Roads

In areas where motorized recreation is emphasized (particularly Semi-Primitive motorized), roads should be maintained in the lowest standard possible consistent with safety and the desired primitive recreation experience.

Miles of road should be reduced, where feasible, to the minimum roads required for public access and management and remaining roads should be located so that, except for road junctions, the sight of other roads is rare to the traveler.

In areas where motorized recreation is emphasized, roads should be maintained in the lowest standard possible consistent with safety and the desired primitive recreation experience.

Scenic parkway characteristics should be maintained, including roadway features such as signs, guardrails, and landscaping, that contribute to the desired scenic character.

Parking and access areas should be strategically located to minimize disturbance and visual clutter associated with signing, parking areas and trailheads.

Lands Adjustment

For Land Adjustment Guidelines for the Sedona/Oak Creek MA See Forestwide direction on page XX.

Management Approaches for Sedona/Oak Creek Management Area

Recreation Special Uses

Develop partnerships with outfitter-guides for Schnebly Hill Road and other roads and facilities that receive high use by commercial tour activities for the purpose of maintaining and protecting resources in these areas.

Provide a commercial guide training program. Such training should focus on national forest goals and regulations, Leave-No-Trace etiquette, and natural and cultural history. Training should occur annually or when new guides are hired. Collaborate with guides, where possible, to develop and implement the training program.

Work with local and regional governments and road agencies to develop transportation solutions that reduce traffic and vehicle impacts at high impact recreation areas on the Forest.

Collaborate with Federal Aviation Administration (FAA), Sedona Airport Administration, and air tour operators to minimize aircraft effects on threatened, endangered, or sensitive animal species. Special flight rules should be in place, particularly over suitable peregrine falcon nesting habitat and big game winter.

Roads

Develop partnerships with commercial tours for maintaining the Schnebly Hill Road and other roads and adjacent facilities used for commercial tour activities.

Dispersed Recreation

Collaborate with State Parks to better meet visitor needs and protect resources in the vicinity of Slide Rock State Park, Deadhorse State Park, and Red Rock State Park.

Oak Creek Canyon Management Area

General Description for Oak Creek Canyon Management Area

The Oak Creek Canyon Management Area is a sub-management area of the Sedona-Oak Creek Management Area. In addition to the direction for the Sedona-Oak Creek Management Area, the direction in this section applies.

The Sedona area was settled by several families in the late 1870's to 1880's. Travel at that time was limited to horse trails. The first wagon road in Oak Creek Canyon was built along Oak Creek below Indian Gardens by pioneer Jim Thompson between 1876 and 1887. By 1930 the highway through Oak Creek Canyon was completed to provide easy transportation for campers, tourists, and fisherman lured by the trout stocked into Oak Creek. This stretch of Highway 89A was formally designated as a Scenic Byway by the Arizona Department of Transportation on Aug. 24, 1984. The desired conditions for this area are in addition to those described for the Red Rock and Ponderosa Pine Landscape Character Zones.

Desired Conditions for Oak Creek Canyon Management Area

Oak Creek Canyon is an area of contrasting recreation settings, ranging from heavily used highway to highly developed recreation sites and resorts to primitive trails. Visitation at Oak Creek Vista is primarily for short-duration, emphasizing interpretation and orientation to Oak Creek Canyon and the red rock country. Developed day-use areas and camping are present along Oak Creek Canyon. Recreation sites along Oak Creek are managed to protect soil condition and riparian vegetation and maintain water quality. Damaged sites are restored to meet the above desired condition.

Trails in Oak Creek Canyon allow for creek access while protecting the riparian community, wildlife habitat and sensitive plants. Opportunities for interpretive trails and walking exist. Historic trails that access the rim of Oak Creek Canyon, such as Telephone, Purtyman, Harding Springs, Cookstove, Thomas Point, Thompson Ladder, and Casner trails, are maintained even though parking may be limited for resource protection.

Development and parking in Oak Creek Canyon is limited to minimize resource impacts. Private vehicle traffic and parking are minimized, while also considering scenic quality and safety. Alternative modes of transportation that reduce automobile dependency and traffic congestion are encouraged. The level of private recreation traffic in the Canyon is consistent with a high-quality recreation experience.

Campfire smoke in Oak Creek Canyon is minimal to protect habitat conditions for bats, birds, and other wildlife species and to improve air quality. The contribution of recreation users to air pollution (visibility and particulate matter) in Oak Creek Canyon is limited through such methods as requiring campers to burn only dry wood, prohibiting wood gathering and prohibiting campfires at certain times.

Road and trail rehabilitation work are focused in the steep drainages, such as Pumphouse Wash, that flow into Oak Creek Canyon and contain fragile plants and rare species. Trails and recreation use are located and managed to reduce impacts of woody riparian vegetation and riparian habitat in Pumphouse Wash.

Research, educational research, and educational activities is consistent with resource protection and recreation experience goals. Forest products are removed from the Sedona/Oak Creek MA for commercial only when authorized by permit and collected in designated areas.

Guidelines for Oak Creek Canyon Management Area

Methods such as placing toilets in strategic locations, providing information about proper sanitation practices, installing shower and hand-washing facilities, and providing gray-water disposal sites should be used to reduce recreation impacts on water quality.

Camping and recreation fires should be prohibited except in designated sites.

Management Approaches for Oak Creek Canyon Management Area

Work with ADOT to block off unsafe parking adjacent to the road and to maintain a high standard of scenic quality in signing.

House Mountain-Lowlands Management Area

General Description for House-Mountain Lowlands Management Area

The House Mountain-Lowlands Management Area is a sub-management area of the Sedona-Oak Creek MA. In the 1986 plan, the area was called the Savannah Management Area. All direction for the Sedona-Oak Creek Management Area applies to the House Mountain-Lowlands Management Area with the exception of the following:

- Desired Condition: Commercial filming using aircraft is limited in all management areas except the House Mountain-Lowlands Management Area.
- Standard: Prohibit plant collection for commercial activities within the Sedona-Oak Creek Management Area outside of the House Mountain-Lowlands Management Area, except for the legitimate purposes of federally-recognized tribes.

In addition to the roads direction for Sedona-Oak Creek Management Area, the desired conditions and guidelines below apply to the House Mountain-Lowlands Management Area.

The desired conditions for this area are in addition to those described for the Verde Valley Landscape Character Zone.

Desired Conditions for House Mountain-Lowlands Management Area

Roads and Facilities

There are few roads in the House Mountain Management Area. Existing roads are primitive, with only native surfacing and no road prism development. Facilities are few and the character of development is rustic and primitive.

Guidelines Standards for House Mountain-Lowlands Management Area

Roads

Locate roads to maintain adequate cover for animal shelter and foraging between roads, especially in locations with high road densities.

Use only native surfacing and do not use road prism development for lateral roads (off of main access roads) unless increased use and development of private property require improvement for resource protection.

Sedona Neighborwoods Management Area

General Description for Sedona Neighborwoods Management Area

This management area is "Sedona's Backyard." It is next to many residential areas, urbanized sections of Sedona and the Village of Oak Creek, sections of State Highways 170 and 89A and a several-mile stretch of Oak Creek south of Sedona. The boundaries of Red Rock-Secret Mountain Wilderness from Capitol Butte to Steamboat Rock are the area's northern perimeter. This area is heavily used by visitors and residents, who cherish the natural landscape so close to Sedona and frequently use the honeycomb of trails.

For scenery desired conditions, see the Sedona and Flagstaff Neighborwoods Landscape Character Description.

Desired Conditions for Sedona Neighborwoods Management Area

Dispersed Recreation

Relatively quiet, easily accessed national forest supports wildlife, scenic viewing, and experiencing nature. A system of trails and pathways surrounds the City of Sedona and the Village of Oak Creek and provides trail recreation opportunities and a means of non-motorized travel off busy streets. Damaged recreation sites are restored, with priority given to sites adjacent to Sedona and the Village of Oak Creek. Local neighborhood concerns about the impacts of visitor use on residential quality of life are address by a variety of methods, including night-time closures, improving signs, and limiting motorized access and the number of visitors. Volunteer partnerships have high resident participation and provide opportunities for exciting stewardship with a strong learning component.

Recreation Special Uses

Special use activities that access NFS land through neighborhoods address resident concerns for safety and minimize disturbance. Mitigations are identified in the authorized operating plans.

Scenery

Natural landscape is highly valued by local residents and visitors. National Forest System lands provide the backdrop for the community's character while accommodating features that are more typical of an urban or rural setting. Infrastructure and developments that serve a broad public interest are sometimes evident but still subordinate to the landscape. Recreation developments contribute to the area's unique sense of place through use of native materials; mimicking line, form, color, and texture of the surrounding landscape; or use of identifiable Forest Service symbols and historic features.

Guidelines for Sedona Neighborwoods Management Area

Dispersed Recreation

Access at neighborhood national forest trailheads should be managed to discourage visitor parking along residential streets and to encourage alternative forms of transportation.

Management Approaches for Sedona Neighborwoods Management Area

Strong community partnerships for stewardship of "Sedona's backyard" support resident health, safety, and quality of life.

Dispersed Recreation

Collaborate with the AZGFD to educate residents about urban wildlife, such as deer, snakes, raccoon, skunk, and coyotes. Special hunting and shooting regulations should be developed collaboratively with the AZGFD, the Yavapai and Coconino County Sheriffs, and the City of Sedona Police Department.

Use the Redrock Trails Plan and the Sedona Urban Trails and Pathways Plan as guides for future trail planning efforts. (Refer to map 6 in the Redrock Trails Plan)

Expand partnerships with neighborhoods to promote trail and resource stewardship and to obtain assistance in trail maintenance and planned trail construction.

Recreation Special Uses

Work with commercial operators, filming groups, and homeowners to resolve safety and quality of life conflicts such as concerns about noise, safety, and facilities maintenance needs.

Walnut Canyon Management Area

General Description for Walnut Canyon Management Area

Walnut Canyon dominates this Management Area, running from the end of Lower Lake Mary to Fisher Point and turning east towards Winona. The scenery is spectacular. Cultural sites are numerous, and the canyon holds religious value for American Indian tribes. The steepest section of the canyon with the most archaeological sites is located within Walnut Canyon National

Monument. The canyon itself supports a multitude of vegetation types and habitats from steep north facing mixed conifer, to riparian vegetation at the canyon bottom. Disturbance-sensitive wildlife species occur in secluded portions of the canyon and along the canyon rim. Lands outside of the canyon are ponderosa pine with Gambel oak understory and some piñon and juniper. There are national forest system trails, including the Arizona National Scenic Trail, in the canyon itself and along the rim. Fisher Point is a popular destination for hikers, mountain bikers, and outfitter/guided horse trips. Canyon Vista is popular for climbing. North and west of Walnut Canyon, the area provides dispersed recreation opportunities and receives heavy use adjacent to private land and the Lake Mary Road. Activities include hiking, horse riding, and mountain biking.

No paved roads or utility corridors occur except on the boundaries. Major roads provide access and other areas are closed to vehicles. Walnut Canyon and its major side drainages are closed to motorized vehicles. The areas south and east of Walnut Canyon provide more remote dispersed recreation opportunities including motorized travelways.

The desired conditions for this area are in addition to those described for the Ponderosa Pine Landscape Character Zone.

Desired Conditions for Walnut Canyon Management Area

Developed Recreation

The Canyon Vista area provides parking, day-use trails, and overnight camping for individuals and groups. Facilities at the site limit resource impacts and provide a camping experience at the less developed end of the spectrum for developed campgrounds.

Roads

Meadows and stream channels degraded by road construction or unauthorized roads are improved through a variety of management activities designed to increase herbaceous ground cover and litter and reduce soil erosion. System roads and trails receive adequate maintenance so that accelerated soil erosion is minimal. Non-national forest system roads are rehabilitated and some poorly located roads are re-located.

Objectives for Walnut Canyon Management Area

Motorized Recreation

Convert XX miles of roads that are not needed for the road system south and east of Walnut Canyon to motorized trails where the ROS setting is suitable for motorized recreation within 10 years of plan approval.

Standards for Walnut Canyon Management Area

See Forestwide Land Adjustments for restrictions on land exchange.

Lands Special Uses

No paved roads or utility corridors occur except on the boundaries of the Walnut Canyon Management Area.

Lands Adjustment

For Land Adjustment Standards for the Walnut Canyon Management Area, see forestwide direction on page XX.

Guidelines for Walnut Canyon Management Area

Lands Special Uses

Research projects within rock shelters and archaeological sites caves should require a permit. Permits are issued on a case-by-case basis by the district ranger.

Roads

Road construction activities should be designed to maintain or improve of soil condition and watershed function.

Long Valley Management Area

General Description for Long Valley Management Area

Long Valley is a corridor of intensive recreation use on the Mogollon Rim Ranger District. At its center is Clint's Well and Happy Jack. The area receives heavy weekend use from dispersed campers and motorized recreationists.

The desired conditions for this area are in addition to those described for the Ponderosa Pine and East Clear Creek Landscape Character Zones.

Desired Conditions for Long Valley Management Area

No direction has been developed for this management area yet. We encourage you to provide comments on desired conditions for this area. Anticipated direction will be primarily recreation based.

Chapter 4. Suitable Uses

Introduction

The identification of an area as suitable for various uses is guidance for project and activity decision-making and is not a commitment or a final decision approving projects and activities. Uses that are not specifically identified as suitable would be evaluated in terms of the desired conditions. Uses that are neutral to or help move the grasslands toward the desired conditions may be allowed. Uses that are suitable must also be consistent with other plan components and other laws and regulations.

Recreation and Transportation Suitability

Table XX displays areas that are suitable or not suitable for motorized uses, including new motorized areas, roads, motorized trails, temporary or permanent road construction, and mechanized travel and non-motorized travel.

Non-motorized travel (not including mechanized travel) is defined as movement not relying on machines that use a motor, engine, or other nonliving power source (e.g., walking, canoeing, and horseback riding).

Mechanized travel is defined as movement using any contrivance over land, water, or air, having moving parts, that provides a mechanical advantage to the user and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs or mobility devices when used as necessary by a mobility impaired person for locomotion (FSM 2353.05). It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts.

Motorized travel³¹ is defined as movement using machines that use a motor, engine, or other nonliving power sources other than a vehicle operated on rails or a wheelchair or mobility device (including one that is battery powered) that is designed solely for the use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area.

A **motorized area** is one that has been designated for motor vehicle use.

³¹ The Coconino NF is currently in the process of implementing the Travel Management Rule. The rule requires forests to designate specific roads, trails, and areas suitable for motorized vehicle use. After NFS roads, trails, and areas have been designated pursuant to 36 CFR 212.51 and these designations have been identified on a motor vehicle use map (MVUM), it will be prohibited to possess or operate a motor vehicle other than in accordance with those designations (in general, cross-country motorized travel will be prohibited). Into the future, this plan will provide the framework in which the MVUM is developed. The following vehicles and uses are exempted from this prohibition: (a) aircraft; (b) watercraft; (c) over-snow vehicles; (d) limited administrative use by the Forest Service; (e) use of any fire, military, emergency, or law enforcement vehicle for emergency purposes; (f) authorized use of any combat or combat support vehicle for national defense purposes; (g) law enforcement response to violations of law, including pursuit; (h) motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations; and (i) use of a road or trail that is authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

NFS roads and trails are roads and trails that the Forest Service determines are necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

NFS motorized trails are divided into two categories, greater than 50 inches and less than 50 inches, to accommodate a variety of vehicles, including single track vehicles.

Temporary roads are roads necessary for emergency operations or are authorized by contract, permit, lease, or other written authorization, and they are not a system road or trail and not included in a forest transportation atlas. Temporary roads are obliterated or rehabilitated following the completion of the activity for which they were built.

Table XX. Recreation and Transportation Suitability

	New Motorized Areas		NFS Roads and Motorized Trails > 50"		NFS Motorized Trails < 50"		Temporary Roads		Permanent Roads		Mechanized Travel		Non-motorized Travel	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
Urban and Rural ROS	X		X		X		X		X		X		X	
Roaded Natural ROS	X		X		X		X		X		X		X	
Semi-Primitive Motorized ROS		X	X		X		X		X		X		X	
Semi-Primitive Non-Motorized ROS		X		X		X	X			X	X		X	
Primitive ROS		X		X		X		X		X	X		X	
Recommended Research Natural Area		X		X		X		X		X		X	X	
Research Natural Area		X		X		X		X		X		X	X	
Botanical and Geological Areas		X		X		X		X		X		X	X	

	New Motorized Areas		NFS Roads and Motorized Trails > 50"		NFS Motorized Trails < 50"		Temporary Roads		Permanent Roads		Mechanized Travel		Non-motorized Travel	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
S=Suitable NS=Not Suitable														
Recommended Wilderness		X		X		X		X		X	X		X	
Wilderness		X		X		X		X		X		X	X	
Eligible or suitable wild and scenic river		X	X ³²		X ³²		X ³²		X ³²	X	X		X	

³²New roads or motorized trails are not suitable in sections classified as wild.

Chapter 5. Monitoring Strategy

Introduction

The purpose of monitoring and evaluation is to evaluate, document, and report how the land management plan is applied, how well it works, and if its purpose and direction remain appropriate. Monitoring determines actual conditions and compares them with desired conditions. Evaluation of monitoring results may identify that desired conditions are not met and propose alternative management strategies that respond to changing conditions or new information, including research and scientific papers. Monitoring and evaluating the effects of plan implementation is critical to adaptive management.

Given the uncertainty of future budgets and resources, the focus and intent of this monitoring strategy is to evaluate the progress of not only required monitoring elements, but also particular areas where the current condition at the time of the development of this plan was drastically different from desired conditions. In this way, the Forest can direct resources towards and evaluate progress of critical changes that need to occur on the Forest.

The monitoring plan consists of monitoring questions that focus on key plan decisions where carrying out projects and activities are likely to cause a change over time.

The forest supervisor annually evaluates the monitoring information displayed in the evaluation reports through a management review and determines if any changes are needed in management actions or the plan itself. In general, annual evaluations of the monitoring information consider the following questions:

- What are the effects of resource management activities on the productivity of the land?
- To what degree are resource management activities maintaining or making progress toward the desired conditions and objectives identified in the plan? Are costs of implementing programs occurring as predicted?
- What modifications are needed to account for unanticipated changes in conditions?

In addition to annual monitoring, the forest supervisor reviews the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly. The plan is ordinarily revised on a 10-year cycle and the Forest Supervisor may amend the plan at any time. All of the monitoring and evaluation timeframes identified in this chapter begin from the date of the Record of Decision.

Monitoring Plan

The monitoring questions and potential monitoring methods that could be used to evaluate movement toward key plan desired conditions are displayed below (table XX).

For each monitoring question/performance measure listed in table XX, additional monitoring descriptors are included to provide context for the type of information to gather and how often to gather it. These descriptors are defined here:

- **Monitoring Question:** The question(s) that will be answered.
- **Scale:** The geographic scale at which the monitoring question will be evaluated.

- **Possible Monitoring Methods and Data Sources:** The possible methods and data sources available to evaluate the monitoring questions at the time of plan approval and are not the required method of measurement. As new tools become available, other methods may be used to answer the monitoring questions.
- **Frequency of Monitoring:** How often information is gathered or measured such as annually, every 5 years, or every 10 years.
- **Frequency of Evaluation:** How often the information is analyzed and reported. Depending upon the question being answered, analysis of the information may occur at longer time intervals than the frequency of monitoring. Some resources need to be monitored annually to produce trend data. Annually gathered data may be analyzed periodically (3, 5, or 10-year cycles), depending upon the time frame specified by each objective.
- **Data Precision and Reliability:** An indication of how rigorous the information used to evaluate the monitoring question are with respect to repeatability, reliability, accuracy, and precision. Two categories of precision and reliability are appropriate at the plan scale and because of varying methods and data sources used to evaluate the monitoring question, both classes may be indicated:
 - **Class A:** Methods that are generally well accepted for modeling or quantitative measurement. Results have a high degree of repeatability, reliability, accuracy, and precision.
 - **Class B:** Methods or measurements that are based on project records, personal communications, ocular estimates, pace transects, informal visitor surveys, and similar types of assessments. The degree of repeatability, reliability, accuracy, and precision are not as high as Class A methods, but they still provide valuable information.

Monitoring and evaluation are identified, approved, and scheduled through the annual budget process. Actual budget levels, funding emphasis, and emergence of new issues may affect accomplishment of both management activities that make progress toward desired conditions as well as monitoring. Partnerships may be developed to accomplish monitoring and evaluation.

Table XX. Coconino NF’s Land Management Plan monitoring questions, monitoring methods, units of measure, and frequency of measurements are displayed.

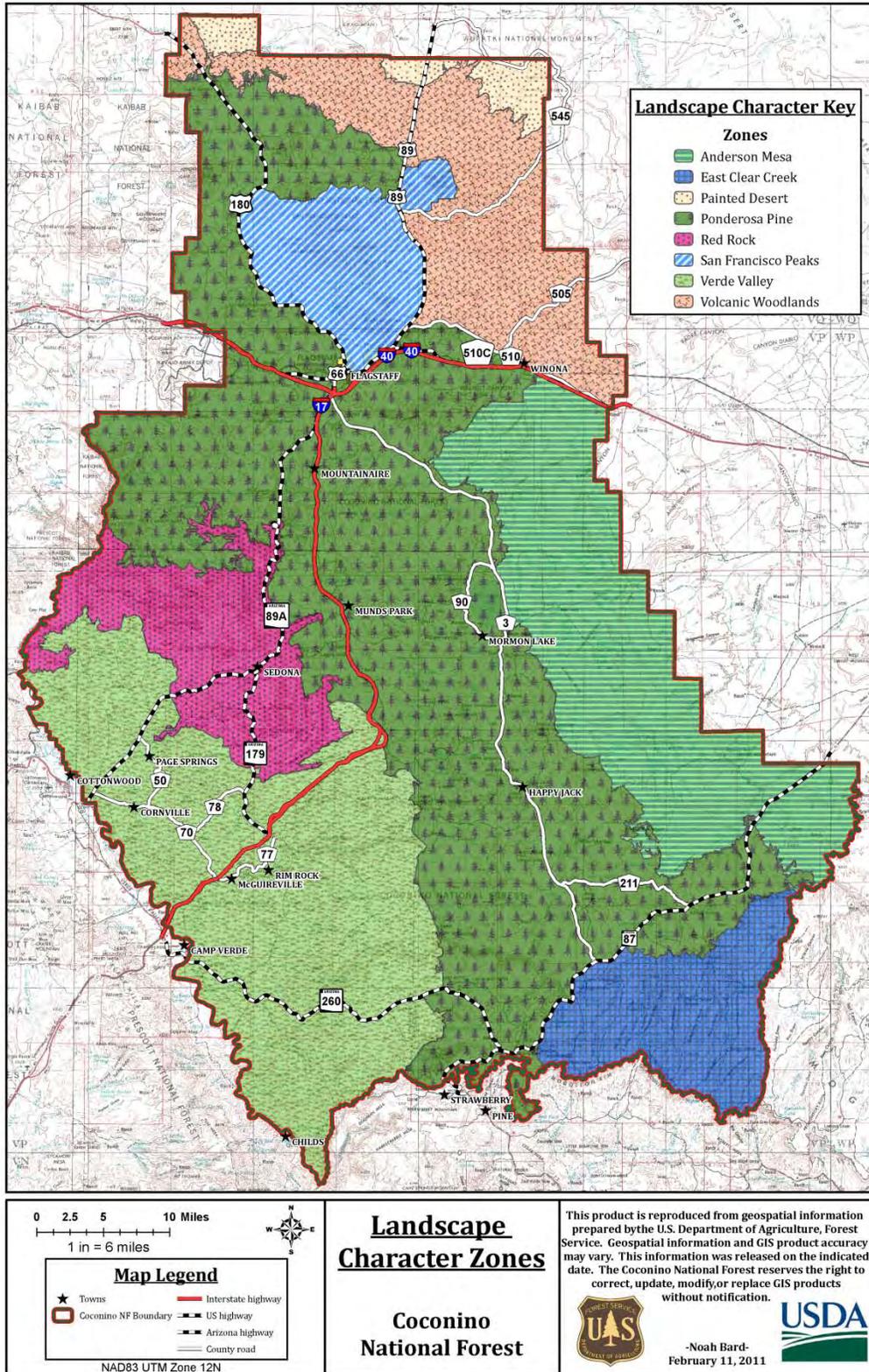
Monitoring Questions	Scale	Possible Monitoring Methods and Data Sources	Frequency of Monitoring	Frequency of Evaluation	Data Precision and Reliability
Maintenance and Improvement of Ecosystem Health					
<p>How well have management activities contributed to maintaining or making progress toward ecological desired conditions? Particular focus in answering this question should be given to PNVTs and the elements of those PNVTs that were identified in the Ecological Sustainability Report as being highly departed and trending away from their reference conditions. Also include the following monitoring requirements: Lands restocked as specified in the plan, sec. 219.12(k)(4)(i)); Maximum size limits for harvest areas evaluated (sec. 219.12(k)(4)(iii))</p>	PNVT	<p>FACTS database(?), Review ground disturbing activities for compliance with Best Management Practices (BMPs) by project; allotment operating instruction implementation; proper functioning data or other approved Forest Service methodologies; and Section 18 reviews of allotment NEPA. Monitor riparian habitats for changes in ground cover, species composition, bank stability, and water quality. Review mid-scale vegetation assessment and percent change; stand exam data; FIA plots; change in species composition and soil condition (range data); and acres of restored grassland. Review mid-scale vegetation assessment and percent change; FIA plots; BAER assessments; and percent departure from desired condition by vegetation type.</p>	Every 5 years	Every 5 years	A, B
<p>Have the incidence of insect, disease, and invasive exotic species precluded the maintenance of or progress toward desired conditions? (sec.</p>	PNVT	<p>Forest health surveys and reports, stand exams, project inspections and reviews, and noxious and invasive exotic weed surveys and treatment reports.</p>	1 to 5 years	Every 5 years.	A

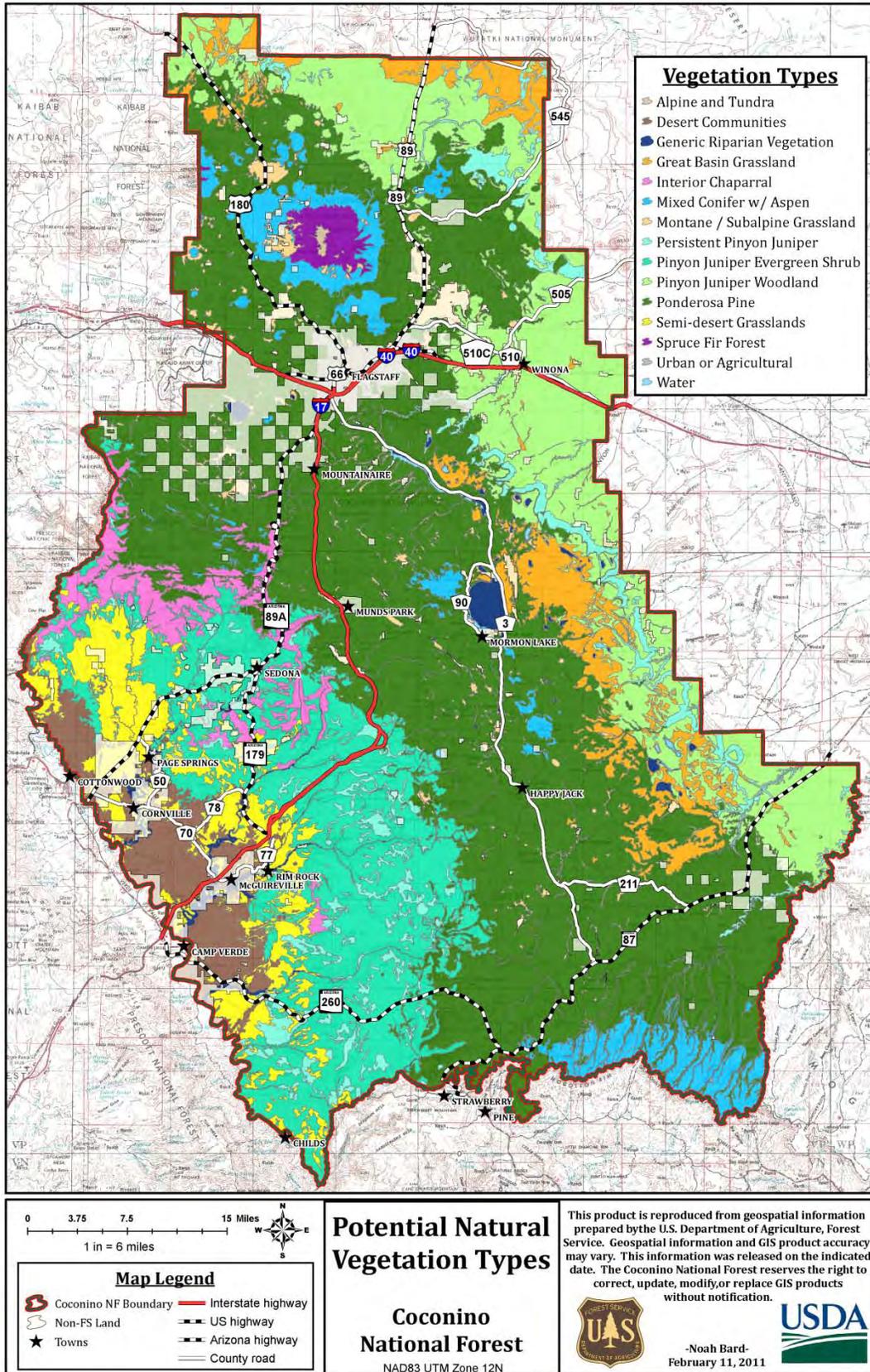
Monitoring Questions	Scale	Possible Monitoring Methods and Data Sources	Frequency of Monitoring	Frequency of Evaluation	Data Precision and Reliability
219.12(k)(4)(iv))					
Are long-term soil health and productivity desired conditions being maintained or met?	PNVT	Review soil disturbing activities for compliance with BMPs by project and allotment operating instruction implementation.	Annually	Every 5 yrs	B
How well are management activities contributing to desired conditions or maintaining watersheds in a healthy state and meeting Arizona water quality standards? Particular focus in answering this question should be given to priority 5 th level HUC watersheds (Rio de Flag, Walnut Creek, and Upper Clear Creek) and 6 th level HUC watersheds identified in the Watershed Condition Assessment.	5 th level HUC watershed	Review soil disturbing activities for compliance with BMPs by project; allotment operating instruction implementation; Section 18 reviews of allotment National Environmental Policy Act (NEPA); burn area emergency rehab assessments (BAER); and Arizona Department of Environmental Quality water quality data.	Every 5 years	Every 5 years	B
Are habitats for threatened, endangered, sensitive, and other species for the forests being maintained or enhanced, meeting recovery objectives, moving towards desired conditions, and contributing to species viability?	Forest	Review implementation of biological opinion terms and conditions and aquatic habitat and population surveys using current approved methodologies. Review implementation and evaluate effectiveness of project mitigation measures affecting habitat.	Annually, on selected newly-implemented and ongoing activities	Every 5 years	A, B
How has management activities influenced habitat and trends of management indicator species?	Forest	Review AZGFD surveys and breeding bird surveys.	Every 5 years	Every 5 years	A

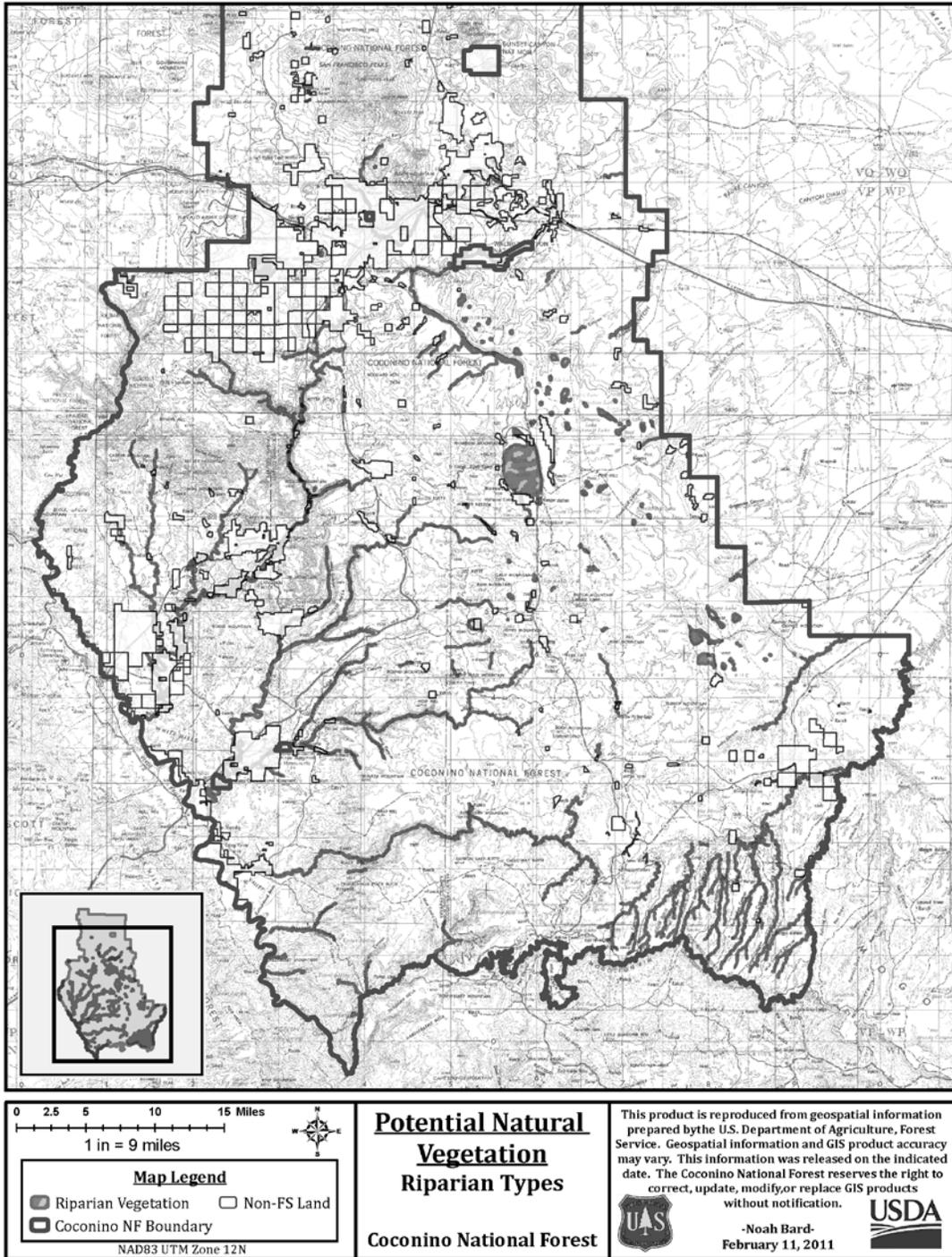
Monitoring Questions	Scale	Possible Monitoring Methods and Data Sources	Frequency of Monitoring	Frequency of Evaluation	Data Precision and Reliability
Has timber suitability classification changed on any forests' lands?	Forest	Re-apply timber suitability criteria and process.	Every 10 years	Every 10 years	A
Are Forest and woodland stands adequately restocked within 5 years of final harvest treatment?	Forest	Review annual reforestation needs report, stocking certifications, silvicultural prescriptions, timber/silviculture tracking database.	Every 5 years	Every 5 years	B
Managed Recreation					
Are recreation facilities in adequate condition to provide for the level of use appropriate under the ROS?	Forest	Percentage of sites surveyed that met national standards	Annually	Every 5 years	A, B
Are objectives for recreation settings and opportunities being achieved?	Forest	Miles and type of trails provided (INFRA database), NVUM	Every 5 years	Every 5 years	A, B
How well do recreational opportunities provide for Forest users' desires, needs, and expectations?	Forest	Review recreation use surveys and acres by recreation opportunity spectrum (ROS).	Every 5 years	Every 5 years	A, B
How are projects and programs affecting scenic integrity? Is scenic integrity being maintained in Very High Scenic Integrity areas?	Forest	Conduct management reviews and BAER assessments.	Every 5 years	Every 5 years	B
How are recreational activities affecting the physical and biological resources of the Forest?	Forest	Review law enforcement warnings and citations regarding resource damage; acres of noxious and invasive exotic weeds treated in developed campgrounds and dispersed camping areas, and trail condition surveys.	Annually	Every 5 years	B

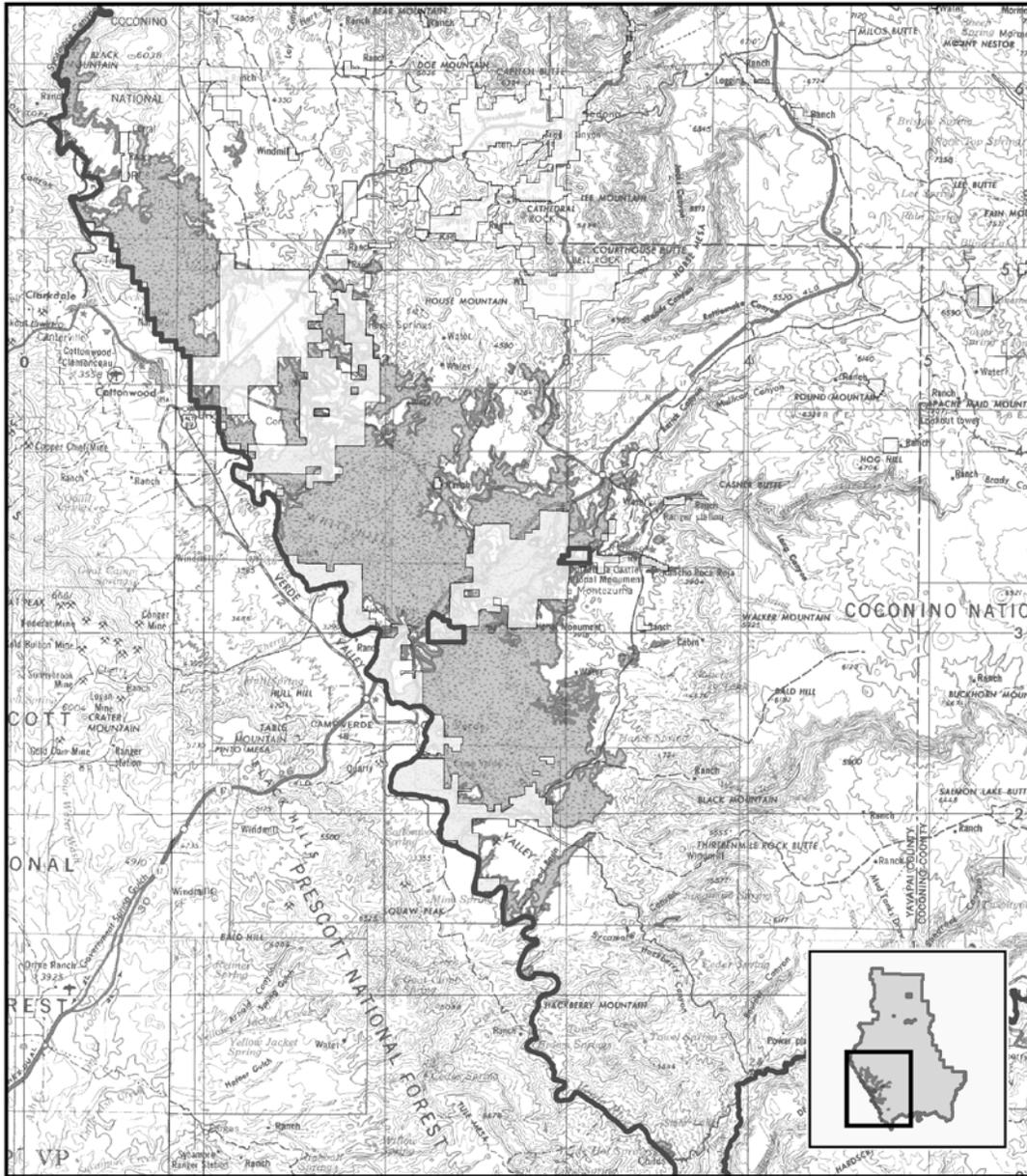
Monitoring Questions	Scale	Possible Monitoring Methods and Data Sources	Frequency of Monitoring	Frequency of Evaluation	Data Precision and Reliability
Community-Forest Interaction					
How are partnerships contributing to maintaining or enhancing recreation resource opportunities?	Forest	Review number of grants and agreements and number of volunteers.	Every 5 years	Every 5 years	B
Other					
Have there been there changes that have resulted in unforeseen issues requiring plan amendments?	Forest	Review the number of plan amendments and conduct a content analysis on those amendments.	Every 5 years	Every 5 years	B
Are the standards and guidelines prescribed being incorporated in NEPA documents and implemented on the ground?	Forest	Review a representative sample of NEPA decision documents for non-implementation of the plan. Conduct management reviews on selected newly-implemented and ongoing activities relative to compliance with the associated NEPA decision.	Annually	Annually	B
How do plan objectives compare with actual accomplishment of objectives? (comparison of projected and actual outputs and services, sec. 219.12(k)(1))	Forest	Annual accomplishment reports	Annually	Every 5 years	B
Lands not suited for timber are re-examined to determine if suitability has changed (and suited lands returned to timber production) (sec. 219.12(k)(4)(ii))	Forest	Reapply timber suitability criteria and process.	Every 10 years	Every 10 years	A

Appendix A. Maps:

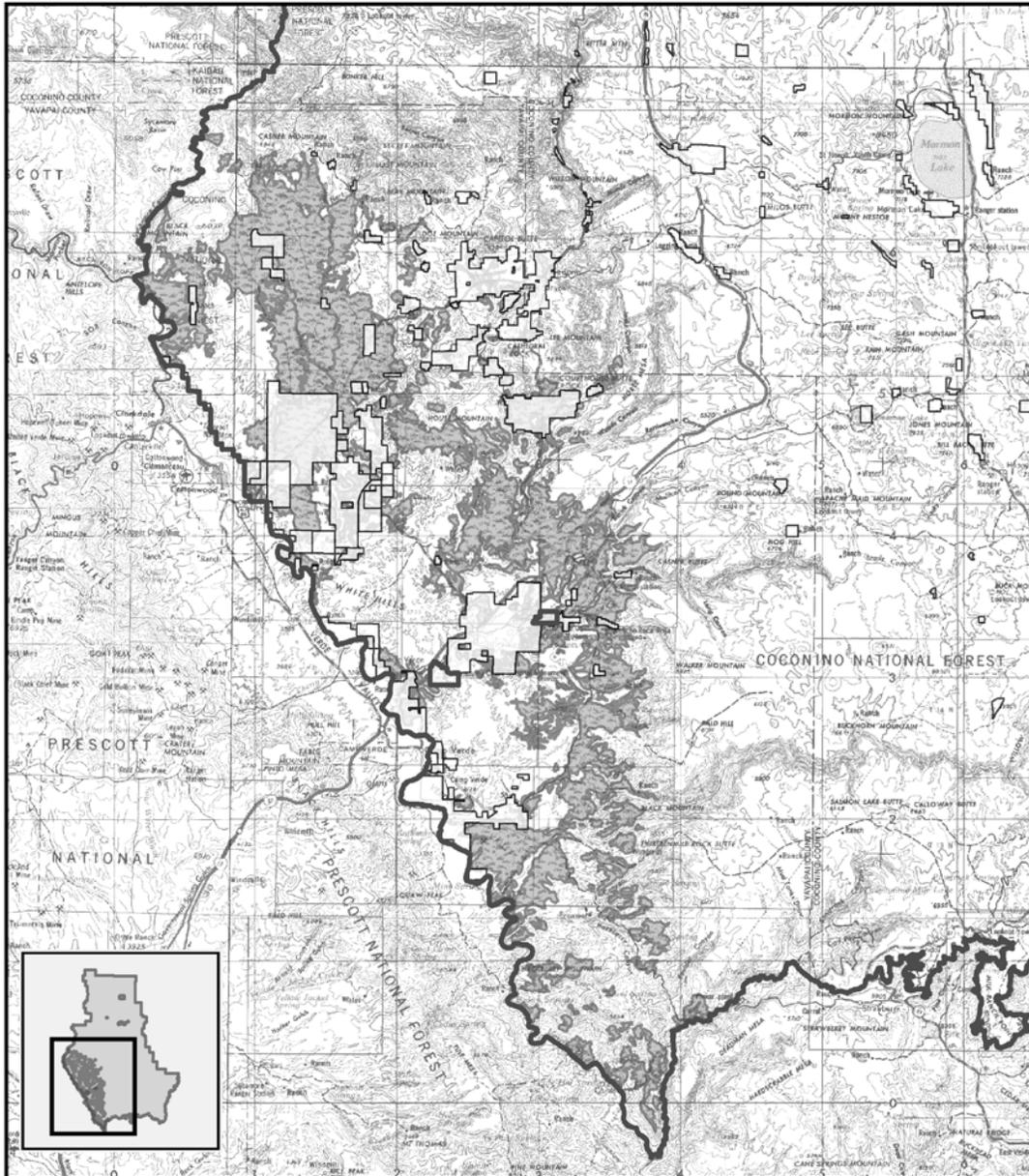




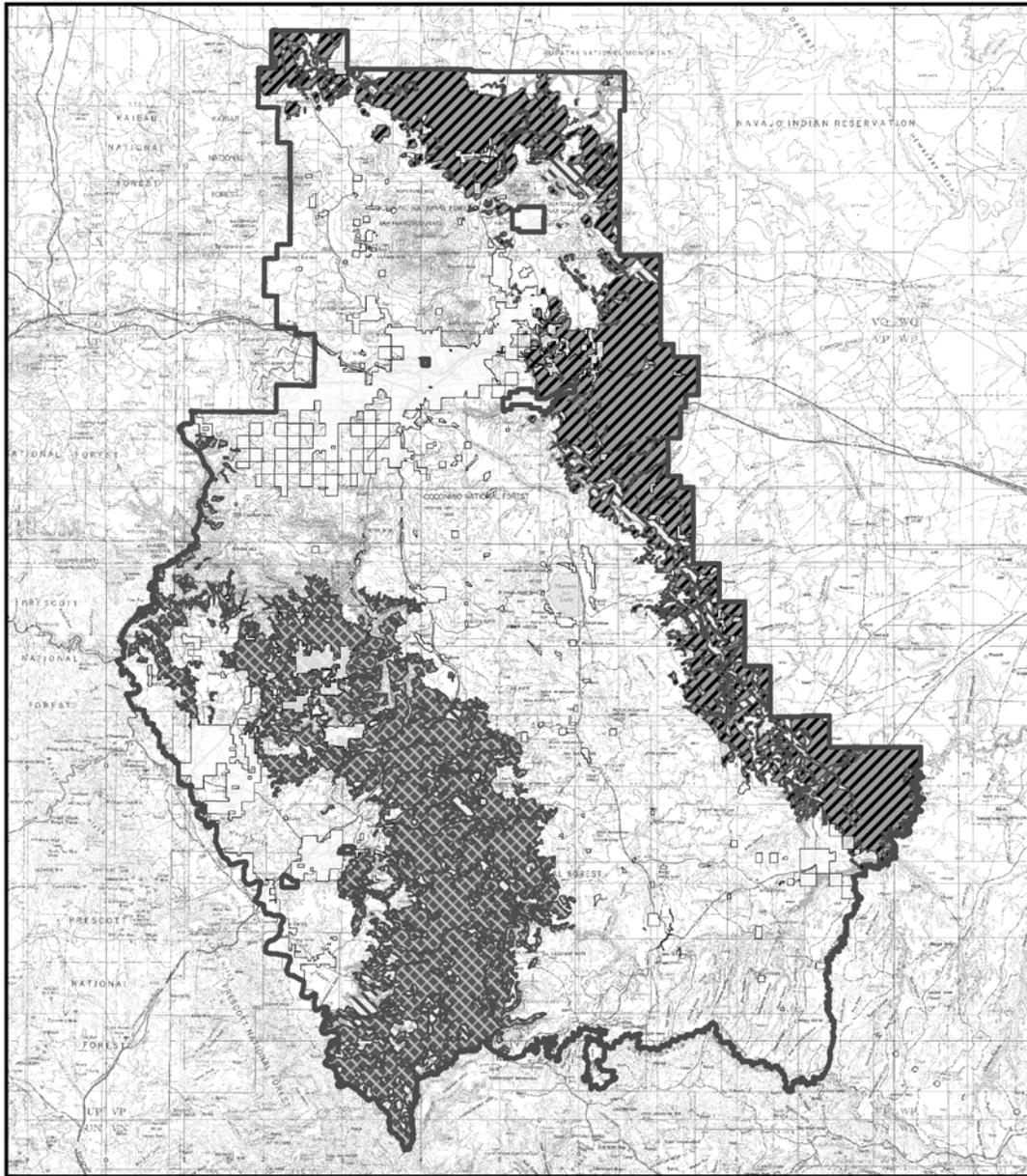




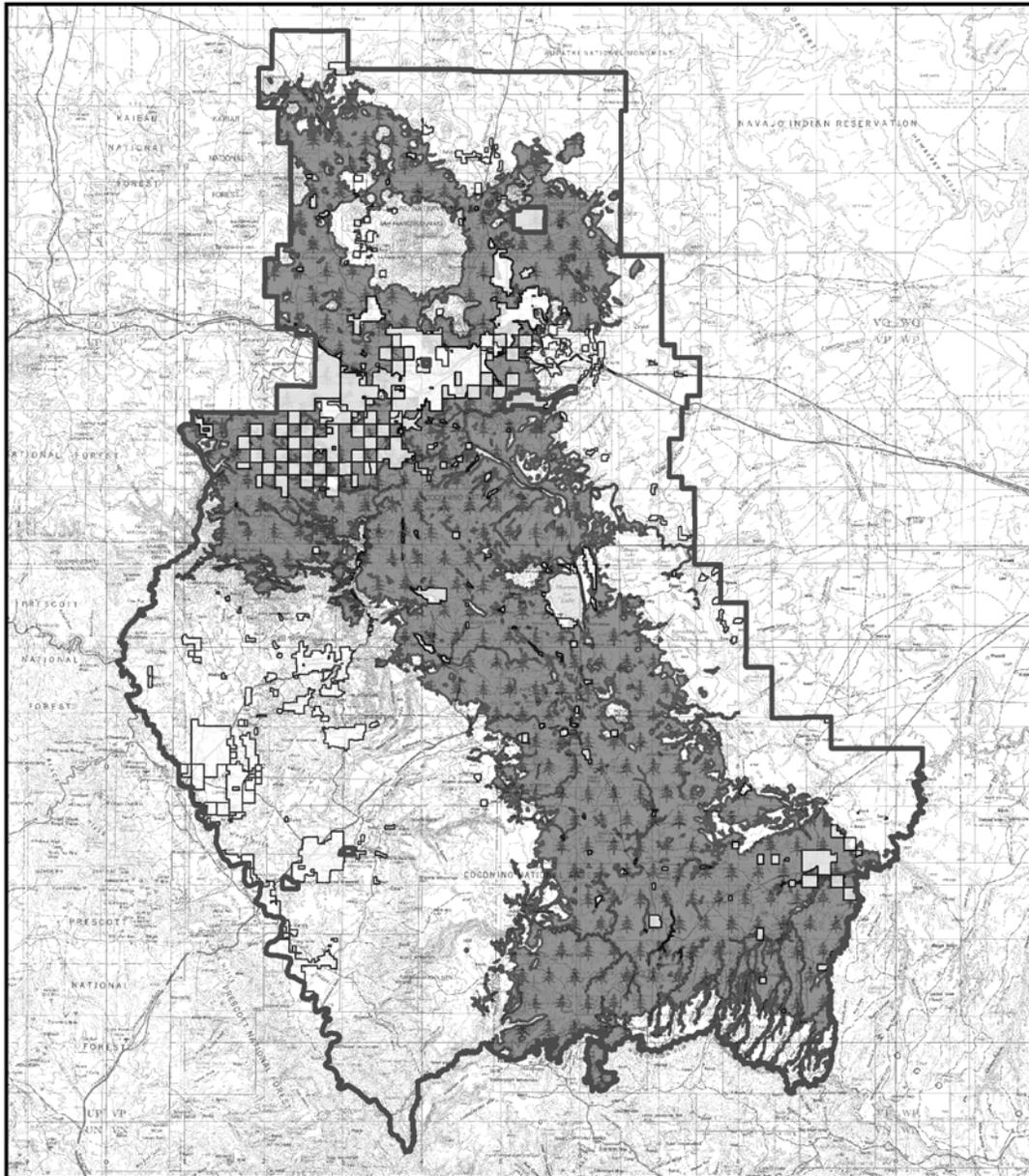
<p>0 2.5 5 10 Miles</p> <p>Map Legend</p> <ul style="list-style-type: none"> Coconino NF Boundary Desert Communities Non-FS Land <p>1 in = 4 miles</p> <p>NAD83 UTM Zone 12N</p>	<p>Potential Natural Vegetation Desert Communities</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p> -Noah Bard- February 11, 2011</p> <p></p>
---	--	--



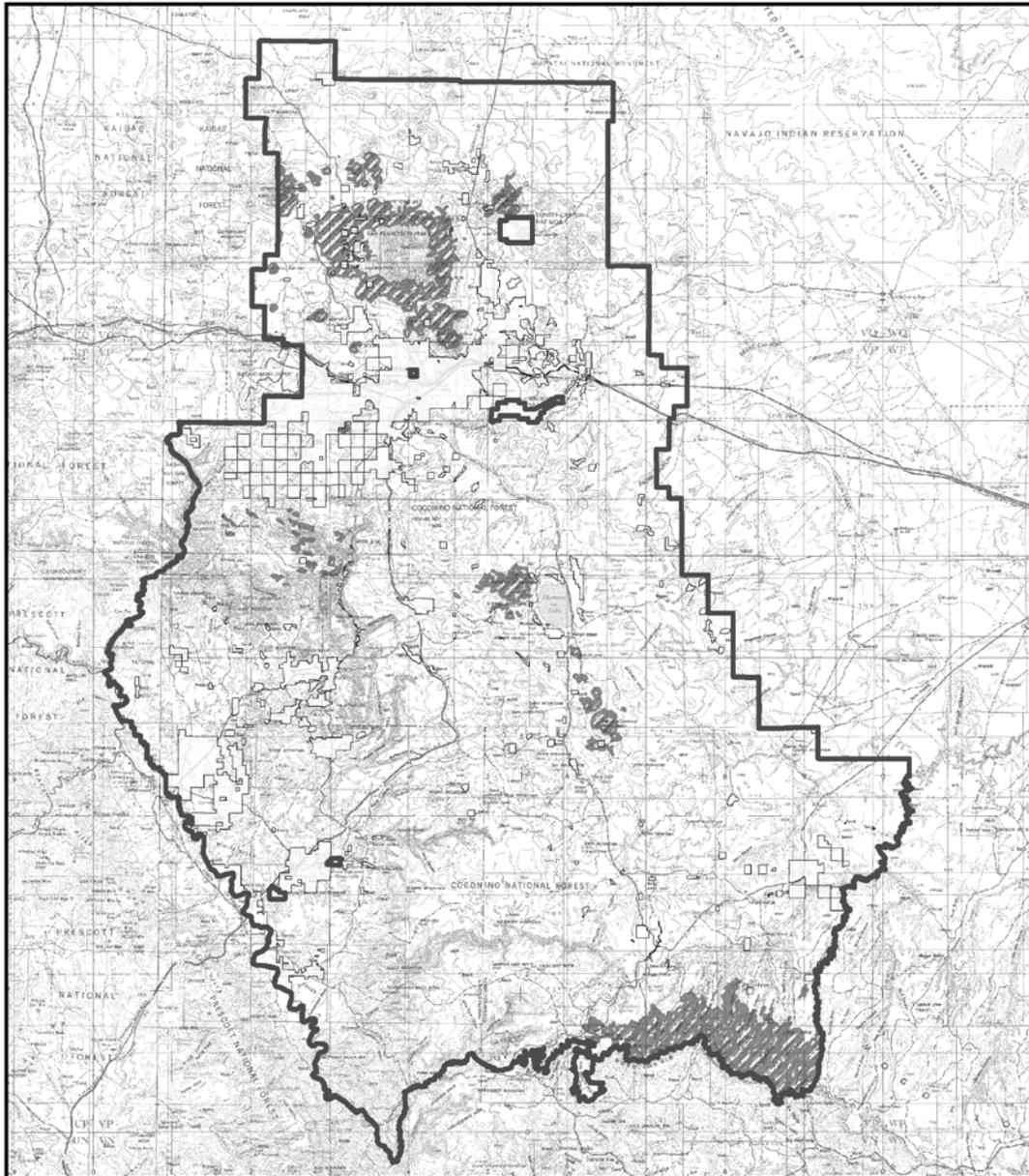
<p>0 2 4 8 12 Miles</p> <p>1 in = 6 miles</p>	<p>Potential Natural Vegetation Semi-Desert Grasslands</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p> -Noah Bard- February 11, 2011 </p>
<p>Map Legend</p> <p> Semi-desert Grasslands Non-FS Land</p> <p> Coconino NF Boundary</p> <p>NAD83 UTM Zone 12N</p>		



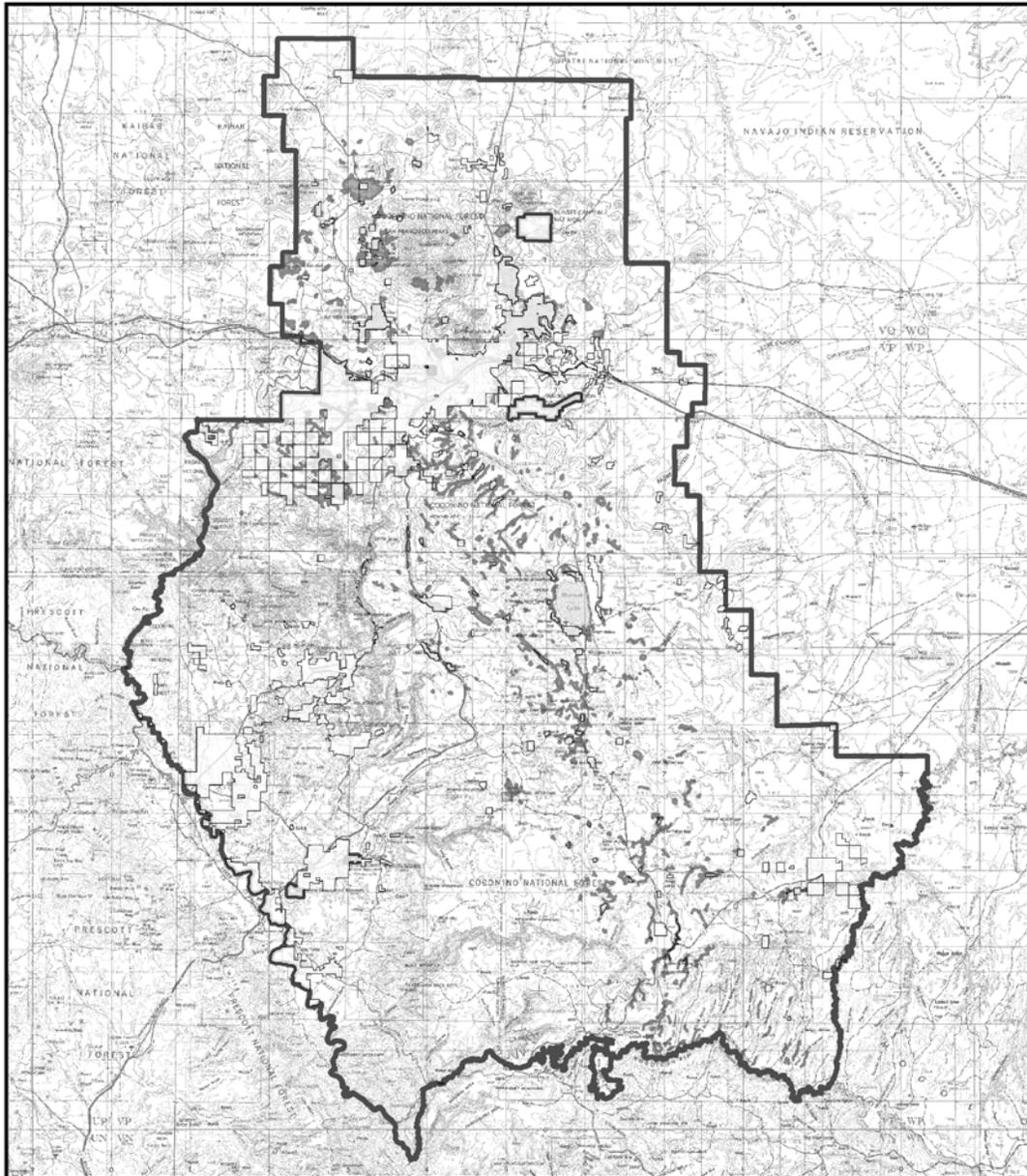
<p>0 2.5 5 10 15 Miles 1 in = 10 miles</p> <p>Map Legend</p> <ul style="list-style-type: none"> Persistent Pinyon Juniper Pinyon Juniper Woodland Pinyon Juniper Evergreen Shrub Coconino NF Boundary Non-FS Land <p>NAD83 UTM Zone 12N</p>	<p>Potential Natural Vegetation Pinyon Juniper</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p> </p> <p>-Noah Bard- February 11, 2011</p>
--	--	--



<p>0 2.5 5 10 15 Miles 1 in = 10 miles</p> <p>Map Legend</p> <p>■ Ponderosa Pine □ Non-FS Land ▭ Coconino NF Boundary</p> <p>NAD83 UTM Zone 12N</p>	<p>Potential Natural Vegetation Ponderosa Pine</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p>UAS -Noah Bard- February 11, 2011</p> 
---	--	---

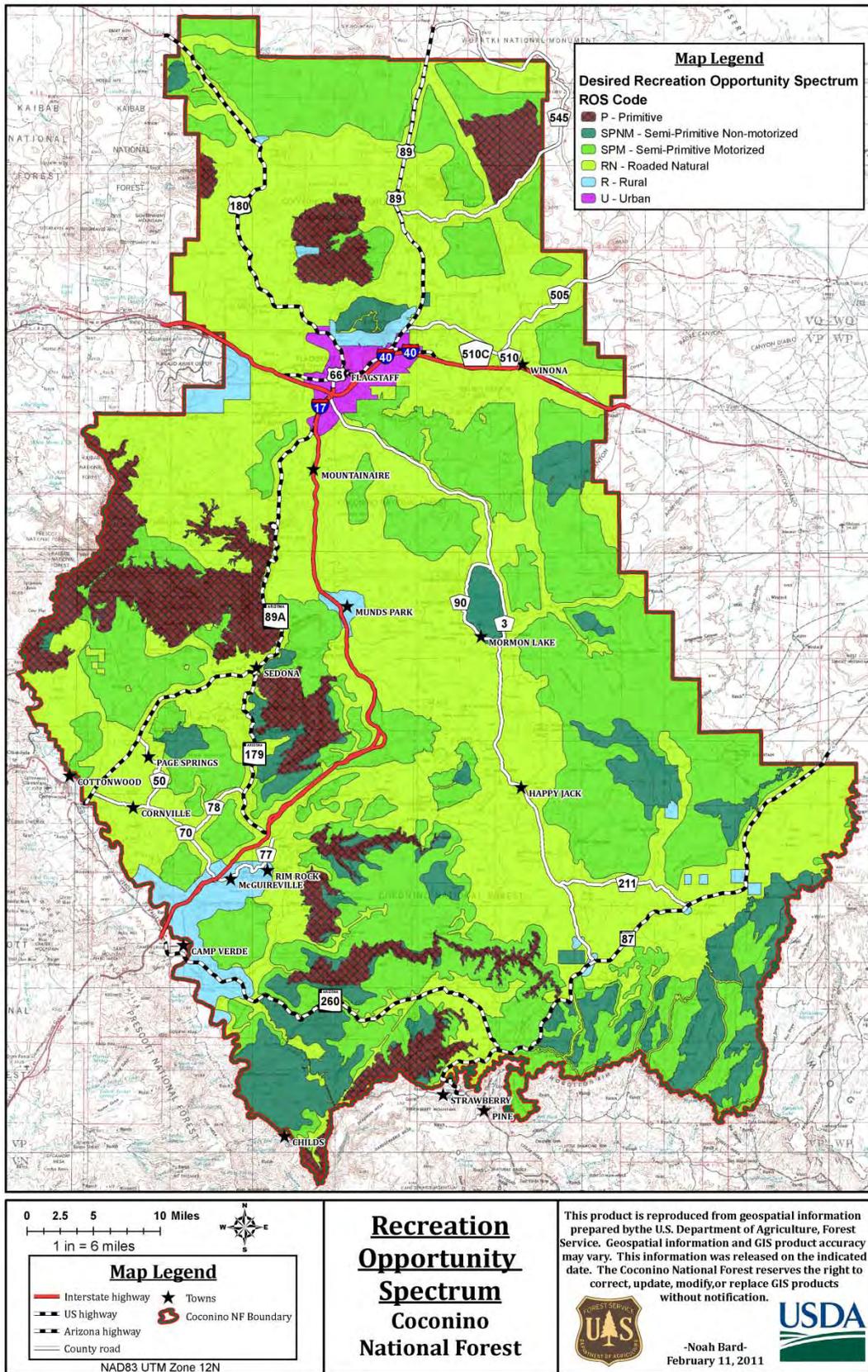


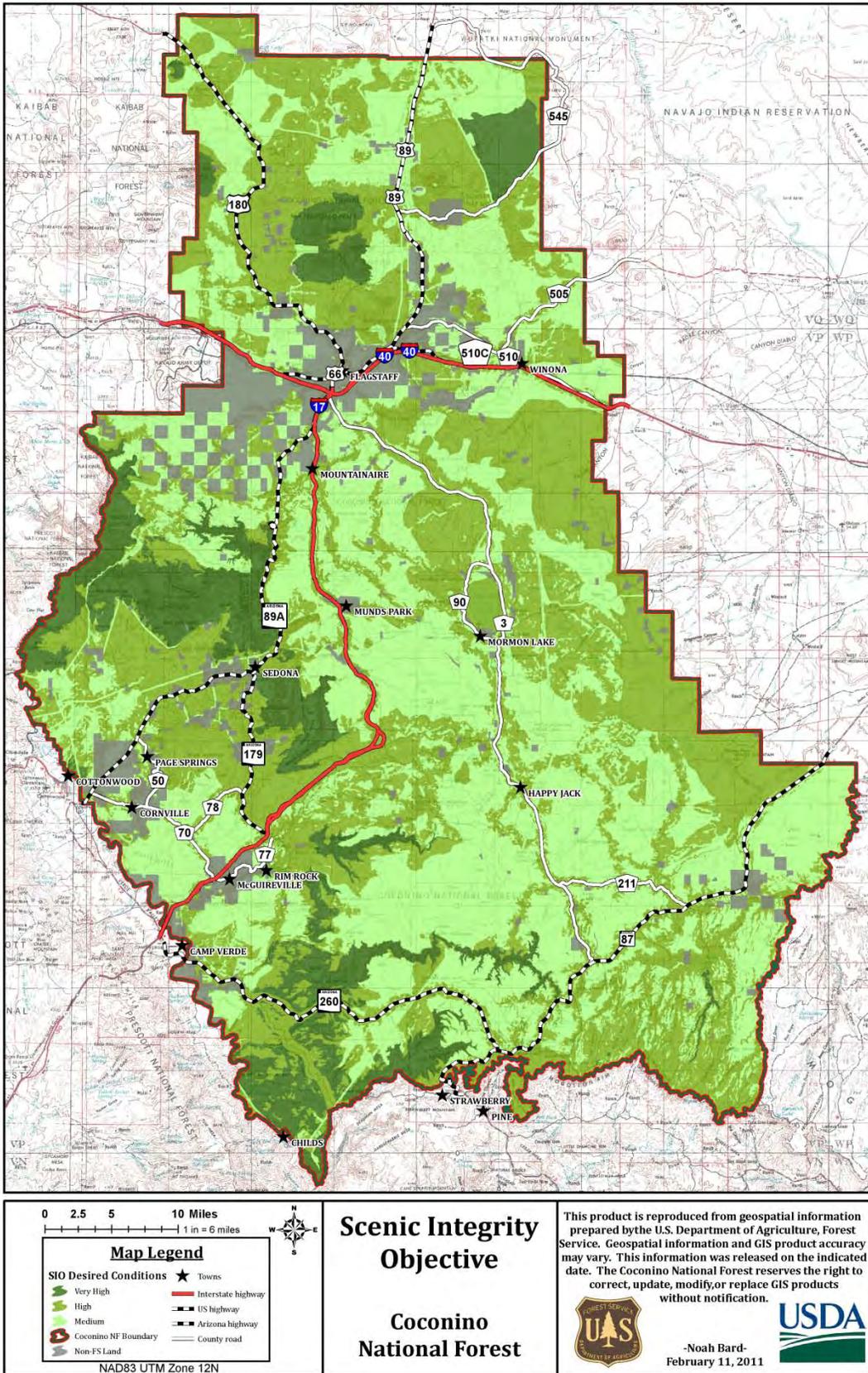
<p>0 2.5 5 10 15 Miles 1 in = 10 miles</p> <p>Map Legend</p> <p> <input checked="" type="checkbox"/> Mixed Conifer w/ Aspen <input type="checkbox"/> Non-FS Land <input checked="" type="checkbox"/> Coconino NF Boundary </p> <p>NAD83 UTM Zone 12N</p>	<p>Potential Natural Vegetation Mixed Conifer</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p>   </p> <p>-Noah Bard- February 11, 2011</p>
---	---	---

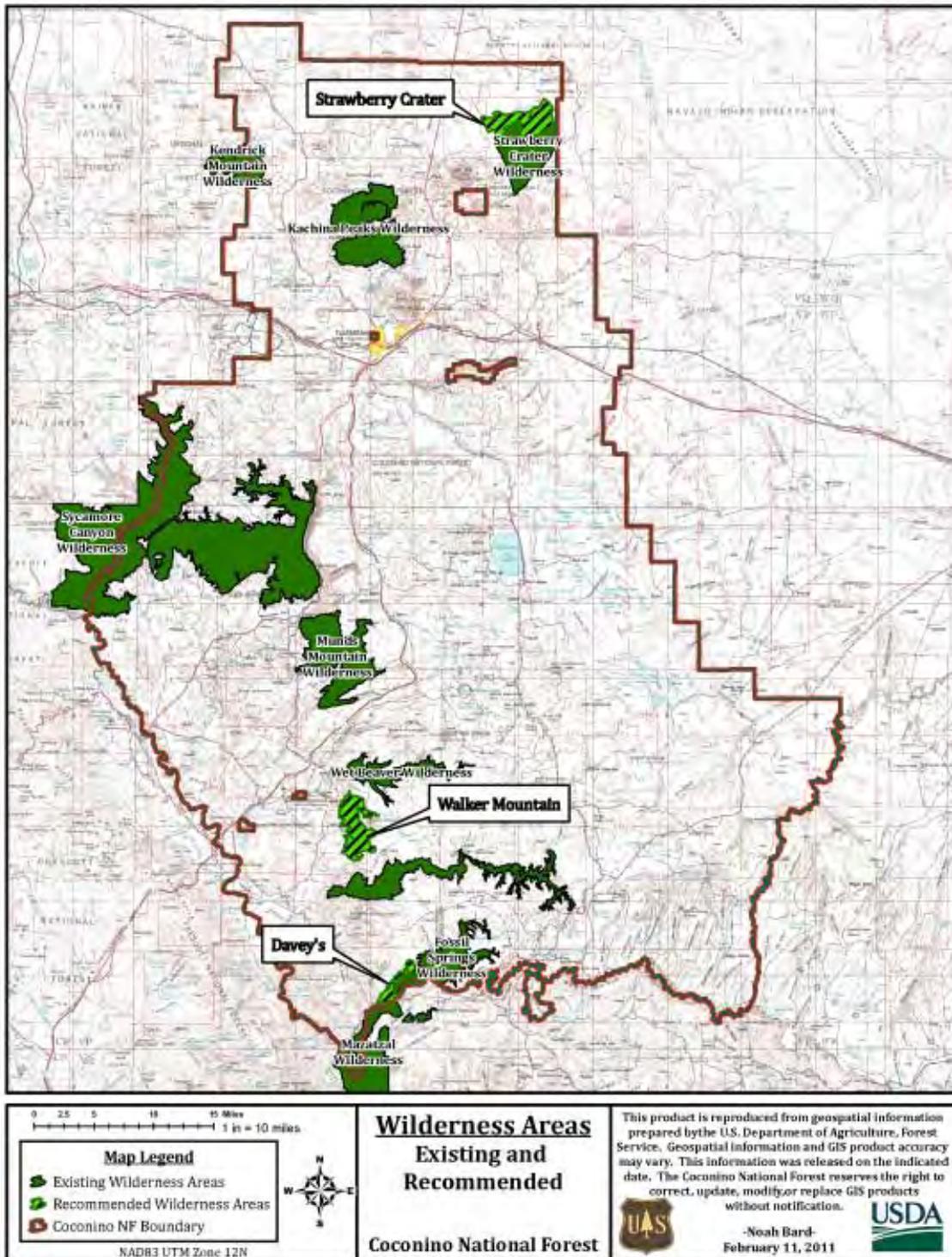


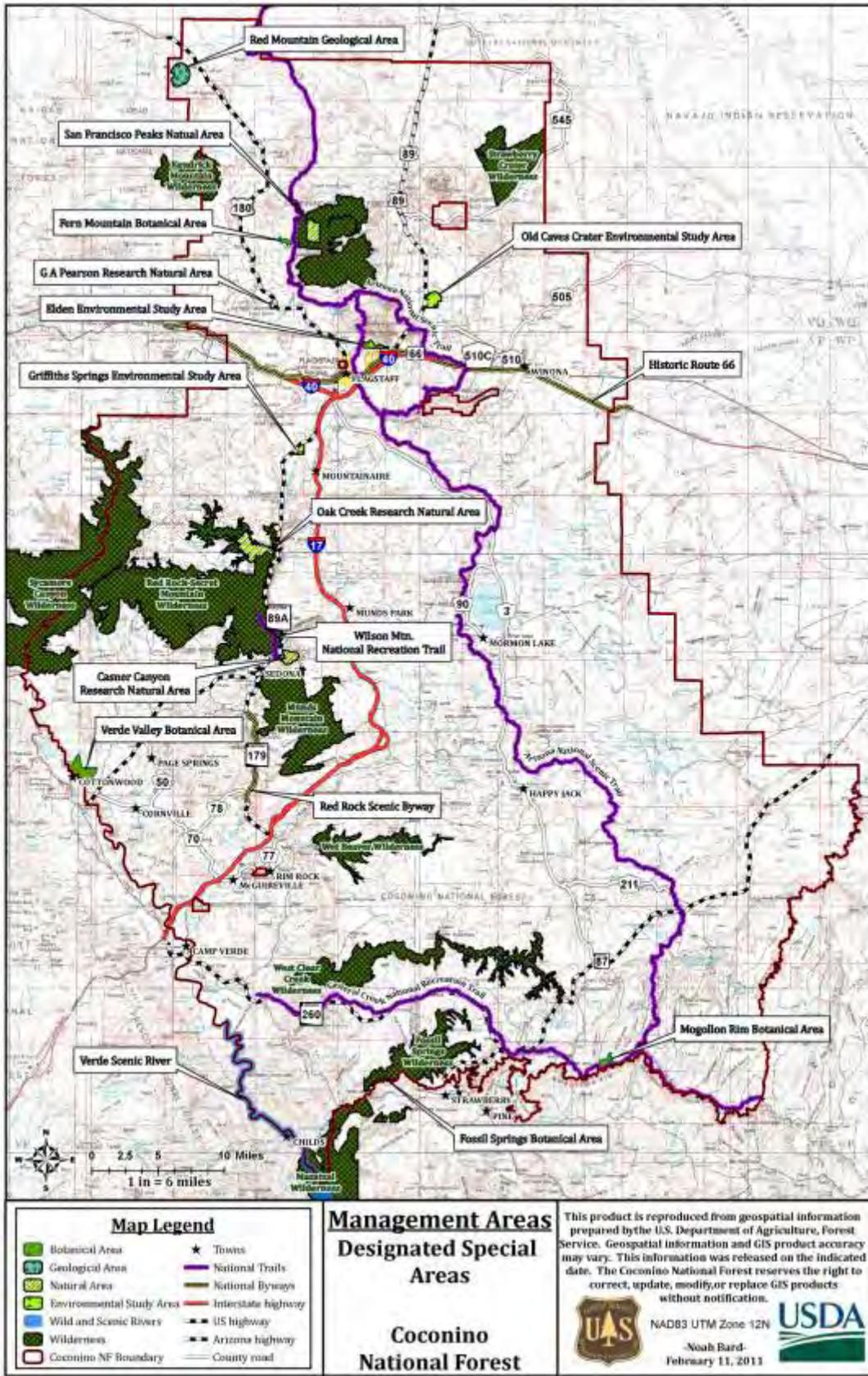
<p>0 2.5 5 10 15 Miles 1 in = 10 miles</p> <p>Map Legend</p> <p>■ Montane / Subalpine Grassland □ Non-FS Land ▭ Coconino NF Boundary</p> <p>NAD83 UTM Zone 12N</p>	<p>Potential Natural Vegetation</p> <p>Montane/Subalpine Grasslands</p> <p>Coconino National Forest</p>	<p>This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.</p> <p>UAS -Noah Bard- February 11, 2011</p> 
---	--	---

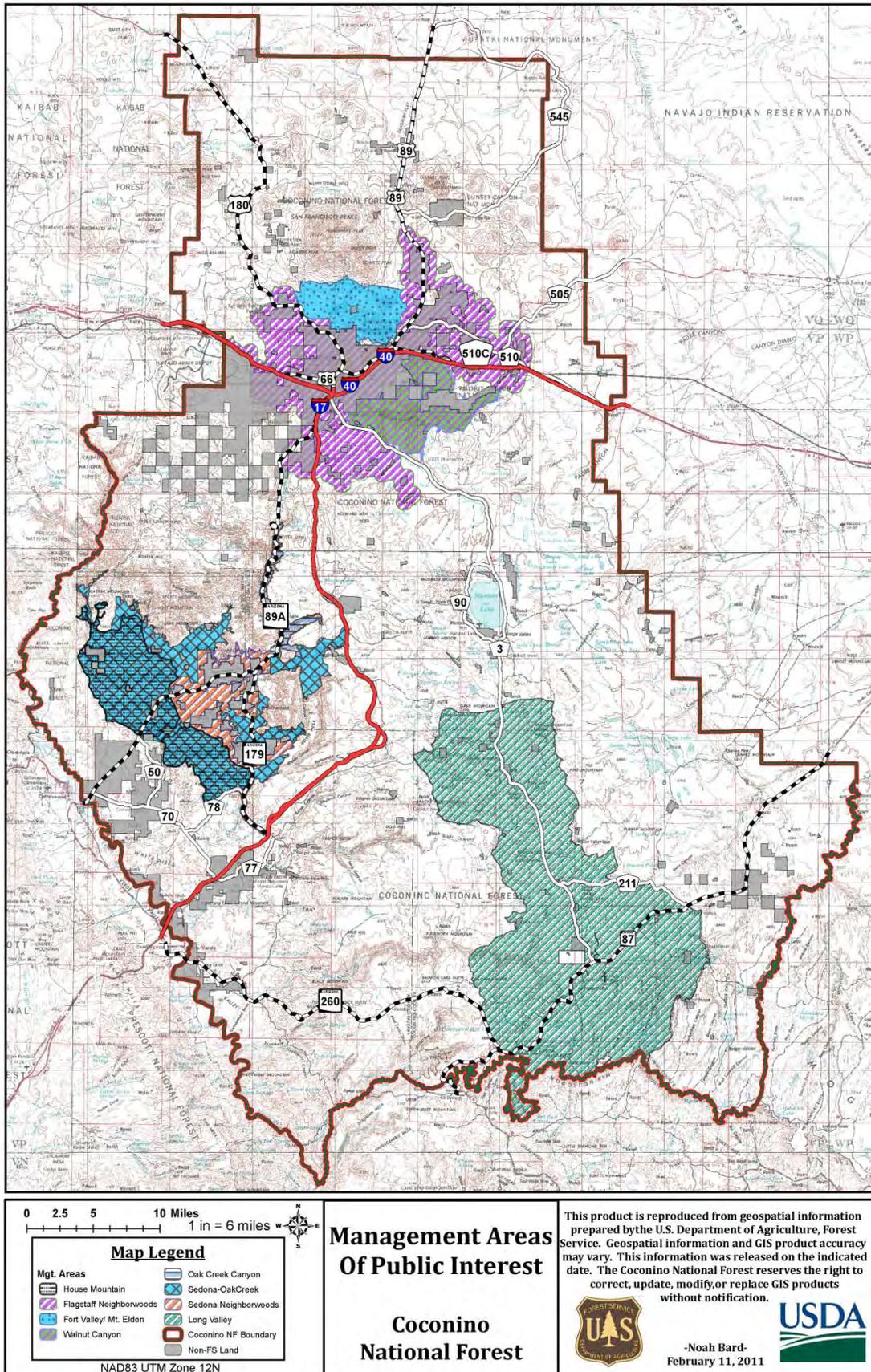


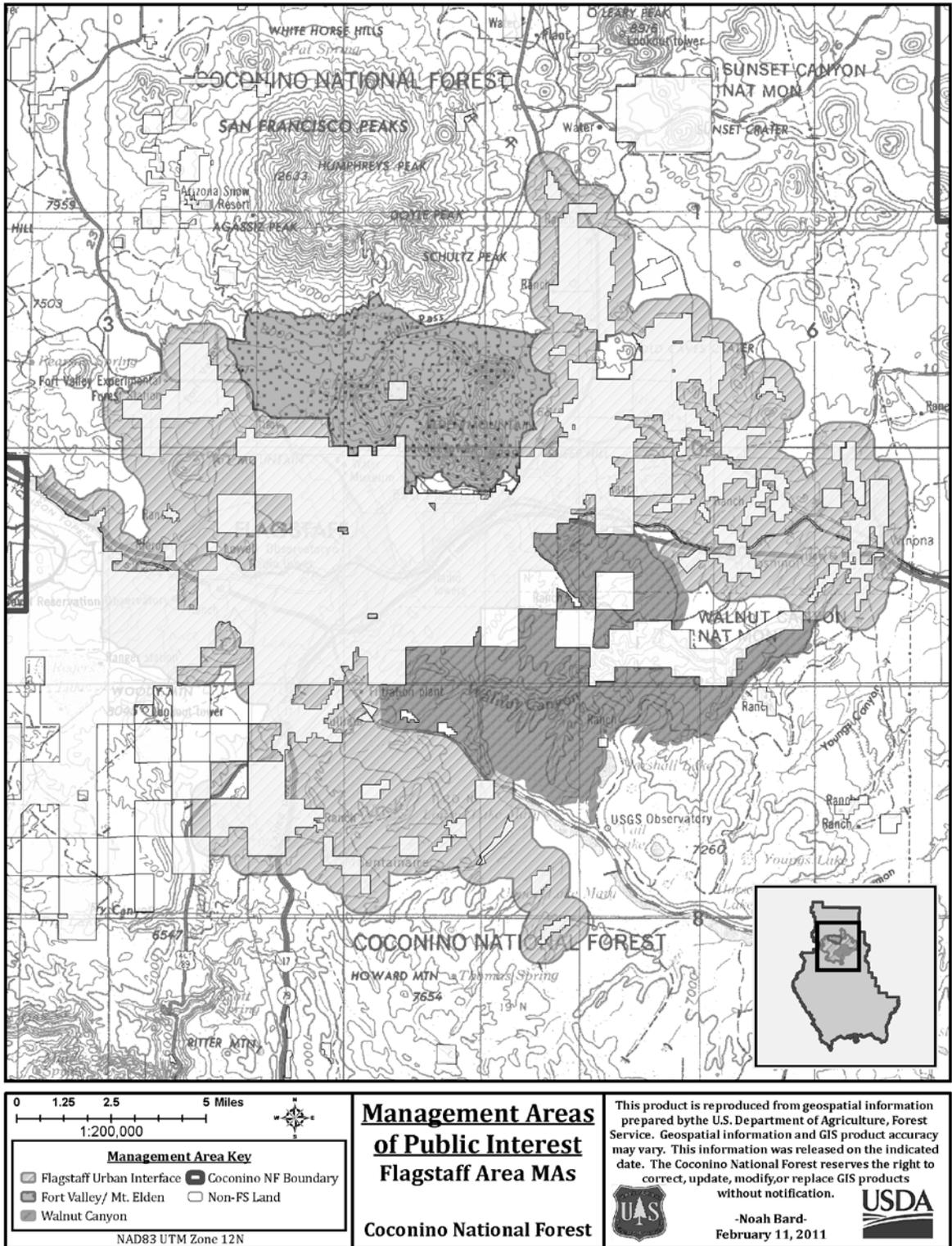


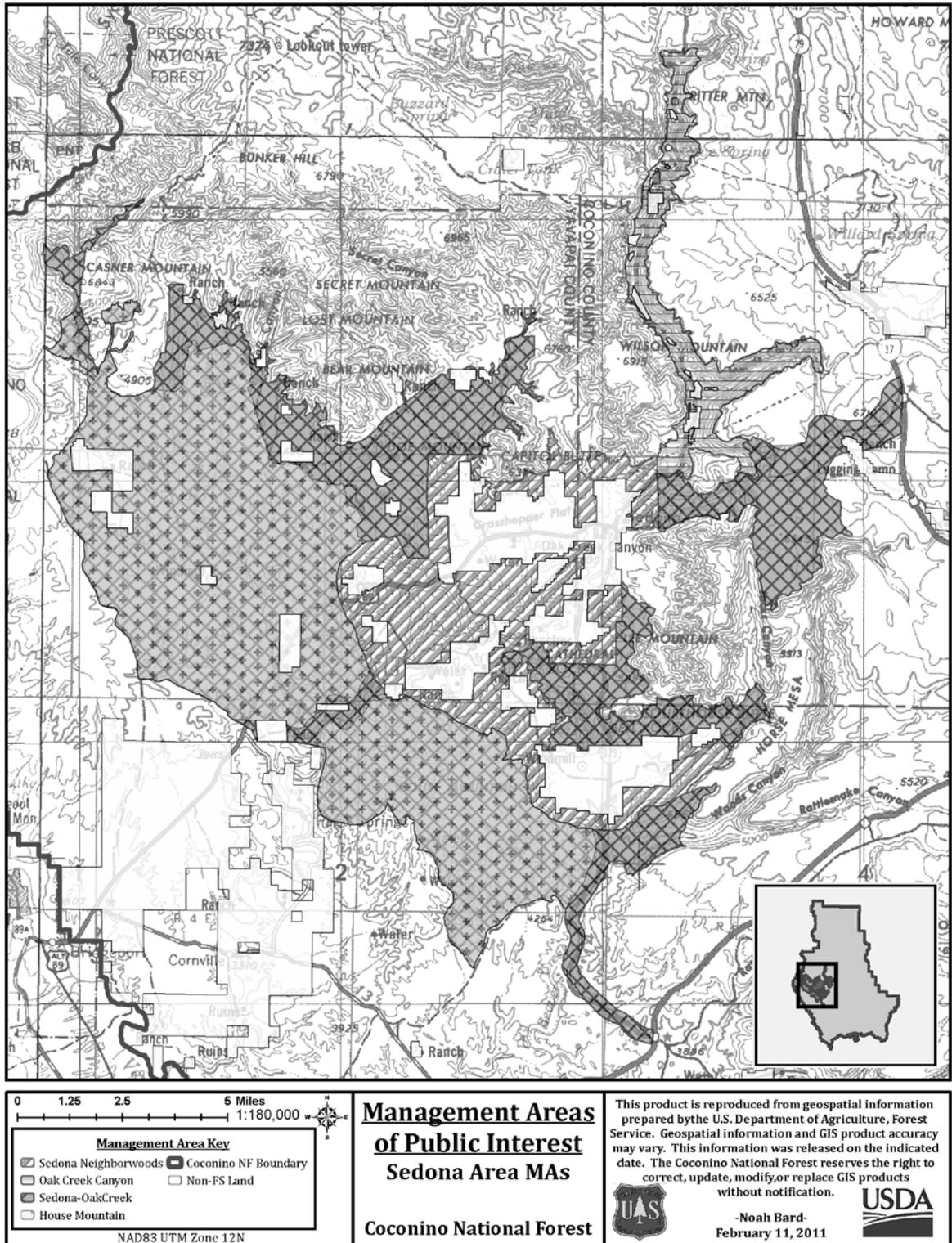


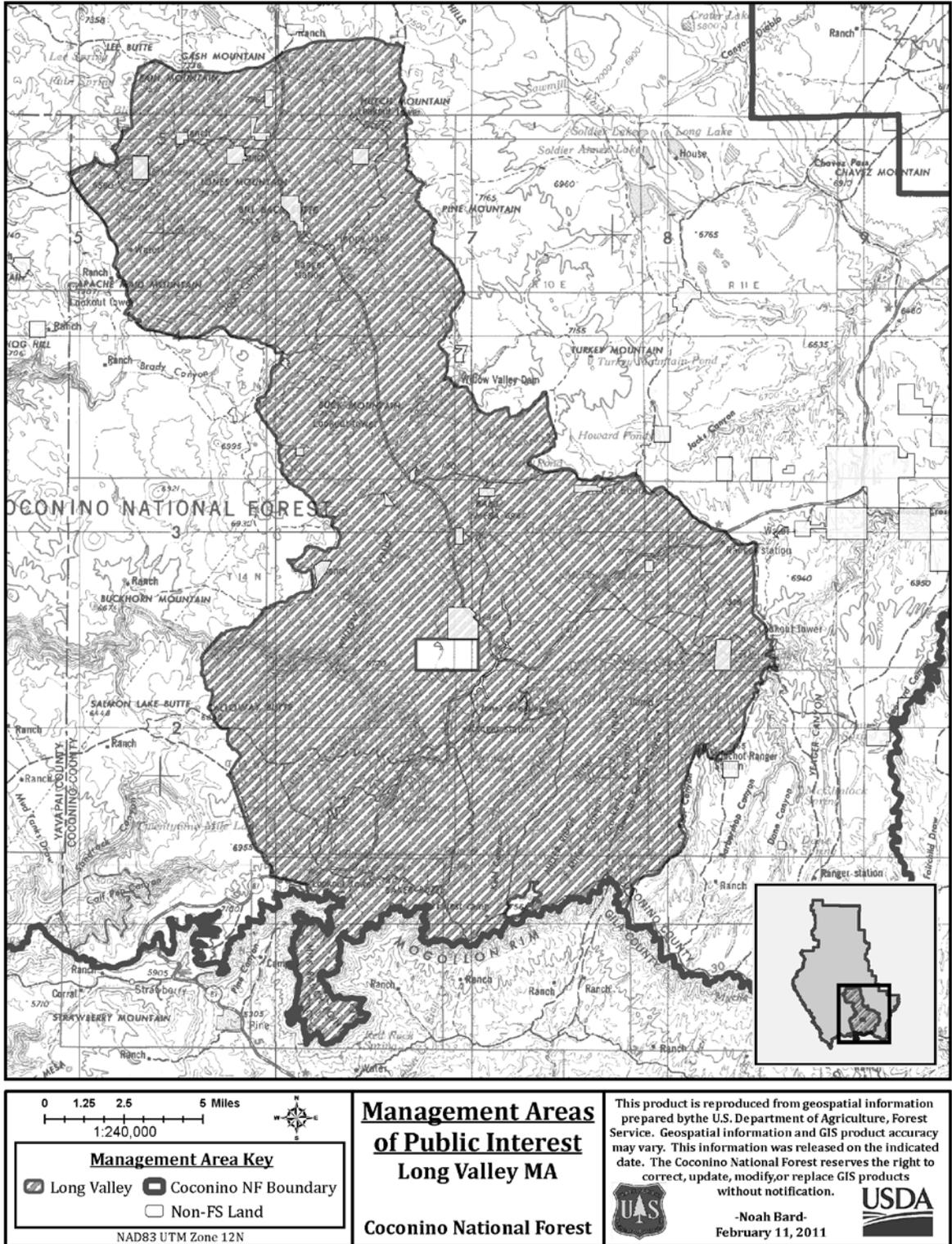












Appendix B. Eligible Wild and Scenic Rivers

Information in progress.

DRAFT

Appendix C. Glossary and Commonly Used Acronyms

Arroyos

Base-for-exchange lands

Best management practices (BMPs)

Climax (seral stages)

Mineral materials – saleable minerals such as sand, gravel, cinders, pumice etc. Limited non-commercial varieties can be collected for free but larger amounts are provided by special use permit at the discretion of the Forest.

Designated special uses

Effective vegetation

Endemic

Fissures

Friable

Functional-at-risk

Herbaceous production

Hydrologic Unit Code or HUC - Watersheds cataloged using a uniform hierarchical system developed by the U.S. Geological Survey. The U.S. is divided and sub-divided into successively smaller hydrologic units, or watersheds, which are nested within each other from the largest to the smallest. Each hydrologic unit is identified by a code. The Coconino NF extends across seven 4th level HUC watersheds which drain into the Little Colorado River basin to the east or the Verde River basin to the west. Each 4th level HUC is comprised of smaller 5th level HUCs which in turn are comprised of even smaller 6th level HUCs.

Hydrophilic

Leasable minerals: Leasable minerals are not locatable and are subject to leasing under the Mineral Leasing Act and include oil, gas, gypsum, and geothermal. By the lease terms, the lessee has the legal right to drill or mine subject only to the terms and conditions of the lease.

Livestock utilization

Locatable minerals: Locatable minerals are minerals that are regulated under the provisions of the 1972 Mining Law include gold, silver, uranium and many others. Locatable mineral uses can occur unless the lands are withdrawn from mineral entry.

[Mesquite bosques](#)

Mineral withdrawal – Mineral withdrawal reserves public lands from entry by leasable or locatable mineral entry. To request a mineral withdrawal, the Forest Service must submit a request and documentation to the Bureau of Land Management.

Narrow and endemic species

[National Forest System \(NFS\)](#)

Native species

Nonnative species

Old growth

Outstandingly remarkable values (ORVs)

Pine Stringers

Planned/unplanned ignition

Post-fledgling family area (PFA)

“Potential”

Potential natural vegetation type (PNVT)

Prescribed fire

Properly functioning condition

Property classes (Heritage)

Proposed/candidate species

Quiet areas

Recreation Opportunity Spectrum (ROS)

Satisfactory/unsatisfactory soil condition

Scales

Scenic integrity objectives

Seral stages

[Significant cave](#) - a cave located on National Forest System lands that has been evaluated and shown to possess features, characteristics, values, or opportunities in one or more of the following resource areas: biota; cultural; geologic-mineralogic-paleontologic; hydrologic; recreational; or educational-scientific for scientific, educational or recreational purposes; and which has been designated “significant” by the forest supervisor.

Soil bearing strength

Special status species

Species of conservation concern

Speleogens

Speleothems

Stubble height

Timber production

Total maximum daily load (TMDL)

Trafficability

Tree clumps

Tree groups

Water rights (claimed and certified)

Water courses (ephemeral, intermittent, and perennial)

Wilderness opportunity spectrum (WOS)

Wildland urban interface (WUI)

Wind-throw

Commonly Used Acronyms

ADOT – Arizona Department of Transportation

AMS – Analysis of the Management Situation

ATV – All Terrain Vehicle

AZGFD – Arizona Game and Fish Department

BLM – Bureau of Land Management

BMP – Best Management Practice

CNF – Coconino National Forest

CWPP – Community Wildfire Protection Plans

DBH – Diameter at Breast Height

EMA – Ecosystem Management Area

ESA – Endangered Species Act

HUC – Hydrologic Unit Code

MA – Management Area

Appendix C. Glossary and Commonly Used Acronyms

MRDG – Minimum Requirements Decision Guide

MVUM – Motor Vehicle Use Map

NAGPRA – Native American Graves Protection and Repatriation Act

NEPA – National Environmental Policy Act

NF – National Forest

NFMA – National Forest Management Act

NFS – National Forest System

NPS – National Park Service

NWPS – National Wilderness Preservation System

OHV – Off Highway Vehicle

ORV – Outstandingly Remarkable Values

P – Primitive

PAC – Protected Activity Center

PFA – Post-fledging Family Areas

R3 – Region 3 of the US Forest Service (Southwestern Region)

RNA – Research Natural Area

ROS – Recreation Opportunity Spectrum

SIO – Scenic Integrity Objective

SMS – Scenery Management System

SPNM – Semi-primitive non-motorized

USFS – United States Forest Service

USFWS – United States Fish and Wildlife Service

WOS – Wilderness Opportunity Spectrum

WSA – Wilderness Study Area

WUI – Wildland Urban Interface

ZBA – Zoological and Botanical Area

Appendix D. PNVT Descriptions

Information in progress.

DRAFT

Appendix E. Species Names

Information in progress.

DRAFT

Appendix F. Southwestern Region Climate Change Trends and Forest Planning

Information in progress.

DRAFT

Appendix G. Proposed and Probable Actions

Information in progress.

DRAFT

Appendix H. List of Preparers

Information in progress.

DRAFT

Appendix

Appendix I. Index

Information in progress.

DRAFT