

SECTION I - INTRODUCTION

A. Purpose

This Fire Management Plan formally documents the fire management program for the approved Kaibab National Forest Land Management Plan (1996), as amended August 2000, hereafter called Forest Plan. It provides specific details of the fire program that most efficiently meets fire management direction for the planning period, including organization, facilities, equipment, activities, timing, locations, and related costs. Each year adjustments are made in the plan to reflect changes in the annual planning process. This document is meant to be a working reference for fire program management.

This plan was developed for all areas subject to wildland fires on the Kaibab National Forest in compliance with the following (FSM 5101, 5103, 5106, and 5108): Federal Wildland Fire Management Policy and Program Review; Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy (June 2003); Wildland Fire Use Implementation Procedures Reference Guide; Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide; Interagency Standards for Fire and Fire Aviation Operations (Red Book); Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems - A Cohesive Strategy; the interagency fire management plan template; and A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.

B. Collaboration

Many sources were included in the development of the Forest Plan. Comments were received from the public, USFS employees, other agencies, and tribal relations. This current Fire Management Plan has been written to comply with the direction as stated in FSH 5109.19, Chapter 50. Much of the information included in this plan has been taken from the previously approved plan. This plan takes into account the concept of interagency relationships and how to better work with our partners.

C. Link to Policy

This plan is a detailed program of action to carry out fire management policies and will help achieve resource and fire management objectives as defined in the Forest Plan.

D. Link to Land and Resource Management Planning

This plan meets State and Federal regulatory requirements by implementing approved fire management direction outlined in the Forest Plan and analyzed in the Final Environmental Impact Statement (FEIS), Kaibab National Forest, 1996.

E. Authorities

FSM 5101 describes the authority for fire management activities on National Forest System Lands. Fire management, as it pertains to wilderness, is guided by the Wilderness Act which is cited in FSM 5101.2, item #27.

FSM 5102 describes the objectives of Fire Management as:

1. Forest Service fire management activities shall always put human life as the single, overriding priority.
2. Forest Service fire management activities should result in safe, cost-effective fire management programs that protect, maintain, and enhance National Forest System lands, adjacent lands, and lands protected by the Forest Service under cooperative agreement.

FSM 5108 lists pertinent references for guidance on the minimum standards and procedures for wildland fire management.

SECTION II – RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. Documents used to develop this Fire Management Plan:

- Wildland Fire Use Implementation Procedures and Reference Guide, May 2005 and March/April 2006 revisions.
- Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide, September 2006.
- Review and Update of the 1995 Federal Wildland Fire Management Policy, January 2001
- Land Management Plan, as amended, August 2000, Kaibab National Forest
- Environmental Assessment, Biological Assessment and Evaluation, Biological Opinion and Decision Notice associated with the amendment 4, August 2000, Kaibab National Forest
- Forest Service Manual (FSM) 5100
- Forest Service Handbooks (FSH) 5109.xx
- Kaibab National Forest, 2002 NFMAS Analysis
- Interagency Standards for Fire and Fire Aviation Operations (“The Red Book”-2008)
- Northern Arizona Area Handbook

B. Management Policies Concerning Fire

The January 2001 Federal Wildland Fire Management Policy (1995 policy update), Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy (June 2003), and Forest Plan are the guiding policy documents for fire management activities on the Kaibab National Forest.

The January 2001 Federal Wildland Fire Management Policy directs Federal agencies to achieve a balance between suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. The policy provides 9 guiding principles and 17 policy statements that are fundamental to the success of the Federal Wildland Fire Management program:

Guiding Principles

- 1. Firefighter and public safety is the first priority in every fire management activity.**
- 2. The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.**
- 3. Fire Management Plans, programs, and activities support land and resource management plans and their implementation.**

4. **Sound risk management is a foundation for all fire management activities.**
5. **Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.**
6. **Fire Management Plans and activities are based upon the best available science.**
7. **Fire Management Plans and activities incorporate public health and environmental quality considerations.**
8. **Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.**
9. **Standardization of policies and procedures among federal agencies is an ongoing objective.**

Policy Statements

1. Safety

Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.

2. Fire Management and Ecosystem Sustainability

The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.

3. Response to Wildland Fire

Fire, as a critical natural process, will be integrated into land management plans and activities on a landscape scale and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances under which wildland fire occurs and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate management response to the fire.

4. Use of Wildland Fire

Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire will be based on approved fire management plans and will follow specific prescriptions contained in operational plans.

5. Rehabilitation and Restoration

Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.

6. Protection Priorities

The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.

7. Wildland Urban Interface

The operational roles of federal agencies as partners in the Wildland Urban Interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding. (Some federal agencies have full structural protection authority for their facilities on lands they administer, and may also enter into formal agreements to assist State and local governments with full structural protection.)

8. Planning

Every area with burnable vegetation must have an approved fire management plan. Fire management plans are strategic plans that define a program to manage wildland and prescribed fires based on the area's approved land management plan. Fire management plans must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objectives, activities of the area, and environmental laws and regulations.

9. Science

Fire management plans and programs will be based on a foundation of sound science. Research will support ongoing efforts to increase our scientific knowledge of biological, physical, and sociological factors. Information needed to support fire management will be developed through an integrated interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land management plans, fire management plans, and implementation plans.

10. Preparedness

Agencies will ensure their capability to provide safe, cost-effective fire management programs in support of land management plans through appropriate planning, staffing, training, equipment, and management oversight.

11. Suppression

Fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

12. Prevention

Agencies will work together with local partners and other affected groups and individuals to prevent unauthorized ignition of wildland fires.

13. Standardization

Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, values-to-be-protected methodologies, and public education programs for all fire management activities.

14. Interagency Cooperation and Coordination

Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.

15. Communication and Education

Agencies will enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be continuously improved through the timely and effective exchange of information among all affected agencies and organizations.

16. Agency Administrators and Employee Roles

Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as the situation demands. Employees with operational, administrative, or other skills will support the wildland fire program as necessary. Agency administrators are responsible and will be held accountable for making employees available.

17. Evaluation

Agencies will develop and implement a systematic method of evaluation to determine effectiveness of projects through implementation of the 2001 Federal Wildland Fire Management Policy. The evaluation will assure accountability, facilitate resolution of areas of conflict, and identify resource shortages and agency priorities.

The purpose of the Interagency Strategy for the Implementation of Federal Wildland Fire Management is to clarify information in the Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001) and set forth direction for consistent implementation of policy at the operational level.

Several specific operational differences existed among the federal wildland fire management agencies. These are clarified by the following:

1. Only one management objective will be applied to a wildland fire. Wildland fires will either be managed for resource benefits or suppressed. A wildland fire cannot be managed for both objectives concurrently. If two wildland fires converge, they will be managed as a single wildland fire.
2. Human caused wildland fires will be suppressed in every instance and will not be managed for resource benefits.
3. Once a wildland fire has been managed for suppression objectives, it may never be managed for resource benefit objectives.
4. The Appropriate Management Response (AMR) is any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using FMU strategies and objectives identified in this Fire Management Plan.
5. The Wildland Fire Situation Analysis process is used to determine and document the suppression strategy from the full range of responses available for suppression operations. Suppression strategies are designed to meet the policy objectives of suppression.
6. Wildland fire use is the result of a natural event. The Land/Resource Management Plan, or this Fire Management Plan, will identify areas where the strategy of wildland fire use is suitable. The Wildland Fire Implementation Plan (WFIP) is the tool that examines the available response strategies to determine if a fire is being considered for wildland fire use.
7. When a prescribed fire or a fire designated for wildland fire is no longer achieving the intended resource management objectives and contingency or mitigation actions have failed, the fire will be declared a wildfire. Once a wildfire, it cannot be returned to a prescribed fire or wildland fire use status.

Relevant fire management direction from the Forest Plan is included in the following sections.

C. Forest-wide Desired Condition, Goals, Objectives, Standards and Guidelines

Forest-Wide Desired Conditions Related to Fire

- No Forest-wide desired conditions have been identified in the Forest Plan which specifically reference fire or fire behavior.
- Each individual Ecosystem Management Area (EMA) addresses specific desired conditions related to fire or fire behavior. (**Appendix A**)

Forest-Wide Objectives Related to Fire

- No Forest-wide objectives have been identified in the Forest Plan which specifically reference fire or fire behavior.
- Each individual Ecosystem Management Area addresses specific objectives related to fire or fire behavior. (**Appendix A**)

Forest-Wide Goals Related to Fire

1. Wilderness (Forest Plan, pg. 18)

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

2. Fire Protection and Fire Use (Forest Plan, pg. 20)

Use prescribed fire and wildland fire use as resource management tools where they can effectively accomplish resource objectives. Wildland fire use is allowed on all of the forest except for the mixed-conifer forest type on the North Kaibab R.D. The Decision Notice for the Wildland Fire Use amendment to the Forest Plan removes this option for the mixed-conifer habitat on the North Kaibab R.D. due to the concerns with the Mexican Spotted Owl habitat. Fire management, prevention, and control are used to protect life, property, and resources.

SECTION III – WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

Wildland fire will be managed to meet the goals and objectives set forth in the Forest Plan, the core principles of the 10-year Comprehensive Strategy, and the National Fire Policy. This includes using the Appropriate Management Response to all human caused fires on the Forest and any fire within the Mixed-Conifer FMU on the North Kaibab R.D. and managing all natural ignitions when possible outside of the North Kaibab R.D. Mixed-Conifer FMU. Prescribed fire will be used on all FMUs of the Forest unless specifically stated in the Forest Plan.

Due to the location of the Grand Canyon National Park's proximity to the Forest, annual coordination occurs between both agencies in order to establish guidance for Wildland Fire Management Strategies that may impact each others' lands. Activities such as training, preparedness, aviation, fire use opportunities, cost sharing, etc. are looked at each season in order to create a more efficient and cost effective organization. The two agencies currently are dispatched out of the Williams Interagency Zone Dispatch Center.

The Forest also has agreements with agencies within the Grand Canyon Zone of the Northern Arizona Area, which includes the Grand Canyon National Park, Truxton-Canyon Field Office (BIA), and Arizona State Land Department. Direction for the Grand Canyon Zone can be located in the Northern Arizona Area Operating Plan.

The Forest also incorporates the 10-Year Comprehensive Strategy in its wildland fire management strategies. A quick summary of the plan is as follows:

A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy, May 2002

The *10-Year Comprehensive Strategy* was developed to address the risk of wildland fire to communities and the environment as a result of a "high level of growth in the wildland urban interface that is placing more citizens and property at risk of wildland fire"

Additionally, the *Strategy* recognizes the following:

" . . . that many of the past century's traditional approaches to land management, the development of unnaturally dense, diseased or dying forests, and treatment of wildland fire have contributed to more severe wildland fires and created widespread threats to communities and ecosystems. Millions of acres of land nationwide are presently classified as being at high risk from wildland fire."

This *Strategy* includes goals, guiding principles, performance measures, and implementation tasks that the Secretaries, Governors, Tribes, local officials, and other endorsers' reemphasize a unified national commitment to reduce the risk of wildland fire

across the landscape. They also understand the need to cooperate with affected landowners.

The four goals of the 10-Year Comprehensive Strategy are:

1. Improve Fire Prevention and Suppression
2. Reduce Hazardous Fuels
3. Restore Fire-Adapted Ecosystems
4. Promote Community Assistance

Its three guiding principles are:

1. Priority setting that emphasizes the protection of communities and other high-priority watersheds at risk.
2. Collaboration among governments and broadly representative stakeholders.
3. Accountability through performance measures and monitoring for results.

To reduce the threat of wildland fire to people, communities, and ecosystems, the following is essential:

- Firefighter and public safety continuing as the highest priority.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.
- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management active, both in the wildland-urban interface and in at-risk areas across the border landscape.
- Active forest and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

B. Wildland Fire Management Goals

The following are Wildland Fire Management goals as identified in the Forest Plan which provide the programmatic direction for the wildland fire program:

- Achieve a program where firefighter and public safety is the highest priority in every fire management activity.
- Wildland and prescribed fire and mechanical treatments are used wherever appropriate as tools to meet resource management objectives.
- Efficiently utilize fire management resources in an interagency setting with focus on reduced cost of operation for all cooperators.
 - Maintain an efficient and effective organization for the suppression of wildland fires at a minimum cost consistent with the values at risk.

C. Wildland Fire Management Options

The Forest Plan allows for the use of all fire management options. These include:

- Wildland Fire Suppression (Forest wide)
- Wildland Fire Use (Forest wide except FMU 2, Mixed-conifer type)
- Prescribed Fire (Forest wide)
- Non-fire Applications (Forest wide except FMU 3, Wilderness)

When dealing with fire activity within the Forest's managed wilderness(es), the following must be complied with:

1. Notify the Forest Wilderness Resource Advisor (WRA). They will determine whether there is a need for a full time advisor. If the Forest WRA is not available, order one for large fire events and delegate authority to them.
2. Give preference to using methods and equipment that cause the least:
 - a. Alteration of the wilderness landscape,
 - b. Disturbance to the land surface,
 - c. Disturbance to visitor solitude,
 - d. Reduction of visibility during periods of visitor use, and
 - e. Adverse effect on other air quality related values (FSM 2324.23).
 - Note: Items (d) and (e) above can be misleading. Smoke from natural fire does not constitute pollution or adverse impact to visibility. Natural fires should not be limited to protect visibility in wilderness and natural smoke, by definition, does not adversely affect any AQRV. Impacts to human health (NAAQS), such as smoke from a prescribed fire, must be addressed.
3. Guidelines for Minimum Impact Suppression Tactics (MIST) and Leave No Trace (LNT) will be followed and can be found with the Forest WRA.
4. Follow the Minimum Requirement Process when exceptions for temporary roads or structures, or use of motorized equipment or mechanical transport must be used. The Forest WRA will have this direction.
5. Burned Area Emergency Rehab (BAER) will only be allowed in wilderness if
 - a. Necessary to prevent an unnatural loss of the wilderness resource or,
 - b. To protect life, property, and other resource values outside of wilderness.

Note: Normally use hand tools and equipment to install selected land and channel treatments (FSM 2323.43b).

6. Activities that use water resources or may impact water resources must be coordinated with the Forest WRA prior to its use.
7. Any helispots or spike camps that may be required to manage the fire within the wilderness will be coordinated with the Forest WRA prior to development.

D. Description of Wildland Fire Management Strategies by FMU

1. Delineate FMUs on a map.

Fire Management Unit delineation can be located in **Exhibit 1**.

2. Summary listing of the identifiers for the FMUs.

All of the fire management unit direction in the following table below comes from the Forest Plan. Many of the Ecosystem Management Areas (EMAs) were combined into one section since they all had the same Key Components and Constraints. Forest Plan direction for fire management activities can be found in **Appendix A**. This includes Northern Goshawk Guidelines. The complete direction for the management of Northern Goshawk can be found in the Forest Plan.

Fire Management Unit	Ecosystem Management Area (EMA)	Key Components & Constraints
<p>1) Fire Use</p> <p>Fire Use permitted with some small areas excepted (See Key Components and Constraints)</p> <ul style="list-style-type: none"> This FMU comprises the majority of the Forest. It is predominantly flat (slopes < 25%) with a frequent fire return interval of <25 years. Vegetation types are primarily grassland, woodland (pinyon/juniper) and ponderosa pine. Soils are quite variable; however erosion risk is generally low to moderate. Water sources are almost exclusively human made. The air shed over this FMU is adjacent to two Class I air sheds (Sycamore Canyon & Grand Canyon). The only T&E species present are MSO and bald eagle. All MIS identified in the Forest LMP are represented. Density of heritage sites is variable and includes the highest densities 	<p>1, 3, 8, 9, 12 & 16 (Pinyon/Juniper)</p>	<p>Size objectives of wildland fire are not set in the Forest Plan but will be based on continuous area of high-intensity burn. All activity-created fuels are promptly removed from areas designated with visual management objectives of “retention – foreground” or “partial retention-foreground”.</p>
	<p>2, 10 & 13 (Ponderosa Pine) *except mixed conifer</p>	<p>Fire use is the preferred method for fuel treatment (except in MSO protected, restricted, and designated critical habitat with current FWS interpretation of “save all trees > 24” dbh.) Priority for fuel treatment is 1) WUI; 2) areas that exceed rates of spread and fire intensity representative of the historical frequent low intensity fire regimes of the southwest 3) then maintenance of existing fuel breaks and fuel reduction corridors. Restrict wildland fire size to 20 acres (of continuous high intensity burn) unless managed as a WFU action.</p>
	<p>7 (Garland Prairie)</p>	<p>Minimize suppression impacts and acreage burned by human-caused fires. Maximum size objective for human-caused fires is 1 acre. Do not construct handline or use retardant in this area.</p>

<p>and most significant sites on the Forest.</p> <ul style="list-style-type: none"> • Virtually all developed recreation sites, administrative sites and private in-holdings are present in this FMU. 	<p>6 (Arizona Bugbane)</p>	<p>Design AMR actions to prevent damage to the plant colony and habitat. The maximum fire size objective is 1 acre. Direct attack and control all fires. Implement the Arizona Bugbane Conservation Strategy – Bill Williams Botanical Area Management Plan, once developed. Dispose of all activity created slash.</p>
	<p>20 (Franks Lake)</p>	<p>Direct attack and control all fires. Maximum fire size objective is 1 acre. Dispose of all activity created slash.</p>
	<p>21 & 22 (Current & planned developed sites)</p>	<p>Direct attack and control all fires. Maximum fire size objective is 1 acre. Encourage utilization of natural fuels for onsite fuel wood needs. Dispose of all activity created slash.</p>
<p>2) Wildland Fire Use Prohibited</p> <p>The description of this FMU is the same as FMU 1 with the following exceptions:</p> <ul style="list-style-type: none"> • This FMU comprises the majority of the mixed conifer forest outside designated Wilderness on the North Kaibab RD. • Fire return intervals vary from 5-150 years, depending upon elevation and aspect. • Vegetation type is aspen, mixed conifer and spruce-fir. • Soils are primarily derived from limestone. • The only T&E species present is the bald eagle. • Density of heritage sites is variable and generally low. • Kaibab Lodge, DeMotte CG, a powerline and an electronic site are the primary real property present other than roads. 	<p>13 (Mixed conifer)</p>	<p>Fire use is effectively precluded in MSO protected, restricted, and designated critical habitat with current FWS interpretation of “save all trees > 24” dbh. Priority for fuel treatment is 1) WUI; 2) areas that exceed rates of spread and fire intensity representative of the historical frequent low intensity fire regimes of the southwest 3) then maintenance of existing fuel breaks and fuel reduction corridors. Restrict wildland fire size to 20 acres (of continuous high intensity burn) unless managed as a Wildland Fire Use action.</p>

<p>3) Wilderness</p> <p>Fire Use is permitted with one small area excepted. (See Key Components and Constraints)</p> <ul style="list-style-type: none"> • Slopes are quite variable with many steep areas and escarpments. • Fire return intervals vary from 5-150 years, depending upon elevation, aspect and re-growth. • Vegetation types and density are quite variable. • Soils and their response to disturbance are quite variable. • Water sources are almost exclusively natural springs and ephemeral draws. • The air shed over this FMU is adjacent to or near two Class I air sheds (Sycamore Canyon & Grand Canyon). • T&E species present are MSO, bald eagle, Apache trout (in Saddle Mountain Wilderness.) and California condor (experimental). MIS identified in the LMP are aquatic macro-invertebrates, elk, goshawk, Lincoln's sparrow, Lucy's warbler, mule deer, plain titmouse, pygmy nuthatch, red squirrel, spotted owl, turkey, yellow-bellied sapsucker, and yellow-breasted chat. • Density of heritage sites is variable and includes some of the highest densities and most significant sites on the Forest. • Kendrick Mountain Lookout is the primary real property of concern. 	<p>4, 11 & 19 (Kendrick, Kanab Creek, Saddle Mountain)</p>	<p>Fire use is permitted to break up unnaturally large areas of continuous fuel and create a more natural "mosaic" of fuel beds. Target stand size is 50 to 150 acres. Maximum fire size is 150 acres for lightning-caused and 20 acres (Kendrick Mountain) or 200 acres (Saddle Mountain and Kanab Creek Wilderness) of continuous high intensity burn. Allow fire to exceed wilderness boundary only if the objectives of the threatened management area can be met. In North Canyon Creek, control all wildland fires within a 2-mile radius of North Canyon Spring.</p>
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- a. **FMU Identifier (see preceding summary tables)**
- b. **FMU Characteristics (see preceding summary tables)**
- c. **Strategic and Measurable Management Objectives Specific to the FMU (see preceding summary tables).**
- d. **Management Constraints or Criteria Affecting Operational Implementation (see preceding summary tables).**
- e. **Historical Fire Occurrence**

Fire has always played a major role in the life cycle of vegetation in the natural landscape. Since the dawn of time, lightning has started most fires, influencing the life cycles of plants and ecosystems. Many plants adapted to fire's effects. In fact, many plants adapted so well that they now depend on fire for their normal life cycle. Fire, as a tool for people to control and modify their surroundings and to assist in various aspects of everyday life, has been used for thousands of years. However, the forest has changed during the Twentieth Century as public policy and forest management practices interfered with the natural fire cycle. Since the turn of the century management activities have resulted in years of fuel buildup and coupled with the current drought conditions, insect infestation, and disease, has left the forest vulnerable to intense and uncharacteristically destructive fires.

- FMU 1, Fire Use Permitted

Much of this FMU consists of ponderosa pine vegetation with large expanses of pinyon/juniper along the fringes. A variety of herbaceous and woody vegetation make up the understory. By studying growth rings and fire scars on trees hundreds of years old, researchers at the University of Arizona's Tree Ring Laboratory learned that areas of ponderosa pine stands averaging 3,000 acres in size have re-burned every two to ten years. These fires typically burned along the ground and at lower heat intensity, and thus were not destructive. These fires acted as natural thinning agents and reduced surplus fuel. The major cause of the present excess of pine production is exclusion of fire. Grazing of flammable grasses along with fire suppression practices of complete control of all fires by 10 AM the next day and an intensive fire prevention program has minimized the number acres burned over the past century. This has resulted in much heavier loadings of both dead and live fuels in all timber vegetation types. Past timber practices have allowed the removal of some of this buildup but has failed to keep it to a level that is healthy and less hazardous. This build-up of fuel has led to conditions that support larger and more intense fires that will leave large acreages of killed or damaged trees, sterilized soils, increased watershed degradation and poor visual quality, destroy critical wildlife habitat and contribute to unsafe fire fighting conditions. Within the pinyon/juniper communities these practices have led to an increase in the density of these trees and allowed them to expand into areas that in the past were considered grass lands. Fires that occur in this vegetation type usually don't spread much away from the source except under extreme drought as in the case of the Bridger/Knoll Fire (50,000+acres).

- FMU 2, Wildland Fire Use Prohibited

The lower elevations of this FMU consist of mixed-conifer stands of pine, aspen, and fir. In the upper elevations the vegetation transitions from the mixed-conifer to spruce/fir. These areas see limited human caused fires due to their location but still suffer from the same kinds of past land management practices as above. Historically these areas saw longer periods between fires (0-35 years) and do not suffer to the same extent from human intervention as in pine fuels but conditions are still well beyond the historical range of variability and capable of supporting catastrophic fires in the future.

- FMU 3, Wilderness

In general these areas contain a mix of all of the above except in the Kendrick Mountain Wilderness that burned in CY 2000 from the Pumpkin Fire. There still exist large patches of mixed conifer in the upper elevations and pine fuel types in the lower elevations that survived the fire. These areas have had their dead fuel loadings reduced to near historical levels but the number of trees per acre is still above that average.

f. The Fire Management Situation

(1) Weather patterns influencing fire behavior and historical analysis for all FMUs in general.

Strong southwest winds and low humidity are prevalent from mid-April to mid-June, resulting in mainly wind driven fire behavior. Hot, dry and unstable conditions usually occur from mid-June to early July, leading to the potential for plume dominated fire behavior. The potential for dry lightning is most prevalent from June to early July but is uncommon. The monsoon, accompanied by higher humidity and rainfall potential, less wind and subdued fire behavior, begins during the first or second week in July and ends in the second or third week in September when dry and mild conditions return leading to a period of increased fire behavior potential before the onset of winter conditions.

(2) Fire season determination for all FMUs in general.

Elevation and the difference in winter weather patterns affecting the North Kaibab Plateau leads to a difference in the length of the fire season between the North and South Kaibab. The North Kaibab generally receives more winter precipitation delaying the onset of fire season in the spring and ending sooner in the fall as the jet stream begins to move further south and with it the tailing end of pacific storms moving across the Rockies. These storms bring

light precipitation to the North Kaibab but generally mean windy and dry conditions for the south. The fires analysis tools in the Fire Family Plus program was utilized to determine the general fire season and is as follows:

North Kaibab: May - September

South Kaibab: April - October

(3) Fuel conditions in the FMU.

FMU 1, Wildland Fire Use Permitted

This FMU is characterized by a dominance of ponderosa pine vegetation with large expanses of pinyon-juniper on the western and eastern edges.

- Ponderosa Pine Fuels:

These fuels can range from open stands of pine with grass understory to closed stands with heavy accumulations of dead and down woody debris. The open park like stands generally cause little control problems except during drought conditions when passive crown fire behavior is possible. The closed stands are generally associated with heavy unnatural accumulations of dead and down woody material and are generally multistoried with low crown base heights. All of these conditions can lead to passive and active crown fire behavior during late May and into July.

- Pinyon/Juniper Fuels:

These fuels range from open P/J with grass understory to more closed stands with very little herbaceous fuels. Fire spread is very limited due to the lack of ground fuels but can support some active crown fire during the most extreme fire conditions. Spread is from crowning and spotting ahead.

FMU 2, Wildland Fire Use Prohibited

This FMU consists mainly of mixed-conifer fuels on the North Kaibab plateau. Lower elevation mixed-conifer consists mainly of an overstory of fir and pine with some dispersed Douglas fir intermixed with clumps of Aspen. Dead and down fuels include greater quantities of 3-inch or larger limb-wood resulting from the over mature or natural events that create a large load of dead material on the forest floor. Lack of fire over the past century has contributed to a heavy infestation of young white fir in the understory. The mixed-conifer stands at the higher elevations consist of closed canopy stands of short-needle conifers and hardwoods of spruce, fir, and aspen. The litter layer consists mainly of compacted leaves, needles and twigs.

FMU 3, Wilderness

All conditions mentioned above exist in this FMU. In addition brush fuel models exist in the lower elevations and are associated with steep slopes. Decadent stands of manzanita and turbinella oak can support very active fire behavior on these steep slopes.

(4) Fire regime alteration

In General the following Fire Regimes are present on the Forest:

- Fire Regime I - ponderosa pine, limber pine, rocky mountain juniper, pinyon-juniper
- Fire Regime II - blue grama, mountain muhly, bluegrass, wheat grasses, shrublands, sagebrush
- Fire Regime III – Douglas Fir, mixed conifer, eastern red cedar
- Fire Regime IV – aspen, blue spruce & associated species, timber mixed with hardwoods, Engelmann spruce, sub-alpine fir, white fir
- Fire Regime V - None

FMU 1, Wildland Fire Use Permitted

Fire Regime I and II is representative of this FMU. Conditions within these Fire Regime's are in general altered from their historical range due to human intervention. Fire exclusion, livestock grazing, logging, and invasion of exotic species are the primary causes of this departure. They are at "high" (most acres are Condition Class 3) risk of loss of native plant and animal habitats, reduced air quality due to wildland fire smoke, degraded water quality and at "high" risk of catastrophic fires that will further degrade watersheds, reduce commodity outputs, and risk the health and safety of our publics and fire fighters alike.

FMU 2, Wildland Fire Use Prohibited

This FMU is a mix of Fire Regime III in the lower elevations and Fire Regime IV in the upper elevations. Conditions in Fire Regime III are as described above. In Fire Regime IV conditions are closest to their historical range due primarily to their geographic location or their timber value. Within III and IV conditions have not been altered as dramatically as in Fire Regime I but the more subtle effects of homogenization and increased woody fuel loadings have created risks to the ecosystem. Fire exclusion, livestock grazing, logging, and invasion of exotic species are the primary causes of this departure. Most acres are classified as Condition Class 3.

FMU 3, Wilderness

All Fire Regimes are representative of this FMU along with the conditions as described above. Most acres are classified as Condition Class 3.

(5) Control problems

FMU 1, Wildland Fire Use Permitted

This area is an elevated plane interspersed with isolated cinder hills and steep volcanic mountains i.e. Sitgreaves Mountain which in many cases are roadless or have very limited access. Elevations range from 6500 to 9500 feet. Drainages are both well and ill defined with many having scarp slopes. The majority of this FMU is very accessible to initial attack forces due to numerous roads, which results in quick initial attack. In contrast the volcanic mountains and the steep canyons that drain the elevated plain create long initial attack times with high resistance to control due to slow and difficult line construction.

FMU 2, Wildland Fire Use Prohibited

This elevated plain extends north from the Grand Canyon and has all the same characteristics and control issues as mentioned above except for the presence of volcanic mountains.

FMU 3, Wilderness

Accessibility, steep slopes, and canyons make for long initial attack times and unsafe fire fighting conditions. Minimal impact suppression techniques add to the complexity of the operation making suppression difficult.

(6) Other elements of the fire environment affecting management.

The Kaibab National Forest adjoins three major federal land management agencies: Grand Canyon National Park, Prescott National Forest, and the Coconino National Forest. Due to decisions within each entity's land management plan or general management plan, the fire management programs differ concerning wildland fire use. The Grand Canyon National Park has an approved Wildland Fire Use program while the Coconino National Forest and the Prescott National Forest are in the process of modifying their Land Management Plans to allow for the use of wildland fire. Coordination between the Kaibab National Forest and any of these agencies will occur during all fire management activities, e.g., wildland fire use, prescribed fire, wildland fire suppression activities, etc.

SECTION IV – WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

Implementation of wildland fire management components must be consistent with fire management capabilities and must consider the current and predicted conditions affecting fire behavior. Preplanned decisions based on historical fire behavior indices should be considered to most efficiently assist in Stage I decisions requiring appropriate management responses.

Fire managers shall use these strategies for expediting the decision-making process to determine whether to respond to an initial action as an emergency and take the appropriate management response or whether the wildland fire ignition could be managed for resource benefits.

1. Setting Out Implementation Procedures

The Forest follows the guidance provided in the Wildland Fire Use Implementation Procedures and Reference Guide, May 2005 and March/April 2006 revisions.

The FSH 5109.19 Chapter 50 provides direction that states: A WFIP shall be initiated for all wildland fires. Specific WFIP requirements are outlined in the Wildland Fire Use Implementation Procedures and Reference Guide, May 2005 and March/April 2006 revisions.

The responsible line officer and fire manager will initiate a WFIP for every natural ignition that will be managed for Wildland Fire Use. In Stage I, following confirmation of a natural ignition, the objective is to determine if the ignition meets the criteria to be declared a wildland fire use event. If the fire is determined to be human caused or an unwanted wildland fire, the appropriate management response will be identified and implemented. If the initial appropriate management response is unsuccessful, a WFSA will be prepared.

The Forest Supervisor is responsible for approving the WFIP Stage I: Initial Fire Assessment, which provides the decision framework for selecting the appropriate management response (FSM 5140.42). This authority may be delegated to the District Ranger, but only if the District Ranger has the requisite fire management knowledge, experience and staff available. The Forest Supervisor is responsible for notifying the Regional Forester of all wildland fire use projects that undergo Stage I WFIP analysis with a “go” decision under severe burning conditions.

B. Wildland Fire Suppression

1. Range of Potential Behavior

The majority of the forest consists of Ponderosa Pine and mixed conifer. Ponderosa pine is the dominant tree species, but Gamble Oak is often represented with an understory of grass and shrubs. At the higher elevations they grade into mixed conifer forests and into pinyon-juniper woodlands and chaparral at the lower elevations. The absence of fire due to successful suppression activities over the past century has led to an unnatural fuel build up of both the live and dead fuels. Multi-storied stands, dog hair thickets and overstocked multi-aged second growth stands of these trees support active crown fire. Fuel Models 2, 9, and 11 are representative. Fuel Model 11 is used wherever there has been an absence of fire and unnatural fuel loads contribute to spread and intensity. Within the mixed conifer fuels, fire burns in the surface and ground fuels with greater intensity than in the pure Ponderosa Pine fuels. The heavy infestation of young White Fir in the understory increases fire intensity and provides the ladder fuels to spread surface fire into the crowns. Crowning out, torching, and spotting are more frequent in this vegetation type than in the other Forest fuel types. Fuel Model 10 is representative. In the higher elevation spruce/fir fuels only under severe weather conditions involving drought, high temperatures, wind, and very low relative humidity do these fuels exhibit problematic fire behavior. The compacted leaves, needles and twigs support slow-burning ground fires with low flame lengths. Fuel Model 8 is representative. In the pinyon/juniper these fuels range from open P/J with a grass and sage understory to more closed stands with very little herbaceous fuels. Fire spread is very limited due to the lack of ground fuels but can support some active crown fire during the most extreme fire conditions. Spread is from crowning and spotting ahead. Fuel Model 8 is representative unless associated with grass and sage which makes Fuel Model 6 more representative.

Fire potential measures the potential for a fire to spread once it starts and its resistance to control. It is a function of stand structure and density, topography, fuel loading, the arrangement of both live and dead fuels and the amount of heat energy these fuels are capable of producing during the passing of the fire front. Heat energy is a product of how dry the fuels are and is measured by the daily outputs of indices and components from the National Fire Danger Rating System. The Burning Index and Energy Release Component are both indicators of the potential for fire behavior from and initiating fire. The Forest Plan requires Fire Management to strive to keep fires in the timber type to 20 acres or less. Fires with potential to exceed 20 acres are considered to have high potential and are characterized by active crown fire behavior (fire spreading through the crowns of the trees independent or along with the ground fire). Fires with moderate potential range from 10-20 acres and characterized by passive crown fire behavior (running surface fires with individual trees or clumps of trees torching). Low fire potential is characterized by fires less than 10 acres in size and by running surface fires. Generally, areas having crown closures less than 60 percent will have a low to moderate fire potential, although potential may be higher on steeper slopes or in areas with heavy fuel loads. Fire behavior in these areas will be limited to passive-type crown fires. Under the average worst case burning conditions, fires in stands with less than 60 percent crown closure will have moderate rates of spread and moderate resistance to control. Areas having crown closures greater than 60 percent are more susceptible to active and independent type crown fires. In such areas, fires will have high rates of spread and high resistance to control.

During the period of 1987-2006, the Forest averaged 198 fires per year, burning an average of 8688 acres annually. During this 20-year period there was a significant change in the moisture regime of the first 10-year period from the second half. In the early 80's and into the early 90's the southwest was considered to be in a wet cycle but since then the weather has been significantly drier and predicted to stay this way for the near future. In general, the average number of fires per year did not change much from the first 10-year period but there has been a significant change in acres burned. The chart below shows the break down of size class and cause and acres burned by 10-year period. The more recent 10-year average is a better descriptor of changing conditions in the southwest in relation to climate and occurrence. Approximately 96% of these wildland fires are Size Class A and B incidents (less than 10 acres in size). The average annual acres burned are skewed by three large-scale stand replacement fires, which occurred during the drought years of 1996, 2000, 2002, and 2006.

	1977-1986	1987-1996	1997-2006
Fires			
Human Caused	618	550	330
Lightning Caused	1318	1540	1547
Total	1936	2090	1877
Size Class (acres)			
A = 0.1 - .25	1659	1640	1384
B = .26 - 9.9	274	413	418
C = 10 - 99.5	3	24	42
D = 100 - 299	0	8	16
E = 300 - 999	0	1	7
F = 1,000 - 4,999	0	2	5
G = 5,000 +	0	2	5
Acres Burned	640	60462	113288

On average, lightning accounts for approximately 75% of the annual number of fires while a variety of human caused fires accounts for the remaining 25%. Historically, abandoned campfires comprise the largest proportion (53%) of the total human-caused fires. The majority of fires are relatively insignificant in terms of size and fire intensity with fire behavior characterized as a slow to moderate moving surface fire. Initial attack crews are successful in suppressing 99% of the fires at less than one acre. The other 1% is usually suppressed under 10 acres and characterized as running surface fires with some individual or groups of trees torching. A very small portion of fires escape initial attack and have the potential to exceed 100 acres. These fires start out as running surface fires and at some point transition from surface spread into the crowns of the trees leading to extreme fire behavior and the highest resistance to control to suppression action. Strong winds are usually the catalyst for these types of events and elevated moderate fire danger to high and high to extreme leading to the potential for large and catastrophic fires.

These infrequent stand replacement events typically burn at high fire intensity levels (FIL 4 and 5) and result in incidents on the scale of thousands of acres. The largest event on the Forest during the analysis period occurred in 1996 when the Bridger Knoll/Jump Fires burned together for 53,680 acres.

2. Preparedness Actions

The Forest has a written Interagency (Kaibab NF & Grand Canyon NP) Preparedness Plan (**Appendix B**) which provides guidance for elevating preparedness levels and actions to be taken during each level. Other criteria used in determining the Forest Preparedness Level are:

- Current and long range forecasted weather affecting fire behavior and potential.
- Current value and trend of 5-day average ERC on the Forest.
- Comparison of current year ERC and Historical average ERC on the Kaibab N.F.
- Fire occurrence on the Forest, within the Zone, and neighboring Forests/Agencies.
- Fire suppression resource availability.
- Resource commitments to non-suppression activities.
- Grand Canyon Zone and Southwest Area preparedness levels.

The Forest's Fire Management Staff (FSO, Deputy FSO, FAFMO) are responsible for determining the appropriate level of preparedness.

The Forest has two different preparedness levels due to the distance between the North Zone (North Kaibab RD/North Rim) and the South Zone (Williams and Tusayan RDs) of the Kaibab. The primary Forest Preparedness Levels are based on local fire potential and resource commitment, however, this level may be increased to assure that sufficient resources are available to respond to the Zone, Area, or National situation.

a. Fire Prevention, Community Education, Community Risk Assessment, and Other Community Assistance Activities

1) Annual Prevention Program:

The Kaibab N.F. North & South Zone Prevention Plans (**Appendix C**) serve as the guide for each district's prevention program.

2) Special Orders and Closures:

The Forest Supervisor retains the authority to issue Campfire/Smoking and Chainsaw restrictions and will recommend issuance of area closures to the Regional Forester when conditions warrant. Criteria for restrictions and closures can be located in **Appendix D**. Districts should make recommendations or requests for restrictions and closures at least five working days prior to the

recommended execution date. Example Orders can be found in the USDA Restriction and Closure Toolbox document found in **Appendix E**. All orders should be coordinated through the Forest Restriction and Closure Coordinator, Liz Schuppert, Public Services Branch Leader, (928) 635-8367.

As a courtesy to the Rim Forests (Apache/Sitgreaves, Coconino, Kaibab, Tonto, and Prescott N.F.s), restrictions and closures will be coordinated with all of these Forest Supervisors. The Forest will also coordinate restrictions and closures with the County and State. The Forest Supervisor for the Kaibab N.F. reserves the right to enter and exit restrictions and closures without prior approval with the Rim Forest Supervisors, the County, and the State. The Southwest Area provides a toll free information line (1-877-864-6985) that identifies any fire restrictions or area closures for all agencies in the area.

3) Industrial Operations and Fire Precautions.

Industrial operations on the forest should be inspected for compliance with all fire precautionary measures detailed in the contract. Details on industrial operations and an inspection form can be found in **Appendix F**.

Industrial Fire Precaution Plan changes are based on the application of the 5 day average Energy Release Component (ERC), short and long term weather forecasts, and professional judgement. Aids for assisting in the determination can be found in FSM 5100-10 and the Timber Sale Contract "C" clauses found in **Appendix G**. The ERC graphs are maintained by the Dispatch Center and can be located on the forest intranet (fsweb.kaibab.r3.fs.fed.us/fire/fire.html) site under Aviation and Fire or the internet at www.fs.fed.us/R3/kai/fire/.

In the event that a Red Flag Warning is issued, the Contracting Officer in coordination with the District FMO and the Forest's Fire Management Staff, may implement Industrial Fire Plan Level D, which automatically shuts down all industrial operations on the district/forest. If this decision is made, the CO will contact the operator per the "C" clauses located in **Appendix G**.

Industrial operators and the general public may call (928) 635-8200 for the Kaibab N.F. 24 hours a day to obtain the current industrial fire precaution plan level.

b. Annual Fire Training Activities

FSM 5135.5 requires all personnel who may receive a wildland fireline assignment to complete an annual Fire Safety Refresher Training. Chapter 13 of the Interagency Standards for Fire and Aviation Operations 2008 (Red Book) requires that the following core topics are included: Avoiding Entrapments, Current Issues, Fire Shelter, Other Hazards and Safety Issues. Each individual will also receive training

in the Forest Service Code of Conduct for Fire Suppression, Incident Complexity Analysis, and the Incident Response Pocket Guide (pages 1 and 18). Refer to the Annual Wildland Fire Safety Refresher Training site (www.nifc.gov) for materials to assist with putting on this training. For non-wildland fireline positions, individuals must meet the requirements set forth in Chapter 7 of the Interagency Standards for Fire and Aviation Operations 2008 (Red Book).

1. Qualifications and Needs Assessment

The Forest's policy requires that all employees wishing to hold an Incident Qualification Card will take the appropriate level of the Work Capacity Test and complete the Wildland Fire Refresher Training. The Incident Qualification Cards are valid for one year from the time they are issued. Those individuals not certified and not issued a Red Card will not be available for any assignment until these requirements are met. District Fire Management Officers are responsible for certifying that the above requirements are met prior to the issuance of individual Red Cards for their unit. The Center Manager is responsible for certifying the above requirements for all Supervisor's Office personnel.

All employees are responsible for submitting their experience records to the Dispatch Center at the end of each fire season. The Dispatch Center will send out an annual reminder letter for employees to do this.

All fire related training courses need to be documented in each employee's qualification file. When an employee completes a training course, they need to make sure that a copy of the training certificate gets forwarded to the Dispatch Center for inclusion into their qualification file.

All Position Task Books will be issued in accordance with FSH 5109.17 (November 2007). For more specific guidance see **Appendix H**.

c. Fire Season Readiness

1) Annual Preparedness Reviews

Preparedness reviews will be completed annually on each District by the Supervisor's Office Fire Management Staff. These reviews will try to be scheduled prior to the start of the fire season (April). Additional reviews will be scheduled by SO Staff to review specific District Fire Management activities to include; fuels management, brush disposal, prescribed fire, suppression activities, fiscal accountability, training and qualifications programs, etc.

2) Season Start and Stop Criteria

NFMAS has determined that the official fire season for the Kaibab N.F. runs from April 23rd through October 19th of each calendar year.

3) Agency Fire Caches

The Kaibab N.F. maintains one 100-person mobile fire cache stored in a 30 foot trailer on the North Zone. This cache is pre-positioned, without a tractor, at the Jacob Lake Administrative Site. This unit contains a standard 100-person cache of tools and supplies plus miscellaneous support items for the incident command post.

District caches are maintained for stocking and resupply of district resources and do not necessarily meet standard stocking levels. The Tusayan RD has an agreement with the Grand Canyon NP to access materials from their cache on the South Rim. (**Appendix I**)

The Prescott Fire Cache is the Kaibab N.F.'s National Interagency Support Cache is within 2 hours of the South Zone and within a days drive of the North Zone. Access to the national fire cache will be through the Dispatch Center.

d. Detection

The Forest detection system relies on a combination of fixed stations (lookouts) and aerial detection. The following are the Forest lookouts and the District on which they are located:

Williams District	Bill Williams Kendrick Round Mountain Volunteer Red Hill (usually unstaffed)
Tusayan District	Red Butte Grandview
North Kaibab District	Jacob Lake Dry Park Big Springs

The South Zone (Williams and Tusayan R.D.s) of the forest generally has very good detection coverage from their lookouts. Aerial detection is used on an "as needed" basis by District request to supplement these lookouts during critical periods.

The North Zone (North Kaibab RD/North Rim) has poor lookout coverage and supplements them with aerial detection. Guidelines for North Kaibab detection flights are:

Very High to Extreme Fire Danger:

Consider flying daily unless wind conditions prohibit a safe flight. Flights should begin at any time of the day between about 1000 hrs and 1800 hrs.

Moderate to High Fire Danger:

Consider flying when the human caused risk is abnormally high, such as: 3 day weekends, other days when an abnormal risk is present due to hunting, family reunions, fuelwood cutting, etc. During “HIGH” fire danger, consider scheduling at least one flight a week (generally on a Sunday or Monday) to look over the more isolated areas of the District and look for abandoned campfires.

Lightning Occurrence or Going Fires:

When there has been lightning on the timbered portion of the District or there are going wildland fires that are limiting the effectiveness of the initial attack organization to successfully control new starts, flights should be considered on a daily basis to speed detection and improve initial attack success. Flights may also be scheduled when the initial attack forces are reduced due to off-Forest dispatches. A flight may be ordered when a smoke is reported in a high risk area, an isolated area that will be difficult to get resources into, a multiple wildland fire situation where prioritizing will be necessary, when communications are poor on a going wildland fire, and to monitor isolated wildland fires (often in wilderness areas) under confine/contain tactics.

Other Guidelines:

If all lookout towers are not staffed, flights may be scheduled more often to cover these blind areas of the forest. If the individual who will be in the aircraft is a qualified VIDEO THERM operator, the camera will be used on the flight to inspect fires or high risk areas. ALL personnel flying on scheduled flights will meet the requirements for a performing as a Flight Manager. Further direction for aviation activities can be found in Appendix J.

****ALL AVIATION ACTIVITIES SHOULD BE USED ONLY WHEN NECESSARY! USE GOOD RISK MANAGEMENT WHEN DETERMINING THE NEED FOR SCHEDULING A FLIGHT.**

e. Fire Weather and Fire Danger

Strong southwest winds and low humidity are prevalent from mid-April to mid-June. Hot, dry and unstable conditions usually occur from mid-June to early July. The potential for dry lightning is most prevalent from June to early July but is uncommon. The monsoon accompanied by higher humidity and rainfall potential and less wind

begins during the 1st or 2nd week in July and ends in the 2nd or 3rd week in September. A period of dry and mild conditions returns until mid to late October before the onset of winter conditions begin.

National Fire Danger Rating System (NFDRS)

The Forest and the Grand Canyon N.P. have developed an Interagency NFDRS Operating Plan (**Appendix J**) which directs both agencies. This plan is used for making fire business decisions for both agencies. Please see this plan for further direction.

f. Policy and Forest Service Manual and Handbook Direction

Forest Staffing Standards

Module Leader Supervisor – Engine, Helitack, and other regular crews used for fire suppression must be trained to standards and accompanied by properly qualified supervisors. On the regular supervisor’s day off, a qualified employee will serve as the alternate supervisor. If no qualified supervisor is present, the module is not available for fire dispatch.

Module strength:

- Engine module - Qualified supervisor, engine operator, trained crew. The recommended staffing for a Type III engine crew is five-person effective. A minimum of three persons, including a qualified engine boss/driver-operator is allowed for reasons such as limited funding, extended staffing, or draw-down. A Type VI engine crew is three-person effective.
- Helitack module - Qualified supervisor, assistant supervisor, trained crew. The helitack crew will be at a minimum, three-person effective.
- Handcrew – Qualified supervisor, assistant supervisor, trained crew, with a maximum of twenty-one people including a trainee.

Minimum draw down of fire suppression:

- Refer to preparedness level staffing in **Appendix B**.

g. Aviation Management

The Forest’s Aviation Plan provides specific instructions and guidelines for conducting safe and efficient aviation operations on the Kaibab National Forest. The plan is a separate document containing the W.O. Aviation Plan, R-3 Aviation Plan, and Kaibab N.F. Aviation Plan. (**Appendix K**)

3. Initial Attack

All wildland fires will receive an appropriate management response (AMR). The AMR is defined as the specific actions taken in response to a wildland fire to implement protection and/or wildland fire use objectives. It allows the manager the full range of responses.

a. Information Used to Set Initial Attack Priorities

The Kaibab National Forest has been grouped into four initial response zones. Zones are basically described as: Zone A-woodland, brush, and grassland; Zone B-commercial timber; Zone C-North Canyon riparian; and Zone D-wilderness.

****Information represented in the following response zones comes directly from the Forest Plan and can also be found in Appendix A.**

Response Zone A includes portions of Ecosystem Management Areas 1, 3, 8, 9, 12 and 16. This zone is generally the **PJ woodland, sagebrush, and grassland** of the lower elevations. The potential for resource damage is very low. Management direction is to provide fire protection to restrict wildland fire size to 200 acres. Suppression responses and tactics should emphasize reducing firefighting costs.

Response Zone B includes portions of Ecosystem Management Areas 1, 2, 6, 7, 10, 13, 20, 21, and 22. This zone is generally the **commercial timber lands**. The potential for resource damage is very high. Management direction is to provide fire protection to restrict wildland fire size to 20 acres. Basic protection objectives are to minimize protection costs on low intensity fires and minimize acreage burned by high intensity fires. Normal suppression tactics are contain and control.

Response Zone C includes portions of Ecosystem Management Area 19. This is an area within a two mile radius of **North Canyon Spring** and is designated to protect the habitat for Apache Trout. The protection objective is to minimize acreage burned and the appropriate management response should be used to keep any unwanted wildland fire from exceeding 5 acres.

Response Zone D includes Ecosystem Management Areas 4, 11, 19 and Sycamore Wilderness. These EMAs contain the three **wilderness areas** located on the forest. The basic protection objective is to allow wildland fire to resume its natural role in the wilderness. The normal responses are confine or contain tactics with control used when necessary to protect other wilderness resource values.

b. Criteria for the Appropriate Initial Attack Response

The Forest Plan provides standards and guidelines for fire suppression objectives by EMA. It provides the direction for use of an Appropriate Management Response in order to achieve these objectives.

The Appropriate Management Response for Fire Suppression (**Appendix L**) guides the timing and location of fires that may be managed using confine or contain tactics. If the fire is human caused, or if it is a natural ignition that does not occur within an approved Wildland Fire Use Area, the fire must be initial attacked using the Appropriate Management Response and the WFIP Stage I is considered complete through the dispatch run log for the fire. Confine and Contain tactics may be employed and the Go/No-Go Checklist will be completed by the District within 8 hours of discovery and strategic fire size-up which completes Stage I of the WFIP. If a confine/contain fire exceeds, or is predicted to exceed 10 acres, the district will complete a Wildland Fire Situation Analysis with Ranger and Staff input to document their decision and strategy. The District Ranger, DFMO, or DAFMO is responsible for assessing and validating the confine/contain decision daily and reporting the status of all fires to the Dispatch Center by close of business.

c. Confinement as an Initial Action Tactic

Confinement tactics should be considered whenever conditions warrant, e.g. firefighter safety and cost efficiency. These types of actions cannot be used to meet resource objectives. The individuals responsible for making this decision will be identified by each District Ranger. Fires managed under this tactic must meet the requirements set forth in the AMR for Suppression Responses. (**Appendix L**)

d. Response Times

Response times for wildland fire dispatches will vary dependent upon what preparedness level the forest is currently under. The following identifies the maximum response times for each Preparedness Level:

Prep Levels I & II:	10 minutes
Prep Level III:	2 minutes
Prep Levels IV & V:	1 minute

e. Restrictions and Special Concerns

Motorized/Mechanical Request	Authorization for Non-Emergency	Authorization for Emergency
Chainsaws/Pumps	Regional Forester	Forest Supervisor
Helicopters/Fixed-Wing <ul style="list-style-type: none"> • Retardant delivery • Bucket Work • Personnel Shuttle • Long-line 	Regional Forester	Forest Supervisor
Transport & supply by aircraft, air drop, & mechanical transport	Regional Forester (FSM 2326.1)	Forest Supervisor
Helispot construction	Regional Forester	Forest Supervisor
Motor Vehicle	Regional Forester	Forest Supervisor
Tractors (Heavy Equipment)	Regional Forester	Regional Forester
Prescribed Fire in Wilderness	Regional Forester	Forest Supervisor
BAER projects in the Wilderness	Regional Forester (FSM 2323.04c.11)	Forest Supervisor

f. Social and Political Concerns

Concerns will be addressed by fire managers, line officers, and affected parties. These concerns have been identified by each district prior to the beginning of each fire season. These concerns will also be used during the development of WFSAs and WFIPs.

4. Extended Attack and Large Fire Suppression

a. Extended Attack Needs

A wildland fire will be considered in extended attack status when:

1. Containment is not expected prior to the second burning period.
2. The Initial Attack IC requests additional resources that results in the fire attaining a complexity rating at the Type III level.

b. Implementation Plan Requirements – WFSAs Development

The responsible line officer shall promptly organize and implement an appropriate management response for each escaped wildland fire. The WFSAs and all forms/documents needed for documenting an escaped wildland fire and briefing an

incoming team are found in Agency Briefing and Information Package. The WFSAs and associated documents provide appropriate management direction, constraints, and economic considerations.

Damaged resource values and average acre suppression costs for the Kaibab N.F. are included with the WFSAs. Once the WFSAs are prepared, an incident commander is briefed and delegated the authority to manage the incident and is provided necessary information on the ICS-201 or in the Agency Briefing and Information package (**Appendix M**).

c. Complexity Decision Process for Incident Management Transition

Incident Complexity Analyses will be completed for all wildland fire incidents. This document assists fire managers in assessing the hazards and complexities of an incident. Appendix M of the Red Book will be used for determining Type 3, 4, and 5 incidents and Appendix L of the Red Book will be used for determining Type 1 and 2 incidents. Initial Attack ICs will use the Incident Response Pocket Guide, page 18 (Appendix M of the Red Book), during their size-up to determine whether or not the level of leadership is appropriate. ICs should document their decisions in determining the level of complexity. For further clarification, see Chapter 10 of the Red Book.

d. Delegation of Authority for the Incident Commander

These documents can be found in the Agency Briefing and Information Package. (**Appendix M**)

5. Exceeding Existing WFIP – Selecting a New Strategy

If it is determined that the original decision to manage a wildland fire for resource benefits will not meet fire management direction and objectives, the fire shall be declared an "escaped wildland fire" and a WFSAs will be completed.

6. Minimum Impact Suppression Tactics (MIST) Requirements

The intent of using MIST is to suppress a wildland fire with the least amount of impact to the resource. Fire conditions and good judgment dictate the actions necessary to be taken. (Incident Response Pocket Guide - IRPG).

7. Other Fire Suppression Considerations

The Forest at this time does not have any special fire suppression considerations.

C. Wildland Fire Use

Wildland Fire Use refers to the management of naturally ignited wildland fires to accomplish specific, pre-stated resource management objectives in predefined geographic areas as defined in the Forest Plan and outlined in this fire management plan.

1. Objectives

Use fire from naturally occurring ignitions as a resource management tool where it can be used effectively to accomplish resource objectives in the Forest Plan (page 20).

2. Factors Affecting Decision Criteria for Wildland Fire Use

If a naturally ignited fire is within an area covered by an approved Wildland Fire Use Plan and meets the appropriate District ID team guidelines and prescriptive criteria, the decision may be to manage the fire for resource benefits. The direction for implementing Wildland Fire Use can be found in the Wildland Fire Use Implementation Procedures Reference Guide (May 2005, Revised March/April 2006). The Wildland Fire Implementation Plan (WFIP) is completed using the WFSA Plus software. Later, if it is determined that the original decision and the selected response will not meet fire management direction and objectives, the fire shall be declared an "escaped wildland fire". A Wildland Fire Situation Analysis (WFSA) will then be completed.

The Kaibab N.F. LMP as amended allows wildland fire use to be used in order to achieve management objectives as stated in the LMP (**Appendix A**). The only portion of the Forest where wildland fire use cannot be utilized for resource benefit is the mixed-conifer type on the North Kaibab R.D. This area was excluded by the Decision Notice. If the fire is located within a pine-oak designated area on the Williams R.D., management of the fire must comply with the Forest Plan and meet certain prescriptive criteria found in the Biological Opinion Summary of the Environmental Assessment for the Implementation of Wildland Fire Use Program within the Kaibab N.F. There are no restrictions if the fire is located on the Tusayan R.D. since there is no designated Mexican Spotted Owl habitat.

Some of the factors that determine whether or not a natural ignition is managed for resource benefits are:

- Firefighter and public safety
- A Fire Use Manager (FUM1, FUM2, or ICT4) must be available and dedicated to management of the incident.
- Proximity to the boundary of wildland fire use area and/or potential to exceed pre-established boundaries.
- Ability of the incident to meet resource management objectives.
- Potential to damage or destroy significant improvements, natural or cultural resource values.
- Time of season (early vs. late)
- Possible complexity of incident
- Fire Danger Rating

- Resource availability (preparedness levels locally, regionally, nationally)
- Social/political concerns
- Air quality issues
- Long-term weather outlook
- ERCs/seasonal severity

**These factors can be found in the Wildland Fire Use Implementation Procedures Reference Guide which is included as an appendix in the Forest Plan amendment.

Each Zone Fire Management Officer, with Line Officer concurrence, is responsible for determining whether or not they will manage a natural ignition. If a “Go” decision is made, they will meet with their district ID team and develop a WFIP. The SO Fire Management Staff must also be kept informed of any decisions to manage wildland fire due to possible constraints imposed by regional and national MAC groups. This usually occurs during specific preparedness levels.

3. Preplanned Implementation Procedures

Prior to the beginning of each fire season, the appropriate paperwork (**Appendix O**) will be filed with the Arizona Department of Environmental Quality (ADEQ) for permission to conduct wildland fire use. This will be the responsibility of the SO Fire Management Staff.

The Forest also coordinates with the Grand Canyon N.P. prior to the start of each season. The Park has a very active wildland fire use program. Coordination is important because each agency has the ability to impact each others land depending upon which side of the canyon the ignition(s) occur. Pre-determined Maximum Manageable Areas (MMAs) have not been established. These are developed as the need arises.

4. Impacts of Plan Implementation

General Impacts

Wildland fire use plays an important role in re-establishing a balanced ecosystem. As proven by many scientific studies, fire is a valuable part of natural forest development. The natural fire role may also cause some adverse side effects, such as:

- Impacts to visual quality in adjacent communities; reduced visibility and safety-related impacts to motorists along key travel ways.
- Adverse affects on sensitive wildlife species may be incurred through loss of habitat or disruption of travel routes.
- Economic impacts to local communities incurred through loss of revenue associated with reduced numbers of visitor or displaced big game hunters in the fall.
- Unavoidable impacts to scenic qualities and vistas associated with stand replacement incidents within the view shed of key travel corridors.

Local Impacts

Any ignitions that are managed on the Tusayan R.D. have the potential to impact the Grand Canyon Class I air shed. Close coordination between the Park and ADEQ are essential. The community of Tusayan and the Grand Canyon Airport may be impacted from smoke caused by any ignitions managed east of Highway 64 due to the natural diurnal flow of the drainages, northeast to southwest. Smoke impacts have the ability to close down the airport, cause health issues to the residents and tourists located in Tusayan and the South Rim of the Park, and cause significant safety issues on Highway 64.

Ignitions that are managed on the North Kaibab R.D. usually will not impact the Class I Air shed. The only significant community that stands to be impacted is Jacob Lake. Larger incidents have the potential to impact Page, AZ. Highway 67, which runs from Jacob Lake to the North Rim of the Park, and Highway 89A, may be impacted by managed ignitions.

Mitigation Measures

It is the responsibility of the Fire Use Manager to keep an eye on impacts caused by the management of any wildland fire use incident. Some of the measures that can be taken to reduce impacts to sensitive areas include:

- Total or partial suppression of the incident
- Placement of precautionary signs along traffic corridors
- Using pilot cars if necessary
- Limiting the number of acres burning

5. Required Personnel

All wildland fire use incidents are required to have a qualified Fire Use Manager (FUM1 or FUM2) or ICT4 at lower complexity levels. It is the responsibility of the Fire Use Manager/ICT4 along with the district line officer to determine the extent of the organization needed to manage the incident. It is highly recommended that a Fire Use Management Team (FUMT) be ordered if the incident has the potential to become more complex. The Forest currently has four qualified Fire Use Manager Type 2s available for implementation. Other individuals have been identified for further development to supplement the Forest's Wildland Fire Use program. In the event that a qualified FUM1 or 2 is not available on the Forest, one will be ordered through the dispatch system.

Consideration should also be taken to make sure that resources are available to manage the incident and there are sufficient resources available to deal with any initial attack activity.

6. Public Information

Refer to the Incident Information Plan (**Appendix P**) to determine public and internal communications need during any wildland fire event.

7. Records

It is the responsibility of the district to assure that a complete documentation package has been assembled for each wildland fire use incident. Once compiled, it will be sent to the Supervisor's Office for storage. The documentation package should include at least the following:

- a. **Planning Documents** – approved planning documents that guided management actions, e.g., WFIP or WFSA, including any revisions or updates.
- b. **Reports** – monitoring reports, summaries of findings, and summaries of all monitoring activities, including a monitoring schedule.
- c. **Periodic Documents** – periodic fire assessments and certification documents.
- d. **Cost Accounting** – funding codes and cost accounting.
- e. **Maps** – permanent maps of all fires greater than 10 acres for inclusion into the official fire history archives.
- f. **Other Information, e.g., digital photos** – other information as appropriate for the situation, such as photo points and digital photos.

Each package must also meet the requirements set forth in FSH 6209.11, Records Management Handbook, Chapter 40, File Designations and Disposition.

8. Cost Tracking

It is the responsibility of the district to assure that costs are being tracked for expenditures occurring on the wildland fire use incident. All costs associated with analysis and management of a wildland fire use incident will be reported to and coordinated with the Forest Budget and Finance section.

D. Prescribed Fire

The Forest's prescribed fire program treats natural fuel accumulations to meet resource management objectives as outlined in the Forest Plan. Treatments have traditionally included wildlife habitat enhancement, range habitat improvement, and hazardous fuels reduction.

The Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide provides the minimum acceptable standards for planning and implementation.

Project level analysis through the National Environmental Policy Act (NEPA) documents the purpose and need for treatment and identifies the goals and objectives of prescribed fire. Direction for management areas identified in the Forest Plan permits the use of management ignited fire as summarized in Section III of this fire management plan.

1. Planning and Documentation

- a) Annual activities that are necessary to prepare and implement the prescribed fire program are listed below:
- Inventory and identify fuel treatment units.
 - Meet annually with National Park Service and the Coconino National Forest to plan treatments that may be mutually beneficial.
 - Update 3-year fuels treatment plan.
 - Participate in interdisciplinary teams (IDTs).
 - Complete required NEPA documentation.
 - Prepare project plans and layout.
 - Prioritize proposed projects based on current year budget allocation.
 - Prepare and approve burn plans.
 - Obtain burn permits.
 - Implement projects.
 - Award contracts.
 - Complete monitoring requirements.
 - Report accomplishments.

The Forest develops out-year program planning and budgeting information for prescribed fire treatments in accordance with the Forest Plan. The development of treatment proposals is typically accomplished one to three years in advance of planned treatments. Field reconnaissance and interdisciplinary analysis are completed one to two years in advance of project implementation.

A collaborative effort exists between the fuels and vegetative management analysis process to enhance the protection of the wildland/urban interface and other valuable forest resources in the most efficient and cost effective manner. District personnel give planning and implementation recommendations to the Forest Leadership Team for their approval.

- b) The long-term prescribed fire program varies in purpose and scope with each FMU.
- FMU #1 - Fire Use is permitted with some small areas excepted. A range of fire regime condition classes exist within the FMU. Prescribed fire is applied to enhance fire-fighting capability, lower or maintain fuel profiles to reduce the damaging effects of fire, and provide a buffer around communities. Within MSO habitat emphasize retention of all trees greater than 24 inches. The priorities for prescribed fire treatment are the WUI areas, those areas in condition class 3 and 2,

follow-up entry to mechanical treatment, and maintenance of past prescribed burned areas.

- FMU #2 - Wildland Fire Use is not permitted. A range of fire regime condition classes exist within the FMU. Prescribed fire is applied to enhance firefighting capability and to lower or maintain fuel profiles to reduce the damaging effects of unwanted wildland fire. Retain all trees greater than 24 inches. The priorities for prescribed fire treatments are those areas in condition class 2 and 3, follow-up entry to mechanical treatment, and maintenance of past, prescribed burned areas.
- FMU #3 – Prescribed fire is permitted to break up unnaturally large areas of continuous fuel and create a more natural “mosaic” of fuel beds.

c) Personnel qualifications.

The prescribed fire program is managed at the district level by the Zone Fire Management Officer with oversight provided by the Forest’s Fire and Aviation Staff. A fuels specialist at the district level is responsible for project level planning and acts as the interdisciplinary team leader or subject matter specialist on assigned projects.

District Rangers are delegated the authority to approve prescribed burn plans on their Districts as long as they meet the requirements in FSM 5140.7. If the line officer does not meet these requirements, they must have someone on the Forest who does meet this requirement approve these plans. This authority may not be re-delegated. It is the responsibility of the District Ranger to obtain necessary input from qualified Staff Specialists to insure that management objectives are defined and met by prescribed fire activities. The District Ranger shall also insure that all personnel involved in planning and execution of burns are qualified to perform their specific job(s) according to *FSM 5140 and FSH 5109.17*.

Level I, II, and III burn bosses (RXB1, RXB2, RXB3) are required for project implementation depending on the complexity of the burn. The forest and districts will maintain a pool of qualified personnel to fill all subordinate positions. The current FSH 5109.17 prescribed fire training course key is Chapter 20, showing the required training for each prescribed fire position. Current qualifications of employees on the Kaibab National Forest can be obtained through the Dispatch Center. The Forest’s policy on issuing and certifying Task Books is found in **Appendix H**.

d) Weather, fire behavior, fire effects monitoring:

Pre-burn monitoring will be conducted to determine when a prescribed fire will be in prescription to meet the burn treatment objectives. Monitoring may include a range of activities from fuel moisture sampling to monitoring of the daily NFDRS indices and components. A test fire will be conducted to confirm that the observed fire behavior will meet the burn treatment objectives. For a multiple day burn the existing fire may be evaluated instead of igniting a test fire if the fuels, topography and weather are representative of the area planned for ignition.

A spot weather and smoke dispersal forecast is required for all prescribed fires of moderate complexity rating or higher prior to ignition or days of active fire spread. The spot weather forecast will request information so that the Burn Boss can determine if firefighter or the public will be placed at risk from rapid rates of spread or spotting. At a minimum, the general weather forecast will be reviewed by the Burn Boss each day following ignition to determine if the Holding Plan is sufficient to hold the fire within unit boundaries. Outside of fire season (November 01 to March 31) a general weather forecast gives sufficient information to the Burn Boss for ignition of prescribed fires with a low complexity rating. This includes pile burning outside of the wildland urban interface and small underburns of low intensity that are surrounded by natural barriers that will prevent fire spread. During this period, the probability of a fire day is less than 0.15, and the probability of a large fire day is 0.9 (During this period the average Spread Component is less than 25 and the average ERC less than 45).

FireFamily Plus Probability Analysis Report
 Joint Probability (Probability that both conditions will occur in %)
 Spread Component vs. Energy Release Component

SIG – KNF, 1992 – 2006

Stations in SIG - knf

020207 - Tusayan	Model: 7G	Weight: 1.00
020212 - Dry Park	Model: 7G	Weight: 1.00
020216 - Warm Springs Canyon	Model: 7G	Weight: 1.00
020284 - Greenbase	Model: 7G	Weight: 1.00

January 1 - December 31

5-Day Analysis Period

1004 data pairs used. 19511 records processed.

FF+3.0.5 01/28/2007-14:06

Spread Component	Energy Release Component					
	0 to 15	16 to 30	31 to 45	46 to 60	61 to 75	76 to 100
0 - 16	2.19	15.64	29.88	24.1	13.65	8.27
17 - 25	0	0	0.4	0.1	0.2	0.2
26 - 29	0	0.1	0	0	0	0
30 - 38	0	0.4	0.3	0.2	0	0
39 - 65	0	0.1	1.79	0.5	0.1	0
66 - 100	0	0	0.4	1.0	0.5	0

The Burn Boss will document burn-day weather conditions, observed fire behavior, smoke dispersal, first order fire effects, and cost per acre of treatment to use during post burn evaluation. In addition to short term monitoring to document the immediate results of a burn, long term monitoring is strongly recommended.

e) Prescribed fire project reviews:

The burn boss, key subordinates, and district fire management officer will conduct and document an informal post-burn review. Formal project reviews are not required except in the instance of an escaped fire. Periodic review of district prescribed burn projects will be conducted by the Forest Fire Staff and key resource specialists. The After Action Review format located in the Incident Response Pocket Guide will be used for these reviews.

f) Documentation requirements:

Burn Bosses must submit the prescribed fire accomplishments using the ADEQ Accomplishment Report (**Appendix O**) according to the ADEQ guidelines.

When a fire is declared escaped, the dispatch log will be used to document the time, associated activities, and actions taken. Those actions will be comensurate with the actions identified in the Escaped Fire Contingency plan as outlined in the burn plan.

- g) Districts will maintain records to display historical prescribed fire accomplishments. Maps of these fires can be created using ArcView/ArcMap files. These files can be located in the Forest database.
- h) For prescribed fire, a Prescribed Fire Burn Plan (refer to FSM 5140 and the Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide) must be prepared for every burn unit regardless of the size or the complexity of the project. Each prescribed fire burn plan must meet the minimum requirements. Before a prescribed fire may be implemented, the prescribed fire burn plan must be approved in writing by the appropriate line officer. Each prescribed burn must be conducted by a qualified burn boss. When the knowledge base, experience and staff are available at the District level to plan, develop, and execute prescribed fire in the complexity ratings of Low, Moderate, or High, then approval authority may be delegated to the District Ranger. If the knowledge base, experience, and staff are not available, then the approval authority shall be retained at the Forest Supervisor's Office. Each burn plan should be reviewed and recommended for line officer approval by a qualified and experienced fire manager.

2. Exceeding Existing Prescribed Fire Burn Plan.

The burn plan identifies resources needed to safely and successfully ignite, execute, and hold prescribed fire throughout the range of prescriptive parameters identified. The contingency resources identified within the prescribed fire plan are identified for those rare events that occur creating or leading to a situation where the burn may become unsuccessful, considering capabilities of existing on-site resources. A prescribed fire will be declared a wildfire, by those identified in the plan, when it is determined that one or more of the following conditions or events has occurred as directed in FSM 5140:

- a. The prescribed fire leaves the approved burn project or unit boundary.
- b. The fire behavior exceeds limits described in the prescribed fire plan.
- c. The fire effects are unacceptable.
- d. The air quality regulatory permit conditions are exceeded and/or an air quality regulatory Notice of Violation has been issued or has been threatened to be issued.

A prescribed fire will also be declared a wildfire when contingency actions have failed or are likely to fail and cannot be mitigated by the end of the next burning period by on-site holding resources and any listed contingency resources.

3. Air Quality and Smoke Management

As specified in Section 118 of the Clean Air Act, (42 USC 7418), amended in 1992, USDA Forest Service fire management activities that result in the discharge of air pollutants (e.g., smoke, carbon monoxide, and other pollutants from fires) are subject to and must comply with all applicable federal, state, interstate, and local air pollution control requirements. The Kaibab National Forest is required to obtain necessary permits for prescribed fire and wildland fire use incidents, comply with the National Ambient Air Quality Standards (NAAQS) both inside and outside the Forest boundaries, and protect visibility according to its congressionally-mandated Class I area status.

The Forest's policy is to meet the State requirements for smoke management by adhering to the ADEQ Smoke Management Regulations (**Appendix O**). Additional actions may be taken in cases of adverse smoke impacts to populated areas.

Project planning will address and quantify potential levels of emissions incurred through project implementation. Smoke management techniques and prescriptions will be used to achieve smoke management objectives. Emission Control Measures (ECMs) will be utilized for emission reduction whenever feasible. Identification of smoke sensitive areas, Class I air sheds, and proposed project mitigation actions are identified in the modeling and project burn plan forwarded to the Arizona Department of Environmental Quality.

Current air quality issues include the Class 1 air sheds at the Grand Canyon National Park and Sycamore Canyon Wildernesses, and numerous smoke sensitive areas from small communities to the larger cities of Williams, Flagstaff, and Sedona. The Prescribed Fire Smoke Management Guide (FSH 420-1; NFES 1279) serves as a manual for smoke management and is considered a supplement to this Plan.

The Arizona Department of Environmental Quality (ADEQ) burn plan (**Appendix O**) will be prepared along with supporting smoke modeling as required. All ADEQ burn plans must be submitted to the Dispatch Center so that the Annual Prescribed Burn Registration (**Appendix O**) can be filled out. Each district will be responsible for submitting 2 copies of the ADEQ burn plan to the Dispatch Center prior to August 1 of each year. Prior to any execution, a daily burn request (**Appendix O**) must be submitted to the Dispatch Center by 1330 the day before the burn. The Dispatch Center will then forward the request to ADEQ. The Dispatch Center shall report all wildland fires greater than 100 acres on a daily basis to ADEQ. The information shall include the location, estimated control date, and estimated incident size of each wildland fire.

Wildland Fire Use:

A map of potential Wildland Fire Use areas will be submitted annually to ADEQ. The Forest will notify ADEQ of any potential wildland fire use project that is expected to attain a size of 100 acres of timber fuel or 300 acres of brush or grass fuel. The ADEQ Burn Plan shall be completed and submitted to ADEQ (in a format approved by ADEQ) prior to the wildland fire reaching the acreage limits described. The Burn Plan is only needed if the fire will reach these acreage limits. (**Appendix O**)

ADEQ shall approve or disapprove a Wildland Fire Use Plan within 3 hours of receipt. If ADEQ fails to respond to the submittal of the Wildland Fire Use Plan, approval may be assumed.

Daily consultation between the FUMA, FUMT, or District Fire Management Officer and ADEQ is strongly suggested. The Dispatch Center shall notify ADEQ of any fire under a wildland fire use strategy when it is projected to attain a size of 100 acres within timber fuel or 300 acres within brush or grass fuel.

The District shall submit a Daily Status Report for each Wildland Fire Use to the Dispatch Center for each day of the burn that the fire perimeter increases. This shall include anticipated daily growth and location of the fire. The Dispatch Center will forward this information to ADEQ.

E. Non-Fire Fuel Application:

Non-fire treatment may include thinning, lop and scatter, hand or machine piling, chipping, and fuel-wood removal by the public. A primary objective of non-fire fuel treatment is prescribed fire unit preparation, such as establishing control lines, clearing around values at risk, or treatment of selective areas to reduce fire intensity which may threaten control lines or result in undesirable fire intensity or severity within the treatment unit.

The emphasis for the hazardous fuels reduction program on the Kaibab is the treatment of heavy fuel load areas in the wildland urban interface, high resource value areas, and ecosystems currently at risk from catastrophic fire (**Appendix A**).

1. Mechanical treatment and other applications

Mechanical or hand treatments are a viable treatment alternative in interface settings where the risk of an escaped prescribed fire is unacceptable or the impacts to viewsheds are unacceptable to the public. They are often the preferred method of treating slash generated from thinning treatments before the introduction of prescribed fire.

Non-fire applications are allowed within the Mexican Spotted Owl habitat protected and restricted areas, but with restrictions (See Forest Plan for specific direction). Each protected activity center has a designated 100 acre “no treatment” area around the known nest site.

The Forest standard and guidelines for the Northern goshawk apply to the forest and woodland communities that are outside of the Mexican Spotted Owl protected and restricted areas. Non-fire applications can be used for landscapes outside Goshawk post-fledging family areas and landscapes within nesting areas, with restrictions (See Forest Plan for specific direction). Limit human activities in or near nest sites and post-fledging family areas during the breeding season, which extends from March 1 through September 30 annually.

See **Appendix A** for non-fire treatments that *can* be used in each of the ecosystem management areas.

a. Annual activities to prepare for and implement the mechanical treatment program:

- Inventory and identify fuel treatment units
- Participate in interdisciplinary teams (IDT)
- Complete required NEPA documentation
- Prepare project plans and layout
- Prioritize proposed projects based on current year budget allocation
- Implement projects
- Award contracts
- Complete monitoring requirements
- Report accomplishments

b. Equipment and seasonal use restrictions as it relates to each FMU

See **Appendix A** for equipment and seasonal use restrictions as it relates to each FMU.

c. Documentation requirements for monitoring:

All projects that include non-fire treatment will include specific prescriptions to meet the desired resource objectives. A monitoring plan will be included in the project plan. Short-term monitoring, documenting the immediate results, and long-term effectiveness monitoring objectives, and any issues or concerns identified in the related NEPA documents is strongly recommended. Permanent photo points, transects, or plots that are revisited in years following a treatment will provide information on successional trends as a result from the project. Longer term monitoring may be necessary to determine if objectives were met. However, the monitoring plan contained in each project will describe the protocols and criteria needed to determine if objectives have been met. The fuel project manager will monitor the measurable objectives identified in the FMUs and will maintain a project folder that will contain the following documentation:

1. Approved NEPA documentation
2. Maps

3. Cost accounting
4. Completed accomplishment form
5. Monitoring Plan

d. Format for critiquing mechanical treatment projects:

All mechanical treatments will undergo a post treatment evaluation to insure that cost effective treatments were utilized and the objectives for improvement of condition class and a reduction in fire behavior characteristics was achieved.

e. Cost Accounting

Within each project record an accurate accounting of total project cost will be maintained and updated as cost are accrued. This will enable a base line of costs by project type for future fire planning and implementation efforts. **Exhibit 4** will be utilized as a base line of information required for cost accounting. Any additional accounting information or modification to this form is allowed to capture true costs of implementation.

f. Reporting and documentation for accomplishments:

All accomplishments are reported through the Forest Service Activity Tracking System (FACTS) on a monthly basis. The districts are responsible for inputting the data. The SO Fire Management Staff will use this to run reports as needed. All fuel treatment acres accomplished by fund type are summarized in the Management Attainment Report (MAR) each fiscal year (FSH 6509.11k).

g. Annual 2008 planned project list:

Refer to (**Appendix Q**) for the FY “08” planned program list.

Section V: Organizational and Budgetary Parameters

A. Current fiscal year budget and the ability to support planned and unplanned actions.

The primary objective in fire program development is to efficiently implement Forest Plan direction within the budget limitations of the current year. The National Fire Management Analysis System (NFMAS) is the process used to analyze protection efficiency. The Fire Management Analysis identifies the most efficient use of firefighter production capability (FFPC) to meet protection objectives. Costs include the preparedness costs, suppression costs, and resource net value changes.

The Forest completed NFMAS in 1998 and the levels analyzed were FFPC at 100% as well as 110%, 90%, 80%, 70%, and 55%. For each funding level, the spreadsheets describe all management and initial attack modules and their associated costs as well as specific periods of time the modules should be staffed. The Forest revised the NFMAS information in December 2002 to fit the new budget guidelines, FFIS, and new cost organization definitions. **Appendix R** displays the Kaibab N.F. revised (2004) staffing mix for each of the five (5) funding levels. The 110% funding level organization is not displayed.

For fiscal year 2008, the Forests will be funded at 80% FFPC and expected to be staffed at 80% of our FFPC. More specific information can be found in the Regional Budget Direction.

Fuels Management – The fuels management program is largely accomplished as a collateral duty by the permanent fire management staff. Each zone organization is staffed with a fuels specialist.

5100-2's and annual program planning and budget documents are included in **Appendix R**.

B. Organizational Chart for FY “08”.

Program Leadership – The Forest fire management program is managed by a Forest Fire Staff Officer with assistance from the Deputy Fire Staff Officer and Fire Management Specialist. A Zone Fire Management Officer manages both districts within the South Zone having a ZAFMO for both the Williams and Tusayan Districts. The North Zone includes both the North Kaibab RD and the North Rim of the Grand Canyon. The leadership for this zone includes a ZFMO and 2 ZAFMOs. This management is covered under an agreement between both agencies.

See **Appendix S** for the FY “08” organization chart. Planned and/or unfunded positions are denoted in addition to existing staffing. Local cooperators, primarily in an interface setting for initial and extended attack incidents, supplement the existing interagency staff and associated preparedness resources. Local resources will be used for these purposes

as well as to suppress escaped wildland fires. Local and National resources from the Southwest Area as well as other geographic areas will be used as appropriate.

Supplemental resources will be ordered to provide increased firefighting capability during periods of high fire danger as well as during periods where ongoing and anticipated levels of initial attack would result in a draw down of local resources. Administratively determined (AD) hiring authority is used on a discretionary basis to supplement agency resources with those staffed by local cooperators outside the parameters of county cooperative fire agreements for initial attack.

C. Cooperative agreements and interagency contacts

The Forest has active agreements or memorandums of understanding with several fire protection agencies in the area which include the Arizona State Land Department (SLD), National Park Service (NPS), Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Coconino, Prescott, and Dixie National Forests. These plans were prepared under the direction and authority of the 1992 Arizona State and Federal Agencies Joint Powers Agreement, Section E, General Provision Items 5 and 6. The agreements are listed under **Appendix T**.

The purpose of these agreements is to:

- Provide a basis for cooperation among the agencies on all aspects of wildland fire management and as authorized in non-fire emergencies.
- To facilitate the exchange of resources and to provide prompt and efficient dispatching of the quickest, initial attack, suppression personnel, equipment (including aircraft), supplies, services, and funds among the agencies.
- To serve as a limited delegation of authority for mutual-aid initial response actions between all agencies.
- To establish operating procedures and services for fire management and protection and non-fire emergencies.

D. Emergency Equipment Rental Agreements

- The process for which dispatch centers order emergency resources is currently being revised. It is expected that this process should be available sometime in March/April of 2008.

Section VI: Monitoring and Evaluation

A. Annual Monitoring Requirements

Monitoring is accomplished on all hazardous fuels projects as well as all treatments completed in support of resource management activities on the Forest (wildlife habitat improvement, site preparation, etc). Monitoring plans for each project are developed during the project planning phase and are included in each prescribed fire burn plan or project folder.

Monitoring and evaluation will be conducted to provide the information to determine whether fire management projects are meeting Forest Plan direction. Monitoring involves the collection of information, on a sample basis, from sources specified in the Forest Plan. Examples may include acres burned by fire intensity level by management area, control measure impacts, any other measurable fire effects, and acres treated mechanically

Conduct monitoring and evaluation of the fire program to determine whether the program and associated projects are meeting Forest Plan direction. Specific goals are to:

1. Ensure that Forest Plan goals and objectives are being achieved and management prescriptions are being implemented as directed.
2. Determine if the costs of implementing the fire program and the management effects are occurring as predicted.
3. Carry out monitoring at intensity commensurate with the risks, costs, and values involved in meeting fire program and land and resource management plan objectives through resource management. The formal management review system in FSM 1400 will be used to evaluate the overall effectiveness of fire program monitoring. The public and other agencies will be involved in the monitoring process.

B. Monitoring Levels

There are three distinct levels of monitoring:

1. Implementation monitoring
2. Effectiveness monitoring, and
3. Validation monitoring

Implementation Monitoring

Implementation monitoring will be apart of routine assignments and helps to document the results in project files as part of fire management responsibilities. Use it to determine if prescriptions, projects, and activities within the fire program are implemented as designed and are in compliance with fire program and land and resource management plan objectives, standards, and guidelines.

Effectiveness Monitoring

Use effectiveness monitoring to determine if plans, prescriptions, projects, and activities are effective in meeting management objectives, standards, and guidelines. Resource and/or technical specialists will conduct this level of monitoring on a limited basis as determined by resource values and risk, and by public issues. Begin effectiveness monitoring only after determining that the fire program prescription, project, or activity to be monitored has been implemented according to land and resource management plan direction.

Validation Monitoring

Validation monitoring determines whether the initial data, assumptions, and coefficients used in development of the fire program are correct or if there is a better way to meet fire program regulations, policies, goals, and objectives. Conduct validation monitoring when effectiveness monitoring results indicate that basic assumptions or coefficients are questionable. In general, conduct validation monitoring studies in close coordination with research personnel. Limit the scope of validation monitoring to those coefficients and standards that are not reasonably substantiated by existing research.

C. Minimum Monitoring and Evaluation Requirements

Monitoring and evaluation of the fire program will include the following:

1. The changes in fire activity (fire occurrence and acres burned by size and intensity) and comparison with the predictions derived for that area where fuel conditions have been altered by management practices.
2. A comparison of the prevention program projections for person-caused fires, with trends evidenced by the fire occurrence statistics.
3. An evaluation of the adequacy of the fire management organization to meet the expected fire frequency and size distribution at the expected cost and net value change levels as projected for the selected fire program.
4. A determination of the adequacy of the values change analysis by comparing the reported annual value change from the individual fire reports with the projected analysis.

5. Assessment of implementation of national, Regional, and local safety direction.

D. Reporting Requirements

Individual Fire Reports (5100-29) will be electronically entered into the web-based FIRESTAT program within 10 days after the suppression strategy was met for small fires. For large fires, the following will apply for reporting:

- a. Within 10 days after the fire is declared out when the difference between suppression strategy met and fire out is less than 20 days; or
- b. Within 20 days after the suppression strategy was met for large fires when the fire out date will be delayed more than 20 days after the suppression strategy was met. Once the fire is declared out, the report preparer at the reporting unit shall update the fire report to reflect the actual date the fire was declared out.

The Dispatch Center audits/corrects the reports that have been entered into the FIRESTAT program. All reports will be audited and corrected by the end of the calendar year.

Additional documentation is required for any Wildland Fire Use incident as well as fire suppression tactics which call for less than full control of the fire (confine or contain). The Wildland Fire Implementation Plan (WFIP) will be utilized to document all actions and decisions related to these types of fires. The decision rational and documentation for these fires will be filed with the 5100-29 in the Official District files.

Additionally, an ICS-209 Incident Status Summary is required daily for all fires larger than 100 acres. The ICS-209 will be submitted to the Dispatch Center by 1800 each day unless the district representative has the ability to enter the document themselves.

Prescribed Fire Reports are completed using the information from the ADEQ Burn Plan and the ADEQ Daily Accomplishment Report.

The Forest Service Activity Tracking System (FACTS) will be used to maintain accurate records of historical burn accomplishments. This data base needs to be updated at least once a month.

APPENDICES

- A. Land Management Plan Fire Summary**
- B. Forest Preparedness Plan**
- C. District Prevention Plans**
- D. Restriction/Closure Criteria**
- E. R3 Fire Restrictions and Closures Toolbox**
- F. Industrial Operations and Inspections**
- G. Industrial Fire Precaution Plan (“C” Clauses)**
- H. Task Book Guidelines**
- I. Fire Cache Guide**
- J. NFDRS Operating Plan**
- K. Aviation Plans (National, Regional, Forest)**
- L. Appropriate Management Response (AMR)**
- M. Agency Briefing & Information Package**
- N. Wildland Fire Use Environmental Analysis**
- O. Arizona Department of Environmental Quality (ADEQ)**
- P. Forest Incident Information Plan (Public Affairs)**
- Q. NFPORS Project List**
- R. NFMAS: 5100-2s**
- S. Fire Organizational Chart**
- T. Agreements**