Draft

Environmental Assessment

Flying V and Flying H Analysis Area

Pleasant Valley Ranger District
Tonto National Forest
Gila County, Arizona

August 2010
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CHAPTER 1 – PURPOSE AND NEED

Background

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment (EA) discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. Supporting documentation, including more detailed analyses of project area resources, is on file in the project planning record located at the Pleasant Valley Ranger District (RD) of the Tonto National Forest (NF) in Young, Arizona. Terms in **boldface** type are defined within appendix A.

This EA will analyze continued grazing (Range Management) on the Pleasant Valley RD as well as the use of **prescribed fire** (Fire Management). Fire Management will be used for vegetation management purposes. Although Fire and Range will be analyzed in the same EA, a separate Decision Notice (DN) and Finding of No Significant Impact (FONSI) will be signed for each action.

Purpose and Need for Action

Range Management

The Flying V and Flying H (Flying V & H) allotments encompass lands identified as suitable for domestic livestock grazing in the Tonto National Forest Land and Resource Management Plan (Forest Plan). Where consistent with the goals, objectives, standards and guidelines of Forest Plan, it is Forest Service policy to make forage from lands suitable for grazing available to qualified livestock operators (*Forest Service Manual* (FSM) 2202.1, *FSM* 2203.1).

The purpose of the proposed action is to achieve, or place management on a path which would eventually achieve, defined long-term objectives (desired future conditions) for the Flying V & H allotments. The proposed action would authorize grazing on the allotments in a manner that maintains or improves project area resource conditions and achieves the objectives and desired conditions described in the Forest Plan. This action is needed to:

- Incorporate an adaptive management grazing strategy that will enable the Forest Service and individual grazing permit holders to respond to changing resource conditions or management objectives in compliance with Forest Service policy contained in FSH 2209.13, Chapter 90. The current management within the last five years has been light to moderate use with conservative stocking and improving conditions are noticeable.
- Improve less than satisfactory, or maintain satisfactory range and watershed condition and increase productivity of herbaceous vegetation through the reduction of canopy cover of woody species on juniper grasslands and juniper woodlands.
- Bring some fences and earthen stock tanks to serviceable condition. Additional pasture fences, trap fences, and water developments are needed to improve distribution of livestock within pastures.
- Formally combine the allotments. The new allotment would be called the Flying H Allotment.
- Construct new fences to create driving lanes to increase the efficiency of livestock movement from the summer pastures to the winter pastures.
Chapter 1 Purpose and Need

**Fire Management**

The purpose of the proposed action is to improve forest health, reduce fire risk, improve watershed health, and improve wildlife habitat within the analysis area. This action is needed to:

- Improve the vegetative condition within the analysis area and its effect on overall forest health, increased fire risk, and reduction of range and wildlife habitat diversity.
- Create across the landscape: mosaic patterns, greater age class diversity, horizontal and vertical structure diversity, and ecotone zones between adjacent vegetation communities.
- Reduce the potential for large, stand-replacing wildfire.
- Protect private land that is surrounded by National Forest lands.
- Establish diversity in age classes within the woodland vegetation type and to identify areas to be maintained in permanent openings. Such actions may reduce bare ground, increase understory composition, diversity, and vigor, and improve the amount and distribution of litter.

**Management Direction**

The analysis area is broken into two categories Range and Fire. The Range analysis area consists of the boundaries of the Flying V and H allotments, roughly 67,300 acres. The Fire analysis area consists of approximately 58,900 acres and does not follow the allotment boundary nor does it include the entire allotment (figure 1). Rather, the Fire analysis area is derived from features which would serve as a means to potentially hold fire, such as roads.

There are several pieces of private property, roughly 414 acres, located within the analysis area. Although the private property is located within the Forest, it is not a part of this analysis. See table 1 for a summary of acres within the analysis area.

**Table 1. Summary of analysis area acreage**

<table>
<thead>
<tr>
<th>Acres</th>
<th>Type</th>
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<tbody>
<tr>
<td>67,300</td>
<td>Range Analysis Area</td>
</tr>
<tr>
<td>58,900</td>
<td>Fire Analysis Area</td>
</tr>
<tr>
<td>414</td>
<td>Private</td>
</tr>
<tr>
<td>2,260</td>
<td>Wilderness</td>
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Figure 1 Range and fire Analysis Area for the Flying V & H EA.
Management Objectives

Management objectives are measurable parameters that can be used to describe attainment of desired conditions. The achievement of these objectives is highly dependent upon adequate precipitation levels and implementation of range improvement practices and other planned vegetation management practices. The anticipated timeframe to achieve objectives is 5-10 years, or 3-5 years after thinning or burning activities. If trends are upward towards the stated objective when monitored, then management may be considered effective in moving towards the desired condition. Vegetation or watershed condition may not improve substantially in key areas with moderate to thick woody overstory until vegetation management projects such as thinning or burning are implemented.

- Maintain or improve **range condition** to fair or better levels, or demonstrate an upward trend towards this objective where herbaceous vegetation is predominant in pastures.
- Improve livestock distribution to allow more uniform conservative utilization of forage resources and diminish concentration areas through trap fencing and added water sources.
- Reduce canopy cover of woody species on historic grasslands and juniper woodlands to improve or maintain satisfactory range and watershed condition and increase productivity of herbaceous vegetation.
- Improve/maintain **satisfactory watershed conditions** and effective groundcover.

Management Prescriptions in All Management Areas

The Forest Plan (1985) identifies the following goals for the range and fire programs on the Forest.

**Range Management**

Maintain a minimum of 30 percent **effective ground cover** for watershed protection and forage production, especially in primary wildlife forage producing areas. Where less than 30 percent exists, management goals are to obtain a minimum of 30 percent effective ground cover (see figure 2). Forage use by grazing ungulates will be maintained at or above a condition, which ensures recovery and continued existence of threatened and endangered species. Provide wildlife access and escape on all livestock and wildlife water developments (Forest Plan, 40-1 and 42, 1985).
Figure 2. Management Areas in relation to range

Management Areas
Pleasant Valley Ranger District
Range Analysis Area

Legend
- Allotment Analysis Area
- Management Areas
  - 5G
  - 5A
  - 5D

Scale 1:275,000

Created By: Sean Brown
Pleasant Valley Range Specialist
3-17-2010
Chapter 1 Purpose and Need

**Fire Management**
For management areas 5D and 5G, the Forest Plan states, “Use prescribed fire to treat vegetation for water yield, forage, and wildlife habitat improvement” (see figures 3 and 4).
Figure 3. Proposed burn blocks
Chapter 1 Purpose and Need

Figure 4. Management Areas in relation to fire

Management Areas
Pleasant Valley Ranger District
Fire Analysis Area

Legend

Management Areas

| 5G | 5A | 5D | Fire Analysis Area |

Scale 1:275,000

Created By: Sean Brown
Pleasant Valley Range Specialist
3-17-2010

0 2.5 5 Miles
Management Area 5A – The portion of the Sierra Ancha Wilderness located in the southern portion of the Pleasant Valley RD - This management area makes up about three percent of this analysis area.

*Emphasis:* Manage for wilderness values, while providing livestock grazing and recreation opportunities that are compatible with maintaining wilderness values and protecting resources (Forest Plan, 1985).

**Direction related to Range Management** - Manage suitable rangelands at level B to maintain permitted use within forage capacity (Forest Plan, 1985). Rangeland in less than satisfactory condition will be treated with improved grazing management. The use of minimal range improvements for protection of forage and soil resources commensurate with wilderness values. Maintain utilization at acceptable levels within key forage producing and wilderness use areas. Minimal range improvements, i.e., boundary fences and essential interior division fences deemed necessary for level B management.

**Direction related to Fire Management** – No prescribed management ignited fire is proposed within the management area. Unplanned natural ignition fire may be used for resource benefit (Forest Plan, 1985).

Management Area 5D – Mogollon Rim-Sierra Ancha Area, Pleasant Valley RD - This management area makes up about two percent of the analysis area.

*Emphasis:* Manage for a variety of renewable resource outputs with primary emphasis on intensive, sustained yield timber management, timber resource protection, creation of wildlife habitat diversity, increased populations of emphasis harvest species, and recreation opportunity. Visual quality is to be emphasized (Forest Plan, 1985).

**Direction related to Range Management** – Manage suitable rangelands at level D. Management seeks to optimize production and utilization of forage allocated for livestock use consistent with maintaining the environment and providing the multiple use of the range. From all existing range and livestock management technology, practices may be selected and used to develop effective methods for achieving improved forage supplies and uniform livestock distribution and forage use. Cultural practices such as brush control, type conversion, fertilization, site preparation, and seeding of improved forage species may be used to improve quality and quantity of forage. Cultural practices may be combined with fencing and water developments to implement complex grazing systems and management methods (Forest Plan, 1985).

Rangeland in less than satisfactory condition will be treated with improved grazing management. Allotment Management Plans (AMPs) and rotation schedules will be formulated and implemented to avoid displacing elk from identified calving areas.

**Direction related to Fire Management** – Forest Plan direction for the Flying V & H analysis area is to implement management for a variety of renewable resource outputs as outlined in Management Area 5D (1985). The primary emphasis for 5D is intensive, sustained yield timber management, timber resource protection, creation of wildlife habitat diversity, increased populations of emphasis harvest species, and recreational opportunity. Timber harvesting methods and timing will include improvement of wildlife habitat quality and watershed condition, and will consider impacts on intensive range and recreation management.
Prescribed fire will be used as a tool to achieve desired resource benefits. Wildfires will be managed consistent with resource objectives. Fires occurring under critical burning conditions in this area could do unacceptable damage and will be controlled at the smallest size possible. Fires occurring under more favorable conditions where damage is not unacceptable will be suppressed at the least cost within predetermined perimeters. Suppression strategy will utilize the method which requires the least cost plus net value change.

Management Area 5D within the Pleasant Valley RD consists of approximately 139,494 acres. Each decade, 20-30 percent (27,899-41,848 acres) of this area is considered allowable for burning. This equates to an average goal of approximately 3,500 acres per year for 10 years.

When compatible, actions will be integrated with resource objectives to meet the desired future condition of the analysis area. Standards and Guidelines for all forested areas (38-51) and Management Area 5D (Forest Plan, 1985) that apply to project activities will be implemented.

Management Area 5G – All other lands on the Pleasant Valley RD

Emphasis: Manage for variety of renewable natural resources with primary emphasis on wildlife habitat improvement, livestock forage production, and dispersed recreation. Watersheds will be managed for improvement to a satisfactory or better condition, improve and manage the riparian areas (as defined by FSM 2526) to benefit riparian dependent resources (Forest Plan, 1985).

Direction related to Range Management – Manage suitable rangelands at level D (see Management Area 5D above) to optimize production and utilization of forage, while maintaining the environment, and providing for multiple use of the range (Forest Plan, 1985). Rangeland in less than satisfactory condition will be treated with improved grazing management along with the installation of structural and non-structural improvements. Develop structural improvements in association with AMP to maintain utilization at levels appropriate with management intensity and Allotment Management Plan (AMP) objectives.

Maintenance is performed on re-vegetation acreage as determined in AMP to retain optimum forage production. Methods will be appropriate to vegetation and terrain of treatment areas and could include prescribed fire, chemical, and/or mechanical treatments.

Direction related to Fire Management – Forest Plan direction for the Flying V & H analysis area is to implement management for a variety of renewable natural resource outputs as outlined in Management Area 5G (1985). The primary emphasis for 5G is on wildlife habitat improvement, livestock forage production, and dispersed recreation. Watersheds will be managed to improve them to a satisfactory or better condition. Improve and manage riparian areas (as defined by FSM 2526) will be improved and managed to benefit riparian dependent resources. Wildfires will be managed consistent with resource objectives and will be suppressed in accordance with suppression guidelines. The resource objectives will be to improve livestock forage production and wildlife habitat diversity, as well as to restore a mosaic of successional stages. Wildfires, or portions of fires, will be suppressed when they adversely affect forest resources, endanger public safety, or have a potential to damage significant capital investments. Suppression strategy should utilize the method that requires the least cost plus net value change. Prescribed fire will be used as a tool to meet or achieve desired resource objectives.
Management Area 5G within the Pleasant Valley RD consists of approximately 224,604 acres. Each decade, 30-50 percent (67,381-112,302 acres) of this area will be considered allowable for burning. This equates to an average goal of approximately 9,000 acres per year for 10 years.

Area 5G is comprised of all other lands not included in management areas 5A through 5D on the Pleasant Valley RD. Vegetation consists of riparian, semi-desert grassland, interior chaparral, piñyon-juniper woodland, juniper savanna and scattered ponderosa pine-juniper.

The fire analysis area has been broken into individual burn blocks utilizing control features such as roads. This allows for analysis area to be treated in stages, creating a mosaic pattern of burned, unburned, and a diversity of age class and species composition. See figure 2 for the proposed burn blocks. Some of the burn blocks exceed the yearly goal of 9,000 acres; however, area 5G will be managed over the decade to accomplish the yearly goal. The text contained within these blocks is only for administrative use to allow identification within the larger analysis area. The names were created from landmarks contained within the boundaries of the block and have no correlation with range pastures.

**Forest Plan Direction for Other Resources:**

The Forest Plan recognizes the need for watershed improvement. The intent of the Plan is to have over 90 percent of the Tonto NF in *satisfactory watershed condition* by the end of the fifth planning period. Management direction is to: “Manage vegetation to achieve satisfactory or better watershed conditions.”

The management prescription for Management Area 5A states "Manage for wilderness values while providing livestock grazing and recreation opportunities that are compatible with maintaining wilderness values and protecting resources" (Forest Plan, 1985).

The management prescription for Management Area 5D states "Manage for a variety of renewable resources outputs with primary emphasis on intensive, sustained yield timber management…Timber harvesting methods and timing will include improvement of wildlife habitat quality and watershed condition…” (Forest Plan, 1985).

The management prescription for Management Area 5G states "Watersheds will be managed to improve them to a satisfactory or better condition . . .” (Forest Plan, 1985). For the purpose of this analysis, *soil condition* will serve as a method to assess upland watershed conditions.

**Management Actions.** Adaptive management uses monitoring data to provide feedback as to whether conditions are moving towards or away from stated desired conditions. Downward trends in vegetation and soil/watershed condition that are observed in any given year will result in management actions being taken. Positive trends would be manifested as the absence or opposite of these occurrences.

Indicators of downward trend for vegetation include:

- Desirable and intermediate species decreasing in vigor
- Lack of young plants from desirable and intermediate species
- Invasion by undesirable species
- Hedged and highlined shrubs. Dead branches generally indicating that shrubs are dying back.
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Indicators of downward trend in soil stability include:

- Rill marks, which are small but conspicuous water channels around vegetation.
- Active gullies are raw, actively downcutting, and may have headcuts. This type of gully may vary from a few inches to several feet in depth.
- Alluvial deposits; soil material transported and laid down as small fans in headwater drainages.
- Soil remnants; original topsoil held in place by vegetation or roots.
- Active terraces; usually caused by hooves of animals; staiostep in appearance on sideslopes.
- Exposed plant crown or roots (pedestalled plants).
- Wind-scoured depressions between plants
- Wind deposits.
- Soil buildup behind plants, logs, and trees on upslope side.

Management actions that may occur in response to monitoring results include:

- Improve livestock distribution using salting, herding, fences, or increased water availability.
- Adjust pasture season of use.
- Adjust livestock numbers up or down in response to forage production.
- Shorten/lengthen use period of pasture.
- Provide more rest and recovery for pasture.
- Defer use until forage plants are dormant or seed is set.
- Implement thinning projects to increase litter cover and/or encourage herbaceous plant establishment.

Desired Conditions

Based on Forest Plan guidance and site-specific knowledge of the allotments, the following objectives constitute the desired condition for the analysis area.

Rangeland/Watershed

- Maintain vegetation to achieve, or be moving toward, satisfactory watershed condition (Forest Plan, 1985) and at least 30 percent effective ground cover (Forest Plan, 1985).
- Maintain satisfactory vegetation condition consisting of a diverse mix of warm and cool season grasses and forbs that are suitable for the site potential based on soil type.
- Maintain satisfactory soil conditions. Impaired soil condition (15 percent) should be in an upward trend, moving towards satisfactory conditions within one decade in areas where the potential exists to restore soil productivity and hydrologic function. Unsatisfactory soil condition (6 percent) should be moving towards satisfactory condition within the same timeframe. Soils should have the ability to accept, hold, and release water and nutrients.
- Ensure soils are well protected by vegetation, litter, or rock and show minimal evidence of current sheet or rill erosion. Minimize soil compaction and disturbance to maintain resource values and sustain outputs.
- Maintain even distribution of livestock in pastures to avoid areas of high impact and concentrated use and to allow for uniform conservative utilization (30-40 percent).
Improve livestock distribution by creating new water sources and adding trap fences to existing and newly created water sources.

- Maintain a balanced distribution of pinyon juniper age class across the landscape.
- Reduce juniper density in juniper savanna and juniper woodland vegetation types to increase livestock and wildlife forage and improve effective ground cover. Maintain existing or newly-created openings to retain optimum forage production (Forest Plan, 1985).

**Riparian and Hydrologic Features**

Desired conditions for key reaches include both short-term and long-term timeframes. The most important short-term desired conditions are to:

- Maintain or increase residual herbaceous vegetation along the greenline or stream bank;
- Minimize the annual impacts to seedling and sapling riparian woody species; and
- Limit physical impacts to alterable stream banks and greenlines.

The most important long-term desired conditions are to:

- Optimize riparian tree and shrub establishment, especially following episodic, regional winter storms;
- Increase the density, vertical and horizontal canopy cover of woody riparian tree species;
- Increase the proportion of obligate and facultative riparian species;
- Maintain canopy cover of herbaceous species to at least 5 percent to 25 percent;
- Decrease the greenline to greenline width;
- Optimize the establishment of floodplains and stream banks; and
- Improve stream channel function and stability.

Reaching desired conditions for riparian areas and stream channels will depend not only on management activities, but on climatic events. Both drought and floods have the potential to affect riparian areas and stream channels. High flows (> 10-year recurrence interval) are likely to scour impaired or unstable channels. Even moderate flows (> 2-year recurrence interval) could cause unstable channels to widen or incise.

**Soils**

- Maintain satisfactory soil conditions
- Move all soils toward a stable or upward trend
- Reduce acres of soils in less than satisfactory condition
- Reduce opportunity for soil erosion

**Fire**

- Maintain or improve the resiliency, productivity, and vigor of forested and woodland sites. This includes a diversity of vegetative structural stages, which represents the historic mosaic conditions. Reduced stand densities improve growing conditions, health, and vigor. Endemic levels of insects and diseases are a vital part of a functioning ecosystem.
- For management areas 5A, 5D, and 5G, the Forest Plan states, “Use prescribed fire to treat vegetation for water yield, forage, and wildlife habitat improvement” (Forest Plan,
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1985). The use of prescribed fire would improve forest health and age class diversity, and would reduce fuel loadings to a more manageable level, while allowing fire to play a natural role in the ecosystem. Wildlife habitat and overall rangeland conditions are also expected to improve. To meet these objectives, varying intensities of prescribed fire will be required with subsequent maintenance burns. Because fire is an historic component of this ecosystem, prescribed fire will be used to emulate the ecological effects of natural fire. A prescribed fire is defined as a prescribed management-ignited fire. Fuel loading is reduced through use of prescribed fire, managing natural ignitions, and a mosaic of vegetative structural stages.

- Maintain a diversity of vegetative structural stages and species composition mixtures; provide an abundance and wide variety of wildlife species habitat. Water sources, snags, hiding and thermal cover, turkey roosts and nesting cover, forage areas, as well as, wildlife travel ways and loafing areas are present in adequate amounts and distributed throughout the area to accommodate wildlife needs.
- Improve and protect terrestrial wildlife habitat, while preserving an overall diversity of aquatic habitat in perennial streams.
- Apply management practices across the landscape to enhance or promote threatened, endangered, and sensitive wildlife and plant species in the ecosystem.
- Maintain a variety of native grasses, forbs, and shrubs throughout the area, in patterns similar to those found historically.
- Promote high visual diversity for the landscape and provide a mosaic appearance throughout the area. Enhance visual quality along major travel corridors, including Forest Road (FR) 202, through implementation of these management practices.
- Maintain stable soil conditions in treated areas long term. Maintain ground cover to minimize accelerated erosion. Retain large woody debris, where appropriate, to reduce erosion, and provide nutrients and sites for growth of ectomycorrhizal root tips.
- Maintain watersheds in satisfactory or better condition to minimize accelerated erosion and soil disturbance. Maintain stream channels in a stable, functioning condition, so water quality complies with regulatory standards appropriate for the use.

Wildlife

General wildlife resource goals for the Tonto NF include:

- Providing for species diversity (Forest Plan, 1985).
- Maintaining viable populations of existing species.
- Improving habitat for selected species.
- Managing to increase population levels of threatened and endangered species.
- Maintaining forage used by grazing ungulates at or above a condition, which ensures recovery and continued existence of threatened and endangered species (Forest Plan, 1985).
- Ensuring regeneration of vegetation in riparian areas to achieve multiple age classes and complex vegetative structure for fish and wildlife habitats is desired (Forest Plan, 1985).

The Forest Plan and the Wildlife 2006 Strategic Plan (AGFD, 2001) identify specific management objectives for game species (including big and small game).

- Maintaining, enhancing, and restoring populations of game wildlife to provide for recreational opportunities, including wildlife viewing.
• Minimizing adverse impacts to wildlife and wildlife resources.

Additional desired conditions include:

• Maintaining or improving occupied habitats for threatened, endangered, sensitive and management indicator species, and ensuring recovery objectives are being met.
• Maintaining a diversity of vegetative structural stages and species composition mixtures to provide an abundance and wide variety of wildlife species habitat across the landscape. This includes water sources, snags, hiding and thermal cover, roosting and nesting habitat, foraging areas, loafing areas, and movement corridors.
• Maintaining abundant and robust browse species.

Proposed Action

Range Management

The Pleasant Valley District Ranger proposes to continue to authorize grazing on the Flying V & H allotments in compliance with Forest Service policy and Forest Plan objectives and desired conditions, as described in the purpose and need for action. The grazing allotments would be combined into one allotment – the Flying H Allotment. Grazing authorization would be accomplished through the issuance of new ten-year term grazing permits in accordance with FSH-2209.13. A new AMP would be prepared for the allotment and would be included as Part 3 of any new term grazing permits issued. The AMP will describe: 1) the management objectives for the allotment; 2) livestock management practices, including allowable use levels, necessary to achieve the management objectives; 3) mitigation measures necessary to comply with Forest Plan standards and guidelines and with applicable terms and conditions of biological opinions; and 4) monitoring requirements necessary to determine if management objectives are being achieved. The AMP will incorporate an adaptive management strategy under which the duration, timing and frequency of grazing, as well as the number of livestock authorized annually, may be continually modified in response to changing resource conditions and achievement of management objectives.

Fire Management

The Pleasant Valley District Ranger proposes to manage the timber and other woody vegetation in portions of Management Area 5D (Forest Plan, p. 151-160) and Management Area 5G (Forest Plan, p. 164-168) to meet the purpose and need for this action. The proposed action will help maintain the health of forest and woodland vegetation, reduce forest fuels and the potential for large stand-replacement wildfire, and improve wildlife habitat and range conditions on Forest Service land within the approximately 58,900 acres of the Fire analysis area boundary. This includes prescribed burning on up to 57,102 acres and shaded fuelbreaks on 1,798 acres. Acres treated per year will not exceed what is allowable for each management area as per the direction outlined in the Forest Plan and described under Management Direction in this environmental analysis.

Varied intensities will be used in the prescription and development of the burn plan to mimic the historic natural fires that occurred within the various fuel types. In the ponderosa pine fuel type, low to moderate intensity understory burns will be used to reduce or eliminate competition from mid and lower vegetation. These types of intensities will reduce stand density, while maintaining
Chapter 1 Purpose and Need

overstory. Shaded fuel breaks will be implemented prior to broadcast understory burns. The shaded fuel breaks will be constructed using hand thinning and piling. The undesired species and brush will be cut and hand piled. The implementation of pile burning will occur 1-3 years after piles are constructed. The prescriptions for these shaded fuel breaks including size of piles and desired species will be planned by the Forest Silviculturist and a site visit will be conducted before original prescription is developed. Implementation of broadcast burning should begin within a 5-year period following treatment of pile units. For areas that do not include shaded fuel break treatments, implementation will begin within 1-3 years following the signature of the Decision Memo. A second and third entry of fire may be needed to achieve desired conditions.

The proposed actions are described in more detail in chapter 2.

Decision Framework

The Pleasant Valley District Ranger is the responsible official. Based in part on the results of the NEPA analysis, the District Ranger will issue a decision document that includes a determination of the significance of the environmental effects. If there is a finding of significant impacts, an environmental impact statement will be prepared. If the District Ranger determines there are no significant impacts, then he or she is responsible for making one of the following decisions: 1) implement the “no-action” alternative (Alternative 1); 2) approve management activities described in the “proposed action” alternative (Alternative 2); or 3) require additional analysis and development of a new alternative, if none of the original alternatives are acceptable. If management activities are to occur, the District Ranger will also decide what mitigation, conditions, and stipulations will be tied to those activities. The decision will be documented in a Decision Notice and include a determination of consistency with the Forest Plan, National Forest Management Act, National Environmental Policy Act and applicable laws, regulations and executive orders. Although range management and fire are assessed in this EA, a separate decision will be signed for each.

Specifically for range management, if it is not necessary to prepare an environmental impact statement, the District Ranger will decide whether or not livestock grazing will continue to be authorized. If grazing continues to be authorized, the District Ranger will determine which management actions, mitigation measures, and monitoring requirements will be prescribed in the AMP, including permitted number of animals, season of use, allowable utilization standards, and the term of the permit. Continuation of authorized grazing will be implemented by issuing a new ten year Term Grazing Permit and an Allotment Management Plan.

Public Involvement

The proposal for the development of an AMP for the Flying V & H allotments has been listed in the Schedule of Proposed Actions since May 2005. A scoping document for the proposed action was sent to the public on February 13, 2008, along with a notice published in the Payson Roundup on February 15, 2008. The purpose of the document was to describe the proposed action to any interested/affected parties, and solicit comments from those who may have concerns with the proposed action. The scoping document was sent to: 28 individuals, 17 private organizations, 9 tribes, 1 university professor, 12 state/county/community officials, 3 federal agencies and 4 congressional delegates. From these scoping activities, 9 comment letters were received. The Forest performed a content analysis on information provided in the comment letters as well as information gained through internal scoping.
After initial scoping was completed, Fire Management was added to the proposed action; therefore, a second scoping document was sent out to the above interested/affected parties on March 5, 2010. From these scoping activities, 2 letters were received. The Forest performed a content analysis on these responses, as well as information gained through internal scoping.

**Issues**

The Forest Service separated the issues into two groups: significant and non-significant. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, “…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…” There were no issues identified from the scoping letters.
Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the Flying V & H allotments. This section presents the alternatives in comparative form, in order to define the differences between each alternative and provide a clear basis for choice among options by the decision maker and the public. Mitigation and monitoring measures incorporated into the alternatives are also described.

Alternative Development

In addition to collecting current field data, specialists reviewed existing information. Field reconnaissance was conducted to identify areas of soil instability, determine the location and condition of riparian areas, and determine the condition and presence of wildlife species and potential habitat. Surveys for threatened, endangered, and sensitive species (TES species) were conducted or are on-going. This information helped with the development of possible projects that could move Existing Conditions toward Desired Conditions and were incorporated into Alternative 2.

Alternatives Eliminated From Detailed Study

No additional alternatives were proposed or considered, because scoping efforts did not result in identification of significant issues that could not be addressed through project design or mitigation measures.

Alternatives Considered in Detail

Alternative 1: No Action

No Action – No Grazing and No Fire or Fuels Reduction Treatments

Range Management – Under this alternative the Term Grazing Permit currently authorizing use on the Flying V & H allotments would be cancelled following guidance in 36 CFR 222.4 and Forest Service Manual 2231.62. Twenty percent of the permitted numbers on the face of the permit would be removed from the allotment each year until no more grazing is permitted (5 years). In the event that all cattle are removed from the allotment at the time of implementing this decision, due to drought or some other circumstances, the permit would be canceled.

No range improvements or burning are proposed. Structural range improvements without value for wildlife habitat would be removed from the allotments. Removal activities would depend upon availability of Agency funding and personnel.

Fire Management – Under this alternative, there would be no vegetative treatments, fuels management, or wildlife habitat emphasis treatments that would meet the Desired Conditions described in Chapter 1.

Alternative 2: The Proposed Action

Range Management – The Pleasant Valley District Ranger proposes to continue livestock grazing on the Flying V & H allotments under the following terms:

1. The name will formally change to Flying H Allotment.
2. The grazing system will be a yearlong, 10-pasture deferred rest rotation with an upper limit of 8,500 AUM’s (equals 650 adult cattle yearlong and 200 yearlings for 5 months).

3. Trap fencing on waters
   - Trap fencing will aid in herd management in a pasture. The ability to close off waters when utilization in the area is being reached, will force livestock to move to other portions of the pasture. Therefore by controlling waters, the utilization patterns will become more consistent throughout the pasture. Triggers will also be utilized with the traps. Triggers will allow remnant livestock to enter the trap to obtain water, but will not let the livestock exit. The permittee will be able to check traps and gather remnant livestock more quickly and easily.

4. Construct 2 ½ miles of fence to create 2 traveling lanes and a small holding pasture to improve movement of livestock.
   - The 2 ½ miles of fence is broken up into three segments in three separate pastures.
   - The herd on the Flying V & H allotments moves naturally from summer to winter pastures and vice versa based on season and herding. Construction of the two traveling lanes will enhance the permittee’s ability to move from summer and winter pastures more rapidly and efficiently.

5. Treat up to 10,875 acres of juniper treatment, of which 10,339 acres will be maintenance of old treatments on historic juniper savannas and juniper woodlands
   - Juniper treatments can be accomplished through various methods including:
     - Commercial fuel wood harvesting with chainsaw
     - Tree shear
     - Mastication
     - Dozing
     - Prescribed fire
     - Use of herbicide
   - Any mechanical juniper treatment will be conducted under the prescription of the Siviculturist. The application of herbicides will not be conducted until the EA titled “Integrated Treatment of Noxious or Invasive Weeds on the Tonto National Forest” has been completed and a decision is signed allowing for its application. When the decision for use of herbicide on the Tonto NF is complete, the District will complete an EA specific for the treatment of juniper. All juniper treatments will comply with the Forest Plan. Herbicide will be used only for the treatment of juniper.

6. Three new wells and one new spring development with pipelines, water storage, and troughs
   - Well locations on the map are approximate. Prior to drilling the wells, a survey will be conducted for actual location. Wells will be placed in a manner to create the least amount of impact to any nearby perennial springs and follow the guidelines found in the Regional Groundwater Policy.
   - The spring development will be designed in a manner which will protect the spring. Protection of the spring could include exclusion of livestock using fencing, if monitoring dictates.
7. An option to split Flying H Pasture, if needed to improve distribution.

These actions are summarized in table 2.

**Table 2. Summary of grazing management**

<table>
<thead>
<tr>
<th>Allotment (Main Pastures)</th>
<th>Grazing System</th>
<th>Upper Limit for AUMs</th>
<th>Authorized numbers in 2009; (% of permit)</th>
<th>Change from Current Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flying V &amp; H (Cooper's Fork, Flying H, Six-Shooter, Traveling, Sombrero, Flying V, Gentry, Lee Bell, Pendleton, and Middleton)</td>
<td>Yearlong, 10-pasture Rest Rotation</td>
<td>8,500 AUMs which equates to 650 adult cattle yearlong and 200 yearlings for 5 months</td>
<td>371 adult cattle, 275 yearlings (5 months) &amp; 10 horses; (67%)</td>
<td>Same upper limit as current permit; develop additional waters (2 new wells, 1 new spring development, pipelines and troughs); trap fencing on waters; 2 small traveling lanes and 1 holding pasture created; 10,875 acres of juniper thinning on historic juniper savannas and juniper woodlands; option to split Flying H Pasture, if needed to improve distribution.</td>
</tr>
</tbody>
</table>

Livestock grazing would be managed under the following terms and conditions.

**Duration and timing of grazing.** Use on the Flying V & H allotments would continue with yearlong grazing. A deferred rest rotation grazing strategy will be employed. No pasture should be grazed at the same time during the growing season in consecutive years under this strategy, and periodic growing season rest would be employed, except for the Middleton Pasture, which is used as a travel lane. The northern pastures, including Flying V, Gentry, Lee Bell, and Pendleton, will typically be used in the late spring to early fall time period (June through October). The southern pastures, including Cooper’s Fork, Flying H, Six-Shooter, Sombrero, and Traveling, will typically receive fall through spring use (November through May). Middleton Pasture is used as a traveling lane (typically used for a month in early spring and a month in the fall to move cattle from summer and winter pastures). Two new traveling lanes and one holding pasture near the northwest end and southern end of Middleton Pasture will be created to facilitate movement of cattle to various summer pastures. Various holding pastures are used for holding/gathering cattle or for sorting and shipment of calves or yearlings.

It is anticipated that this pattern will be generally followed for the allotments, understanding that herd size and observed resource conditions will ultimately dictate how many and which pastures are used. Grazing management would ensure that pastures receive periodic summer growing season rest or deferment in order to provide for grazed plant recovery. The sequence and timing of pasture rotations would be set annually based on monitoring of ecological condition and utilization.

**Intensity of grazing.** Forage utilization would be managed at a level corresponding to light to moderate grazing intensity in order to provide for grazed plant recovery, increases in herbage
production, and retention of herbaceous litter to protect soils. **Conservative use** equates to 30 to 40 percent on herbaceous species and < 50 percent use on browse (current year’s leaders). Consistent patterns of utilization in excess of 40 percent of key herbaceous species and 50 percent of browse species in **key areas** would be used as a basis to modify management practices or take administrative actions necessary to reduce utilization in subsequent grazing seasons. The document entitled “Principles of Obtaining and Interpreting Utilization Data on Southwestern Rangelands” will provide guidance and direction for utilization monitoring (2010).

**Adaptive Management.**

Within this overall strategy, annual adjustments may be made to the number of livestock that will graze (intensity), the length of time they spend in a pasture (frequency, intensity), the time of year a pasture is grazed (timing), or the degree to which they are distributed in a pasture (intensity, frequency). The basis of adaptive management is a “stock and monitor” approach used to adjust the timing, intensity, frequency, and duration of grazing in order to meet resource goals.

Monitoring will be used to provide feedback to adjust management actions in order to achieve specific desired conditions over the long term. Management objectives are chosen that will be used to document if desired conditions are being achieved. The proposed action is designed to provide sufficient flexibility to allow for changes in management, when resource conditions show that changes are needed. Changes in management may include administrative decisions such as the specific number of livestock authorized annually, specific dates for grazing, class of animal, or modifications in pasture rotations. However, such changes would not exceed the limits for timing, intensity, duration, and frequency defined in the term grazing permit. Adaptive management would be implemented through annual operating instructions, which would adjust livestock numbers and the timing of grazing, so that use is consistent with current productivity and is meeting management objectives.

Adaptive management also includes monitoring to determine whether identified structural improvements are necessary or need to be modified. In the case that changing circumstances require physical improvements or management actions not disclosed or analyzed herein, further interdisciplinary review would occur. The review would consider the changed circumstances and site-specific environmental effects of the improvements in the context of the overall project. Based on the results of the interdisciplinary review, the Ranger would determine whether correction, supplementation or revision of the EA is necessary in accordance with Forest Service Handbook direction at FSH 1909.15(18) and FSH 2209.13(96.1), or whether further analysis under NEPA is required.

Riparian use guidelines are as follows:

- **obligate riparian tree species** – limit use to < 50 percent of terminal leaders (top 1/3 of plant) on palatable riparian tree species accessible to livestock (usually ≤ 6 feet tall);
- **deergrass** – limit use to < 40 percent of plant species biomass; **emergent species** (rushes, sedges, cat-tails, horse-tails) – maintain an average of six to eight inches of stubble height during the grazing period.

Riparian utilization will be measured seasonally, when livestock are in the pasture. Livestock will be moved from the critical area or pasture, when recommended guidelines are met. In early seral or degraded riparian areas, riparian utilization measurements cannot take place until riparian
vegetation is re-established, such as on Cherry Creek. Until such time, an alternate monitoring method will be applied. Methods may include but are not limited to: Landscape Appearance Method (LAM) and streambank alteration. Photo points will be used to monitor trend.

**Administrative action necessary to implement the decision.** The following administrative actions would be used to implement the NEPA-based decision to authorize grazing.

- **Permit Issuance.** New ten-year term grazing permits would be issued.
- **Allotment Management Plans.** An AMP, based on this EA, would be developed for the allotment and incorporated into the grazing permit.
- **Annual Operating Instructions (AOI).** On an annual basis, the Forest and permittee would jointly prepare an annual plan, referred to as the AOI.

**Improvements**

Improvements proposed to promote achievement of desired conditions were developed in coordination with the grazing permittee and are listed in table 3. Figure 5 shows approximately where the improvements will be placed. These improvements have been proposed in the context of adaptive management, meaning that they have been identified as possible practices to assist in the achievement of desired conditions, if management alone is not sufficient. Future monitoring may indicate that the projects are not necessary, in which case they would not be implemented. However, if some or all improvements are not implemented, the upper limits of permitted livestock numbers may not be achievable. Funding will be a cooperative effort between the permittee, Pleasant Valley Ranger District, and other partner organizations or agencies.

**Table 3. Proposed range improvements for Flying V&H allotments**

<table>
<thead>
<tr>
<th>Improvement Type</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct approx. 1 mile pasture division fence to split Pendleton Pasture and create a holding pasture.</td>
<td>Improve operation efficiency and facilitate timely pasture rotation from Middleton Pasture to Pendleton or Flying V/Lee Bell Pastures.</td>
</tr>
<tr>
<td>Drill a well in Six-Shooter and Sombrero pastures; each with approx. 2.5 miles surface pipeline, troughs, and storage tanks.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
<tr>
<td>Juniper treatment may occur on approximately 10,875 acres. Reduce density of juniper trees through mechanical treatment (chainsaws, pushing with dozer, fuel wood sale, hydraulic tree shear) and/or prescribed fire.</td>
<td>Improve/maintain range and watershed condition and effective ground cover; improve forage plant production. Reduce density of junipers on historic juniper savannahs and juniper woodlands. Maintain existing or newly created openings to retain optimum forage production.</td>
</tr>
<tr>
<td>Improve spring in Flying H Pasture; with approx. 1 mile surface pipeline, 2-4 troughs, and storage tanks. If monitoring indicates, the spring source will be fenced to exclude livestock.</td>
<td>Allow for the best chances of improvement of riparian areas by excluding the spring from livestock. This management strategy should allow upland vegetation to complete summer’s growing season rest and minimize impacts to riparian.</td>
</tr>
<tr>
<td>Improvement Type</td>
<td>Purpose</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Construct fenced traps around stock waters (approx. 2-10 acres each) and construct loading chutes.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Improve operation efficiency and facilitate timely pasture rotation. Need to load and unload livestock.</td>
</tr>
<tr>
<td>Gentry Holding: extend pipeline roughly one mile and add troughs.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
<tr>
<td>Cross Trails: split holding pasture.</td>
<td>Improve management of livestock.</td>
</tr>
<tr>
<td>Develop Middleton Mesa Spring; add 1.5 miles of above ground pipe, pump, storage tanks, and troughs.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
<tr>
<td>Wilson Creek: construct a fence to create driving lane (Sec 29).</td>
<td>Improve management of livestock.</td>
</tr>
<tr>
<td>Pendleton Pasture: drill a well, 2.5 miles of above ground pipeline, storage tanks, and troughs.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
<tr>
<td>Middleton Pasture: construct a fence for a traveling lane (Sections 10 and 11).</td>
<td>Improve management of livestock.</td>
</tr>
<tr>
<td>Six miles of above ground pipe, storage tanks, and troughs. Water from well in Sombrero Pasture.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
<tr>
<td>Rock House Well: extend a pipeline to Pendleton Pasture along traveling lane, add troughs and storage tanks.</td>
<td>Improve livestock distribution and better control pasture usage patterns. Need for permanent water.</td>
</tr>
</tbody>
</table>
Figure 5. Allotment map with proposed improvements
**Alternative 2 – Proposed Action, Continued**

**Fire Management** – The Pleasant Valley District Ranger proposes to manage the timber and other woody vegetation in portions of Management Area 5D (Forest Plan, 1985) and Management Area 5G (Forest Plan, 1985) to meet the future desired conditions described previously. This proposed action would include planned ignitions on up to approximately 57,120 acres and shaded fuel breaks on roughly 1,798 acres. Large burn blocks will be designated and planned ignitions will be applied at a landscape scale. Fire will be applied in mosaic patterns over the landscape. Varied intensities will be used in the prescription and development of the burn plan with a goal of mimicking the historical natural fires that occurred within the various fuel types. In some cases, fire intensities and frequencies will need to depart from historical regimes in order to allow vegetation to reach desired conditions.

In the ponderosa pine fuel type, low to moderate severity understory burns will be used to reduce or eliminate competition from mid-level and lower vegetation. Also, these types of severities will reduce the stand density, while maintaining the overstory. Historically, this fuel type burned at lower severity with a frequent fire return interval. To accomplish this, shaded fuel breaks will be implemented prior to broadcast understory burns. Figure 6 shows roughly where juniper cuts and shaded fuel breaks occur. Shaded fuel breaks are not considered a range improvement; however, they are included on the map as they are a part of the overall analysis. The shaded fuel breaks will be constructed using hand thinning and hand piling. The undesired species and brush will be cut and hand piled. The implementation of pile burning will occur in 1-3 years after piles are constructed. The prescriptions for these shaded fuel breaks, including size of piles and desired species, will be planned by the Forest Silviculturist and a site visit will be conducted before the original prescription is developed. Implementation of broadcast burning should begin within a 5-year period following treatment of pile units.
Figure 6. Allotment map with juniper treatments/fuel breaks

Flying V & H Juniper Treatments/Shaded Fuel Breaks

Legend
- Juniper Treatments
- Shaded Fuel Breaks
- Allotment Analysis Area

Scale 1:170,000
Created By: Sean Brown
Pleasant Valley Range Specialist
2-23-2010

0 0.5 1 2 Miles
In most of the interior chaparral fuel type, moderate to high intensity fires will be used to mimic natural fire. The use of fire as a treatment will be applied in a mosaic pattern and not all of the area will sustain the same fire severity. There will be areas that are left unburned and areas with low, moderate, high, and very high severity burns. This applied over the landscape will help achieve the desired conditions. Openings will be created at varying sizes with most being in the 0-200 acres size range, although larger openings may be created. In this fuel type, natural fires were less common, but occurred at higher severities with a fire return interval of every 30-100 years. In some types of chaparral and chaparral woodland, the understory is strongly dominated by manzanita. Burning in these areas is likely to enhance manzanita production. In these areas, fire will be used sparingly, unless site-specific conditions dictate otherwise.

In the piñyon/juniper fuel type, varied fire severity treatments will be applied. In piñyon/juniper/oak woodlands that have a more open stand quality (less than about 35 percent canopy cover), low to moderate severity fire will be mimicked to maintain the qualities associated with an open canopy, while protecting the older age class of the piñyon/juniper species. In juniper savannah and juniper woodland vegetation types, moderate-to-high severity fire will be used to reduce the stems per acre, create ecotones, and restore/maintain grasslands. Depending on the stand structure, the stands that were more open historically had lower severity and a shorter fire return interval than more dense stands. The piñyon/juniper/oak stands that were historically more closed tended to be persistent woodlands that had a low fire return interval and experienced high/very high severity fires under extreme conditions when they did burn. Fire will be used sparingly in these types, unless site-specific condition dictates otherwise.

The desired outcome is to create a mosaic on the landscape that, when viewed at a scale that exceeds the analysis area boundaries, includes adjacent treatments, past large scale wildfires and naturally occurring openings and vegetation changes. For areas that do not include shaded fuel break treatments, implementation will begin within 1-3 years following the signature of the Decision Memo. The initial entry or first entry of fire over the majority of the analysis area is likely to be completed within 15 years from the date implementation begins. Second and third entry of fire may be needed to achieve desired conditions.

Burn treatments will be coordinated with juniper thinning projects. Juniper treatment areas will be burned preferably in the fall (Soeth, 1999) 3-5 years after thinning to allow enough time for grasses to become re-established beneath slash. The purpose of the burn would be to kill re-sprouting junipers and maintain openings within the canopy to allow for herbaceous growth and provide wildlife cover and foraging areas.

**Monitoring and Mitigation**

**Monitoring and Mitigation for Range Management**

The objective of monitoring is to determine if management is being properly implemented and if the actions are effective at achieving or moving the resource toward desired conditions. Effectiveness monitoring includes measurements to track condition and trend of upland and riparian vegetation, soil, and watersheds. Monitoring would be done following procedures described in the interagency technical reference, the *Region 3 Rangeland Analysis and Training Guide*, and the *1988 R3 Range Analysis and Management Handbook*. These data are interpreted...
to determine if management is achieving desired resource conditions, if changes in resource condition are related to management, and to determine if modifications in management are necessary. Effectiveness monitoring would occur at least once over the ten-year term of the grazing authorization, or more frequently, if deemed necessary. Changes in riparian vegetation and stream channel geomorphology condition and trend will be measured at five to 10 year intervals. Protocols are described in the Interagency Technical Reference (1996), Cowley and Burton (2002), or the most current acceptable method.

Implementation monitoring would occur annually and would include such things as inspection reports, forage utilization measurements in key areas, livestock counts, and facilities inspections. Utilization measurements are made following procedures found in the Interagency Technical Reference and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands. Utilization measurements in riparian areas are made following the Interagency Technical Reference (Interagency Technical Team, 1996), McBride and Grove (2002), and Cowley and Burton (2002) or the most current acceptable method.

Utilization would be monitored on key forage species, which are native perennial grasses that are palatable to livestock. Key forage species will be determined on a site by site basis. At a minimum monitoring would include use in key areas, but may include monitoring outside of key areas. The Pleasant Valley District Range Staff Officer and the permittees would be responsible for monitoring livestock grazing utilization. Over time, changes in resource conditions or management may result in changes in livestock use patterns. As livestock use patterns change, new key areas may be established and existing key areas may be modified or abandoned in cooperation with the permittee.

The permittee would be encouraged to participate in monitoring activities. Records of livestock numbers, movement dates, and shipping records would be kept by the permittee and would be provided to the District Range Staff annually.

Management practices include measures to reduce or avoid resource impacts (mitigation) that are incorporated into the project design. These measures have been used on previous projects and are demonstrated to be effective at reducing environmental impacts. They are consistent with applicable Forest Plan standards and guidelines. Implementation of these practices in combination with the duration, timing, and intensity of proposed grazing is intended to avoid the occurrence of adverse environmental impacts.

- **Soil, Water and Vegetation** – The objective is to mitigate effects of livestock grazing and facility construction through the use of Best Management Practices (FSH 2509.22) and adaptive management. Practices include, but are not limited to the following.

  - Utilization of key upland herbaceous forage species in key areas will be managed to achieve the goal of light-to-moderate grazing as a pasture average. Protect plant vigor to provide herbaceous residue for soil protection and to increase herbage producing ability of forage plants. A utilization guideline of 30-40 percent use of key species and < 50 percent of current year’s growth of desirable browse species in key areas will be used.
  - The Pleasant Valley Ranger District and permittees will jointly prepare annual operating plans that consider current conditions and management goals. Periodic field checks including stock counts, range improvement monitoring, and utilization
monitoring will be used to identify needed management adjustments. This is to ensure achievement of resource and management objectives.

- Management practices will be used to achieve proper distribution or lessen the impact on sensitive areas. Practices include herding, salting, and controlling access to waters. Salt will be placed on good feed, one-quarter to one-half mile from waters and salting locations will be moved annually. Placement of liquid or bulk supplements will require prior approval of the District Ranger.

- Mechanical treatment to reduce juniper density in the juniper savanna and juniper woodland vegetation types to increase forage and improve effective ground cover. Maintain existing or newly created openings to retain optimum forage production.

- No hay will be placed on forest land to help minimize the introduction of weed seeds.

- **Wildlife** – The objective is to mitigate impacts to wildlife from livestock grazing and from disturbance associated with construction of range facilities.

  - All water developments will include wildlife access and escape ramps. Waters will be available to wildlife year round.
  - All reconstructed fencing will be built to Forest Service standards to provide for wildlife passage through the fence. At a minimum, this will be a four-strand fence with smooth bottom wire 16 inches off the ground and a total height of 42 inches or less.
  - An average of 60 percent of standing herbaceous vegetation will be left for wildlife forage and cover.
  - Juniper density in the juniper savanna and juniper woodland vegetation types will be reduced to increase wildlife forage and improve effective ground cover. Existing or newly created openings will be maintained to retain optimum forage production.
  - Best management practices will be followed for tanks and stock pond maintenance as outlined in the Chiricahua Leopard Frog Recovery Plan by U.S. Fish and Wildlife Service (USFWS, April 2007) in areas with the potential to support the species. The objective is to minimize short-term impacts to frogs, while allowing maintenance activities within occupied habitats. While past survey efforts have found no Chiricahua leopard frogs to be present in parts of the project area, a survey of the entire area is currently being conducted.

- **Heritage Resources** – The objective is to protect heritage resources (historic and prehistoric sites) from impacts caused by range construction projects or livestock concentration.

  - Archaeological surveys will be conducted prior to construction of any new range improvements. Locations will be selected where impacts to heritage resource sites are avoided.
  - Existing range facilities (water troughs, corrals) where cattle congregate will be periodically inspected to determine if livestock are causing damage to known heritage sites.
  - Salting locations will be placed outside the boundaries of heritage resource sites.
Monitoring and Mitigation for Fire Management

The objective of monitoring is to determine if management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions.

Implementation monitoring would occur at various timelines as outlined in the Region 3 Prescribed Fire Template (National Wildfire Coordinating Group (NWCG), 2010). The monitoring of broadcast burn units will be accomplished through ocular estimations and the implementation of photo points. These photo points will be randomly placed within the burn, marked with a steel post and their coordinates recorded. Pictures will be taken at 0, 90, 180, and 270 degrees from these points and will be recorded in the project file. These photos will then be used to monitor pre-burn, immediate post-burn, one-year post-burn, and five-year post-burn to determine if objectives are being met.

- **Fire - Recommended Mitigation Measures for Fuel and Juniper Treatments**
  - The use of off-road vehicles such as dozers and skidders during mechanical treatments can cause soil compaction and displacement – off-road vehicle impacts can be reduced or eliminated by following best management practices. By limiting the period of use to dry soil conditions, soil compaction and rutting can be reduced.
  - Burning piles can sterilize soil, remove organic matter, and destroy soil structure. Damage from burning can be reduced by spreading slash (where appropriate); so slash can be broadcast burned, chipping slash, or by creating only small burn piles, which do not generate as much heat and produce less soil damage. Generally piles should be smaller than 15 feet wide.
  - Maintain an adequate amount of Coarse Woody Material (CWM). CWM consists of downed woody material greater than three inches in diameter. Soil quality standards require five-to-ten tons/acre of CWM in ponderosa pine forests and seven to fourteen tons/acre in mixed conifer (FSH 2554.02). (Note: Constructed Fuelbreaks can have less than the above amounts of CWM).
  - Limit prescribed burning to no more than 20 percent of any 6th code watershed in a three-year period. Burning large portions of a watershed can lead to greatly increased runoff and pose a risk to downstream values. By limiting the amount of each watershed that is burned, the risk of downstream flooding is reduced. If prescribed burns stay within prescription in areas of ponderosa pine and mixed conifer vegetation, there may be sufficient needle cast to protect the soil in the year following the burn. In that case, it would be possible to burn another 20 percent the following year.
  - Limit prescribed burning to appropriate ecosystems and conditions. As described above in environmental effects of fire management, certain ecological types may not respond well to fire or may not respond well under certain environmental conditions. Prescribed fire should be limited to appropriate ecosystems and conditions.

- **Soil, Water, and Vegetation** – The objectives are to use fire from either planned or unplanned ignition in a safe, carefully-planned and cost-effective manner to benefit, protect, maintain, and enhance National Forest System resources; to reduce future fire suppression costs; and to the extent possible, restore natural ecological processes and achieve management objectives adopted in approved forest land and resource management plans (FSM 1920). Practices include, but are not limited to the following.
Chapter 2 - Alternatives

- **Wildlife** - The objective is to mitigate impacts to wildlife from planned and unplanned ignitions from disturbance associated with wildfire. In addition to those described for Soil, Water, and Vegetation, practices will include:
  
  o Use of varying ignition patterns and seasonality to create ecotones.
  o Surveying for endangered, threatened, proposed, and candidate species (listed species) prior to implementation of planned ignitions.
  o Conducting emergency consultation with the United States Fish and Wildlife Service (USFWS) for unplanned ignitions in areas that are known to support listed species or are in critical habitat for listed species.
  o Following management guidelines for northern goshawk, Mexican spotted owl, and Chiricahua leopard frog that are current at the time of project implementation.
  o Identifying and preserving special wildlife habitat requirements throughout the process with the assistance of the Pleasant Valley RD wildlife biologist. This includes, but is not limited to, protection and retention of snags and downed woody materials; raptor nest sites; squirrel nest trees; turkey roosts, nesting cover, and loafing areas; deer fawning and elk calving areas; and retention of unburned vegetation along drainage channels to provide for wildlife hiding cover.

- **Heritage Resources** - The objective is to protect heritage resources (historic and prehistoric sites) from impacts caused by prescribed fire. The Forest Archaeologist may approve additional measures to further protect sites in accordance with Protocol J for Large-Scale Fuels Reduction, Vegetation Treatment, and Habitat Improvement Projects (Protocol J) of the Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities (Programmatic Agreement); however, if a lesser level of protection is recommended, or if it is likely that adverse effects cannot be avoided, the Forest shall consult with the State Historic Preservation Officer (SHPO) on additional protection measures prior to approving Heritage Resources Clearance and prior to implementation of each phase of the project.
  
  o All sites not currently evaluated for National Historic Register eligibility will be treated as eligible for the Register for all levels of project(s) implementation.
  o No use of mechanized equipment (e.g., trucks, skidders, chippers, crushers) will occur within established site boundaries.
  o No staging of equipment or supplies will occur within established site boundaries.
  o No piles of slash will established within site boundaries.
  o During any subsequent burning activities, no ignition points will occur within established site boundaries.
  o Fire-sensitive sites (sites containing fire-sensitive components, including but not limited to, organic elements and rock art) will be protected during any subsequent burning activities, including maintenance burns, by the use of hand lines, wet lines,
or staging of an engine adjacent to the site, as determined appropriate to the resource through consultation with fire management and heritage resource personnel.

- Standing trees within established site boundaries will be felled using hand falling techniques only.
- Standing trees within and adjacent to established site boundaries will be directionally felled peripherally, away from site feature(s).
- Slash resulting from harvest activities will be scattered to limit fuel concentration within established site boundaries and to provide erosion protection, or removed entirely from within the site boundaries, as determined in consultation with Heritage Resources Specialists.
- Removal of standing trees below 9-inch diameter at breast height (dbh) will result in no more than 5-10 tons per acre of fuels within established site boundaries to limit fuel concentration and potential fire damage to site component(s). Anything above this level will be removed by hand.

**Additional Considerations in Monitoring and Mitigation for Heritage**

*Protocol H* of the *Programmatic Agreement*, monitoring will be conducted as part of the day-to-day activities of the professional cultural resource specialists and certified para-archaeologists working in the area. Grazing allotments cover most of any given forest and when archaeologists are in the field conducting surveys, they are most likely surveying within a grazing allotment. The archaeologists will use these opportunities to observe and report on grazing activities, the effectiveness of the grazing strategy, and potential impacts to heritage resources. Any incidents of damage to historic properties from grazing will be reported, and the archaeologists will draw upon the protection measures outlined in the Protocol to ensure that the effects are avoided or minimized.

In accordance with Protocol J of the Programmatic Agreement, post-treatment monitoring of sites with determined to be fire-sensitive will occur to determine the effectiveness of the protection measures in order to gather data that will be used to improve planning for protection of heritage resources in future projects. This also includes monitoring of non fire-sensitive sites in order to expand available information on the effects of prescribed fire on archaeological sites. Determinations of the number of both non- and fire-sensitive sites (e.g., a percentage) which will be monitored subsequent to an individual treatment as well as the appropriate post-project monitoring requirements to be utilized will be determined by the Forest Archaeologist.

**Future Review of the Decision**

In accordance with Forest Service Handbook direction [*FSH 1909.15(18)* and *2209.13(96)*], an interdisciplinary review of the decision will occur within 10 years, or sooner if conditions warrant. If this review indicates that management is meeting standards and achieving desired condition, the initial management activities would be allowed to continue. If monitoring demonstrates that objectives are not being met and management options beyond the scope of the analysis are warranted, or if new information demonstrates significant effects not previously considered, a new proposed action would be developed and further analysis under NEPA will occur.
## Comparison of Alternatives

This section provides a preliminary summary of the effects of implementing each alternative. Information in tables 4 and 5 is focused on activities and effects. Different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

### Table 4. Comparison of alternatives: range

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Forest Policy and Forest Plan Consistency</td>
<td>Consistent with Forest Plan. Not consistent with policy (FSM 2202.1, 2203.1).</td>
<td>Consistent with Forest Plan and policy.</td>
</tr>
<tr>
<td>Meets Purpose and Need</td>
<td>Does not authorize grazing, but achieves Forest Plan resource objectives, with possible exception of satisfactory watershed condition, which may not be achievable in areas of dense juniper overstory unless thinning occurs. Adaptive management would be precluded.</td>
<td>Authorizes grazing and achieves Forest Plan objectives. Provides for adaptive management to respond to changing conditions or to meet management objectives. Should allow for increased forage production in areas currently suppressed due to woody overstory.</td>
</tr>
<tr>
<td>Effects on soil condition</td>
<td>Nearly all compacted soils will begin to improve. Some soils will recover to acceptable levels over the next 10 – 15 years while other soils may take longer. Erosion likely to remain high in areas with thick juniper overstory and little ground cover in interspaces.</td>
<td>Soil compaction to remain stable and in some places recover over the next 10 - 20 years. Recovery will be slower than under Alternative 1 especially in heavily-used areas favored by livestock. Areas with thick juniper overstory treated by lopping and scattering should improve more than under Alternative 1.</td>
</tr>
<tr>
<td>Effects on Wildlife and Plants</td>
<td>Overall, primary diversity, and productivity would increase. Foraging, hunting, nesting, fawning, hiding, and thermal cover should improve, increasing survival rates for many big and small game, management indicator, threatened, endangered, and sensitive species. General wildlife habitat and corridor maintenance would be improved. No effect to spotted owl. Likely to leave the most available forage for wildlife; however, may be reduced due to juniper densities increasing on savannas and juniper woodlands.</td>
<td>Spotted owl may be affected but not likely. Leaves 60 percent to 70 percent forage for wildlife. All potential habitat for Chiricahua leopard frog has not been surveyed, but adverse effects unlikely following mitigation measures and terms and conditions from Biological Opinions. The proposed management should allow for adequate cover and forage values for wildlife. Likely to increase forage and effective cover in juniper treatment areas.</td>
</tr>
<tr>
<td>Riparian Areas and Stream Channels</td>
<td>Riparian areas and stream channel conditions will improve to the greatest extent and at the fastest rate under this alternative.</td>
<td>This alternative should allow the stream channels and riparian areas to move toward or meet desired conditions, though at a slower rate than Alternative 1.</td>
</tr>
</tbody>
</table>
## Chapter 2 - Alternatives

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects on upland vegetation and watershed condition</td>
<td>Herbaceous vegetative condition is most likely to improve in openings where livestock typically congregate, although ungulate use from elk will continue. In areas of high density overstory of pine and juniper, herbaceous vegetation may show no measurable improvement. In areas of thick juniper, where there is little cover in the interspaces, erosion likely to remain high, since herbaceous production is suppressed.</td>
<td>Vegetative condition most likely to remain stable or improve slowly. High density pine/juniper areas may not improve until 1-5 years after some thinning treatments are implemented. Watershed condition remains satisfactory in openings, and will improve in areas thinned of juniper or pine as herbaceous production increases.</td>
</tr>
<tr>
<td>Heritage Resources</td>
<td>No effect on Heritage Resources.</td>
<td>Managed grazing is not considered to constitute an effect on heritage resources when the grazing strategy is designed to match herd size with capacity and distribute livestock as evenly as possible across the allotment.</td>
</tr>
<tr>
<td>Socio-Economics</td>
<td>Removal of the livestock would result in an initial reduction in gross economic returns to the permittee, unless the cattle could be placed on private land.</td>
<td>Personal characteristics such as self-sufficiency, independence, hard work and other traits associated with the ranching lifestyle would likely be protected under this alternative.</td>
</tr>
<tr>
<td>Recreation and Special Management Areas</td>
<td>Would be in accordance with wilderness values; however, selecting this alternative based on eliminating grazing from wilderness would not be in accordance with the <em>Wilderness Act</em>. Those rivers with potential for a wild, scenic, or recreational river are accessible; therefore, future eligibility may be impacted. The section of an inventoried roadless area would not be impacted because nothing would change regarding management of existing roads. No conflicts between recreational users and livestock; existing range improvements remain in wilderness areas until FS can arrange for removal.</td>
<td>Potential conflicts with recreational users mitigated through project design; would be in accordance with wilderness values. Those rivers with potential for a wild, scenic, or recreational river are accessible; therefore, future eligibility may be impacted. The section of an inventoried roadless area would not be impacted, because nothing would change regarding management of existing roads.</td>
</tr>
</tbody>
</table>
### Table 5. Comparison of alternatives: fire

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Forest Policy and Forest Plan Consistency</td>
<td>Consistent with Forest Plan. Not consistent with policy (<em>FSM 2202.1, 2203.1</em>).</td>
<td>Consistent with Forest Plan and policy.</td>
</tr>
<tr>
<td>Meets Purpose and Need</td>
<td>Does not authorize prescribed burning, but achieves Forest Plan resource objectives, with possible exception of satisfactory watershed condition, which may not be achievable in areas of dense juniper overstory unless thinning occurs.</td>
<td>Authorizes prescribed burning and achieves Forest Plan objectives. Should allow for increased forage production in areas currently suppressed due to woody overstory.</td>
</tr>
<tr>
<td>Effects on soil condition</td>
<td>There would be no direct and indirect impacts to soils from prescribed fire. The lack of fire may lead to an increased risk, in some areas, of a large wildfire with a potentially large increase in erosion.</td>
<td>There would be some short term (1-3 year) instability following a prescribed burn. The long-term effects would be a decreased risk, in some areas, of a large wildfire which would reduce the risk a potentially large increase in erosion.</td>
</tr>
<tr>
<td>Effects on Wildlife and Plants</td>
<td>There would be no direct and indirect effects on wildlife and plants from prescribed fire. The lack of prescribed fire could increase the risk of catastrophic fire with potential negative effects to big and small game, management indicator, migratory bird, threatened, endangered and sensitive species, including Mexican spotted owl and Chiricahua leopard frog. Forage may be reduced due to juniper densities increasing on savannas and juniper woodlands.</td>
<td>There may be possible short term effects from prescribed fire including loss of downed woody materials and reduction in hiding cover and forage following prescribed burns and shaded fuelbreaks. The long-term effects include an increase in the diversity of wildlife habitat s through increased vegetative structural diversity and species composition and decreased risk of catastrophic wildlife. All potential habitat for Chiricahua leopard frog has not been surveyed, but adverse effects unlikely if recommended mitigation measures followed (<em>USFWS 2007, SESAT 2008</em>).</td>
</tr>
<tr>
<td>Riparian Areas and Stream Channels</td>
<td>There would be no direct or indirect impacts to stream channels or riparian areas from prescribed fire. The lack of fire may lead to an increased risk, in some areas, of a large wildfire with potential negative impacts to stream channels and riparian areas. Riparian areas and stream channel conditions will improve to the greatest extent and at the fastest rate under this alternative.</td>
<td>There may be possible short-term impacts from prescribed fire such as increased sedimentation. Long-term effects would be a decreased risk in some areas of a large wildfire, which would reduce the risk a potentially large increase in sedimentation and peak flows. This alternative should allow the stream channels and riparian areas to move toward or meet desired conditions.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Alternative 1</td>
<td>Alternative 2</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Effects on upland vegetation and watershed condition</td>
<td>There would be no direct and indirect impacts to vegetation and watersheds from prescribed fire. The lack of fire may lead to an increased risk, in some areas, of a large wildfire with a potentially negative impacts to vegetation and watersheds.</td>
<td>Vegetative condition most likely to improve. Effects on vegetation from burning will be highly variable depending on type of treatment and type of ecosystem. Areas with heavy juniper or manzanita overstory and little herbaceous understory may have negative impacts from burning. Most areas of chaparral and piñyon/juniper with a grassy understory should improve. Impacts should be generally positive, if fire applied to appropriate ecosystems.</td>
</tr>
<tr>
<td>Heritage Resources</td>
<td>No effect on Heritage Resources.</td>
<td>By implementing mitigation measures, as identified in Protocol J, there should be no impact to Heritage Resources.</td>
</tr>
<tr>
<td>Socio- Economics</td>
<td>No effect on Socio Economics</td>
<td>No effect on Socio Economics</td>
</tr>
<tr>
<td>Recreation and Special Management Areas</td>
<td>Would be in accordance with wilderness values. The section of an inventoried roadless area would not be impacted because nothing would change regarding management of existing roads. No conflicts between recreational users and fire use</td>
<td>Ignitions are not planned in the Wilderness therefore no effect is anticipated. Impacts to the public would be minimal.</td>
</tr>
</tbody>
</table>
Chapter 3 – Affected Environment and Environmental Consequences

This section summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. The section is organized by resource. Within each section, the affected environment is briefly described, followed by the environmental consequences (effects) of implementing each alternative.

Past, present, and reasonably foreseeable actions for consideration in cumulative effects include: historic grazing, natural disturbances (i.e., drought and flood events), road development, off-road vehicle (OHV) use, mining, fires, and dispersed recreation.

Existing Conditions

Range Management Affected Environment

The Flying V & H allotments have been managed together since the mid-1980s. The combined allotments consist of about 67,300 acres and are located on the eastern side of the Pleasant Valley RD, about 5 miles east of Young. The allotments are bordered by the Fort Apache Indian Reservation to the east. Elevations range from about 3,000 feet at the southern end in Cherry Creek to around 6,400 feet at the top of Shell Mountain. Vegetation is predominantly piñyon/juniper and juniper woodland/grassland associations, with ponderosa pine found at higher elevations and on north-facing slopes and canyons. Interior chaparral and semi desert grasslands are found at lower elevations in winter pastures.

About 61 percent of this allotment ranges from 0-30 percent slope. These areas are most accessible to cattle, and effects to vegetation by grazing will be most pronounced. Cattle may access areas from 30-60 percent slope (31 percent of allotment), but less frequently, so effects to vegetation are less. Areas of greater than 60 percent slope are not considered accessible to livestock (8 percent of allotment); therefore, vegetation in these areas would not be significantly affected by the various management strategies.

For all the allotments, herbaceous forage production is greatest in those vegetation types with widely spaced trees, few shrubs and located on productive soils (savannas and some woodland vegetation types). Vegetation types with a large shrub component may provide substantial browse forage, although this will depend on species composition and accessibility. The topography is extremely variable on both allotments, a situation that makes it difficult to properly distribute cattle throughout most pastures.

Allotment Management History. The current AMP was approved on August 21, 1987. This plan provided for the two separate allotments to be managed as one unit, which is comprised of about 67,300 acres and located on the eastern side of the Pleasant Valley RD.

Stocking Levels. The 20-year average stocking rate has been 5,494 AUMs; this is about 65 percent of the term permitted number of livestock based actual use data for the years 1985-2009. The permitted numbers for 2009 were 371 adult cattle and 10 horses yearlong and 275 yearlings for 5 months (equivalent to 5,535 AUM’s). See table 6 for stocking averages.
Table 6. Summary of Flying V & H allotments acreage and use records

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>67,300</td>
<td>1,221-7,798 AUM’s, (102-650 adult cattle)</td>
<td>5,638 AUM’s (469 adult cattle)</td>
</tr>
</tbody>
</table>

It is a standard and guideline listed in the Forest Plan for Management Areas 5A and 5G (those that encompass the Flying V & H allotments) that “rangeland in less than satisfactory condition will be treated with improved grazing management.” **Satisfactory range condition** is achieved with fair or better vegetation and watershed condition at key areas. Trend monitoring data from 2004 through 2008 indicates that range conditions are meeting and/or moving towards Forest Plan standards (soil and forage conditions are generally stable or upward under current management). Some key forage species present on the allotment include side-oats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), plains lovegrass (*Eragrostis intermedia*), three awns (*Aristida* spp.), shrubby buckwheat (*Eriogonum wrightii*), and vine mesquite (*Panicum obtusum*). To adjust to resource needs, stocking rates were light-to-moderate during that time period due to extended drought (table 7). The lighter stocking rates combined with management strategies during the drought likely contributed to the improved range condition.

Table 7. Actual use stocking rate

<table>
<thead>
<tr>
<th>Flying V and H Allotments Actual Use Stocking Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>1988</td>
</tr>
<tr>
<td>1989</td>
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<td>1990</td>
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<td>1991</td>
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<td>2005</td>
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<td>2006</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
</tr>
</tbody>
</table>
### Flying V and H Allotments Actual Use Stocking Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual Use, Animal Unit Months</th>
<th>% Stocking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>5,534</td>
<td>65%</td>
</tr>
</tbody>
</table>

Term permitted number since 1986 has been 8,500 AUMs

Average Stocking Rate % (AUMs) 65%

Average Actual Use (AUMs) 5,494

The current term permit allows for up to 650 adult cattle yearlong and 200 yearlings for 5 months, which equates to 8,500 **Animal Unit Months** (AUM). Figure 7 shows the configuration of the pastures.

The permittee has proposed a number of new water developments and fences (figure 7). Widely-spaced water developments will enhance livestock distribution in pastures, as well as provide permanent water during dry years. By enhancing water distribution within a pasture, more of the pasture would be utilized, thereby relieving or decreasing pressure around existing water sources. Additional fences will create additional travel lanes. Though the majority of the herd moves instinctively from northern summer pastures south to winter pastures, additional travel lanes will aid in expediting livestock movement.
Chapter 3 – Environmental Consequences

Figure 7. Allotment map with existing pastures and improvements
There are 5 fenced pastures currently used in the winter months. These are Six-Shooter, Cooper’s Fork, Sombrero, Traveling, and Flying H. Typically, the herd is split amongst these pastures based on available forage instead of rotating through each pasture separately.

The Flying H Pasture (which was once grazed as a separate allotment) is usually grazed in late winter and spring primarily by yearlings (February-May). There are good shipping and handling facilities on private land inside this pasture; therefore, the yearlings are sorted and gathered here prior to sale. The current grazing strategy utilizes a rest-rotation grazing system for two summer pasture units. One summer pasture unit is comprised of Flying V/Lee Bell/Gentry pastures. When this unit is being grazed, the herd is divided unequally among these pastures based on available forage. The second summer unit is Pendleton Pasture. One unit is grazed from about June through September every year, while the other unit is completely rested. The units alternate between grazing and resting from year to year.

Middleton Pasture is used as a traveling lane to and from the summer and winter pastures. Middleton is typically used in May or June, and again in October-November.

Because of changes in management and the use of Middleton Pasture as a traveling lane, conditions on the allotment have improved. Based on monitoring data and field inspections, the abundance and diversity of perennial grass species has increased and the intensity of grazing has decreased. In addition, the efficiency of livestock movement has improved which would likely contribute to the improved range conditions.

Baseline conditions for vegetation were assessed using the Parker Three Step Method for assessment of range condition (table 8) found in the R3 Range Analysis and Management Handbook, FSH 2209.21. Vegetation condition is assigned a score that is comprised of a composition component (54 percent of score), forage frequency/cover component (36 percent), and a vigor component (10 percent). Plant species are classified as either decreasers, increasers, or invaders based on the plant’s response to grazing pressure from wild and domestic ungulates. Decreasers are plant species that ungulates tend to prefer, but the plant may be poorly adapted to repeated defoliation; so they tend to decrease in response to poorly managed cattle grazing. Increasers are plant species adapted to some grazing, so they tend to persist and flourish with properly managed grazing. Invaders are those species that will increase in abundance under heavy disturbance, such as poorly managed grazing. Vegetation condition rated as “fair” by this method is characterized by a satisfactory mix of desirable species, with adequate cover and vigor to provide quality grassland habitat.
Table 8. Vegetation score condition changes by pasture on Flying V and H allotments

<table>
<thead>
<tr>
<th>Pasture</th>
<th>Watershed</th>
<th>Condition/Year</th>
<th>Veg Trend</th>
<th>Condition</th>
<th>EGC^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flying V Allotment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentry</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>C-11</td>
<td></td>
<td>47F/1960</td>
<td>40P/1982</td>
<td>52F/1992</td>
<td>down</td>
</tr>
<tr>
<td>Middleton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-5</td>
<td></td>
<td>29P/1959</td>
<td>36P/1982</td>
<td>44F/1992</td>
<td>down</td>
</tr>
<tr>
<td>C-6</td>
<td></td>
<td>28P/1959</td>
<td>35P/1982</td>
<td>42F/1999</td>
<td>down</td>
</tr>
<tr>
<td>Flying V</td>
<td></td>
<td></td>
<td></td>
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</tr>
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<tr>
<td>Flying H Allotment</td>
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<td></td>
</tr>
<tr>
<td>Gentry</td>
<td></td>
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<tr>
<td>C-9</td>
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<td>C-11</td>
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<tr>
<td>Middleton</td>
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<td>C-5</td>
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<td>C-6</td>
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<tr>
<td>Flying V</td>
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<td>C-10</td>
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<td>C-12</td>
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<td>KA5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>stable</td>
</tr>
<tr>
<td>Six-Shooter</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>C-1</td>
<td></td>
<td>good/1959</td>
<td>52F/1985</td>
<td>45F/2003*</td>
<td>down</td>
</tr>
<tr>
<td>C-4</td>
<td></td>
<td>fair/1959</td>
<td>31P/1985</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pendleton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>stable</td>
</tr>
</tbody>
</table>

*pace transect ^effective groundcover = vegetation + litter hits

Those with adjectival rating only could not rescore because of no dot tally

Vegetation Condition Classes:

- 0-20: Very Poor
- 21-40: Poor
- 41-60: Fair
- 61-80: Good
- 81-100: Excellent

Vegetation conditions with associated trend for each were evaluated at key areas (KA) on the Flying V & H allotments using the Parker Three-Step Method. This evaluation method gives a relative range condition rating based on cattle preferences for forage species. It also gives an indication of plant species density, diversity, and effective groundcover (EGC). Key areas typically are placed at least one half mile from water sources, roads or fence lines (concentration areas) and have vegetation that is representative of the pasture in which it is located. Table 8, above, summarizes the data.

In 2004, five long-term monitoring sites (key areas) were created on the Flying V & H allotments. This data has been collected in cooperation with Gila County Cooperative Extension, Natural Resource Conservation Service (NRCS), the permittee, and the Tonto NF. KA3 and KA5 have replaced old Parker key areas due to human disturbance (i.e., camping sites or new roads/trails).

Vegetative condition on the Flying V Allotment was fair or good with a stable or upward trend at 5 of the 9 monitoring sites. Gentry Mesa (C9), Flying V (C12 & K5), Pendleton (C13), and Coopers Fork (KA2) had stable or upward trends. Gentry Mesa (C11) and Middleton (C6) had a downward trend mainly due to juniper encroachment, which has caused a lack of herbaceous species density and vigor. The Gentry Mesa C11 and Middleton Mesa C6 key areas have been thinned of juniper, since the clusters were monitored last. The Six-Shooter site (C1) showed a downward trend in 2003 mainly because of observed drought effects, including loss of plant vigor and mortality. Only one site showed poor vegetative condition, largely due to lack of species.
diversity (Flying V C10). This cluster site was in a location with considerable human-caused disturbance, leading to poor groundcover. For this reason, a new key area, KA5, was established in the eastern part of Flying V Pasture. A pace transect with 200 data points showed fair vegetative condition with a stable trend in 2007 at KA5. The cluster site C-10 should be abandoned for future monitoring in favor of the KA5 location, as it better represents conditions in the pasture. If the C-10 site is not considered, then vegetation condition rates “Fair” or better at 5 out of 8 monitoring sites on the Flying V Allotment.

Vegetative condition on the Flying H Pasture was evaluated in 1972 when 2 of the 4 permanent clusters were monitored. One cluster had good vegetative condition with an upward trend, and the other had poor vegetative condition with an upward trend. KA3 pace transect was established near the old Cluster C2 in 2006 and read in 2007. The vegetation was rated in high-fair condition with an upward trend. There was a noticeable die-off of curly mesquite (Hibe) in the area; however, this appears to have allowed various other desirable grass species to establish in the area.

Effective groundcover (EGC) is a measure of the percentage of ground area covered by live basal vegetation or persistent litter. These serve to protect the soil surface from accelerated erosion. It is a Forest Plan guideline to “maintain a minimum of 30 percent effective groundcover for watershed protection and forage production.” It is also a Plan guideline to “manage vegetation to achieve satisfactory or better watershed condition.” Effective groundcover is in excess of 30 percent at 8 out of 9 key monitoring areas. Only the key area in Six-Shooter Pasture showed less than 30 percent EGC. Based on these criteria, vegetation condition is meeting stated goals at 5 of the 9 sites on Flying V Allotment and 2 of 3 sites on the Flying H Allotment.

**Fire Management Affected Environment**

Forested and woodland stands are declining in health and vigor due to drought, bark beetle, overstocked stand conditions, and limited age class/size (structural) diversity. These latter two conditions, limited age class/size (structural), are scientifically referred to as stand density index (SDI) and vegetative structural stage (VSS), respectively. These vegetative conditions are not representative of those historically found in the analysis area.

Fire has been excluded as a natural component of the ecosystem. Within ponderosa pine, high fuel loads and unnaturally dense vegetative stands of predominately smaller trees are found in the analysis area. The chaparral stands are decadent providing poor nutritional browse with an unnaturally high dead to live component. The chaparral stands are also continuous with few openings, this canopy closure allows for few ecotone transition zones. The pattern over the landscape provides little to no mosaic pattern, age class diversity, or ecotone boundaries. As a result, the potential for large, high severity wildfire exists. Private land and other improvements are also present.

Approximately 923 acres within the fire analysis area can be characterized by condition Class 1 being “within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances” (see figure 8).

**Figure 8. Condition Classes for Fire Analysis Area**
Chapter 3 – Environmental Consequences

Condition Classes for Proposed Prescribed Fire Treatments

Flying V & H Allotments and Fire Treatment Environmental Assessment
Roughly 48,471 acres within the fire analysis area can be characterized as condition Class 2 having a “moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.” Approximately 9,506 acres within the affected range allotments can be characterized as Condition Class 3 having a “high departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances” (table 9).

### Table 9. Vegetation condition classes and acreage

<table>
<thead>
<tr>
<th>Condition Class</th>
<th>Acreage</th>
<th>Relative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>923</td>
<td>2 %</td>
</tr>
<tr>
<td>2</td>
<td>48,471</td>
<td>82 %</td>
</tr>
<tr>
<td>3</td>
<td>9,506</td>
<td>16 %</td>
</tr>
<tr>
<td>Total</td>
<td>58,900</td>
<td>100 %</td>
</tr>
</tbody>
</table>

The overall fire behavior in the project area can best be described as moderate to high. Fire severity, intensities, and rates of spread are usually moderate to high; but can be very high depending on the time of year, fire indices, and weather. During the monsoonal season, when weather conditions are cooler, many of the naturally occurring fires may be single lightning-struck, burning trees that offer little to no threat. During dryer and hotter conditions fires, naturally occurring or human caused, can be high intensity.

The analysis area has experienced no large wildland fires in the last 5 years. The last large fire to affect the area was the Coon Creek Fire in 2000. This fire burned roughly 954 acres in the Flying H Allotment.

Lack of diversity in vegetative structural stages and species composition does not provide an abundance or diversity of habitat for wildlife. Native grasses, forbs, and shrubs are present, but not in similar patterns as found historically. For the benefit of wildlife, recreation, watershed health, and livestock, there is a need to re-establish these historical patterns.

The majority of the analysis area has visual quality objectives (VQO’s) that are varied throughout the landscape. See Chapter 3, Recreation, Lands, and Special Uses Affected Environment.

Soil conditions are satisfactory except for some woodland sites where accelerated erosion is present due a combination of historic wildfire control, historic cattle grazing, and encroachment of junipers, which has reduced grass/forb soil stabilizing ground cover.

Watersheds are in satisfactory condition on 74 percent of the allotment. Water quality complies with regulatory standards.
Soils

Soils Affected Environment

Soil condition is an evaluation of soil quality based on an interpretation of factors which affect vital soil functions. These functions are: the ability of the soil to hold and release water (hydrologic function), the ability of the soil to resist erosion and degradation (soil stability), and the ability of the soil to accept, hold and release nutrients (nutrient cycling). Categories of soil condition are satisfactory, impaired, and unsatisfactory.

Soil condition is satisfactory on approximately three quarters of the allotment (table 10). Generally, these soils have not been heavily impacted and have highly effective vegetative ground cover. Plant species density and diversity are high. Soil condition is meeting goals at 6 out of 9 sites on Flying V Allotment and 3 of 3 sites on the Flying H Allotment.

Table 10. Soil Condition Acres

<table>
<thead>
<tr>
<th>Category</th>
<th>Acres</th>
<th>Relative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfactory</td>
<td>50,094</td>
<td>74%</td>
</tr>
<tr>
<td>Impaired</td>
<td>12,773</td>
<td>19%</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>3,730</td>
<td>6%</td>
</tr>
<tr>
<td>Unstable</td>
<td>693</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>67,290</td>
<td>100%</td>
</tr>
</tbody>
</table>

Areas considered to have impaired, unsatisfactory or unstable soil condition comprise about 26 percent of the allotment. Nineteen percent of the soils (12,773 acres) have impaired soil condition. Most of these soils occur on open mesas or juniper woodlands on slopes from 0 to 15 percent. Specifically, these have slight to moderate soil compaction and have lost part of the original "A" horizon through moderate sheet and rill erosion. These soils have not been compacted as much as the heavily-used soils in unsatisfactory condition. Nutrient cycling is limited as well with a poor distribution of litter in the interspaces. Vegetation diversity and species composition are relatively low.

The unsatisfactory soil condition class makes up 3,730 acres (6 percent) in the allotment. Most of the unsatisfactory soils occur in the flat open grasslands. These soils have high amounts of surface compaction and poor soil porosity and root distribution resulting in moderate to high amounts of sheet, rill, and gully erosion, and very poor diversity, density, and composition of perennial grasses with little litter cover. Soil piping (subsurface erosion channels) occurs on some of the heavy clay mesa soils that were rated as unsatisfactory.

One percent of the soils (693 acres) were mapped as unstable. These soils are geologically unstable and occur along Cherry Creek in the extreme southern end of the allotment. Some other areas of unstable soils occur on scarp slopes scattered throughout the allotment but are in areas too small to map.

Soils Environmental Consequences

Livestock grazing can affect soil quality in several ways. Pressure exerted on the soil surface by large animals can cause compaction. Heavy grazing can reduce vegetation and litter cover. These
Factors can lead to decreased rainfall infiltration, increased runoff, increased erosion, and reduced soil organic matter and root growth. Changes in soil quality can also affect the productivity and composition of plant communities (NRCS, 2001). Juniper control treatments can impact soils during treatments but can provide long-term benefits. Benefits include improving ground cover by spreading of slash and encouraging increased herbaceous growth. Prescribed fire normally produces positive results; however, results can be negative depending on the type and condition of an ecosystem.

**Direct Effects:** Hoof action of cattle can directly impact soils by compacting soils. The risk for compaction is greatest when soils are wet (NRCS, 1996). Compaction decreases water infiltration, restricts rooting depth, and increases the hazard of water erosion. Trailing by cattle on steeper slopes can physically displace soils, leading to erosion. Cattle tend to concentrate on flatter areas, especially if they are fairly open. Holechek reports that cattle tend to use 10 to 30 percent slopes, 30 percent less often than 0 to 10 percent slopes and 30 to 60 percent slopes 60 percent less often than flats. Slopes over 60 percent are seldom used (Holechek, 1992).

Because of the tendency of cattle to use flatter slopes, areas of impacted soils are more likely to be found on gentler slopes. Building new fences and developing waters, as mentioned in the proposed action, would have extremely small, localized direct impacts to soils. Juniper control treatments can directly impact soils through ground disturbance by the equipment used. The use of fire for maintenance of juniper treatments can directly impact the soils by sterilizing soils where burns are too hot. Burning of slash piles in shaded fuelbreaks can sterilize soil, remove organic matter, and destroy soil structure. Broadcast burning can cause a reduction in overstory and ground cover. If fires are very hot, they can cause water repellent soils to develop.

**Indirect Effects:** Cattle indirectly impact soils by removing vegetation, resulting in a loss of protective cover including litter. The loss of vegetation and litter reduces infiltration and exposes the soils to raindrop impact and overland flow, thus leading to soil crusting and increased erosion. The reduced cover can also result in a loss of soil organic matter and a reduction in soil microbes, which play a significant role in nutrient cycling. Soils that are lower in organic matter have poorer structure, which can also affect infiltration and root growth. Building fences and developing waters will indirectly affect soils by improving distribution of cattle resulting in a net positive effect. Juniper control treatments can indirectly impact soils by removing overstory cover thus leaving soils, at least temporarily, more susceptible to erosion. Juniper treatments that add slash cover can indirectly lead to an increase in herbaceous cover and a decrease in erosion potential. Fires used in juniper control projects can indirectly impact soils, in some cases, by allowing an increase in noxious plants (Overby, 2000). Broadcast burning on a landscape scale can have positive effect by reducing the risk of large wildfires, which often lead to a large increase in erosion. Broadcast burning, however, can also have negative effects. If fires are very large and hot, they can lead to post-fire erosion problems similar to those of wild fires. In certain ecosystems, mostly woodlands with little herbaceous understory, fire can open the area up to erosion and invasive weeds.

**Cumulative Effects:** Cumulative effects include the direct and indirect effects of the proposed action and alternatives when added to all past, present, and reasonably foreseeable future actions. Activities include:

- Past and Current Grazing. Past grazing actions have resulted in soil erosion and compaction while current management has, in some cases, prevented or slowed recovery.
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- Mining. There are old, inactive mines within the analysis area. The mines are currently closed. Mining activity has had only small, localized impacts to vegetation, but runoff from mine areas has led to increased soil erosion.
- Coon Creek Fire. The Coon Creek Fire occurred in 2000, and burned 954 acres within the analysis area. Most of the area was chaparral vegetation and burned with low-to-moderate severity. Chaparral vegetation normally recovers within five years or less following a fire.
- Board Prescribed Fire. The Board Prescribed Fire occurred in 2009. Of the entire prescribed burn area, about 1,400 acres burned with moderate-to-high severity, mostly within chaparral vegetation. The area burned was within the Turkey and Ash Creek watersheds. Although the area burned was outside of the analysis area, sediment and high flows from the burn affected parts of the Cherry Creek drainage within the analysis area.
- Travel Management. Unauthorized cross country travel can negatively impact soils and vegetation through direct impacts on soils and removal or degradation of herbaceous or woody vegetation. The Travel Management Rule is intended to analyze alternate motorized routes in order to provide access and a recreation experience sufficient, so vehicle operators no longer feel compelled to travel off established roads or trails. Enforcement of the Travel Management Rule is imperative to ensure compliance. Improperly maintained roads can cause soil erosion where runoff from roads is allowed to concentrate. Road maintenance that includes Best Management Practices (BMP) should reduce sedimentation into the streams and be beneficial to the watershed. Roads can be a source of concentrated runoff which can lead to localized soil erosion down slope from roads. Road maintenance that includes BMPs should reduce erosion and be beneficial to the watershed.
- Juniper Thinning. Past juniper treatments include juniper chaining and pushes conducted in the past 40-to-60 years.
- Green Fuelwood Sales. Roughly 1,300 acres of juniper have been treated as fuelwood sales in the late 1980s and early 1990s. The fuelwood sales required lop and scatter of slash which increased ground cover and encouraged herbaceous growth.
- Climate. Recent and on-going drought and possible future climate change can also impact conditions.

Environmental Consequences by Alternatives

The alternatives are contrasted based on the likelihood of upland vegetation and soils attaining the short- and long-term desired conditions. The likelihood of attaining desired conditions will depend largely on the type of grazing management, stocking rates, and the effectiveness of vegetation treatments (juniper control, fuel breaks, and burning). Meeting short-term utilization goals will limit the annual impacts of livestock grazing. Following recommended mitigation measures will limit the short-term impacts of juniper and fuels treatments. Long-term desired conditions are measured through effectiveness monitoring to determine if grazing management vegetation treatments are moving the analysis area toward desired condition.

On the Flying V & H allotments the soils in less than satisfactory condition are generally on gentler slopes. Even with good management, flatter areas will still have a tendency to receive heavy use since these areas are favored by livestock. Key areas, established to monitor cattle use, are normally on flatter, more open areas. If monitoring of grazing intensity of these areas shows acceptable use, other parts of a pasture can be expected to have acceptable levels of impacts.
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**Alternative 1: No Action**

**Direct and Indirect Effects:**

1) **Effects of No Grazing:** Hoof action of cattle can cause direct impacts by compacting soils. Compaction decreases water infiltration, restricts rooting depth, and increases the hazard of water erosion (NRCS, 2001). Therefore, the quickest and most likely recovery from past grazing activities would normally occur with complete protection from grazing. The amount of time required for complete recovery after degradation can vary from several years to decades depending on the severity of the impacts and the nature of the ecosystem. Although the soil conditions that are currently less than satisfactory are largely attributable to the cumulative effects of historic grazing, continued grazing could slow or prevent recovery in some areas, if utilization routinely exceeds 40 percent. Even with complete rest, areas with impaired and unsatisfactory soil condition will not improve rapidly.

2) **Effects of no mechanical juniper treatments:** There would be no juniper treatments under this alternative. Most juniper treatments produce positive results that lead to a net increase in herbaceous cover. Under this alternative, areas with overly thick juniper cover would likely not improve.

3) **Effects of no Prescribed Fire (Fire Management):** Under this alternative there would be no prescribed fire or shaded fuelbreaks. There would be no direct effects of fire to soils and vegetation but the long-term risk of wildfire would increase. Certain fire-dependent vegetation types are not likely to reach desired conditions without prescribed fire.

**Cumulative Effects:** The direct and indirect effects of this alternative, when combined with other past, present, or reasonably foreseeable actions, will be generally beneficial to soils and vegetation. The lack of grazing would allow compacted soils to recover, but the lack of juniper treatments would not allow an increase in herbaceous cover in areas of thick junipers. The lack of prescribed fire would reduce the short-term effects of fire but may leave the area more vulnerable to a large wildfire which could lead to a large increase in erosion.

**Alternative 2: Proposed Action**

**Direct and Indirect Effects:**

1) **Effects of Grazing:** The success of meeting the short and long-term desired conditions will depend on timely monitoring and cattle management. About 40 percent of the allotment occurs on slopes greater than 30 percent, slopes that tend to get little use. About 25 percent of the allotment contains soils that are in less than satisfactory condition. Nearly all of these occur on slopes of less than 30 percent and most of these occur in juniper grasslands/savannas or juniper woodlands. Forage production on these areas is normally low. There will be a tendency for flatter areas (including areas in unsatisfactory condition) to be overused. These areas need to be closely monitored so that the use of adaptive management techniques will, over time, allow these areas to recover. Developing new or improved water sources will be a positive indirect effect that improves cattle distribution. Building new fences will have very minor direct affect on soils but the indirect effect should be positive by improving distribution.

2) **Effects of Mechanical Juniper Treatments:** The environmental effects of juniper treatments will depend on the type of treatment and the condition of the areas treated.
Possible treatments include: chainsaws, pushing with dozer, fuelwood sales, and hydraulic tree shear. Maintenance of treated areas may require burning or herbicide application. Juniper treatments generally produce positive results. However, the overall effects of juniper control treatments can be either positive or negative depending on the type of treatment, initial conditions, and follow up treatment. Generally, following treatment, the least amount of runoff and sediment occurs after slash has been scattered. Removing slash following treatment will produce more runoff/sediment while burning slash leads to the most (Thurow, et al., 1997). When properly conducted, juniper treatments will reduce runoff and erosion and increase herbaceous cover.

a) Commercial fuelwood harvesting with chainsaws should be beneficial. Green fuelwood sales with lop and scatter can improve cover, prevent erosion, increase soil moisture, and allow herbaceous growth (Soeth, 1999). The areas treated may need maintenance treatments such as burning or herbicides.

b) Hydraulic tree shears can be effective in increasing ground cover but not as effective as green fuelwood sales. Soil disturbance is normally minor, if equipment is used when soils are dry.

c) Mastication - Mechanical mastication is a newer fuel treatment and its impact to soil properties has not been fully studied. A study in a piñon–juniper woodland suggested that mastication may somewhat improve soil structure, result in less soil disturbance, lower soil temperatures, and higher soil moisture than burning of piles. (Owen, 2009) a study by Hatchett et al., (2006), concluded that mastication produced relatively low or nonexistent environmental impacts.

d) Pushing with dozer (including chaining) - These treatments will initially reduce juniper densities but will normally require periodic maintenance to control seedlings and re-sprouting of junipers (mostly alligator junipers). Soil disturbance is extensive locally. Compaction can occur and large pits are created where the root mass is removed (Thurow, et al., 1997). Follow-up treatment every five-to-ten years will likely be needed. Chaining projects in the past have led to a large increase in juniper densities overtime. In the McInturf area of the Pleasant Valley District, juniper densities increased from about 60 trees per acre in 1946 to about 315 trees per acres in 1996 in an area chained in the 1950s (Ambos, 2005).

e) Prescribed fire used to treat re-sprouting junipers for maintenance of juniper treatment areas, will reduce the amount of protective slash that is created from mechanical juniper treatments. The proposal to delay the burns for three-to-five years will allow herbaceous cover to begin to become established underneath the slash before burning takes place. This partially reduces the negative effects of burning.

f) Herbicide application - Negative effects of herbicide application include the potential for decreasing microbial populations or altering species composition of microorganisms in the soil profile. Generally, such impacts do not persist and populations recover after a few days or weeks (Tonto NF, Draft Weeds EA, 2009). A positive aspect of herbicide application on soils would be a lessened need to conduct post-treatment prescribed fire, which is used to treat re-sprouting junipers. By eliminating or delaying fire, litter and herbaceous growth would more likely increase.

3) Effects of Prescribed Fire (Fire Management): The environmental effects of fire management will depend on the type and condition of the ecosystem and the type of treatment. Treatments include prescribed fire and creation of shaded fuelbreaks.

Results from prescribed fire can be positive or negative and will vary depending on starting conditions and type of burn. Large scale broadcast prescribed fires can produce results similar to
that of wildfires. “It may be stated that for fire to work as a management tool for juniper reduction, a reasonable potential must exist for perennial grasses to recover and establish following treatment” (Ansley, et al., 2005). In some cases, burning leads to an increase in unpalatable, noxious, or ephemeral plants (Overby, et al., 2000). Maintenance burns of five-to-ten year old treatments will be effective providing there is enough herbaceous cover. Overby states, “When the understory community is sparse with little perennial grass cover, slash should remain on site following fuelwood cutting until establishment of herbaceous understory” (2000).

1) Broadcast burns may not produce positive results in certain vegetation types or under certain conditions.
   a) In some chaparral types, specifically the Alligator Juniper/Manzanita/White Oak type, which occurs on gentle slopes on Mescal limestone north and south of Rock House, burning is not likely to be beneficial. This type is dominated by manzanita in the understory, alligator juniper in the overstory, and has almost no herbaceous growth. It may be difficult to carry a burn in this type, but if a burn occurs it could lead to a great deal of bare soil due to a lack of herbaceous cover. Burning could also lead to an increase in unpalatable, noxious, or ephemeral plants. If the fire were able to kill the cover of manzanita, since the seeds are stimulated by fire, the net result would likely be an increase in manzanita cover as has happened in the Dude Fire (Ambos, 2009).
   b) Maintenance burns, used to treat re-sprouting junipers in areas of mechanical juniper treatments, can cause an increase in bare soil and erosion by reducing the cover of slash. The proposal to delay the burns for three-to-five years will encourage herbaceous cover to begin to become established underneath the slash before burning takes place. This partially, but not totally, reduces the negative effects of burning.
   c) In piñon/juniper types with a sparse understory such as the large area of piñon-juniper between Catholic Peak and Q Ranch (Arizona piñon/alligator juniper/Arizona white oak/manzanita vegetation type) burns could lead to increased bare soil and an increase in annual plants.
   d) Broadcast burns in chaparral vegetation will be positive, if burn severity is mostly low and moderate, occurs in a mosaic, and there are no large patches of moderate and high burn severity. Large patches with moderate to high severity can cause large amounts of soil loss and impacts to streams within the watershed.

2) Broadcast burns will normally produce positive results in many ecosystems.
   a) In alligator juniper woodlands and savannas, which include alligator juniper/blue grama woodland, the alligator juniper/sideoats grama woodland the blue grama/alligator juniper savanna and the curly mesquite/alligator juniper savanna, areas with sufficient grass may benefit from burning which may stimulate the grasses and reduce the density of juniper seedlings. Much of these types are planned for mechanical juniper treatment. After treatment, slash should be left on the ground for as long as possible to reduced erosion and enhance herbaceous growth.
   b) In the Arizona piñon/alligator juniper/Arizona white oak/blue grama woodland, areas with sufficient grass to carry a fire may benefit from burning, which may reduce oak, piñon, and juniper seedlings.
   c) In grasslands burning may stimulate grasses and reduce the density of encroaching woody plants. Burning may suppress grass production in sideoats, blue and hairy grama grasslands for up to three years, but they will recover fully (U.S. Forest Service Fire Effects Information System).
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d) In chaparral with a good species mix, burning can stimulate growth of desirable browse species (“A” browse species such as mountain mahogany, ceanothus, and silktassel, FSH 2209.21). In Turbinella Oak/Mountain Mahogany Chaparral, Arizona White Oak/Mountain Mahogany Chaparral, and Alligator Juniper/Arizona White Oak/Mountain Mahogany Chaparral, burning can reduce a buildup of fuel and kill older, decadent plants and open up a site to seedlings.

e) In the ponderosa pine fuel type, low-to-moderate severity understory burns will be used to reduce or eliminate competition from mid and lower vegetation. These types of severities will reduce the stand density, while maintaining the overstory. The net effects will be positive, mostly because of a reduced risk of catastrophic wildfire. There may be a short-term increase in erosion because of a reduction in litter cover. Erosion rates should return to normal within one-to-two years.

3) Burning in some ecosystems can be either positive or negative depending on conditions.

a) In the Velvet Mesquite/Black Grama Semi-Desert Grasslands, burning can be either positive or negative depending on conditions. During drought, black grama can be damaged by fire.

b) In other grassland ecosystems, grass production may be suppressed for several years following a fire, but will fully recover.

4) Shaded fuelbreaks will occur on relatively few acres, in the immediate vicinity of private land. Slash pile burning in fuelbreaks can sterilize soil, remove organic mater, and destroy soil structure. Burning damage can be reduced by spreading slash (where appropriate) so slash can be broadcast burned or chipped. Create small burn piles, which do not generate as much heat and produce less soil damage. Generally piles should be smaller than 15 feet wide. Fuelbreaks will reduce the risk of the spread of wildfire.

The overall direct and indirect effects of burning should be positive, if fire is applied to the appropriate ecosystems during the right conditions and if fires burn in a mosaic pattern with few large areas of extreme fire behavior.

Cumulative Effects:

Cumulative effects will differ depending on whether or not all or parts of the proposed action are selected.

a) **Grazing & No Prescribed Fire**: The direct and indirect effects of only the part of this proposal dealing with grazing management (including juniper treatments), when combined with other past, present or reasonably foreseeable actions (cumulative effects discussed above), should result in most areas moving toward desired conditions. Compacted soil may recover more slowly than under the No Grazing Alternative, because of continued hoof action of cattle. Juniper treatments would allow the vegetation in those areas treated to reach desired condition. The lack of fire will have no short-term effects to soils and vegetation but could lead to a long-term increase in wildfire leading to negative effects on soils. Certain fire-dependent vegetation types may not reach desired conditions because of a lack of fire.

b) **Grazing & Prescribed Fire**: The addition of prescribed fire would increase the short-term negative effects of fire to soils and vegetation, but decrease the long-term risk of wildfire. Certain fire-dependent vegetation types are more likely to reach desired conditions because of prescribed fire. Otherwise the effects would be the same as under “a” above.
c) **Prescribed Fire but No Grazing**: Prescribed fire would increase the short-term negative effects of fire to soils and vegetation but decrease the long-term risk of wildfire. Certain fire-dependent vegetation types are more likely to reach desired conditions because of prescribed fire. Fire alone, without juniper thinning, will not allow most overstocked juniper stands to reach desired condition. The lack of grazing will allow compacted soils to recover more quickly.

**Watershed**

**Watershed Affected Environment**

Watershed condition on the Flying V Allotment was fair with a stable or upward trend at 7 of the 9 sites (Gentry, Flying V [2], Six-Shooter, and Cooper’s Fork KA2) and fair with a downward trend at one site (Gentry). The two remaining sites showed poor soil condition with one in a stable trend and one in a downward trend (Pendleton, Middleton). The newly established KA5 in Flying V Pasture has good watershed condition with a stable trend. Watershed condition rates fair or better at 6 out of 9 monitoring sites, or if C-10 is dropped, 6 out of 8 sites.

Watershed condition on the Flying H Pasture at both sites was fair with a stable trend in 1972. Watershed condition is meeting goals at 3 of 3 sites on the Flying H Allotment. KA3 pace transect was established near the old Cluster C2 in 2006 and read in 2007. The soil was in fair condition with an upward trend.

Watershed characteristics are also rated by the **Parker Three Step method** (see table 8). The rating is comprised of two components, erosion hazard index and current erosion. The erosion hazard index is a numerical value that is based on the percentage of bare ground measured along transects. The current erosion value is assigned based on qualitative observations related to the amount of active sheet erosion observed, and the visual evidence of chronic erosion as shown by pedestalled plants or active rills and gullies.

Effective groundcover (EGC) is a measure of the percentage of ground area covered by live basal vegetation or persistent litter. These serve to protect the soil surface from accelerated erosion. It is a Forest Plan guideline to “maintain a minimum of 30 percent effective groundcover for watershed protection and forage production.” It is also a Plan guideline to “manage vegetation to achieve satisfactory or better watershed condition.” Effective groundcover is in excess of 30 percent at 11 out of 12 key monitoring areas. Only one site in Six Shooter Pasture did not meet this management guideline.

**Watershed Environmental Consequences**

Watersheds are affected by the vegetation surrounding them, because soils are held in place by grasses and other vegetation. The desired conditions and management objectives expressed for watershed values are expected to be achieved under the adaptive management alternative for grazing. Watershed health can be improved through properly managed grazing. Annual monitoring is necessary to assess potential drought effects and make adjustments, as needed.
Affects of Grazing

Direct Affects: Range research supports the concept that forage plant health and productivity, and overall ecological condition of rangelands can be improved or maintained through properly managed livestock grazing (Holecheck, et al., 1999). A study by Navarro, et al., (2002) of Chihuahuan Desert rangelands in New Mexico showed that from 1952 through 1999, the amount of rangeland classified in late seral stage or climax ecological condition increased from 25-38 percent, while grazed conservatively (34 percent average). Ecological condition fluctuated most during periodic drought events in this study. Loeser, et al., (2007) compared the effects to vegetation composition and cover of three grazing practices on a semiarid grassland site near Flagstaff, AZ. The study was conducted during a period of recurrent drought from 1997 to 2004. It found that high-impact grazing brought about a decrease in plant cover over time, but cattle removal treatment plots demonstrated no consistent differences in cover from the moderate grazing treatment plots. During the severe drought year in 2002, when northern Arizona received only 19 percent of the 20-year precipitation average, the study found that total plant canopy cover declined by 10 percent for no grazing and moderate grazing treatments, while declining in excess of 30 percent in the high-impact treatment.

The proposed action includes juniper thinning projects on 10,875 acres. The areas targeted for treatment are mainly those that have received some form of thinning treatment in the past. These are located on productive soils in relatively flat terrain. The method of thinning may include mechanical treatment (chainsaws, pushing with dozer, commercial fuelwood sale, hydraulic tree shear) and/or prescribed fire. The treatment methods should allow for slash to be placed on the soil surface to provide immediate effective groundcover, while providing a favorable microclimate for herbaceous plant establishment. The treatments will also allow for the maintenance of existing or newly created openings to retain optimum forage production.

Following the Forest Plan, the commercial treatment areas should have the silvicultural prescription be an even-aged management under the shelterwood cut method with piñyon uncut and 40 large juniper trees left per 40 acre cut block (Forest Plan, 1985). The following cover standard and guidelines will apply in areas where threatened, endangered, and sensitive species habitat requirements do not conflict:

- Provide a ratio of 60:40 percent forage to cover in piñyon-juniper.
- Permanent openings, fresh cut areas, and immature stands qualify as forage producing areas.
- Design the fuelwood harvest blocks in the woodland type in irregular shapes less than 40 acres and less than 600 feet across.
- Achieve a savannah condition in the piñyon-juniper type by leaving a minimum of 40 mature trees per 40-acre cut block.

A study conducted on the Pleasant Valley RD from 1987 to 1994 to compare forage production and groundcover changes between thinned juniper woodlands and uncut control areas showed that untreated areas had an average production of 138-252 lbs/acre, while areas thinned with slash placed on soil surface showed production values from 809-1,366 lbs/acre. Effective groundcover ranged between 42-52 percent in cut areas, and between 19-30 percent in uncut areas (Soeth and Gottfried, 1999). Similar improvement is likely on these treatment areas.

Indirect Effects: Livestock may indirectly impact watersheds by removing vegetation, resulting in a loss of protective cover including litter. Building fences and developing waters will indirectly
affect watersheds by improving distribution of cattle resulting in a net positive effect. Juniper control treatments may indirectly impact watersheds by removing overstory cover thus leaving soils more susceptible to erosion. Juniper treatments that add slash cover can indirectly lead to an increase in herbaceous cover and a decrease in erosion potential. Fires used in juniper control projects may indirectly impact watersheds, in some cases, by allowing an increase in noxious plants (Overby, 2000). Broadcast burning on a landscape scale may have positive effect by reducing the risk of large wildfires, which often lead to a large increase in erosion. Broadcast burning, however, may also have negative effects. If fires are very large and hot, they may can lead to post-fire erosion problems similar to those of wild fires. In certain ecosystems, mostly woodlands with little herbaceous understory, fire can open the area up to erosion and invasive weeds.

**Alternative 1 – No Grazing**

**Direct Effects:** Removal of livestock from the watersheds will reduce forage utilization by cattle, but forage utilization from other ungulates will continue. The potential for and rate of recovery for watersheds in less than satisfactory condition are variable and difficult to predict. The most rapid recovery can be expected in small watersheds with perennial surface or subsurface water flow.

**Indirect Effects:** Watersheds within the allotments are mostly in satisfactory condition. The no-grazing alternative may provide an increase of upland vegetative cover, shifts in species diversity and improvement of soil condition.

**Alternative 2 – Proposed Action**

**Direct Effects:** The proposed action recommends mitigating the direct effects of livestock on watersheds by adhering to utilization guidelines. Annual utilization monitoring will be used to ensure grazing does not exceed the recommended standard.

**Indirect Effects:** If management prescriptions are followed and cattle are moved when use guidelines are met, watersheds will continue in upward or stable condition.

**Cumulative Effects:** The direct and indirect effects of this alternative, combined with other past, present or reasonably foreseeable actions are likely to result in attainment of desired conditions for the watersheds within the analysis area.

**Affects of Fuel Treatments**

**Direct Effects:** Direct Effects consist mainly of damage to the vegetation (trees, shrubs and grasses) and partial consumption of the underlying litter layer. The severity of damage depends on the intensity of the fire. High intensity fires can cause severe damage to plant cover, while low intensity fires (such as prescribed fires) may have minimal effects.

**Indirect Effects:** Wild fires and prescribed fires can have indirect effects on watersheds by changing the vegetation cover. High intensity wildfires can have substantial impacts on runoff caused by precipitation. Cool burning fires may have little impact, as vegetation stays relatively intact. Other indirect effects of wildfire in watersheds could include increases in soil temperature from reduced shading, loss of litter, and other vegetative cover.

**Alternative 1 – No Fuel Treatment**
Chapter 3 – Environmental Consequences

**Direct Effects:** There would be no direct risk to watersheds from prescribed burning, though due to a buildup of fuels through most of the analysis area, the potential to impact watersheds would be increased by this alternative.

**Indirect Effects:** Potential for potential watershed impacts including severe flooding that could result from an increase likelihood of catastrophic wildfires by permitting fuels to buildup through much of the analysis area would be greater than for the proposed action.

**Alternative 2 – Proposed Action, Fuel Treatments**

**Direct Effects:** Creating shaded fuel breaks by hand thinning will improve herbaceous vegetation diversity on watersheds. Prescribed fires will change vegetative conditions, improving diversity of species. Successful implementation of prescribed burns will improve watershed conditions.

**Indirect Effects:** Impact should be short lived due to recruitment of herbaceous vegetation and potential resprouting of oak and juniper.

**Cumulative Effects:** The direct and indirect effects of this alternative, combined with other past, present or reasonably foreseeable actions are likely to result in attainment of desired conditions for the watersheds within the analysis area.

**Riparian Areas/Water Quality**

**Riparian Areas/Water Quality Affected Environment**

**Stream Channels, Riparian Areas, and Key Reaches**

Nine riparian areas in six pastures (table 11) were selected as key reaches designated for monitoring from the 60+ miles of intermittent and perennial stream channels on the Flying V & H allotments described in appendices A and B. Key reaches are identified by the interdisciplinary team for the purpose of describing desired conditions and developing management objectives for riparian areas in the Flying V & H allotments. Key reaches, similar to upland key areas (Interagency Technical Team, 1996), are those stream channels/springs/riparian areas that are representative, responsive to changes in management, accessible to livestock, and contain key species (figure 9 map).

**Table 11. List of key reaches within each pasture.**

<table>
<thead>
<tr>
<th>Key Reaches</th>
<th>Pasture(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherry Creek</td>
<td>Pendleton</td>
</tr>
<tr>
<td></td>
<td>Flying H</td>
</tr>
<tr>
<td>Walnut Creek</td>
<td>Flying V</td>
</tr>
<tr>
<td>Wilson Creek</td>
<td>Flying V</td>
</tr>
<tr>
<td>Sloan Creek</td>
<td>Middleton</td>
</tr>
<tr>
<td>Campbell Creek (needs further eval)</td>
<td>Middleton</td>
</tr>
<tr>
<td>Oak Creek</td>
<td>Flying H</td>
</tr>
<tr>
<td>Gentry Canyon (needs further eval)</td>
<td>Gentry</td>
</tr>
<tr>
<td>Tankhouse Spring (Rock House Creek)</td>
<td>House Spring</td>
</tr>
<tr>
<td>(needs further evaluation)</td>
<td></td>
</tr>
</tbody>
</table>
Figure 9. Key reaches on Flying V & H allotments map
Existing Condition of Key Reaches

Cherry Creek

_Pendleton Pasture._ Approximately five miles of Cherry Creek flow through the Pendleton Pasture. Cherry Creek has the potential to be designated as a Wild and Scenic River. According to the NWI maps, it is perennial. In some years, sections of Cherry Creek may have interrupted perennial flow. The valley bottom is generally wide (100 to >300 feet). The reach above the Wilson Creek confluence is confined within a steep canyon, which is generally narrower than the reach below. The reach downstream from Wilson Creek (key reach) lies in a wide valley bottom (>300 feet). The channel is a “C” type with a high width/depth ratio, wide and shallow with a large floodplain. Sediments are characterized as bimodal, cobbles embedded with sands and gravels. Based on field observations from 2009, the riparian tree overstory consists of scattered large, old Fremont cottonwood, velvet ash, Gooding’s willow, alder, narrowleaf cottonwood, sycamore, and red willow. Woody seedlings are present, maybe as a result of a large flood that occurred in December 2008. The understory shrub and herbaceous species component is depauperate and dominated by early seral and weedy species. Currently, the grazing rotation uses this pasture in alternate years during the summer. According to the permittee (Johnson, 2003), the allotment boundary fence was not maintained for several years, allowing unauthorized and yearlong use by the neighboring allotment. The species diversity and composition was similar in June 2009, except for a flush of woody seedlings, which may have been established after the high flow event in January 2008. The seedlings were browsed and there was some bank alteration, which seemed to be caused by elk. There is no monitoring record of riparian vegetation utilization; but the lack of woody species regeneration, low species diversity, high composition of early seral and weedy species could be attributed to excessive use.

_Flying H Pasture._ Approximately 4.5 miles of Cherry Creek flow through the Flying H Pasture, including about a half mile of stream that crosses the Ellison and Flying H Ranches. At the upper end of the pasture, Cherry Creek is confined within a canyon. The valley bottom widens downstream. The channel is an “F” throughout its length within the pasture. There are isolated patches of mature trees along Cherry Creek, but most of the vegetation is a dense band of seedling and sapling Fremont cottonwood, sycamore, Gooding’s willow and seep willow along the greenline. There is little herbaceous vegetation along the greenline or the broad, flat cobble bars. Bulrush (_Scirpus americanus_) and Bermuda grass are present along the water’s edge.

According to the permittee (Johnson, 2004), livestock were placed on Cherry Creek in the Flying H Pasture in January 2004, but the cattle headed into the higher adjacent country because of insects. No use of woody species was observed on a riparian vegetation walk-through along Cherry Creek at the lower end of the pasture in mid-June 2004.

Walnut Creek

_Flying V Pasture._ The headwaters of Walnut Creek originate on the broad, gently sloping, grassy meadow of the Flying V Pasture mesa. Flying V Spring marks the transition between the mesa, and Cherry Creek canyon. Above the spring, Walnut Creek is an ephemeral, unvegetated, “F” channel (flat and shallow with little floodplain development). At the lower end of the spring, Walnut Creek is head cutting upward. The lower mile of Walnut Creek below the spring is an “F” channel that appears to have incised, and widened, and has moderately high potential for streambank and floodplain development. Field trips were conducted to this area in 2004 and
2009. Riparian vegetation appeared more extensive, in density and height, in 2009 than in 2004. The plant with the greatest density is American bulrush, which is stabilizing the large amount of sand and gravel sized sediment in the channel. Other species include cocklebur, watercress, spike rush, Arizona grape, and rabbitfoot grass. Woody species include box elder, Fremont cottonwood, Gooding’s willow, red willow, and walnut.

**Wilson Creek**

*Flying V Pasture.* Wilson Creek is similar to Walnut Creek. The headwaters are located in meadows on a mesa. It drops downstream into a canyon that leads to its confluence with Cherry Creek. Fences on the ground do not match those of the allotment map. The lower gradient upper reach appears to be located in both the Lee Bell Holding and Holding Pastures. There is perennial water in the channel in the Holding Pasture. Although grazed in 2002 when water was very limiting, management practices have lead to the development of a floodplain and a green-line of deergrass plants in an “F” channel that appears to be recovering. Farther downstream in the Flying V Pasture, the valley bottom narrows and the slope steepens. The stream remains mostly perennial, although the type changes to a “B” and woody species become dominant. Species diversity seems moderately high for both woody and herbaceous species. All size classes were observed for red and Gooding’s willows, Fremont cottonwood and velvet ash. Deergrass and American bulrush are common. Mr. Johnson says that Wilson Creek becomes intermittent downstream, with limited accessibility for cattle.

**Sloan Creek**

*Middleton Pasture.* Sloan Creek is perennial below Joe’s Spring with the flow becoming interrupted perennial from Forest Road (FR) 127 and the cabins to the Forest boundary. This area was visited in June 2009. The channel, above the road, is a “B” type with step/pool features. Boulders and cobbles are the dominant sediment. The banks and floodplains are covered with thick vegetation, with high species diversity and cover. The overstory is characterized by large sycamore, alder, walnut, and boxelder trees. Understory shrubs include grape, blackberry, Virginia creeper and birch-leaf buckthorn. Noted forbs include yellow monkey flower, American speedwell, *Geranium caespitosum*, and meadow-rue. In 2003, this reach experienced high use with many areas of exposed soil. On the most recent trip, there were no signs of use. Downstream from the road, the stream dries, downcuts and becomes an “F” type. Riparian vegetation species and density is similar to the upper reach, but there are large, eroding cutbanks along most of the reach.

**Campbell Creek**

*Middleton Pasture.* There is no data for Campbell Creek. The NWI map does not delineate most of the two-mile length of channel except for a one-quarter mile reach it shows as having riparian deciduous forest just above the Forest Service/Reservation boundary. Campbell Creek should be evaluated for its value as a key riparian reach.

**Oak Creek**

*Flying H Pasture.* Oak Creek originates in the northeast corner of the Flying H and Traveling pastures below Sombrero Peak from three tributaries: the West Fork, the East Fork and the Little East Fork.
Oak Creek in the Flying H Pasture is the only stream on the allotment with riparian data prior to 2003. Six permanent photopoints were established in 1997, above and below Forest Road (FR) 203. Stream channel cross sections were established in 1999. According to Mr. Johnson, Oak Creek had no riparian vegetation when he became the permittee over 20 years ago. In recent years, Oak Creek has been dry from the confluence of the three tributaries to the FR 203 road crossing. Mr. Johnson said Oak Creek was mostly perennial during the 1980s. It is a “Be” (low gradient, narrow floodplain) above the road where a permanent stream channel cross-section was established. There are scattered mature sycamores, cottonwoods, willows, deergrass plants, seep willow, and desert broom. Below the road, the channel is mostly an “F” type. Large deergrass plants are common below the road. There are perennial pools and seeps, and mature overstory sycamore, willow, and cottonwood.

Use patterns may have changed as a result of drier climatic conditions. The pasture was used prior to May in the late 1990s, and in May and June between 2001 and 2005. The pasture was not used in 2002. Use levels have been variable, since the photopoints were established. The reach above the road has typically received consistent high use, whereas, the reach below the road has often been used lightly. There has been documented change above the road, with the loss of many deergrass plants, and a widened channel. The drought, possibly combined with grazing use in 2001, may be attributable for the changes observed. By late 2004, recruitment of deergrass plants was observed in this reach.

**Gentry Canyon**

_Gentry Pasture_. Gentry Creek flows about two miles through Gentry Canyon in the Gentry Pasture. There is no monitoring record of use by cattle. Walkthroughs were conducted in 2003 and 2004. The upper, west end above the canyon is accessible to ungulates, and some hedging of willows and other woody species was observed in 2003. Evidence of use decreases and presence of deergrass increases with distance downstream. The pasture was not used in 2004. Both upland (ponderosa pine, juniper) and weedy species (clover) occur throughout the length of the canyon. Riparian species include Fremont and narrow-leaf cottonwood, boxelder, red, coyote and arroyo willow, walnut, ash, salt cedar, horse’s tail, spike rush, sedges, false indigo, and New Mexico locust. From the photos, the channel appears to have “F” reaches, with a few areas dominated by bedrock. The stream is intermittent with perennial pools in bedrock areas. Canyon walls are steepest toward the reservation boundary. Mr. Johnson told us that the upper end usually has perennial water in pools, and that the canyon portion is usually dry. There was water in pools in 2003 and none in 2004. Gentry Canyon should be evaluated for its value as a key riparian reach.

**Tankhouse Spring (Rock House Creek)**

_House Spring Pasture_. Rock House Creek originates in the Pendleton Pasture below Gunsight Butte and drains east through the House Spring Pasture. Most of the channel is ephemeral. At its upper end on the mesa, it is an “F” type channel dominated by fine sediments. As the slope steepens, it drops along limestone bedrock shelves. The vegetation is typical of upland slopes, with an occasional sycamore tree. At House Spring near the eastern edge of the pasture, the stream becomes perennial. This is also the site of an old homestead. There is moderately high diversity, but low cover of tree, shrub and herbaceous species. Between the spring and the Tonto NF boundary, about one-quarter mile of the creek is excluded. This reach is a perennial “F,” with a low gradient flowing over bedrock shelves. Herbaceous species grow along the greenline and within the channel. Aquatic species like _Chara_ are present, as well as lowland leopard frogs.
Climate Data
Climate on the Flying V & H allotments is characterized by a bimodal precipitation pattern with about 60 percent occurring as frontal systems in the winter from December to March and about 40 percent occurring as monsoons in the summer from July to September. Summer storms can be more intense than winter storms but are generally of shorter duration and smaller aerial extent.

The nearest climate gage to the allotment is Pleasant Valley Ranger Station.

The period of record is 1964-present and the average annual precipitation is 22.55 inches (NOAA, 2010). The data indicates all of the last ten years (2000-2009) except 2008 have had below average precipitation, with 2002 being below 50 percent of average and 2008 being almost double (39.82 inches).

Wild and Scenic Rivers
Two reaches of Cherry Creek within the Flying V & H allotments have been classified as a potential wild and scenic river (see figure 9 on p. 59). Cherry Creek from FR 329 (Turkey Creek confluence) to Billy Lawrence Canyon has been classified as a potential wild river. A portion of this reach flows through the Pendleton Pasture. Cherry Creek from Billy Lawrence Canyon to the north boundary of the Ellison Ranch has been classified as a potential scenic river. A portion of this reach flows through the Flying H Pasture. The outstandingly remarkable values (ORVs) for both reaches are Scenery, Fish and Wildlife (NPS, 2007). Forest Handbook direction is to manage potential wild and scenic rivers to protect their indicated ORVs (FSH 1909.12, Chapter 80).

Water Quality
The Arizona Department of Environmental Quality (ADEQ) evaluates the water quality status of waters within the state in a Nonpoint Source Assessment Report (2008). Cherry Creek is the only drainage within the allotment that has been evaluated for the 2006 ADEQ report. The evaluated reach extends from Fournile Canyon to the Salt River. Water quality standards for Cherry Creek are intended to protect the designated uses of aquatic and wildlife-cold water fisheries (A&Wc), full body contact recreation (FBC), fish consumption (FC), agricultural irrigation (AgI), and agricultural livestock watering (AgL). Samples collected at two sites indicate Cherry Creek is “Attaining all uses.”

Designated uses for non-ephemeral, unlisted tributaries above 5,000 feet are aquatic and wildlife-cold water fisheries (A&Wc), fish consumption (FC), and full body contact recreation (FBC). Designated uses for non-ephemeral, unlisted tributaries below 5,000 feet are aquatic and wildlife-warm water fisheries (A&Ww), fish consumption (FC), and full body contact recreation (FBC). Designated uses for ephemeral, unlisted tributaries are aquatic and wildlife-ephemeral water fisheries (A&We) and partial body contact recreation (PBC).
Riparian Area Regulatory Framework

The Forest Service Manual (2004) provides direction for managing all Forest Service lands. Objectives and policy for riparian areas (FSM 2526.02 and 2526.03) include:

- To protect, manage, and improve riparian areas, while implementing land and resource management activities.
- To manage riparian areas in the context of the environment in which they are located, recognizing their unique values.
- Manage riparian areas under the principles of multiple-use and sustained-yield, while emphasizing protection and improvement of soil, water, and vegetation, particularly because of their effects upon aquatic and wildlife resources. Give preferential consideration to riparian-dependent resources when conflicts among land use activities occur.
- Give attention to land along all stream channels capable of supporting riparian vegetation (36 CFR 219.27e).
- Give special attention to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water. This distance shall correspond to at least the recognizable area dominated by the riparian vegetation (36 CFR 219.27e). Give special attention to adjacent terrestrial areas to ensure adequate protection for the riparian-dependent resources.

Direction for managing riparian areas on the Tonto NF is found in the Forest Plan (1985). The intention of this plan is to manage riparian areas for protection of soil, water, vegetation, wildlife, and fish populations. The project specific desired condition statements are listed in the Affected Environment Section. Key standards and guidelines/desired conditions from the Forest Plan (1985) include:

- Coordinate with range to achieve utilization in the riparian areas that will not exceed 20 percent of the current annual growth by volume of woody species.
- Coordinate with range to achieve at least 80 percent of the potential riparian overstory crown coverage.
- Coordinate with range to achieve at least 50 percent of the cottonwood-willow and mixed broadleaf acres in structural Type I (tall trees with well-developed understory) by 2030.
- Rehabilitate at least 80 percent of the potential shrub cover in riparian areas through the use of appropriate grazing systems and methods.
- Rehabilitate and maintain, through improved management practices, mixed broadleaf riparian to achieve 80 percent of the potential overstory crown coverage. Natural regeneration is anticipated to achieve most of this goal. Artificial regeneration may be necessary in some areas.
- Re-establish riparian vegetation in severely degraded but potentially productive riparian areas. Natural regeneration is anticipated to achieve this goal, but artificial regeneration may be necessary in some areas.
- Rehabilitate cottonwood willow Type II (tall trees with little or no understory) to achieve conversion to Type I (tall trees with well-developed understory) by the year 2030. Natural regeneration is anticipated to achieve most of this goal, but artificial regeneration may be necessary in some areas.

The Arizona Department of Environmental Quality (ADEQ) has jurisdiction from the Environmental Protection Agency (EPA) to implement the Clean Water Act in Arizona. The
Southwestern Region has a Memorandum of Understanding with ADEQ (2008) in which the Forest Service agrees to use Best Management Practices (BMPs) for on the ground projects.

**Riparian Areas/Water Quality Environmental Consequences**

Riparian areas have ecological importance beyond their small percentage of land area. This percentage is even smaller in the arid southwestern United States, and inversely, their importance more critical. Although volumes of literature have been written on riparian systems in the southwest, little actual research has been accomplished (Milchunas, 2006). The limited research available shows that grazing has greater effects on southwestern riparian understory plant communities than adjacent upland plant communities. Southwestern riparian plant communities are more sensitive to livestock grazing and more likely to experience reductions in plant species diversity, than plant communities that evolved with ungulate grazing (Milchunas, 2006). Clary and Kruse (2003) concur that southwestern riparian systems have not had the intensive study that other regional riparian ecosystems have had. In their review of environmental impacts, management practices and management implications for Southwestern riparian areas, they state the necessity to rely on proven principles and practices from other similar riparian areas to fill the gaps in management applications in the Southwest.

**Effects of Grazing**

**Direct Effects:** Riparian areas, with their high species diversity and structural complexity, provide critical terrestrial and aquatic habitat to wildlife species from adjacent upland and riparian area environments. Cattle tend to congregate in many riparian areas. They favor riparian forage and water availability, shade in warm months and gentle topography. Excessive grazing, trampling and trailing impacts can destabilize and break down stream banks, cause mechanical damage to shrubs and small trees, reduce or eliminate woody seedlings and saplings, expose soils, eliminate or shift native herbaceous species to weedy or exotic species with reduced root systems, and cause widening or incision of stream channels (Trimble and Mendel, 1995; Clary and Kruse, 2003). These changes may lead to loss of stream stability and function (Rosgen, 1996). Stream channel profile, stream bank stability, streamside vegetation, channel bottom embeddedness, stream sediments and stream temperature are all aquatic species habitat features that can be directly or indirectly affected by livestock grazing practices. Maintaining native obligate riparian plants is extremely important to many streams because of their resistance to the erosive energy of flowing water (Clary and Kruse, 2003). Herbaceous riparian vegetation is especially important to stabilizing stream bank, point bar and floodplain deposits. Development of these features is critical to the channel restoration process (Clary and Kruse, 2003). One of the most important factors influencing riparian conditions is utilization (Mosley, et al., 1999; Clary and Kruse, 2003).

**Indirect Effects:** Stream channels and riparian areas can also be affected indirectly by watershed condition and/or stream channel conditions above and below the stream reach of interest. Soil compaction, decreased infiltration, and loss or alteration of upland vegetation can cause increased runoff and higher peak flows, leading to channel adjustments and decrease in stream function (Gori and Backer, 2005).

**Effects of Fuels’ Treatments**

The effect of fire and its role in riparian ecosystem dynamics is not well understood (Baker, 1990). Prescribed fire is rarely used in the management of these systems. However, some effects
of prescribed fire can be derived from experience with wildfires in riparian systems (DeBano and Neary, 1996).

**Direct Effects:** Direct effects consist mainly of damage to the vegetation (trees, shrubs, and grasses) and partial consumption of the underlying litter layer. The severity of damage depends largely on the intensity of the fire. Wildfires have killed mature cottonwood, sycamore, velvet ash and walnut (Bock and Bock, 1990). Intense fires can cause severe damage to plant cover, while low intensity cool-burning prescribed fires may have minimal effects.

**Indirect Effects:** Wildfires and prescribed fires can have indirect effects on the riparian system by changing the fluvial processes on a watershed. Intense wildfires can have substantial impacts on storm flow, erosion, sedimentation, and water quality. Cool burning prescribed fires may have little impact on these factors. Increases in peak flows from degraded watershed conditions following a fire (particularly intense wildfires) can have profound influences on riparian biota by sediment deposition in the channel and floodplain, and alteration of channel geomorphic characteristics from scouring and sediment transport. Increases in annual flood peaks of greater than 20 percent can lead to channel instability and degradation, and aquatic and riparian habitat deterioration (DeBano and Neary, 1996). Peak flows from summer thunderstorms on chaparral watersheds in Arizona burned by wildfire have increased by as much as 975 times peak flows in an unburned control watershed and peak flow increases of as much as 58 times pre-burn peak flows have been recorded in ponderosa pine watersheds (DeBano and Neary, 1996). Watersheds in the Flying V & H allotments analysis area are prone to large peak flow responses due to some steep topography and climate (monsoon weather conditions and a close source of moist tropical air).

The net effect of a prescribed burn on peak flows that could potentially affect riparian ecosystems is dependent on the type of fire, size of area burned within a watershed, climate, watershed, and soil characteristics, and the severity of the fire (DeBano and Neary, 1996). Potential impacts are also dependent on the stream type affected by the peak flows and the condition and health of the channel and riparian vegetation (Rosgen, 1996). “F” type channels, such as reaches of Cherry Creek, have naturally high bank erosion rates, which can be accelerated by increases in peak flows. The more naturally stable “A” and “B” channel type reaches would be less likely to be impacted by increases in peak flows. Low intensity prescribed burns are likely to have little impact on peak flows and other water resource conditions, particularly if BMPs are implemented.

Other indirect effects of wildfire in riparian zones include increases in stream temperature from reduced shading, reduced dissolved oxygen concentration from increased stream temperature, alterations in the quantity and quality of organic matter inputs to streams, and aquatic macro-invertebrate population changes.

Riparian systems on the Tonto NF serve an important function as buffer strips, which capture sediment and nutrients from adjacent uplands, thereby preventing them from entering streams. Low intensity fires that do not kill streamside riparian vegetation can be used throughout the riparian area without creating substantial damage (Neary et al., 1996). Where damage to woody vegetation would be expected from fire, riparian buffer strips should be created from which fire would be excluded. Width should be proportional to the size of the contributing area, slope, and the nature of the downstream drainage.
Chapter 3 – Environmental Consequences

Criteria Used to Evaluate Alternatives and Determine Consistency with Management Direction

The criteria used to evaluate alternatives will be based on the likelihood of moving toward or attaining desired conditions described in the affected environment and in the Forest Plan (Forest Plan, 1985) for the nine key reaches listed above in Table 12. Key reaches are defined as those stream channels/springs/riparian areas that are representative, responsive to changes in management, accessible to livestock, and contain key species.

Cumulative Effects Common to All Alternatives

The existing condition of streams and riparian areas on the Flying V & H allotments is the result of the cumulative effects of historic and recent management, natural disturbances, and the interaction between these two agents of change. This discussion includes the Cherry Creek 5th code watershed and begins with the settlement of lands in the vicinity of Pleasant Valley and Young in the 1870's.

This area was considered settled and fully stocked with cattle by 1890 (Wagoner, 1960 and Croxen, 1978). There have been many accounts of the overgrazing and subsequent drought and flood events that occurred not only in Pleasant Valley, but throughout central and southeastern Arizona. The Forest Service Range Management files (File Code 2210) for the Flying V & H allotments document concentrated use in springs, riparian areas, and on the flat mesas from the 1960s through the 1990s.

Many historic and more recent activities have also indirectly affected streams and riparian areas by affecting Cherry Creek’s watershed condition. Livestock grazing that decreases grass and herbaceous cover has been associated with increased surface runoff, decreased soil infiltration, decreased soil moisture capacity, and increased soil erosion. Grazing, in addition to the other activities described below, can result in hydrological changes that affect adjacent riparian areas and aquatic habitats by increasing the frequency and intensity of floods, resulting in the erosion and deposition of sediment (Gori and Backer, 2005).

According to the permittee (Johnson, 2003), the allotment boundary fence in the Pendleton Pasture was not maintained for several years, allowing unauthorized and yearlong use on Cherry Creek. The site appears to have a long history of concentrated grazing use. It is very depauperate in both species composition and structure.

It is commonly believed that riparian areas have high inherent potential for recovery from disturbance (Milchunas, 2006). In fact, recovery is highly variable. The amount of time required for riparian recovery after severe degradation can vary from several years to decades (Clary and Kruse, 2003). Recovery is dependent on existing condition of the watershed, stream channel, and riparian area (flow regime, channel gradient, dominant channel substrate, watershed area, and type and extent of riparian vegetation), future management, climate, and natural disturbances (Kindschy, 1987, 1994). Most of the stream channels and riparian areas on the Flying V & H allotments have been assessed as either impaired or unstable condition (Mason and Johnson, 1999), or functioning-at-risk or non-functioning (Barrett, et al., 1993).

Other activities and management actions that have occurred within the Cherry Creek watershed include road development, lack of road maintenance, off-road vehicle use, active sand and gravel
mining in Cherry Creek, instream channel stabilization and reinforcement, mining, fire suppression, juniper treatments, prescribed fire, and wildfires.

The Board Prescribed Fire occurred in 2009 and burned about 2,300 acres within the Turkey Creek and Ash Creek watersheds on the Cherry/Frio Allotment, of which about 1,400 acres burned with moderate to high severity, mostly within chaparral vegetation (Ambos, 2010). These creeks are tributary to Cherry Creek and their confluences are near the western boundary of the Flying V & H allotments adjacent to the Pendleton Pasture. The fire generated sediment and ash, which were deposited in Turkey Creek and Cherry Creek during high flows (Loomis, 2010).

Climate change presents additional considerations. According to the Arizona Drought Monitor Report (ADWR, 2010), Arizona remains in a long-term drought, which has likely had an effect on the Flying V & H allotments. According to National Climatic Data Center (NOAA) data, there has been a marked upward trend in the globally averaged annual mean surface temperature since the mid-1970s (Shein, 2006). Models used by Seager, et al., (2007) to predict how climate change will affect the southwestern United States indicate that this region has begun the transition to a dryer climate, which will continue into the 21st century. However, the models are too broad-scale to predict how climate change might affect the monsoons, which contribute 40 percent of the total annual precipitation received on the Tonto NF (Lenart, 2005).

**Alternative 1 - No Action**

**Direct Effects of No Grazing:** Stream channel and riparian area recovery are considered optimal when the direct effects of livestock grazing are eliminated (Clary and Kruse, 2003). As stated above in the cumulative effects, the potential for and rate of recovery are variable and difficult to predict. The most rapid recovery can be expected in small watersheds with perennial surface or subsurface flow, an existing source of native riparian herbaceous and woody vegetation, and availability of fine sediments. Recovery of larger watersheds and stream channels usually requires a much longer time frame. There would be no change to the classification of proposed Wild and Scenic Rivers in the project area.

**Indirect Effects of No Grazing:** Soils within the allotment are mostly in satisfactory condition. For those areas with soils in impaired and unsatisfactory condition, the No Grazing Alternative usually provides the most rapid increase of upland vegetative cover, shifts in species diversity, and improvement of soil condition.

**Direct Effects of No Fuels Treatments:** There would be no direct risk to riparian areas from prescribed burning, though due to a buildup of fuels through much of the analysis area, the potential for a wildfire to impact riparian areas would be increased under this alternative.

**Indirect Effects of No Fuels Treatments:** The risk of short term impacts to water quality from introduction of ash or due to removal of vegetative cover from prescribed burning would not exist under this alternative.

Potential for substantial watershed impacts, including severe flooding, that could potentially result from an increased likelihood of catastrophic wildfires by permitting fuels to build up through much of the analysis area would be greater than for the proposed action.

**Cumulative Effects:** The direct and indirect effects of this alternative, when combined with other past, present or reasonably foreseeable actions (cumulative effects) as listed above, should result
in reaching desired conditions at the fastest rate. However, as stated in the direct effects, potential for recovery and rate of recovery will vary by key reach. With increasing watershed size, the cumulative effects of historic, recent and on-going management activities, along with altered disturbance regimes (fire and flood) make it difficult to predict whether eliminating the direct effects of cattle grazing will allow riparian vegetation recovery, and consequently stream channel recovery, in Cherry Creek. Currently, there are no reaches along Cherry Creek within the allotment where grazing has been eliminated for a long enough period of time to resolve this question. However, if there is potential for recovery of riparian vegetation, eliminating the direct and indirect effects of livestock grazing should allow the most rapid rates of recovery. Downstream in an alluvial reach of Cherry Creek in the Dagger Allotment, recovery of young age classes of woody plants and the herbaceous component is occurring. There have also been notable increases in herbaceous species diversity and cover along the Verde River greenline since grazing ceased in 1996.

The direct and indirect effects of prescribed burning would be eliminated under this alternative. However, some of the untreated watersheds would be left vulnerable to wildfires which could have impacts on storm flow, erosion, sedimentation, and water quality, as stated above, which, when combined with the impaired condition of the stream channels, would result in negative effects to the channels and riparian areas.

**Consistency with the Riparian Area Management Direction.** The No Grazing Alternative eliminates the direct and indirect effects of cattle grazing to recovering stream channels, riparian areas and watersheds within the Flying V & H allotments. This alternative meets the intent of Forest Plan direction to protect, manage, and restore riparian areas.

**Alternative 2 –Proposed Action.**

**Direct Effects of Grazing:** The proposed action recommends mitigating the direct effects of livestock grazing in key reaches by adhering to the riparian utilization guidelines. This mitigation measure should be effective for the following key reaches: Walnut Creek, Sloan Creek, Wilson Creek, and Oak Creek. If riparian area utilization guidelines are followed and cattle are moved when use guidelines are met, riparian area and stream channel condition should be maintained or improved. Campbell Creek, Gentry Canyon and Tankhouse Spring need further evaluation to determine their value as a key riparian reaches and if the riparian use guidelines would apply.

Because the riparian vegetation on the key reaches of Cherry Creek is in early seral condition, the riparian use guidelines will not effectively identify the threshold of unacceptable impact that would trigger moving cattle from the riparian area or pasture. Therefore, other methods of monitoring will be used including but not limited to Landscape Assessment Method (LAM) and streambank alteration. Limiting the direct effects of cattle grazing should allow riparian vegetation to recover, though the rate of recovery for Cherry Creek is difficult to determine.

Juniper treatments would not directly affect stream channels or riparian areas.

With the use of BMPs, proposed mitigation, and annual use monitoring, there should be no effects on the classification of potential Wild and Scenic Rivers for the project area.

**Indirect Effects of Grazing:** The soils within the allotment are mostly in satisfactory condition. Grazing of uplands with impaired and unsatisfactory condition soils may slow the rates of upland recovery, indirectly slowing the rate of riparian area and stream channel recovery. If management
prescriptions are followed and cattle are moved when use guidelines are met, the negative, indirect effects of grazing will be minimized.

There may be short-term increases in peak flows and sedimentation in the channels downstream of juniper treatments. These effects can be mitigated by following BMPs and leaving slash on the ground. The long-term effects of juniper treatments would be an increase in herbaceous ground cover which would slow overland flow and trap sediment, thereby reducing peak flows and the amount of sediment reaching the channels.

**Effects of New Developments.** There would be no direct effects of trap fencing on waters to riparian areas or stream channels. The indirect effect would be better cattle distribution due to the ability to close off waters.

The construction of 2.5 miles of fence to create traveling lanes would not have a direct effect on riparian areas. The indirect effect would be better cattle distribution and allowing the cattle to avoid key riparian areas while traveling through the pasture.

Pumping water from the proposed wells could have a direct effect on surface water sources by reducing the flow; however, these effects will be minimized or eliminated by use of the groundwater policy and BMPs. The indirect effects would be better cattle distribution by offering alternative water sources.

Developing springs and piping the water away from the riparian area will encourage better distribution of cattle. If monitoring indicates the riparian areas are still receiving heavy use, they will be fenced for protection. The springs will then recover at the rate of Alternative 1. The direct effects of removing water from springs will be mitigated by following BMPs.

**Direct Effects of Fuels Treatments:** Creating shaded fuel breaks by hand thinning will have no direct effects on stream channels or riparian areas. For prescribed fire, planned ignitions will not occur in riparian areas. If low intensity fire enters a riparian area, it should have little effect other than to thin grasses and seedlings. Successful implementation of prescribed burns should have little impact on water quality.

**Indirect Effects of Fuels Treatments:** Greater potential for watershed impacts exists from prescribed burning of chaparral than from ponderosa pine or mixed conifer due to higher intensity burning and greater consumption of vegetation. Impacts that could result from chaparral burns include increased erosion and sedimentation, and increased peak flows. Impacts should be short lived due to re-sprouting of burned juniper and recruitment of herbaceous vegetation.

**Cumulative Effects:** The direct and indirect effects of this alternative, when combined with other past, present or reasonably foreseeable actions (cumulative effects discussed above), are likely to result in attainment of desired conditions for the riparian areas on Walnut Creek, Sloan Creek, Wilson Creek, and Oak Creek, but at a slower rate than the No Grazing alternative. Because of the large size of the watershed and the numerous impacts in the watershed, it is difficult to determine how the direct and indirect effects of this alternative, when combined with other past, present or reasonably foreseeable actions will affect Cherry Creek. However, if there is potential for recovery of riparian vegetation, monitoring the effects of livestock grazing and moving cattle from the area when guidelines are met, may allow Cherry Creek to move towards meeting desired conditions, but at a slower rate than the No Grazing alternative.
If BMPs are successful, prescribed fire and juniper thinning should produce minimal negative cumulative effects and allow for an increase in herbaceous vegetation in the uplands, allowing riparian areas and stream channels to move toward meeting desired conditions at a faster rate than the No Grazing alternative.

**Consistency with the Riparian Area Management Direction.** This alternative will meet the intent of Forest Plan direction to protect, manage, and restore riparian areas, if the described mitigation measures are successful. The mitigation measures have a high probability of success for most of the key reaches in the Flying V & H allotments. It is difficult to predict the rate of riparian recovery for Cherry Creek given the size and existing condition of the Cherry Creek watershed.

**Wildlife**

**Wildlife Affected Environment**
In general, the quality of wildlife habitat is ultimately dependent on the quality of the soil resources, upland watersheds, vegetative conditions, and riparian areas.

**Threatened and endangered species**

Four species listed as threatened and endangered (T&E) by the USFWS are known to occur or have the potential to occur in the analysis area. Potentially affected species were identified by evaluating the location and nature of the proposed action, reviewing existing information on occurrences of T&E species including Pleasant Valley RD records, the AGFD’s Heritage Database Management System (HDMS), and designated critical habitat, and consultation with the USFWS. These species are bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax trailli extimus*), and Chiricahua leopard frog (*Lithobates chiracahuensis*). It should be noted that the purpose of this section is to disclose existing conditions. For effects determinations and other detailed information, refer to the Biological Assessment in the Project Record.

**Bald Eagle**

**Distribution:** In Arizona, bald eagles occur as both residents and winter migrants. Nesting occurs in trees, snags, and rock features and is usually associated with riverine and lacustrine environments. Perches for roosting, foraging, and guarding such as large trees and snags are important habitat components. Breeding birds tend to return to breeding areas around the first part of December and young usually fledge by June. The eagle’s diet is primarily comprised of fish, but they may also consume small mammals, carrion, birds and reptiles.

**Habitat:** On Tonto NF, habitat along the Salt River, Verde River, and Tonto Creek has provided core nesting, foraging and wintering habitat for the species. The only nest documented on the Pleasant Valley RD is known to occur in Dupont Canyon on the Buzzard Roost Allotment, approximately 10 miles west of the Flying V & H analysis area. Also, wintering bald eagles that are not part of the Arizona nesting population are thought to be present in the analysis area, although documentation does not exist identifying the use of specific areas. Wintering birds commonly roost in small groups in large conifers or cottonwoods adjacent to perennial waterways. While large trees are limited in the analysis area, wintering birds may still occur.
Mexican Spotted Owl

**Distribution:** Mexican spotted owls (MSO) are known to occur in Arizona, New Mexico, southern Utah, portions of Colorado, and in Mexico (Ganey, et al., 1988). The range of the Mexican spotted owl in the United States has been divided into six recovery units (RUs) as identified in the Recovery Plan (USFWS 1995). The Tonto NF contains portions of two of these RUs: the Upper Gila Mountain Recovery Unit (UGM) and the Basin and Range West (BRW). The majority of the analysis are occurs within the BRW Recovery Unit with the northernmost portion within the UGM Recovery Unit.

**Habitat:** MSOs nest and roost primarily in closed-canopy forests with complex structure or rocky canyons (Ganey, et al., 1988). These forests are typically uneven-aged, multistoried, and have high canopy closure. They do not build nests, but use naturally occurring sites, often in large diameter trees, cliff cavities and abandoned hawk or raven nests. Their prey consists mainly of small mammals, although birds, insects, and reptiles are taken as well. Prey species composition varies with vegetation cover type.

The Flying V & H Allotments include 3,626 acres of critical habitat divided between two critical habitat units: Upper Gila Mountain Unit 10 in the north and Basin and Range West Unit 5 in the southwest (figure 10). Detailed vegetation data for the analysis area is limited, but what is available indicates that only a portion of the 3,626 acres would contain the physical and biological features necessary for the species’ survival (referred to as primary constituent elements). The analysis area also contains two established Protected Activity Centers (PAC); the Gentry PAC in the Gentry pasture/Gentry Mesa burn block and the Devil’s Chasm PAC in the Flying H pasture, which is outside of the Fire analysis area (figure 10). During surveys in 2010, a new pair of MSOs was observed roosting on a side drainage of Cherry Creek in the Pendleton pasture/burn block and a PAC is currently being developed.
Figure 10. Mexican Spotted Owl Critical Habitat and Protected Activity Centers Analysis Area Map
Monitoring of spotted owl PACs on the Tonto NF has occurred sporadically over the years utilizing several methods including formal monitoring in accordance with the USFWS protocol, informal visits, and radio-telemetry studies conducted by non-governmental groups. A pair of non-nesting owls was found in the Gentry Mountain PAC in 1994, but no detections have been made during subsequent surveys in 1995, 1998, 2000, and 2008 through 2010. In Devil’s Chasm, a pair was found roosting in 1993, 1994, and 2000, but there was no response or signs of owl activity during protocol-level surveys in 2010. A pair of owls was detected in Cold Springs Canyon PAC during surveys in 1994, 2000, and 2010, but nesting status was undetermined.

**Southwestern Willow Flycatcher**

**Distribution:** One of four currently recognized willow flycatcher subspecies, the southwestern willow flycatcher is a neo-tropical migrant that breeds in the southwestern United States and migrates to Mexico, Central America, and extreme northern South America during the non-breeding season (Phillips, 1948; Unitt, 1987). Currently, southwestern willow flycatchers occur along 12 drainages in Arizona, including the Colorado, Bill Williams, Verde, Salt, Tonto Creek, Big Sandy, Gila, San Pedro, Santa Maria, Little Colorado, San Francisco, and Hassayampa drainages (Paradzick, et al., 2000, Spencer, et al., 1996). This species can be found in central Arizona on the Apache-Sitgreaves and Tonto NFs as well as on private land near the Prescott and Coconino NFs. On the Tonto NF, critical habitat is designated on Tonto Creek from the high water level of Lake Roosevelt, upstream to the confluence with Rye Creek and on the Salt River from the diversion dam upstream to the confluence with Cherry Creek.

**Habitat:** The southwestern willow flycatcher is a riparian obligate. This species nests along rivers, streams, and other wetlands where dense growths of willow (Salix spp.), baccharis (Baccharis spp.), buttonbush (Cephalanthus occidentalis), boxelder (Acer negundo), saltcedar (Tamarix spp.) or other plants are present, often with a scattered overstory of cottonwood (Populus spp.) and/or willow. Historic nest locations of this flycatcher throughout its range are not well known, so it difficult to determine whether the habitats where they are located today are representative of all the different habitat types they could use for nesting.

Breeding habitat for southwestern willow flycatchers does not occur in the analysis area and designated critical habitat is over 12 miles from the analysis area (occurring on the Salt River beginning at the confluence of Cherry Creek and going downstream to Roosevelt Lake). Although neither suitable breeding habitat or critical habitat exists on or adjacent to the analysis area, it might be used by migrating flycatchers. Migrant birds have been detected in riparian habitat suitable and unsuitable for nesting and may occur in non-riparian areas.

**Chiricahua Leopard Frog**

**Distribution:** Discontinuously distributed in Arizona, New Mexico, Sonora and Chihuahua, populations occur in the montane areas of the Mogollon Rim and along the eastern base of the Sierra Madre Occidental at elevations from 3,300-8,900 ft. Now absent from many historical localities and numerous mountain ranges, valleys, and drainages within its former range, it currently occupies an estimated 61 confirmed sites in Arizona, down from an estimated 212 historical occurrences (USFWS, 2002). The largest number of extant localities in Arizona is on the Coronado NF. On the Tonto NF, at least four extant populations exist on the Pleasant Valley RD and frogs released at 4 sites on the Payson Ranger District in 2009, continue to persist in 2010.
**Habitat:** Leopard frogs as a group are habitat generalists that can adapt to a variety of wetland situations. Chiricahua leopard frog habitat includes lakes, rivers, streams, springs, ponds, and man-made structures such as reservoirs, stock tanks, and acequias (Sredl and Jennings, 2005). In Arizona, slightly more than half of historic localities were natural lotic systems, a little less than half were stock tanks, and the remainder, were lakes and reservoirs. Currently, 63 percent of extant populations in Arizona occupy stock tanks. Chiricahua leopard frogs use permanent or nearly permanent pools and ponds for breeding. Time from hatching to metamorphosis is shorter in warm water than in cold water, so water permanency is probably more important at higher elevations and in the northern portion of the species’ range. This species is found at elevations of 1,000-2,710 m (3,281-8,890 ft). On the Coronado NF, this species occurs at elevations of 3,281-6,600 ft (1,000-2,013 m). On other Arizona NFs, the frog occurs at elevations of 3,540-8,280 ft (1,080-2,525 m). The species is rarely found in aquatic sites inhabited by non-native fish, bullfrogs, or crayfish.

The Recovery plan (USFWS 2007) has defined likely to be occupied habitat as: 1) currently suitable habitat where the frog has been documented within the last 10 years, but is apparently now absent or 2) suitable habitat that is (a) within 1 mile overland of occupied habitat, (b) within 3 miles along an ephemeral or intermittent drainage from occupied habitat, or (c) within 5 miles along a perennial stream from occupied habitat. Both the Regional BA for Wildland Urban Interface (WUI) prescribed fire projects and the Regional Grazing Criteria indicate that if no surveys have occurred, presence is to be assumed in likely to be occupied habitat.

Figure 11 depicts the drainages, tanks, and streams where protocol-level surveys are currently being conducted and the location of the Gentry Creek Management Area (MA), as identified in the Chiricahua leopard frog recovery plan (USFWS, 2007), in relation to the analysis area. Surveys previously conducted in northern portions of the analysis area did not detect frogs, but survey information is lacking for the majority of the area. The nearest known occupied habitats to the analysis area (Crouch Creek and West Prong of Gentry) are less than 3 miles north and northwest along intermittent drainages. Both of these populations are within the dispersal distances identified that would indicate that “likely to be occupied” habitat is currently present in the analysis area.
Figure 11. Drainages and stock tanks to be surveyed to protocol for Chiricahua leopard frogs Analysis Area map 2010
Forest Sensitive Plant and Wildlife Species

Table 12 contains a list of the sensitive species identified by the Regional Forester that are known to occur or have the potential to occur in the analysis area. This list was developed from knowledge of the area by the Tonto NF biologists as well as information from AGFD biologists, Pleasant Valley RD records, and AGFD’s HDMS. Species observed in the analysis area include common black hawk, zone-tailed hawk, lowland leopard frog, and Arizona toad. See project record for complete Biological Evaluation.

Table 12. Forest sensitive plant and wildlife species with potential to occur in Analysis Area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plants</strong></td>
<td></td>
</tr>
<tr>
<td>Tonto Basin agave</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Mt. Dellenbaugh sandwort</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Chihuahuan sedge</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Cochise sedge (Arizona giant sedge)</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Arizona bugbane</td>
<td>USFWS Candidate Species, Forest Sensitive</td>
</tr>
<tr>
<td>Mogollon fleabane</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Eastwood alumroot</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Fish Creek rockdaisy</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Arizona phlox</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Galiuro sedge</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td><strong>Insects</strong></td>
<td></td>
</tr>
<tr>
<td>Netwing Midge</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
</tr>
<tr>
<td>Lowland leopard frog</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Arizona toad</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td><strong>Reptiles</strong></td>
<td></td>
</tr>
<tr>
<td>Mexican garter snake</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Narrow-headed garter snake</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
</tr>
<tr>
<td>Common black hawk</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Zone-tailed hawk</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>American peregrine falcon</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
</tr>
<tr>
<td>Western red bat</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Allen’s lappet-browed bat</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>Pale Townsend’s big-eared bat</td>
<td>Forest Sensitive</td>
</tr>
<tr>
<td>White-nosed coati</td>
<td>Forest Sensitive</td>
</tr>
</tbody>
</table>

**Fish**

Cherry Creek and its tributaries harbor both native and nonnative fishes. There are five native species, four of which are listed as Forest Service Sensitive (longfin dace, desert sucker, Sonoran sucker, roundtail chub) and one which is not (speckled dace), but appears to be declining on the Tonto NF (Calamusso, pers. comm.). Five nonnative fishes are also found in the drainage...
(flathead catfish, yellow bullhead, green sunfish, red shiner, and brown trout). Table 13 shows sensitive species of fish on the analysis area.

**Table 13. Fish species and determination of effects.**

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>No Grazing</th>
<th>Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonora Sucker</td>
<td>Sensitive</td>
<td>Allow for fastest recovery of species</td>
<td>May impact individuals but not likely to cause a trend to federal listing or a loss of viability.</td>
</tr>
<tr>
<td>Longfin Dace</td>
<td>Sensitive</td>
<td>May reduce populations over time due to reduced erosion.</td>
<td>Has/May have a beneficial impact on the species.</td>
</tr>
<tr>
<td>Desert Sucker</td>
<td>Sensitive</td>
<td>Allow for fastest recovery of species</td>
<td>May impact individuals but not likely to cause a trend to federal listing or a loss of viability.</td>
</tr>
<tr>
<td>Roundtail Chub</td>
<td>Sensitive, Federal Candidate Species</td>
<td>Allow for fastest recovery of species</td>
<td>May impact relative abundance at the population level, and <strong>may result in a loss of population viability and a trend toward federal listing.</strong></td>
</tr>
<tr>
<td>Speckled Dace</td>
<td>Non-Sensitive, But Declining on the Tonto NF</td>
<td>Allow for fastest recovery of species</td>
<td>May impact population viability but is not likely to result in a trend toward federal listing.</td>
</tr>
</tbody>
</table>

**Management Indicator Species**

Management indicator species (MIS) were selected as part of the development of the Forest Plan. They were selected to adequately monitor the effects of implementation of the Forest Plan’s proposed action on wildlife habitat and species diversity. In 2002, the Tonto NF completed a status report for all management indicator species assigned in the Forest Plan (Klein, et al., 2002). See the Project Record for the complete MIS report.

Six of 30 MIS species for the Tonto NF were omitted from analysis due to habitat (mostly elevational) not being present in either analysis area. For the Range analysis area, another 12 species will be omitted from further analysis due to lack of effects to the community types they are indicators for, including snag components, forest conditions or vertical diversity in mixed conifer or ponderosa pine. Only species that represent the herbaceous conditions, riparian conditions or density of juniper will be analyzed (table 14). For the Fire analysis area, an additional 5 species will be omitted due to lack of effects on riparian vegetation a result of the mitigation measure that requires buffers around this habitat type. Species that represent conditions in pinyon-juniper, ponderosa pine, chaparral, desert-scrub, and aquatic habitats are discussed in table 15.
### Table 14. MIS habitat trend according to alternative for range analysis area

<table>
<thead>
<tr>
<th>Species</th>
<th>Indicator of Key Habitat Condition</th>
<th>Indicator or KHC Trend (Alt 1/Alt 2 Acres)</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash-throated flycatcher</td>
<td>Ground cover in P-J</td>
<td>10,875/17,349 0/10,875 17,349/0</td>
<td>28,224</td>
</tr>
<tr>
<td>Gray vireo</td>
<td>P-J Tree Density</td>
<td>0/0 10,875/0 11,681/28,224</td>
<td>28,224</td>
</tr>
<tr>
<td>Townsend’s solitaire</td>
<td>Uniper berry production</td>
<td>0/0 10,875/0 11,681/28,224</td>
<td>28,224</td>
</tr>
<tr>
<td>Juniper titmouse</td>
<td>P-J woodlands, general conditions</td>
<td>0/0 10,875/0 11,681/28,224</td>
<td>28,224</td>
</tr>
<tr>
<td>Spotted towhee</td>
<td>Shrub density in chaparral, successional stages of P-J</td>
<td>0/0 10,875/0 39,195/50,070 50,070</td>
<td>1,413,986</td>
</tr>
<tr>
<td>Black-chinned sparrow</td>
<td>Shrub diversity in chaparral</td>
<td>0/0 0/0 21,846/21,846</td>
<td>1,413,986</td>
</tr>
<tr>
<td>Black-throated sparrow</td>
<td>Shrub diversity in desert-scrub</td>
<td>0/0 7,471/0 0/7,471 7,471</td>
<td>896,771</td>
</tr>
<tr>
<td>Canyon towhee</td>
<td>Shrub diversity in desert-scrub</td>
<td>0/0 7,471/0 7,471/7,471 7,471</td>
<td>896,771</td>
</tr>
<tr>
<td>Common black hawk</td>
<td>Riparian streamside</td>
<td>0/586 0/0 586/0 586</td>
<td>10,232</td>
</tr>
<tr>
<td>Western wood pewee</td>
<td>Mid-story riparian</td>
<td>0/596 0/0 596/0 596</td>
<td>10,232</td>
</tr>
<tr>
<td>AZ gray squirrel</td>
<td>General riparian – may indicate an alder component</td>
<td>0/586 0/0 586/0 586</td>
<td>10,232</td>
</tr>
</tbody>
</table>

### Table 15. MIS habitat trend for fire analysis area

<table>
<thead>
<tr>
<th>Species</th>
<th>Indicator of Key Habitat Condition</th>
<th>Indicator or KHC Trend (Alt 1/Alt 2 acres)</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elk</td>
<td>General forest conditions ponderosa pine</td>
<td>0/0 0/0 3,539/3,539 3,539</td>
<td>421,138</td>
</tr>
<tr>
<td>Turkey</td>
<td>Vertical diversity ponderosa pine</td>
<td>0/3,539 3,539/0 3,539/3,539 3,539</td>
<td>421,138</td>
</tr>
<tr>
<td>Pygmy nuthatch</td>
<td>Old-growth ponderosa pine</td>
<td>0/0 0/0 3,539/3,539 3,539</td>
<td>421,138</td>
</tr>
<tr>
<td>Violet-green swallow</td>
<td>Cavity nesting habitat ponderosa pine</td>
<td>0/0 0/0 3,539/3,539 3,539</td>
<td>421,138</td>
</tr>
</tbody>
</table>
### Chapter 3 – Environmental Consequences

<table>
<thead>
<tr>
<th>Species</th>
<th>Indicator of Key Habitat Condition</th>
<th>Indicator or KHC Trend (Alt 1/Alt 2 acres)</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Upward</td>
<td>Downward</td>
</tr>
<tr>
<td>Western bluebird</td>
<td>Forest openings ponderosa pine</td>
<td>0/3,539</td>
<td>3,539/0</td>
</tr>
<tr>
<td>Hairy woodpecker</td>
<td>Snags ponderosa pine</td>
<td>0/0</td>
<td>3,539/0</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>Vertical diversity ponderosa pine</td>
<td>0/3,539</td>
<td>3,539/0</td>
</tr>
<tr>
<td>Abert’s squirrel</td>
<td>Successional stages of ponderosa pine</td>
<td>0/3,539</td>
<td>3,539/0</td>
</tr>
<tr>
<td>Ash-throated flycatcher</td>
<td>Ground cover in P-J</td>
<td>9,077/18,448</td>
<td>0/9,077</td>
</tr>
<tr>
<td>Gray vireo</td>
<td>P-J tree density</td>
<td>0/0</td>
<td>9,077/0</td>
</tr>
<tr>
<td>Townsend’s solitaire</td>
<td>Juniper berry production</td>
<td>0/0</td>
<td>9,077/0</td>
</tr>
<tr>
<td>Juniper titmouse</td>
<td>P-J woodlands, general conditions</td>
<td>0/0</td>
<td>9,077/0</td>
</tr>
<tr>
<td>Spotted towhee</td>
<td>Shrub density in chaparral</td>
<td>0/0</td>
<td>9,077/0</td>
</tr>
<tr>
<td></td>
<td>successional stages of P-J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-chinned sparrow</td>
<td>Shrub diversity in chaparral</td>
<td>0/0</td>
<td>0/0</td>
</tr>
<tr>
<td>Black-throated sparrow</td>
<td>Shrub diversity in desert-scrub</td>
<td>0/0</td>
<td>4,663/0</td>
</tr>
<tr>
<td>Canyon towhee</td>
<td>Ground cover in desert-scrub</td>
<td>0/4,663</td>
<td>0/0</td>
</tr>
</tbody>
</table>

The Tonto forest wide MIS analysis (Richards, 2005) contains the population trends for the above species. The predicted change in habitat for either alternative is not significant enough to cause a change in population status for any of these species. Further information on these species is available in the forest wide MIS analysis for the Tonto National Forest (Klein, et al., 2002).

### Migratory Birds

On January 10, 2001, President Clinton signed *Executive Order 13186* placing emphasis on conservation of migratory birds.

To date there has been no Regional or Forest Policy developed to provide guidance on how to incorporate migratory birds into NEPA analysis. Advice from the Regional Office is to analyze effects in the following manner: (1) effects to Species of Concern listed by Partners in Flight; (2) effects to Important Bird Areas (IBAs); (3) effects to important over-wintering areas. At the time this direction was received, Arizona had not completed its comprehensive wildlife conservation strategy (AGFD, 2006). Table 16 incorporates those “species of greatest concern” that are also
listed as protected migratory birds and their associated habitat types. The following is an attempt to disclose the impacts, if any of this project.

Cherry Creek and its tributaries serve as corridors for migration of birds within and through the Tonto NF. Although relatively small watersheds, migratory birds use the riparian areas for habitat needs while migrating to different latitudes depending on the time of year. Upland riparian vegetation associated with water along these drainages provides a diversity of habitats that support a diversity of bird species.

Habitat types identified by the Arizona Partners in Flight Plan (Latta, et al., 1999) suggest that six main vegetation types are represented in the analysis area (table 16). Not all species listed are expected to occur in the analysis area, but elements of their habitat may.

### Table 16. Habitat types and associated migratory bird species in the Analysis Area

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Species</th>
<th>Habitat/Disturbance Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine habitat</td>
<td>Northern goshawk, Cordilleran flycatcher, Purple martin, Mexican spotted owl</td>
<td>Utilization levels should minimize deleterious impacts to herbaceous vegetation. Cattle use expected to be low on steep slopes. Low to moderate intensity and severity fires will minimize effects to overstory.</td>
</tr>
<tr>
<td>Juniper</td>
<td>Gray flycatcher, Piñyon jay, Gray vireo, Black-throated gray warbler, Juniper titmouse</td>
<td>Utilization levels should minimize deleterious impacts to herbaceous vegetation. Openings created by juniper removal and prescribed should increase habitat quality for those species that prefer openings.</td>
</tr>
<tr>
<td>Chaparral</td>
<td>Black chinned sparrow, Virginia’s warbler</td>
<td>Moderate to high intensity fire will create openings and increase currently low herbaceous component. Utilization levels should minimize adverse impacts of grazing.</td>
</tr>
<tr>
<td>High elevation riparian</td>
<td>Common black hawk, Southwestern willow flycatcher, MacGillivrays warbler, Red-faced warbler</td>
<td>Overgrazing and drought has contributed to declines in diversity and composition. Rotational grazing and riparian protection measures will lessen impacts. Buffers will minimize effects of prescribed fire.</td>
</tr>
<tr>
<td>Mixed conifer</td>
<td>Mexican spotted owl, Northern goshawk, Cordilleran flycatcher,</td>
<td>Utilization levels should minimize deleterious impacts to herbaceous vegetation. Cattle use expected to be low on steep slopes. Low to moderate intensity and severity fires will minimize effects to overstory.</td>
</tr>
</tbody>
</table>
Chapter 3 – Environmental Consequences

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Species</th>
<th>Habitat/Disturbance Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-desert grassland</td>
<td>Grasshopper sparrow, Botteri’s sparrow, Rufous-winged sparrow, Baird’s sparrow, Cassin’s sparrow</td>
<td>Some grasslands have been impacted (i.e., species shifts) from overgrazing in the past, compounded with drought. Efforts to balance cattle stocking rates with capacity may improve habitat coupled with long-term cumulative benefits of prescribed burning.</td>
</tr>
</tbody>
</table>

There are no designated IBAs in the analysis area. The nearest IBA is the Salt-Verde Ecosystem (Saguaro Lake north through the Mazatzal Wilderness), located more than 25 miles to the west of the project area. There is no association or important link between the bird communities in the Flying V and H analysis area and the Salt-Verde Ecosystem IBA. As a result, no IBAs are affected by the project.

**Over-wintering Areas**

The project area may provide wintering habitat for a variety of raptors and upland songbirds, but lacks the characteristics of an important over-wintering area. These include significant concentrations, a unique assemblage, or a high diversity of wintering birds.

**Wildlife Environmental Consequences**

**Effects of Range Management**

With the wide variety of wildlife species present in the six major vegetative habitat types in the analysis area, it is not practical to provide a summary of the probable effects of the two alternatives on each wildlife species. However, one common factor that affects wildlife is available forage. Forage utilization as specified in the proposed action does not differentiate between the use by cattle and that used by other ungulates. Table 17 provides a comparison of both alternatives by habitat type.

**Table 17. Important bird areas by habitat type and alternative**

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponderosa Pine/ Mixed Conifer</td>
<td>Conditions for this habitat type would mostly remain static. In areas of future improved herbaceous cover, small mammal densities may increase. Soil conditions may improve faster under this alternative.</td>
<td>Wildlife habitat changes from implementing Alternative 2 are generally low. Livestock herbivory on overstory is negligible. Some disturbance of nesting/roosting birds could result if roundup times occur in those areas.</td>
</tr>
<tr>
<td>Alternative</td>
<td>Description</td>
<td>Environmental Consequences</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td><strong>Piñon/Juniper</strong></td>
<td>Piñon and juniper components would remain comparable to other Alternatives. Inter-specific competition from cattle would be eliminated and browser composition could become more abundant. Soil conditions on flatter terrain would likely improve faster under this alternative.</td>
<td>Wildlife habitat would likely remain similar to existing conditions. The stocking rates and animal months would have minor effect on these habitat types. Impaired soil may improve over time. Rest-rotation grazing should minimize effects to habitat and wildlife species distribution.</td>
</tr>
<tr>
<td><strong>Chaparral</strong></td>
<td>Overall primary diversity and productivity would increase. Habitat selection by native wildlife would improve with normal precipitation patterns. Fawning, hiding, and thermal cover would improve with improved survival rates for big game, upland game, MIS, T&amp;E, and sensitive species. Soil conditions would likely improve faster under this alternative.</td>
<td>Under this Alternative, with proper monitoring, site herbaceous productivity and soil conditions may improve. If primary productivity improves, those wildlife species associated with this habitat guild may respond positively, although not as much as Alternative 1.</td>
</tr>
<tr>
<td><strong>High Elevation Riparian</strong></td>
<td>Tonto NF Standards and Guidelines may be achieved/maintained the quickest. Degraded riparian areas with water may improve more quickly. Some will recover slowly or remain impaired. This Alternative would most likely support improved wildlife species diversity over time. General wildlife habitat, edge effect, and corridor maintenance would be improved. Aquatic parameters may benefit more quickly and improve habitat conditions for many aquatic species.</td>
<td>Tonto NF Standards and Guidelines will likely be achieved/maintained through use of Adaptive Management. Recruitment and establishment of riparian dependent trees and shrubs should improve more slowly than Alternative 1. Improvement of floodplains may indirectly improve wildlife habitat parameters. Aquatic parameters will likely remain similar to current conditions.</td>
</tr>
</tbody>
</table>

**Alternative 1 – No Action**

**Direct Effects:** would have the least impact; however it is unpredictable how much forage use by other ungulates would occur.

**Indirect Effects:** Changes in vegetation due to lack of grazing may cause monocultures resulting in decreases in diversity and quantity of wildlife species.

**Alternative 2 – Proposed Action**

**Direct Effects:** would utilize 30 – 40 percent of the available forage in key areas (less in others) on the Range analysis area. It is expected that herbaceous forage will have an upward trend to the benefit of forage dependent wildlife.
Indirect Effects: Changes in vegetation due to grazing may result in increases in diversity and quantity of wildlife species.

Effects of Fire Management

Alternative 1 - No Action

Direct Effects: Prescribed burns or shaded fuel breaks would not occur. Decreased diversity would be expected in the vegetative composition and structure of the Fire analysis area.

Indirect Effects: Since the habitat condition is not expected to change, wildlife populations would generally remain the same. The capability for game species would remain the same, although no improvements for species such as turkey and deer would occur through management activities. Habitat for nongame species would remain the same as would habitats for T & E and sensitive species. The potential for catastrophic wildfire events within the Fire analysis area would remain high, threatening habitat for big and small game, management indicator, migratory bird, T & E, and sensitive species, such as Mexican spotted owl, Chiricahua leopard frog, and sensitive fish. Forage for some species may be reduced due to juniper densities increasing on savannas and juniper woodlands.

Alternative 2 – Proposed Action

Direct Effects: Improves overall forest health, reduces fire risk, improves watershed health and wildlife habitat. Using prescribed fire, a mosaic of patterns, age class diversity, horizontal and vertical structure diversity, and ecotone zones within and between adjacent vegetation communities could be created. Reduces stand densities.

Indirect Effects: Possible short-term effects include decreases in herbaceous cover, increased risk of erosion of soils and sedimentation of waterways from ash in areas of high intensity and severity fire. If recommended guidelines and mitigation measures are implemented for T& E and sensitive species, such as Mexican spotted owl, Chiricahua leopard frog, and northern goshawk, adverse long-term effects from prescribed burns can be minimized or avoided.

Although a relatively small percentage of the project area is proposed for mechanical treatment, a large portion is proposed for prescribed burning over a 10-year period. This should result in a significant improvement over time in the herbaceous and cover components across the analysis area.

The snag and dead/down component would remain stable overall. The large log and snag density may decrease in some areas as a result of burning, while increasing in others over time.

Wildlife forage areas of varying size will be created in chaparral, piñyon/juniper, and mixed conifer/ponderosa pine habitats across the analysis area. These openings will vary in size from 0 to 200 acres. The purpose of these areas is to provide openings that mimic a more natural pattern, which existed historically under the natural disturbance regime. These openings will provide areas of increased forage for a large variety of wildlife species. Maintenance of these openings may reduce bare ground, increase understory composition, diversity, and vigor, and improve the amount and distribution of litter.
Wildlife Cumulative Effects from Range and Fire

Cumulative effects include the direct and indirect effects discussed above when added to all past, present, and reasonably foreseeable future actions. These activities and occurrences have contributed incrementally to changes in ecological conditions in the analysis area and may continue to influence conditions in the analysis area over the term of the project. Many of the species addressed in this section have home ranges or territories that would not be expected to extend beyond the boundaries of the analysis area (i.e., Abert’s squirrel, some non-migratory songbird species, etc.). As a result, these species would only be affected by actions occurring within the analysis area. In addition to those described for each alternative, additional activities include:

- Unplanned ignitions (including the Coon Creek Fire and future fires)
- Unauthorized cross-country travel
- Dispersed recreation
- Drought
- Climate change
- Road maintenance

There are those species (i.e., elk, deer, turkey, many migratory bird species, T&E species) that would be expected to have a range that exceeds the allotment boundary, and therefore, possibly be affected by actions occurring on adjacent lands, including allotments, fire analysis areas, and private and tribal lands. In addition, those described for each alternative and species with home ranges inside the analysis area are the following:

- Continued grazing on adjacent allotments (i.e., Cherry Creek, Frio Canyon, Red Lake, etc.)
- Prescribed burns in adjacent areas (i.e., Cherry Burn, Lacey Prescribed Burn, etc.)
- Ridge Timber Sale

Most of the environmental effects resulting from past and current projects have similar direct and indirect effects to those discussed for each alternative and are not adverse. Effects from planned projects have been or will be accounted for in separate NEPA documents. In the case of unplanned ignitions, such as the Coon Creek fire or future fires of high intensity and/or severity, fire suppression efforts are implemented to reduce adverse effects to extent practicable.

Recreation

Recreation Affected Environment

The Flying V & H allotments have several dispersed recreation sites, but no developed campgrounds. The analysis area has no major recreation facilities in the area.

The implementation of the Travel Management Rule will likely sanction Off-Highway Vehicles (OHV) motorized trails within the allotment area. This will give rise to more recreational OHV use on those trails designated to be in the forest service trail system. The Travel Management Rule process is expected to produce a Motorized Use Map by late 2010. Once the process is completed, staging areas and possibly campgrounds for OHV use may be constructed.
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The 1985 Forest Plan indicates three management prescriptions for the Flying V & H allotments. The Forest Plan describes the predominant recreation opportunity spectrum classes (ROS) for each of the management prescription areas (table 18).

The Forest Plan direction for this area is to manage for a variety of renewable resource outputs including recreational opportunities. The Forest Plan describes the predominant recreation opportunity spectrum (ROS) classes for this area to be semi-primitive motorized and roaded natural with a small percentage rural, mainly around developed recreation sites.

**Table 18. Recreation based upon Management Areas and ROS Class**

<table>
<thead>
<tr>
<th>Management Areas</th>
<th>Management Emphasis</th>
<th>Recreational Opportunity Class</th>
<th>% of Management Area</th>
<th>Visual Quality Objective</th>
<th>% of Management Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>5A</td>
<td>Wilderness Non-Motorized</td>
<td>Wilderness Opportunity Spectrum</td>
<td>100</td>
<td>Preservation</td>
<td>100</td>
</tr>
<tr>
<td>5D</td>
<td>Recreation Opportunity</td>
<td>Semi-Primitive</td>
<td>23</td>
<td>Retention</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-Primitive Motorized</td>
<td>40</td>
<td>Partial Retention</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roaded Natural</td>
<td>36</td>
<td>Modification</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urban</td>
<td>1</td>
<td>Maximum Modification</td>
<td>9</td>
</tr>
<tr>
<td>5G</td>
<td>Dispersed Recreation</td>
<td>Semi-Primitive</td>
<td>41</td>
<td>Retention</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-Primitive Motorized</td>
<td>46</td>
<td>Partial Retention</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roaded Natural</td>
<td>12</td>
<td>Modification</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urban</td>
<td>1</td>
<td>Maximum Modification</td>
<td>45</td>
</tr>
</tbody>
</table>

**Special Management Areas**

Special management areas represent congressionally designated areas, areas subject to court ordered management protection, and areas governed by agency rules published in the federal register (figure 12).

**Wilderness.** The analysis area contains a portion of the Sierra Ancha Wilderness (designated by the *Wilderness Act of 1964*). The Sierra Ancha Wilderness receives moderate visitation to its western side, i.e., Workman Creek area, mostly during the summer and fall. The eastern side of the Sierra Ancha Wilderness receives considerable visitation to the ruins along the FR 203 from October to May.

Approximately 2,260 acres of the Flying H Allotment lies within the northeast portion of the Sierra Ancha Wilderness. The *Wilderness Act of 1964*, stated in Section 4(d)(4)(2) “…the grazing of livestock, where established prior to September 3, 1964, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.” Grazing was addressed in the *1980 Colorado Wilderness Act, P.L. 96-560*, as House Report 96-617, which was reissued in House Report 96-1126.
In 1990, the House reissued the grazing guidelines as House Report 101-405, Appendix A that accompanied the *Arizona Desert Wilderness Act of 1990, P.L. 101-628*. These guidelines reaffirm the issuance of permits and the maintenance of facilities. Adjustments in livestock numbers should be made as a result of revisions in the normal grazing and land management planning and policy setting process. Occasional use of motorized equipment is authorized, when no practical alternative exists. “The use of motorized equipment should be based on a rule of practical necessity and reasonableness.”

**Inventoried Roadless Areas.** The purpose of the *Roadless Rule* was to establish prohibitions on road construction, road reconstruction, and timber harvesting in inventoried roadless areas on national forest system lands. The intent of this rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management. The *Roadless Conservation Rule* was adopted by the U.S. Forest Service on January 2, 2001.

Two roadless areas occur within the Flying V & H allotments at the north end of the Sierra Ancha Wilderness. There are 7,484 acres of the Cherry Creek Roadless area and 1,077 acres of the Sierra Ancha Wilderness Contiguous area. A few pre-existing roads/trails occur in the inventoried roadless area, and are occasionally used by the permittee for allotment management activities. No new roads or trails are proposed.
Figure 12. Map of Special Management Areas
Recreation Environmental Consequences

Recreation

All of the allotments are used by 4WD vehicles and off highway vehicles for recreation, touring, and hunting. Interaction with livestock is a probability, but not necessarily a negative impact on the motorized public. There is a possibility of motorized recreationists harassing livestock.

Alternative 1 – No Action

Direct Effects: Would reduce the need to maintain the roads for transportation of cattle.

Indirect Effects: Eliminate the presence of allotment managers in the field that often alert the Forest Service of erosion control and road maintenance needs.

Alternative 2 – Proposed Action

Direct Effects: Would maintain the status quo.

Indirect Effects: Ensure that effective reporting and advocacy for these remote roads continues.

Special Management Areas

Wilderness. Flying H Allotment encompasses part of the Sierra Ancha Wilderness.

Alternative 1 – No Action

Direct Effects: Would allow the wilderness to seek a natural order.

Indirect Effects: Tanks and fence lines would deteriorate and be removed through natural erosion and volunteer work forces using minimum requirements and primitive tools to accomplish restoration of the impacted resources.

Alternative 2 – Proposed Action

Direct Effects: Would have minimal effect on the Sierra Ancha Wilderness due to the allotment’s small amount of acreage within the wilderness boundary.

Indirect Effects: No tanks exist within the wilderness, which precludes the need to use motorized or mechanized equipment in the wilderness.

Inventoried Roadless Areas

Alternative 1 – No Action

Direct Effects: There would be less need to access or maintain tanks or roads to tanks.

Indirect Effects: This would require stabilization and reclamation efforts.

Alternative 2 – Proposed Action

Direct Effects: Flying V & H allotments contain Inventoried Roadless Areas. The Flying V & H allotments contain a number of stock watering tanks that may require maintenance periodically.
Indirect Effects: The infrequent maintenance of these tanks is allowed as a permitted action or with written authorization.

Recreation Cumulative Effects
Cumulative effects are the past, present, and reasonably foreseeable future actions that add to the direct and indirect effects considered in this EA. The following activities have been identified as potentially contributing to the effects analyzed herein. These activities and occurrences have contributed incrementally to changes in ecological conditions in the project area and may continue to influence conditions in the project area over the term of the project. Foreseeable future actions are those for which a proposed action has been approved or those proposed for NEPA analysis in the future. Other possible future actions are considered too speculative to include in this analysis. The following projects or activities could contribute toward cumulative impacts within the analysis area:

- Dispersed Recreation

Most of the environmental effects resulting from the past and current projects are not adverse, or if so, they are limited in magnitude, distance from the specific area in which the activity occurred or is occurring, and length of time in which they occur. The effects from these projects have been accounted for in the environmental consequences for each resource area.

Heritage Resources

Heritage Affected Environment
The Flying V & H allotments contain more than several hundred known and hundreds, if not thousands, of undocumented archaeological sites. These sites represent the occupation and agricultural modification and use of this area by people related to the Hohokam, Salado, and Anchan archaeological traditions over a period of 8,000 to 10,000 years. The allotments contain several known historic Apache sites. They also contain several historic sites reflecting use and occupation by Anglo and Hispanic ranchers, stockmen, miners and prospectors, and the U.S. Forest Service.

Surveyed coverage within the allotments vary, but have involved fuelwood sales, grassland maintenance thinning (agra-axe) projects, fuels management primarily in the form of prescribed burns, range improvements, mineral exploration, recreation, maintenance of utility lines with associated vegetation removal, and engineering projects relating to emergency road repairs. These formal studies also include a Heritage Overview of the Piedmont of the Sierra Ancha and the Cherry Creek geographic area, which encompasses a large portion of the lower part of the analysis area. The density of prehistoric sites within the surveyed areas has been variable, but has been very high in some areas; however, much of the analysis area remains unsurveyed. Known heritage properties include a variety of features, ranging from historic cabin sites to simple artifact scatters to large prehistoric habitation sites. The great majority of these features, however, are prehistoric consisting of collapsed stone masonry structures representing both permanent habitation as well as seasonal use, agricultural features such as checkdams and roasting pits for the processing of agave. There are also a large number of features associated with a long history of cattle ranching, including a few historic homestead sites, and both large and small-scale mining and ore processing, primarily asbestos related. Many other prehistoric and historic
archaeological sites are represented by nothing more than a scatter of artifacts on the ground surface which may have subsurface remains.

No traditional cultural properties, native plant gathering areas or tribal sacred sites are currently known to be located within the allotment; however, no specific efforts to identify and inventory such areas have been made.

From the 1870s to the early 1920s, grazing of what would become the Flying V & H allotments was heavy and unregulated. This resulted in an initial reduction of vegetative cover, which may have affected heritage resources by soil loss, erosion, and trampling. Since the establishment of the allotment and implementation of grazing management, the known heritage resources inventoried within have stabilized and in many cases improved in condition as vegetative cover returned.

**Heritage Environmental Consequences**

Impacts to heritage resources, especially archaeological sites, can be generally defined as anything that results in the removal of, displacement of, or damage to artifacts, features, and/or stratigraphic deposits of cultural material. In the case of heritage resources that are considered eligible for inclusion in the National Register of Historic Places, this can also include alterations of a property’s setting or context. In the case of traditional cultural properties and sacred places, additional considerations may include alterations in the presence or availability of particular plant species.

**Alternative 1 – No Action and Alternative 2 – Proposed Action**

Heritage resources, depending on their nature and composition, are subject to several different types of impact from activities associated with grazing.

**Effects of Grazing**

*Direct Effects:* From grazing are generally considered to be those resulting from concentrated livestock trampling or construction.

*Indirect Effects:* Can include erosion and changes in vegetative composition and density that alter the setting and geographic context of sites.

**Effects of Fuels Treatments**

Impacts to heritage resources similarly have occurred historically with regard to fire. Given the length of time that the majority of the sites within the analysis area have been abandoned (minimally 100 to 700 years) and the pre-settlement fire regime, it is assumed that prehistoric sites have experienced numerous episodes of being burned over. Some classes of prehistoric sites, particularly rock art and sites located in protected geographic locations, such as rockshelters or caves may not have experienced burning since abandonment due to the nature of the geography in which they are situated. In these instances, fire-sensitive components such as roofs in cliff dwellings, basketry and wooden tools may still be intact and would be vulnerable to any episodic wildfire or prescribed fire events. Historic sites in the analysis area are dominated by mining operations which occurred pre- and post-WWII, when suppression activities were standard practice. The lack of organic remains, such as structures and tools on open (as opposed to
rockshelters/caves) prehistoric properties is expected; the preservation of fire-sensitive materials, which are expected to still be intact on sites less than 100 years old as well as those prehistoric site classes noted above need to be ensured.

Since site condition assessments for heritage resources are not available for any time prior to the introduction of European settlement and livestock species to the Southwest, some level of effect is assumed to have contributed to the current condition of all sites on the allotment. Given the non-renewable nature of heritage resources, particularly archaeological and historic sites, any portion of them that has been damaged or removed diminishes their cultural and scientific value permanently. The missing parts cannot be replaced and they cannot be bred in captivity and released into the wild to create more sites at locations of our convenience.

**Direct and Indirect Effects:** All effects to heritage resources are considered cumulative.

**Heritage Cumulative Effects**

Based on a history of observation and consultation with the State Historic Preservation Officer (SHPO), managed grazing is not considered in and of itself to constitute an effect on heritage resources, when the grazing strategy is designed to match herd size with capacity and distribute livestock as evenly as possible across the allotment in order to avoid localized concentrations of animals and the resultant impacts to soils and vegetation associated with intense trampling. Changes in grazing strategy are likewise not considered to have an effect provided that whatever new strategy is implemented does not alter these conditions. Adverse effects can be foreseen if a proposed grazing strategy were to introduce livestock into an area not known to have been grazed historically. They may also be expected when a grazing strategy proposes shifting to a more intensive system where higher permitted numbers or high intensity/short duration schedules would concentrate livestock into confined areas, where either the absolute or relative stock density would cause a significant increase in surface disturbances due to trampling that would be above previous or existing levels. This could result in either direct or indirect adverse effects depending on the degree of trampling resulting from localized concentration and on the presence or absence of heritage resources in the concentration area, the nature of the resource and its resistance to such impacts, and the distance to other heritage sites. For the most part, these conditions tend to be associated with the construction of range improvements designed to provide water or to concentrate and hold stock for roundup or shipping. Thus, the greatest potential for direct adverse effects to heritage resources is associated with the construction of range improvements and the access roads needed to build and maintain them.

Impacts from the proposed treatments are comparable to those of past activities, which have occurred in the analysis area. As recognized in the Protocol, hand cutting and hand piling have a negligible potential for ground disturbance. Mechanical treatments involving fuelwood sales, timber sales and other thinning operations have a potential for disturbance to the top few centimeters of soil, primarily in the form of artifact and features component displacement and compaction for example, but rarely any for subsurface disturbance. It should be stressed, that mechanical treatments have not been proposed for this Environmental Analysis.

As would be expected, burning intensity varies according to the density of material burned. Broadcast burning typically consists of low-intensity fires with flame lengths of 2 feet or less and isolated torching for both ponderosa pine and pinyon-juniper, although isolated pockets of fuels may burn at moderate intensity levels. Burns within chaparral can be of high intensity given the
volatile nature of the fuels in treated areas, but in creating a mosaic pattern with specific ignition patterns, these tend to be isolated. Burning in grassland is of extremely short duration with very low intensity, having virtually no potential of impacts to Heritage resources. Fuel loadings of both live and dead components on the known sites in the analysis area generally fall within the ranges identified for their respective vegetation types. Typically, since the higher loadings tend to obscure sites, especially when the bulk of that load is composed of dense brush, needlecast and litter, on-site fuel loads tend toward the lower end of the scale; otherwise many of them might not have been identified in the first place. It should be stressed that minimally, a naturally occurring wildfire will occur even if prescribed fires are not introduced to the analysis area.

While burning operations can pose a threat to sites with organic components (e.g., wooden artifacts and features) or to some fire sensitive prehistoric site types such as rock art, depending on the nature of the artwork and the rock on which it is located. Given the low number of such sites in the analysis area, depending on the individual site conditions, the low-to-moderate intensity fires expected from prescribed burns through the fuels expected to be associated with the archaeological sites in the analysis area are thus not likely to create any substantial risk to these Heritage resources.

**Mitigation**

Mitigation of impacts to heritage resources for all alternatives is best accomplished by avoidance of these properties by the placement and construction of all range improvements. It can also be achieved by minimizing opportunities for the localized concentration of animals, improving distribution across the allotment and across each pasture, and by reducing the intensity of grazing for the allotment as a whole. In instances where a proposed improvement will involve any potential for ground disturbance, such as stock tanks and other water developments, a 100 percent archaeological survey will be conducted for areas which have no previous survey coverage, or have out-dated surveys which do not conform to current standards. Other, more specific mitigation requirements may be identified as each of these improvements is developed and a heritage inventory is made of their areas of potential effect. Such protective measures are developed in accordance with the goals of the project taking into account site vulnerability as well as the methods of project implementation. All inventoried heritage sites are treated as eligible for the National Register of Historic Places with the exception only of those that have been formally determined to be not eligible in consultation with SHPO. Archeological clearance must be approved with all necessary consultation with SHPO and the potentially interested Tribes prior to issuing any decision regarding the construction, modification, or removal of all improvements. This approach, based on long-term consultation with SHPO and on Region 3 policy as embodied in the First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities between the U.S. Forest Service Region 3, the State Historic Preservation Officers of Arizona, New Mexico, Texas, and Oklahoma, and the Advisory Council on Historic Preservation, signed December 24, 2003, and specifically, Appendix H, the Standard Consultation Protocol for Rangeland Management (Protocol H) developed pursuant to Stipulation IV.A of the Programmatic Agreement is considered to be the "standard operating procedure" for treating potential grazing impacts to heritage resources on the Tonto NF.
Protection measures identified under the Protocol H include:

1) archaeological survey will be conducted for areas proposed for surface disturbance which have no previous survey coverage, or have out-dated surveys, which do not conform to current standards.
2) relocation or redesign of proposed range improvements and ground-disturbing management practices to avoid direct and indirect impacts to historic properties.
3) relocation of existing range improvements and salting locations sufficient to ensure the protection of historic properties being impacted by concentrated grazing use.
4) fencing or exclosure of livestock from individual sensitive historic properties or areas containing multiple sensitive historic properties being impacted by grazing.
5) periodic monitoring to assess site condition and to ensure that protection measures are effective.
6) other mitigation measures involving data recovery, for example, may be developed and implemented in consultation with the SHPO as the need arises. The appropriate tribes will be consulted if the mitigation is invasive or if it affects a Traditional Cultural Places (TCP) or other property of concern for them.

These protection measures apply equally to all alternatives but a No Action/No Grazing Alternative, to which only the first two measures apply.

Similarly, based on long-term consultation with SHPO and on Region 3 policy as embodied in the First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities between the U.S. Forest Service Region 3, the State Historic Preservation Officers of Arizona, New Mexico, Texas, and Oklahoma, and the Advisory Council on Historic Preservation, signed December 24, 2003, and specifically, Appendix J, the Standard Consultation Protocol for Large-Scale Fuels Reduction, Vegetation Treatment and Habitat Improvement Projects developed pursuant to Stipulation IV.A of the Programmatic Agreement is considered to be the “standard operating procedure” for treating potential grazing impacts to heritage resources on the Tonto NF.

1. All sites not currently evaluated for National Historic Register eligibility will be treated as eligible for the Register for all levels of project(s) implementation.
2. No use of mechanized equipment (e.g., trucks, skidders, chippers, crushers) will occur within established site boundaries.
3. No staging of equipment or supplies will occur within established site boundaries.
4. No piles of slash will established within site boundaries.
5. During any subsequent burning activities, no ignition points will occur within established site boundaries.
6. Fire-sensitive sites (sites containing fire-sensitive components, including but not limited to, organic elements, rock art, etc.) will be protected during any subsequent burning activities, including maintenance burns, by the use of hand lines, wet lines, or staging of an engine adjacent to the site as determined appropriate to the resource through consultation with fire management and heritage resource personnel.
7. Standing trees within established site boundaries will be felled using hand falling techniques only.
8. Standing trees within and adjacent to established site boundaries will be directionally felled peripherally, away from site feature(s).
9. Slash resulting from harvest activities will be scattered to limit fuel concentration within established site boundaries and to provide erosion protection, or removed entirely from
Socio-Economics

Socio-Economics Affected Environment

Young, Arizona, is a small (population approximately 561 by Census 2000), remote community accessed by dirt and graveled roads 126 miles northeast of Phoenix. The town is completely surrounded by the Tonto NF. Originally established as a cattle ranching community in the 1880s, the town is primarily a retirement and second home community, with the median age of the population being 48.3 years. However, cattle ranching remains an important part of the local culture and economic base. Major employers in the community are the public school and the U.S. Forest Service. Of the approximately 5,000 acres of private land ownership in the valley, about half or 2,500 acres have been subdivided into 2-to-5 acre plots, and the remaining 2,500 acres remain as open space (Arizona Department of Commerce, 2008).

Gila County, with a population of approximately 51,335 (U.S. Department of Interior, 2000), encompasses approximately 4,752 square miles. Within the county, ownership or administrative control occurs as follows: the U.S. Forest Service -55.5 percent of the land, Apache Tribe -37 percent, individuals and corporations -3.7 percent, U.S. Bureau of Land Management -1.9 percent and the state of Arizona –less than 1 percent (Arizona Department of Commerce, 2008). With little private land to assess property taxes, the county is dependent upon the funding from the federal government. The U.S. Government makes payments to Gila County under various programs, the two most important being:

1) Payments in Lieu of Taxes (PILT). These payments are made to the local governments based upon the acreage of federal land within the county, population, consumer price index and previous year payments. In 2001, Gila County was to receive approximately $1,498,572 from this program.

2) Secure Rural Schools and Community Self Determination Act of 2000 (PL 106-393). Traditionally, the federal government had returned 25 percent of the revenues collected on Forest Service lands from grazing permits and timber sales to the counties on which these revenues were generated. With decreased timber sales and fees generated from grazing permits, the above Act was designed to “...restore stability and predictability to the annual payments made to States and counties containing National Forest System lands and public domain lands managed by the Bureau of Land Management for use by the counties for the benefit of public schools, roads and other purposes.” Under the legislation, the County would receive a fixed income from the federal government, regardless of the income generated on the federally administered lands. The amount is to be based on the average of the highest three years within a ten-year period. Gila County has elected to be funded under the Act, rather than continue to receive 25 percent of the revenues generated from the Forest Service System lands.

The social environment is perhaps the most diverse and emotionally charged arena in ecosystem management. The social environment for this analysis comprises the people living in and adjacent to the Tonto NF. Forest resources play an important social role for the people of the Southwest. The goods, services, and uses available from the National Forests represent major components in the lives of many residents within the area of the Tonto NF, especially those in rural areas.
Geographically this region has two distinct types of population centers. There are several small rural communities scattered along and within the boundaries of the Forest. In addition, the Phoenix metropolitan area abuts the Forest along its southwestern boundary. The smaller communities tend to rely at least partially on Forest resources (mining, ranching, and timber) for their economic development. This is evidenced by the Gila County Land Use and Resource Policy Plan for public lands, which states, "Federal and state agencies need to recognize and take into account the critical role that public lands in Gila County play in the overall functioning of the County, and in the County's economy and tax base" (Gila County, 1997). The Phoenix metropolitan area and the town of Payson have experienced great population growths in recent years. The influx of people has caused public opinion to change regarding what the appropriate uses of the public lands are. Those uses which have had historical importance to many rural areas in the past (timber, livestock grazing, and mining) are being looked upon as not appropriate, whereas the demand for recreational type activities on public lands is greatly increasing.

Few generalizations can be made about the communities across the Southwest. They are as diverse as the people who live there and due to the increasing desirability of the Southwest as a living location. The diversity is ever increasing. It should not be expected that all residents have the same or even similar points of view on various issues.

Lifestyles include style and perceived "quality of life" for individuals or groups. This may include employment or work patterns, leisure and recreation behavior, how and where people practice their religion, and visitation patterns with friends and family.

In rural areas of the Southwest, where sparse populations dominate the landscape, a rural lifestyle exists. Most residents live close to where they work and have a direct or indirect tie to the natural resources for their livelihood. Most rural residents believe resource utilization would be less disruptive to their local communities than most other forms of economic development. Recreational activities generally include hunting, camping, and fishing. Rural residents tend to be willing to live at a lower income, if the only means of acquiring higher incomes is to live in a highly urbanized area. Community and family are essential to their quality of life.

Ranching and the grazing of domestic livestock have been a part of the Southwest culture for 400 years. Grazing sheep and cattle in the Southwest was introduced by the Spanish in the late 16th century. The tradition of an open range endured for several hundred years before Anglo-Americans arrived in the Southwest, and when they came, the new arrivals expanded the traditional pastoral practices into modern range-cattle and sheep industries. In the Southwest, the national forests were of equal or greater importance to the people for their range resources, as they were significant for timber, watershed, or mineral resources (Baker, 1988).

Effects to lifestyle, personal values, and attitudes are hard to quantify and explain. Effects to individuals will vary greatly depending on each individual's personal operation and values. The effect of change on any individual permittee would vary depending on the size of loss or gain, the financial condition of the operation, the price of the product at market, operating costs, dependency on federal lands for their operation, diversity of their household income, and desire to remain in the ranching business. These factors are very individualistic, and as such, are hard to specifically quantify. Additionally, much of this information is of a personal nature and not readily shared with others in a public domain.
The effects to community will vary depending on the community's capacity to adapt to internal and external forces. Community capacity depends upon the community members’ collective ability to pursue goals; the skills, experience and education levels of people in the community, and the diversity of local businesses. Generally, small isolated communities are more vulnerable as they contain less diverse economies, less capital, and have fewer people to initiate and implement change.

**Economic Effects**

Neither alternative will affect future payments received through PILT or PL 106-393. Young and Gila County could be affected by the alternatives due to the amount of money made by the permittee and how much is spent in the local economy. This is related to a multiplier effect, or that monies spent in a community are re-spent. Multipliers in rural communities are generally lower than for large municipal areas, as expenditures for large ticket items are usually made outside the local area. Multipliers of 1.25 to 1.75 are common in rural areas associated with adjacent public lands (Loomis, 1993).

Because the effects are related to the dollars generated and spent by the operation, economic returns to the community and county would be greatest under Alternative 2, and there would be no economic returns as a result of grazing activities under Alternative 1.

**Social Effects**

Removal of the livestock could result in the loss of some of the culture and lifestyle tied to ranching. This could intensify feelings of mistrust, loss of personal control, and threaten lifestyles, resulting in negative attitudes towards the Forest Service, and other federal agencies in general.

Conversely, those individuals who perceive grazing to be an unsuitable use of federal lands may feel increased trust and increased positive attitude towards the Forest Service, and other federal agencies in general. These individuals may perceive an increased social benefit from livestock removal.

Personal characteristics such as self sufficiency, independence, hard work, and other traits associated with the ranching lifestyle would most likely be protected under this alternative. Continuation of the ranching operation in a sustainable manner will provide for the continuation of the culture and lifestyle tied to ranching in this area.

Conversely, those individuals who perceive grazing to be an unsuitable use of federal lands may feel decreased trust and increased negative attitude towards the Forest Service, and other federal agencies in general. These individuals may perceive a decreased social benefit from continuing grazing.

**Environmental Justice**

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Toward attaining EJ for all communities and persons in the United States, Executive Order 12898 (February 11, 1994) directed all Federal agencies to evaluate their proposed actions to determine the potential for disproportionate adverse impacts to minority and low-income populations.
In the memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice concerns. The memorandum states that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA.”

Implementation of either alternative evaluated in this EA would not result in adverse impacts to environmental resources and socioeconomic conditions. Therefore, disproportionate direct, indirect, or cumulative adverse impacts on low income or minority populations would not occur.

Prescribed Fire
There are two active or proposed prescribed fire projects located within the project area: the Lacy Burn (28,720 acres), and Cherry Burn (42,000 acres).

Approximately one-sixth (4,108 acres) of Lacy Prescribed Burn project overlaps the affected allotments. The intent of this project is “improve forest health, age class diversity, and reduce fuel loadings to a manageable level in order to allow natural wildfire to play its role in the ecosystem.” This project is restricted to only burning 5,000 acres per year. This area was last treated in 2006.

The Cherry Burn project has 30,101 acres overlapping the proposed project area. This project is restricted to only burning 5,000 acres per year. Desired conditions for areas treated by prescribed fire are to treat an average of 1,000 acres per year in the piñon-juniper vegetation communities. Few trees over six inches in diameter are expected to be affected by prescribed fire; therefore, it is anticipated that the structure will remain in the mature age class, 6-11” dbh (Forest Plan, 1985).

Direct Effects of Project Actions: Since the amount of available forage is the factor that dictates the carrying capacity for grazing on the rangeland resource, available forage is the unit of measure that should be used to measure the effects of project actions on the rangeland resource. Range structures are those fences, water developments, and other constructed facilities that are necessary to implement a grazing strategy. These structures are government property maintained by the authorized permittee, and they may be affected by project actions. Direct effects are assumed to be those occurring immediately upon implementation, and within 1 year following treatment (table 19).

<table>
<thead>
<tr>
<th>Action</th>
<th>Direct Effect To Rangeland Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast Burning or Vegetative Maintenance (34,209 acres)</td>
<td>Forage plants will be consumed by fire, leading to direct reduction in available forage in areas that are burned. This is the most widespread treatment that is proposed, so if large sections of an allotment or pasture are burned in a single year, it would likely negatively affect an allotment’s carrying capacity for that year, or would alter the pasture rotation schedule for that year. Livestock may be harmed, if burning occurs when they are using a pasture. Range improvements such as fences, water developments, or corrals may be damaged by fire. The reduction in available forage could last 1-2 years or more, depending on growing conditions for forage plants.</td>
</tr>
</tbody>
</table>
**Indirect Effects, Long-Term:** Long-term effects are taken to be those that occur at least 1 year after project implementation, lasting up to 5-50 years (when vegetation density may reach pre-treatment levels, depending on vegetation type) (table 20).

### Table 20. Indirect effects to rangeland resources from implementation of prescribed fire

<table>
<thead>
<tr>
<th>Action</th>
<th>Indirect Effect To Rangeland Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast Burning or Vegetative Maintenance (34,209 acres)</td>
<td>Burning brush species in chaparral habitats can improve the quality of the browse by making it more palatable and accessible (increase in available forage). The improvement may be seen in the year immediately following the burn, and could persist for 5-10 years. Burning has also been shown to release nutrients into the soil that is held in litter and woody debris. This “fertilizer effect” can lead to increased herbaceous production following a burn. The effects would be short-lived, probably lasting only 1-3 years following the burn. Burning may also reduce the shrub and small tree overstory, which would create openings favorable for herbaceous plant establishment. Broadcast burning can remove the thick layer of needle-cast and other large organic debris that may be inhibiting herbaceous plant establishment on the forest floor; this would likely result in an increase in the available forage following favorable climatic conditions. The improvement in forage production could be seen until the overstory becomes thick again, or the litter layer builds up extensively, which may take 10-20 years or more. Areas burned to bare ground may be more readily colonized by noxious/invasive plant species.</td>
</tr>
</tbody>
</table>

### Timber

**Timber Affected Environment – Woody Vegetation**

**Existing Condition**

There are approximately 67,291 acres within the Flying V & H analysis area with approximately 42,058 acres classified as juniper or piñon-juniper woodland and approximately 3,677 acres classified as ponderosa pine type. Species composition and stand densities are quite variable and are influenced by aspect and soil types. There are two general categories that can be used. Juniper woodland generally consists of areas stocked predominantly with alligator juniper which has a grassy understory. These areas tend to occur on flatter topography. Many of these areas are juniper savannahs, some of which have experienced juniper invasion and other areas were chained in the 1950s and 60s and have regenerated to predominantly alligator juniper. The second category is piñon-juniper, which is distinct from the juniper woodland in that it is stocked with a variety of species such as alligator juniper, piñyon pine, Arizona white oak, Emory oak, sparse ponderosa pine, and tends to have a shrub component in the understory. Grass understory may exist in some sites of this type, depending upon soils, and on other sites the shrub component may dominate the understory. Steeper slopes in this type tend to have the dense shrub understory with little herbaceous cover.

Densities are quite variable across the juniper woodland and piñyon-juniper woodland types. Areas that are juniper woodland savannahs may only have 20-30 ft.$^2$ of basal area/acre of large diameter trees (i.e., 20-30") and areas that were pushed or chained in the 1950-60’s may have similar or higher basal areas, that consist of small diameter trees (i.e., $\leq 10.0’$) that have come back from seed and sprouts. Areas of piñyon-juniper type may have basal areas of 70 to 100 ft.$^2$/acre comprised of a mix of alligator juniper, Arizona white oak, Emory oak, piñyon, and sparse ponderosa pine. These stands tend to be multistoried and uneven-aged, consisting of: (1)
junipers ranging from 0.1” diameter up to trees 30 to 40” in diameter; (2) oaks that are 0.1” to 30+” diameter; (3) piñon ranging from 0.1” up to 14” or more; and (4) the widely scattered ponderosa pine that will generally be 12-20”+ in diameter. Stems/acre may number into the hundreds because of oak, juniper, and piñon reproduction. Stand density correlates directly with herbaceous understory. The denser the stands, the less herbaceous cover exists. The more open the tree canopy is, the more herbaceous cover exists or the greater the potential is for herbaceous cover.

The ponderosa pine stands tend to occur on north aspects and as stringers along drainages where more moisture is available. These stands appear to be single storied or possibly two storied in structure and generally consist of trees ranging from 5” diameter up to trees 20-30” in diameter. The majority of trees are in the 15-30” diameter range and generally there is little or no ponderosa pine regeneration occurring. The understory and mid-canopy trees are alligator juniper, Arizona White oak and Emory oak. Basal areas range from 60 to 150 ft.$^{2}$ with stand averages generally around 100-120 ft.$^{2}$

**No Action Alternative**

This alternative provides no treatments of woody vegetation by mechanical means or by fire. The juniper woodland and the piñon-juniper woodland areas will continue under their current conditions for a period of time. However, as time goes by stand conditions will change in each of these types due to tree growth and reproduction that will occur.

Juniper woodland areas that are savannahs and currently producing fair to good forage will experience a reduction in forage production if no treatment or natural disturbances occur over the next 20 to 40 years. Forage production will be reduced due to increasing numbers of junipers from natural reproduction and from existing trees expanding in stem and crown diameters. Additional canopy cover will create more shade and adversely affect herbaceous cover. Savannah areas may experience reduced forage production of ±10% (estimate only) over a 40 year period. Areas where young junipers are currently dense (i.e., areas chained 40-50 years ago) and forage is limited will experience significant increases in canopy density and forage reduction. Fire risk may reduce over this time period due to a reduction in fuels capable of carrying fire.

Piñon-juniper stands with grassy understories will likewise experience an increase in the number of stems per acre due to natural regeneration of oak, juniper, and piñon. Existing trees will increase considerably in stem and crown diameters over a 40 year period. Current oak, juniper and piñon seedlings that are ± .5” diameter and 1-3 feet in height may well be ± 5.0” diameter and 15-20 ± feet in height. Existing overstory trees will also increase in diameter and crown width, all of which will adversely affect and reduce forage production. Some mature overstory trees will die over this time period. Fire risk in these sites may go down since fine fuels for carrying fire (i.e., grass) will be reduced. The denser stand conditions will create conditions more favorable for insect and pathogen problems in the tree species.

Piñon-juniper sites that have a shrub understory will likewise increase in stand density from tree growth and reproduction over a 40 year period. Shrubs will tend to expand their area of occupancy and increase in density and height. This will significantly reduce any forage that currently exists on these sites. Dead wood in the shrub and trees layers will increase and create more potential for fire occurrence and fire risk. Potential for pathogen and insect problems will increase.
ponderosa pine stands will continue to grow. Canopy closure will increase, tree diameters will increase 2-4 inches over a forty year period, thus increasing the stand basal area/acre. This increased growth and canopy closure will further reduce forage production and the potential for the ponderosa pine to naturally regenerate. Forest floor fuel loadings will increase from the current level of about 10-15 tons/acre to potentially ≥20 tons/acre, which will increase the fire risk. Increase stand density and will reduce tree vigor and health and create potential problems from pathogens and insects.

**Proposed Action**

Proposed actions of juniper thinning, fuelbreak construction, and prescribed burning will provide a means to reduce vegetation density, alter structure, and age class distribution, and reduce fuel continuity, all of which will tend to reduce fire risk, increase forage production potential, and improve wildlife forage and browse.

Areas of juniper woodland that may be thinned will have stand density significantly reduced, especially in stands where alligator juniper is the primary or only species occupying the sites. Such sites that were chained in the 1950s or 60s are presently stocked with several hundred stems per acre, most of which are ≤ 8” diameter. Treatment will reduce stocking to a minimum of one tree/acre average with the largest trees being retained. Slash will be lopped and scattered, which will help reduce erosion and provide a microhabitat for existing grass to increase in health and vigor, produce seed and to increase area of occupancy. Sites that currently display fairly good grass cover and are not experiencing much erosion will respond the fastest. These sites may achieve sufficient grass cover to allow broadcast burning to occur within 4-5 years after thinning. Burning will help reduce juniper sprouts and maintain the open character achieved by thinning. Sites that are currently experiencing erosion and have rather poor grass cover may require ± 15 years to achieve sufficient grass cover to carry a broadcast burn. This time period will allow sprouts to grow tall enough to be out of lethal range of a light to moderate grass fire. Therefore, an additional maintenance thinning of the sprouts may be necessary to allow maintenance of the thinning by means of prescribed fire. Repeated burning at 5-6 year intervals may then be effective in maintaining the open character created by the thinning.

Piñyon-juniper sites with a grass understory and light shrub component that are treated by the fuelbreak construction will see a reduction in tree canopy cover and increased forage production. Tree canopy cover may be reduced 40-60 percent from pretreatment levels. Thinning will create a distribution of trees ≥ 10 inches diameter as individuals, small clumps or groups with trees ≤ 10” diameter found as individuals spaced about twenty feet apart and 20 feet from these clumps and groups. Slash from the cut trees and shrubs will be piled and burned. Since a grassy understory exists, there is potential for forage production to improve sufficiently over a 4-5 year period to possibly carry a prescribed burn. Burning will help reduce the oak and juniper sprouts that will occur. It is possible that sufficient forage will occur to allow repeated burning at 5-6 year intervals to help maintain the open character created by the fuelbreak thinning. Sites such as these that fall within “juniper thinning” areas will experience increase potential for forage production due to decreased canopy cover. However, these areas will not experience the level of canopy reduction as the fuelbreak because only juniper ≤ 8” dbh (diameter at breast height) will be cut. All other existing oak, piñyon, and ponderosa pine and shrubs will be retained. These areas may only experience a canopy reduction of 20-40%. These thinnings will improve forage production and allow use of fire as a periodic disturbance (reintroducing fire as a natural disturbance). Fire risk may actually increase somewhat due to increased forage available to carry fire. Stand density
reduction will provide a positive effect in reducing conditions favorable to insects and pathogens that infect the tree species.

Piñyon-juniper sites with a shrub understory that are thinned for fuelbreak construction will see a similar tree canopy reduction as mentioned above. The primary difference will be a heavier, denser shrub component that is removed, piled and burned. Due to the sites being more favorable to shrub cover than forage cover, the use of prescribed fire to maintain the open character created by the thinning may not be possible. If sufficient herbaceous cover becomes established over time to carry fire, then prescribed burning could play a role in maintenance. Most likely, the shrub component and the oak and juniper will sprout and restock the sites. Additional thinning may be necessary to maintain the open character desired for the fuelbreak. Sprouting will provide good browse for wildlife and the fire risk of these sites will be significantly reduced since flammable material (dead woody material) will be removed. Potential problems from pathogens and insects will be reduced due to reduced tree density and improved tree health and vigor.

The ponderosa pine stands within the fuelbreak treatment areas will have the understory and mid-canopy density reduced by thinning of juniper, oak, and some pine ≤ 10”diameter. This will reduce fuel ladders within these stands but will not reduce the pine density of the overstory. This will allow these stands to be prescribe burned without much potential for torching or crowning, since the fuels that would normally carry fire into the crowns will be eliminated. Pile burning followed by prescribe burning may scorch some overstory trees and possibly create some holes in the overstory canopy if ground fuels (litter, logs, limbs, etc) are sufficient to create the heat to kill small patches of the overstory. Generally, the pine stands will not see much reduction in canopy cover or stand density as most of the overstory trees are large enough in diameter and crowns height is sufficient to not be damaged much by a low to moderate intensity surface fire. Any canopy gaps that are created by burning will allow more sunlight to reach the forest floor and thus allow for herbaceous cover to establish and possibly pine regeneration to occur over time.

Piñyon-juniper woodland outside of the proposed fuelbreaks will be treated by prescribed fire. Areas with sufficient herbaceous cover to carry fire will experience mortality of the smaller trees and shrubs. Burning will probably not kill many of the large trees unless fuel loading (i.e., Limbs, dead wood, etc) is sufficient within their vicinity to produce enough heat and flame height to kill them. It is not anticipated that fire will reduce tree stocking significantly in such areas, but if forage is sufficient to carry fire, it is probably fairly open to begin with. In contrast, piñyon-juniper sites with shrub understory that have sufficient dead woody component to carry fire will burn at much higher intensities and will probably kill 60 to 100 percent of the trees within the path of the fire. The steeper the slopes the more mortality will occur. Prescribed burning will create a mosaic of burned and unburned areas across the landscape. The unburned areas will remain essentially the same as they are. Areas that are burned may not have many live trees remaining, but this will vary with burn intensity. These burned areas will have shrubs and juniper and oak sprouts appear within the first year of burning. These sprouts will create new stands of early successional stage trees and shrubs adjacent to unburned areas of older, later successional stage trees and shrubs. As burning progresses over the landscape during a 10-15 year period, it will create a diverse mosaic pattern of age and size classes across the landscape and help meet LMP desired conditions.
**Cumulative Effects**

**No Action Alternative**

Existing conditions of the woody vegetation is a result of the past hundred or more years of intense grazing and fire suppression activities. Reduced herbaceous cover created conditions favorable for juniper, oak, and piñon regeneration to occur and shrub species to increase areas of occupancy. Fire suppression prevented fire from doing its natural role of reducing densities. This has lead to dense stands of woodland species across the landscape. This alternative carried into the future will create denser stand conditions, will increase fire risk, and increase risk of insect and disease related events that may cause extensive mortality. The desired conditions of improving forage production and ground cover in savannahs will not be met. Improving and maintaining improved age class distribution across the landscape will not be met and creating conditions conducive to using prescribed fire as a tool to allow fire to play its natural role in the ecosystem will not occur. Potential for large scale, high intensity wildfires will increase.

**Proposed Action Alternative**

The proposed action and its use of juniper thinning, fuelbreak construction, and prescribed fire will help meet the desired conditions of (1) improving age class distribution; (2) reducing juniper densities in the juniper savannas and piñon-juniper types to increase forage and improve ground cover; (3) improving health and vigor of woodland tree species and moving it more toward historical conditions; and (4) use of prescribed fire to improve forest health, age class diversity, and reduce fuel loadings to a more manageable level while allowing fire to play a natural role in the ecosystem. Conditions created by the proposed actions will be an improvement for the resources compared to the no action alternative, but will not move the landscape very far in the direction of historic conditions. Continued treatments over time and more intense treatments overtime will be needed to more approximate historical conditions. The proposed actions will provide distinct improvements in general health and vigor of woody species as well as forage and ground cover and wildlife habitat and improve the sustainability of these resources for use by future generations.
Chapter 4 Consultation and Coordination

The Forest Service consulted the following individuals, Federal, state and local agencies, tribes and non-Forest Service entities during the development of this environmental assessment:

Consultation with Others

The Forest attempted to contact 84 separate individuals/parties believed to be interested or affected by the proposed action, when it initiated scoping on the proposed action through a scoping letter sent on February 13, 2008. The scoping document was sent to the following: 28 individuals, 17 private organizations, 9 tribes, 1 university professor, 12 state/county/community officials, 3 federal agencies and 4 congressional delegates. From these scoping activities, 9 comment letters were received.

A second scoping document including the Chapter 1 and 2 of the EA was sent out to the public on June 9, 2008, along with a second notice published in the Payson Roundup on June 6, 2008. The purpose of the document was to further describe the proposed action along with a preliminary effects analysis to previously interested/affected parties. The scoping document was sent to the following: 12 individuals/private organizations, 9 tribes, and 5 state/county/community officials. From these scoping activities, 5 comment letters and or emails were received.

From these scoping activities, 12 parties commented or otherwise expressed an interest in the proposal and will receive a notice of this environmental assessment. Complete mailing lists of individuals and groups consulted with are contained in the project record.

Federal Agencies

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service

State/County/Local Government

- Arizona Department of Water Quality
- Arizona Department of Water Resources
- Arizona Game and Fish Department
- Arizona State University (ASU), Center for Environmental Studies
- Gila County Board of Supervisors
- Gila County Extension Service

Tribes

- Fort McDowell Yavapai Nation
- Yavapai-Prescott Tribe
- Yavapai-Apache Nation
- Tonto Apache Tribe
- San Carlos Apache Tribe
- White Mountain Apache Tribe
- Salt River Pima-Maricopa Indian Community
- The Hopi Tribe
- Zuni Pueblo
Chapter 4 – Consultation and Coordination

**Individuals/Organizations**

American Rivers
Center for Biological Diversity
Forest Guardians
Audubon Society
Maricopa Audubon Society
Nature Conservancy
Palo Verde Sierra Club
Sierra Club, Grand Canyon Chapter
Sonoran Bioregional Diversity Project
Southwest Center for Biological Diversity
Southwest Forest Alliance

The Wilderness Society
Tonto Rim Sports Club
Western Watersheds Project, Erik Ryberg
Wilderness Society
Bob Benne
Jeff Burgess
Woody Cline
Dave Cook, Gila County Cattle Growers
Nathan Ellison
Mike Hemovich
Michael Lechter

**List of Key Preparers, Team Members**

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<tr>
<th>Don Luhrsen, District Ranger</th>
<th>Responsible Official</th>
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<tr>
<td>Sean Brown, Team Leader</td>
<td>Writer, Range, Vegetation/Watershed &amp; Socio-Economic Analyses</td>
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<td>Julia Camp, District Wildlife Biologist, Pleasant Valley RD, Robert Calamusso, Fish Biologist Supervisor’s Office, Jennifer Jennings, Senior Biologist, Logan Simpson, Design Inc.</td>
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<td>Dave Frew, Recreation, Lands, Minerals Staff, Pleasant Valley RD</td>
<td>Recreation/Lands/Special Uses Analyses</td>
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<td>Janet Grove and Lynn Mason, Riparian Ecology and Hydrology, Supervisor’s Office</td>
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<td>Norm Ambos, Soils and Watershed Staff, Supervisor’s Office</td>
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<td>Denise Ryan, Forest Archeologists</td>
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<td>Genevieve Johnson</td>
<td>Forest Planner</td>
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<td>Candy Luhrsen</td>
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Appendix C. Definitions

**Animal Unit Month (AUM):** The amount of forage required by an animal unit for one month is often calculated as 26 lbs. of forage per day by dry weight. The term is an expression of grazing impact and is related to the amount of forage removed. When estimating stocking rates for grazing allotments, the amount of forage available is expressed in AUMs of forage. This gives an idea of how many animals of a certain class or kind can graze. A cow/calf pair requires an average of 1.32 AUMs of forage for one month, a dry cow (no calf) 1 AUM, a yearling steer or heifer is 0.7 AUM. An AUM is the proper basis for documenting estimated grazing capacities and estimating and describing grazing impacts.

**Conservative Use:** Forage utilization is maintained between 30-40 percent of annual forage production by weight in pasture key areas. Qualitative indicators of conservative use can be described by the following: forage plants have abundant seed stalks; areas more than a mile from water show little use; about one-third to one-half primary forage plants show grazing on key areas (Holechek, et. al., 1999).

**Deferred Rest-Rotation Grazing Strategy:** A grazing system in which the same pasture is not grazed at the same time during the growing season in consecutive years (deferment), with a rest period also added in which the pasture is not grazed at all during the growing season. A typical 3-pasture scenario using this system would have pasture A grazed May-July in year 1, August-October in year 2, and rested in year 3. The schedule then repeats.

**Desired Plant Community** is determined through the interdisciplinary planning process based on desired conditions for vegetation within a planning unit. The desired community may be a lower successional stage within a potential natural community that is a forested type in order to maximize forage output. Ecological Site Descriptions for certain range sites may describe the desired plant community (*R3 Rangeland Analysis and Management Training Guide*, 1997).

**Effective Ground Cover** is a measure of the percentage of ground area covered by live basal vegetation or persistent litter. These serve to protect the soil surface from accelerated erosion. It is a Tonto NF Plan guideline to “maintain a minimum of 30 percent effective ground cover for watershed protection and forage production.”

**Key Areas:** A relatively small portion of a range selected because of its location, use, or grazing value as a monitoring point for grazing. Key areas should be located within a single ecological site or plant community, be responsive to management actions and be indicative of the ecological site or plant community they are intended to represent. Key areas will normally be ¼ to 1 mile from water, located on productive soils with level to intermediate slopes, and be readily accessible for grazing. Size of key forage monitoring areas may be 20-500 acres. In some situations such as high mountain meadows with perennial streams, key areas may be closer than ¼-mile from water and less than 20 acres (Forest Plan, p. 42-1).

**Light to Moderate Grazing Intensity:** Based on review of numerous grazing intensity studies, Holechek (1999, 2004) identifies light-to-moderate grazing as 32-43 percent average use of primary forage species. These averages are based on pasture-wide utilization averaged over time. The Forest Service monitors utilization based on the use of key forage species in key areas. Key areas are selected to be representative of management effectiveness over the entire pasture. For the purposes of monitoring, an annual use guideline of 30-40 percent of key species in key areas would be used to monitor use in all pastures, which combined with growing season rest or deferment, should ensure pasture-wide average use of less than 40 percent. Grazing intensity can
be measured before and during the growing season. Grazing intensity can be utilized to manage livestock so that expectations of end of growing season utilization measurements will not be exceeded.

**Parker Three Step Method**: A method for determining range condition used by Region 3 of the Forest Service. The method is outlined in *R3 Forest Service Handbook 2209.21*. The vegetative rating shown by this method is a commodity rating based on the value of the land for cattle grazing. The more plant species present that cattle prefer to graze, the higher the vegetation condition portion of the score. It is not a measure of ecological status or similarity with site potential.

**Prescribed fire** is defined as either a prescribed management ignited fire or an unplanned natural ignition fire.

**Range Condition** is a subjective expression of the status or health of the vegetation and soil relative to their combined potential to produce a sound and stable biotic community. Soundness and stability are evaluated relative to a standard that encompasses the composition, density, and vigor of the vegetation and physical characteristics of the soil. Condition classes may be classified as excellent, good, fair, poor, and very poor (Forest Plan, p. 59).

**Satisfactory Range Condition** can be evaluated using the Parker Three Step method. A Parker Three Step vegetation and soil stability rating that is fair or better with a stable or upward trend is also considered satisfactory range. Ratings less than fair with an upward trend are moving towards this objective (*R3 Rangeland Analysis and Management Training Guide*, 1997).

**Satisfactory Watershed Condition** can be evaluated using the Parker Three Step soil stability rating, which includes an erosion hazard component and a subjective evaluation of current erosion. A soil stability score that rates fair or better is considered satisfactory, or an upward trend towards a fair rating. Satisfactory watershed condition can be visualized as an area with minimal sheet erosion, good groundcover from live vegetation and litter, and bare spaces generally small and not coalescing, or without distinguishable runoff pattern (*R3 Forest Service Handbook 2209.21, Ch. 40*, 1988).

**Soil condition** is an evaluation of soil quality based on an interpretation of factors which affect vital soil functions. These functions are: the ability of the soil to hold and release water (hydrologic function), the ability of the soil to resist erosion and degradation (soil stability), and the ability of the soil to accept, hold and release nutrients (nutrient cycling). Categories of soil condition are satisfactory, impaired, and unsatisfactory.

**Watershed Condition** is a measure of the ability of a watershed to provide a sustained and orderly flow of water while maintaining soil productivity (Forest Plan, p. 234).